

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

+++++

BRIEFING ON RESOLUTION OF GENERIC SAFETY ISSUE-191,
ASSESSMENT OF DEBRIS ACCUMULATION ON PRESSURIZED WATER
REACTOR SUMP PERFORMANCE

+++++

THURSDAY

APRIL 15, 2010

+++++

The Commission convened at 9:30 a.m., the Honorable Gregory B. Jaczko,
Chairman, presiding

- NUCLEAR REGULATORY COMMISSION
- GREGORY B. JACZKO, CHAIRMAN
- KRISTINE L. SVINICKI, COMMISSIONER
- WILLIAM D. MAGWOOD, IV, COMMISSIONER
- WILLIAM C. OSTENDORFF, COMMISSIONER

1 STAKEHOLDER PANEL

2 AMIR SHAHKARAMI, CHAIRMAN, PWR OWNER GROUP EXECUTIVE COMMITTEE,

3 SENIOR VP EXELON AND SITE VP BRAIDWOOD, EXELON NUCLEAR

4 DAVID HEACOCK, PRESIDENT AND CHIEF NUCLEAR OFFICER, DOMINION NUCLEAR

5 JEFFRY GASSER, EXECUTIVE VP AND CHIEF NUCLEAR OFFICER, SOUTHERN

6

7

8 NRC STAFF

9 BILL BORCHARDT, EXECUTIVE DIRECTOR FOR OPERATIONS

10 JOHN GROBE, DEPUTY DIRECTOR FOR ENGINEERING AND CORPORATE

11 SUPPORT, NRR

12 WILLIAM RULAND, DIRECTOR, DIVISION OF SAFETY SYSTEMS, NRR

13 MCHAEAL SCOTT, CHIEF, SAFETY ISSUE RESOLUTION BRANCH, DIVISION OF

14 SAFETY SYSTEMS, NRR

15

16

17

18

19

20

21

22

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

2 CHAIRMAN JACZKO: Good morning everyone.

3 It is a little warm in here, so I will not
4 be offended if anyone wants to take off their
5 jacket or anything like that.

6 Feel free, if it gets a little hot.

7 They are working on it.

8 I think today is a very good opportunity to
9 really have an in-depth briefing and discussion on
10 one of the canonical long-standing safety issues
11 that this Commission has been dealing with.

12 When I first came to the Commission in
13 2005, I learned a little bit about GSI-191.

14 One of the things I quickly learned was
15 that what I was learning wasn't particularly new.

16 This is an issue that has been around for
17 some time, we have been working for a long time to
18 get resolution, really culminating in a generic
19 letter that was issued in 2004.

20 That generic letter had put a response time
21 for submittals at the end of 2007, and so we are in
22 that period now where we are working through the

1 submittals and working to get closure, which I
2 think is a very important point for this issue.

3 One way or another, I think we have an
4 opportunity today to have the Commission shed some
5 light on their thoughts on what appears to be a
6 reasonable approach by the staff to work to closure
7 with the issuance of a series of 50.54(f)
8 letters, with a plan to have licensees perform
9 additional modifications in the next two outages
10 that they are planning.

11 I think the fundamental question for the
12 staff today is, or I think for the Commission, is
13 to really look and see if there is really a
14 technical reason why we shouldn't be moving forward
15 in that direction.

16 I hope as we go through the presentations,
17 we will hear from the industry and from the staff,
18 what the technical underpinnings are for the
19 various views that we have about whether or not we
20 have resolved all of the safety issues here with
21 GSI-191.

22 I look forward to a very informative

1 meeting and keeping in mind that this is certainly
2 one of the most important and fundamental safety
3 issues that we deal with.

4 Recirculation and loss of coolant accidents
5 is one of the most fundamental design basis
6 accidents that we deal with.

7 That system, in our regulations, is
8 required to function for long periods of time to
9 allow for long-term cooling, and that is our
10 recirculation system and it's a fundamental system
11 and it is clearly one of those we got wrong a
12 couple of decades ago.

13 The initial assumptions we made were 50%
14 sump blockage, and we had very small sump screens.
15 That was clearly something that turned out to be an
16 incorrect assumption, a non-conservative
17 assumption, and that led I think to where we are
18 today to try to resolve this issue and deal with
19 all of the phenomenon associated with it.

20 I look forward to a very interesting
21 discussion, and we will hear first from an industry
22 panel and then from the staff.

1 I will ask if any of my colleagues would
2 like to make any comments.

3 COMMISSIONER SVINICKI: Thank you Mr. Chairman, I
4 appreciate you giving some background.

5 I know this isn't the first meeting of our
6 new colleagues, but I have to say since I reside on
7 the same floor that they do, I will tell you that I
8 think this is -- they may be two weeks, less than
9 two weeks into the job now.

10 I think it is evidence of the fact that we
11 show no mercy, whatsoever.

12 We have caused them to kind of dive in to
13 all of the background.

14 I have seen staff up on the 18th floor
15 carrying around boxes of samples of insulation, and
16 pipes, and things like that.

17 I know that they spent a lot of time
18 looking at this, but it's a lot to absorb.

19 I guess I am saying we are not showing much
20 mercy, but I do at least feel for them because it
21 is a lot of information.

22 They've been leaning into it.

1 COMMISSIONER MAGWOOD: Thank you, Chairman.

2 It has been a lot of information, but it

3 has been very interesting.

4 This is an issue that has been going on for

5 about a decade now I guess, and I know that the

6 staff has been wrestling with it for quite some

7 time.

8 Yet, it's conspicuous among a lot of the

9 issues we deal with in that, conceptually, it's

10 quite easy to understand and explain to people, but

11 when it comes to actually analyzing the effect, it

12 is very difficult and has proven to be quite

13 allusive in that manner.

14 As a result of the complexity of the issue,

15 the agency's guidance has evolved, clearly, and we

16 are going to hear a lot from our industry witnesses

17 today about the actions they've taken over the last

18 few years.

19 It is never desirable to see regulatory

20 actions as a moving target, but I think we all

21 recognize as our knowledge about these events and

22 phenomena change, our response has to change as

1 well.

2 Hopefully, you'll take that into
3 consideration as you're going forward.

4 I'd really like to see this issue brought to
5 closure.

6 I hate seeing safety issues left hanging
7 for long periods of time, but I think it is also
8 very important that when we bring this to
9 conclusion, we do it with some finality so we don't
10 have questions that are still remaining in the
11 future.

12 I want to see this brought to a closure,
13 but I also want to see this brought to a final
14 closure.

15 Thank you, Mr. Chairman.

16 COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman.

17 I echo my colleagues' comments I know this is a very complex set of issues.

19 Commissioner Magwood and I had the chance
20 to get briefed by NRC staff I guess last Friday on
21 this, and that was very helpful.

22 I appreciate that opportunity.

1 Yesterday I was at Watts Bar Unit II. I had
2 a chance to crawl down there in the sump and see
3 what the strainers looked like, to get a better
4 appreciation for what an in-state, at least on the
5 strainer piece, looks like.

6 I still have a number of questions.

7 I will ask some of these today, but a lot of
8 information to process and I look forward to
9 continuing my education process.

10 Thank you.

11 CHAIRMAN JACZKO: Thank you.

12 We will begin our meeting with Amir
13 Shahkarami who is here representing the PWR Owners
14 Group. Amir.

15 MR. SHAHKARAMI: Thank you very much.

16 Good morning, Chairman and Commissioners.

17 I'm Amir Shahkarami. I am the Chairman for
18 PWR Owners Group Executive Committee. I'm also
19 Exelon Senior VP, on-site VP at Braidwood Station.

20 I appreciate the opportunity to provide you
21 with the PWR Owners Group perspective to adequately
22 resolve the GSI-191 and Generic Letter 2004-02

1 based on what really the NRC and industry
2 have been able to accomplish up to this point.

3 Slide number two.

4 You are looking at the timeline, I think.

5 Mr. Chairman talked about that, prior to PWR we had the
6 BWR strainer issues so it has been really there for
7 a long time.

8 Both NRC and industry have been addressing
9 this issue as a new concern has added to the
10 GSI-191.

11 First, was the concern of the debris catch on the existing
12 sump.

13 Industry installed larger sump and I'm
14 going to talk about that.

15 Then the chemical effects on long-term
16 cooling for the fuel.

17 Each of these issues have added and
18 required testing analysis for acceptance criteria and
19 acceptance criteria
20 for long-term cooling
21 is just coming to closure.

22 Next slide.

1 Resolution actions.

2 This was developed to address GSI-191
3 based on highly conservative and deterministic
4 approach.

5 We have made plant modifications based on
6 application of conservative testing and methods.

7 Methods were developed in full recognition
8 of inherent conservatism.

9 All PWR licensees have replaced their
10 strainers and implemented numerous other changes
11 and improved operational enhancements.

12 To us, GSI-191 is no longer a safety issue
13 for PWRs.

14 Next slide.

15 Let me just touch on summary of actions.

16 The median size of new screens are about
17 4000 square foot, compared with what we had
18 installed previously at 150 square foot, I'm sorry,
19 square foot.

20 On average, you are looking at 32 times
21 larger than original screen size that had been
22 installed.

1 We also have done other modifications,
2 replacement of fibrous insulation with reflective
3 metallic. We changed to alternate buffering agent
4 from what would have made a chemical interaction
5 more severe, so we have changed the buffering at
6 some of our units.

7 We have installed flow diversions and
8 debris interceptors and also made modifications on the
9 downstream effect.

10 As I indicated before, we have also
11 enhanced operational and emergency procedures.

12 Current status.

13 Action in the last 24 months focused on
14 attempts to respond to the NRC review questions.

15 We have had over 1000 RAIs that we have
16 been asked on test and analysis packages that
17 generally are about 300 to 400 pages.

18 Efforts to remove overly conservative
19 assumption and view holistically have been
20 unsuccessful.

21 NRC has allowed limited credit for key phenomenon that
22 significantly reduced potential for the blockage.

1 The industry has been unsuccessful in
2 attempts to obtain NRC staff acceptance of level of realism
3 in the design analysis, thus
4 minimizing the impact of
5 compounding conservatism.

6 Efforts to risk-inform the analysis have been
7 continually sidetracked, pending completion of
8 effort to risk informed ECCS LOCA regulation which is 10 CFR 50.46(a).

9 Let me just touch on some of the issues that
10 I will discuss as far as conservatism.

11 As an example, debris generation modeling calls
12 for combination of a break size with
13 vanishing a small frequency somewhere around E to
14 E-10. A physical
15 impossible break opening
16 time considered instantaneous break.

17 Treatment of break location based solely on
18 minimizing the regeneration without consideration
19 of likelihood.

20 Use of a conservative all encompassing a
21 spherical zone of destruction surrounding the
22 break.

1 The result, combined with similar
2 conservatism from other phenomenon involving this
3 issue such as debris transport, chemical participation,
4 and containment sump head losses.

5 This is a very complex scenario.

6 From the time that the pipe breaks, to
7 dislodgement of insulation, to transport to the
8 screen and bypassing the screens to the fuel.

9 It looks like every step that we have
10 taken, we use a deterministic conservative
11 approach to analyze that.

12 A determination of reasonable assurance of
13 compliance with current regulation is possible now.

14 We don't think further plant modification would improve
15 plant safety.

16 On the last slide, slide number six, what
17 actions we recommend as PWR Owners Group.

18 As noted before, the actions already
19 taken by industry have addressed the safety concerns associated
20 with GSI-191.

21 The review issues that remain reflect the
22 difficulties associated with demonstrating deterministic compliance

1 for a postulated event as complex as ECCS recirculation.

2 Those estimates to further reduce insulations
3 on large components such as the steam generator and
4 some of the piping is estimated in hundreds of man rem

5 In average, we are looking about 200 rem
6 per plant to go remove additional insulation.

7 This course of action is unnecessary given
8 the plant modification already completed, the
9 margin of safety employed, and analysis, and the
10 adverse impact on worker safety of removing fiber
11 insulation.

12 We are asking to permit application of
13 GDC-4, which is exclusion of leak-before-break
14 qualified piping to local debris generation.

15 As you know this request has been made in
16 the past, and you look at some of the big factors that were not
17 considered has changed today and we can talk
18 about those changes.

19 Current regulation GDC-4 permit exclusion
20 of local dynamic effects for leak-before-break qualified piping.

21 This exclusion is applicable to local
22 debris generation.

1 Path forward, NRC should allow use of GDC-4
2 exclusion for local dynamic effects and as means to
3 close remaining plant issues applicable to GSI
4 would enable conclusion of reasonable assurance for
5 all PWRs.

6 Industry will continue to gain margin as
7 we change large components to make sure we don't
8 put bad insulation back in place as we go forward.

9 PWR Owners Group also has developed a project scope to
10 gain additional margin in reduction of zone of
11 influence, and there are two issues open with the
12 staff that we are working on.

13 One is the scaling factor and one is the
14 ANSI non-conservative modeling that we are working
15 on, and we also have another action on the fuel for
16 the long-term cooling that needs to be resolved,
17 and I'm personally involved with that with the
18 staff.

19 That concludes my presentation.

20 CHAIRMAN JACZKO: Thank you.

21 We will now turn to David Heacock who is
22 the President and Chief Nuclear Officer at

1 Dominion.

2 MR. HEACOCK: Thank you very much, Chairman, I
3 appreciate the opportunity to be here this morning and
4 address the Commission on this important issue.

5 I think we agree 100% as to the goal to
6 close this issue out as soon as possible to get it
7 resolved.

8 I will address Dominion's perspective on
9 resolving the containment sump issues, generic
10 safety issue 191, and generic letter 2004-02, as
11 well some of the challenges and obstacles that we
12 have faced along the way.

13 Slide two, please.

14 Basically, at North Anna we are essentially
15 complete right now.

16 We resolved all the issues except for the
17 downstream issues in the reactor vessel, and we're
18 on the way. Surry is a very similar plant, we
19 made a commitment to install a continuous vent and
20 once that's done we'll match Anna's
21 approach, and I will go into a little more detail
22 on that; the other two units still have issues

1 pending.

2 As evidenced by the timeline that Amir
3 pointed to a few minutes ago, this had been going
4 on for some time.

5 We do have a few remaining issues, but
6 we firmly believe that with the modifications and
7 analysis completed today and committed to already
8 for our units, that our plants are fully
9 capable of responding to and recovering from a
10 design basis accident today.

11 From that perspective we believe we provide
12 a reasonable assurance already.

13 Next slide, please.

14 Dominion was faced with a number of plants
15 that had large amounts of fibrous insulation.

16 Really had to pick one of the two paths.

17 You can see from the timeline here the
18 decision initially was to pursue an active
19 strainer.

20 If we had done so, we'd be the only people
21 in the universe with an active strainer.

22 We chose not to later on because of the

1 maintenance problems with something that is,
2 basically, a big grinder that would grind up
3 anything that came into its path to allow for a
4 much smaller area.

5 Instead, we chose to put a large surface
6 area strainer in, in lieu of removing insulation
7 because the dose consequences were so large for
8 insulation removal.

9 Particularly North Anna and Surry, and some other plants
10 have very, very large quantities of fibrous
11 insulation.

12 We chose the large surface area approach.

13 In the aggressive schedule also complicated
14 things.

15 The problem we had is there is just a
16 handful of vendors that can do this kind of work,
17 and we all descended upon these vendors
18 simultaneously.

19 As a result, once the music stopped, all
20 the chairs were full.

21 We had to pick some different vendors.

22 We fortuitously chose AECL for our vendor

1 for North Anna and Surry, and it turns out that was
2 a good choice ultimately because of their R&D
3 experience.

4 Next slide, please.

5 There is a significant amount of R&D effort
6 required to resolve this issue, and Amir touched on
7 many of the issues that we talked about already.

8 One thing I think that was unforeseen was a
9 substantial amount of containment analysis that had
10 to be done, and then licensing amendment request
11 that had to be prepared, and both of those had to
12 be reviewed and approved by the NRC before we could
13 get this issue resolved.

14 We're designing modifications and doing
15 containment reanalysis simultaneously.

16 The extensive chemical testing that needed
17 to be done was also something that took a lot of
18 R&D efforts, and the timeline didn't allow for us
19 to do what we normally would've done, which would
20 be to do those in sequence.

21 We would have built a test rig, tested the
22 chemical and debris affects for one unit, and then

1 gone on to the next unit and take the lessons
2 learned from the first test and apply it to the
3 next one and NRC review along the way.

4 Instead, we had to do those in parallel.

5 The bottom line is, we are doing all the
6 testing at the same time to build a huge rig and do
7 that.

8 By the time you're done with that, acceptance
9 criteria is unknown.

10 We're building the modifications, we're
11 doing the testing before the acceptance criteria is really
12 known.

13 Next slide, please.

14 This will illustrate North Anna and Surry,
15 I picked North Anna Unit II simply because the
16 drawing is a little clearer on that even though
17 it's a busy drawing.

18 The whole point of this, is that you can
19 see the big circle there is the containment
20 basement.

21 This basically takes about 180 degrees, the
22 rest of the containment has stuff in it and can't

1 be consumed with the sump.

2 We had the head stand and so forth.

3 This is pretty much as big as you can make
4 it.

5 We went from about 168 square feet, I will
6 show in the next slide the actual dimensions, to
7 over 6000 square feet of surface area.

8 Slide six, please.

9 This kind of illustrates where we were
10 previously, had a combined total for all of our
11 systems of 168 square feet of sump area, we were
12 well over 6000, a 38 fold increase.

13 You can see from Amir's numbers for
14 industry average is we're on the high-end of that.

15 The reason for that is quite simple, we're
16 also on the high-end of the amount of fibrous
17 material in our containments.

18 So by adding additional surface area we are
19 able to overcome additional fiber loading.

20 Clearly we are better off than we were
21 before, this is a huge increase in the amount of
22 sump area.

1 The velocities are way down, the reloading
2 is way down. As you mentioned, Chairman, the 50% load
3 was an unrealistic assumption to begin with.

4 Now we have realistic assumptions in
5 layers of conservatism that give us great assurance
6 that this is acceptable today.

7 Slide seven, please.

8 One thing that became apparent to us almost
9 immediately was a one-size-fits-all solution
10 wasn't going to work, not fleet wide not even within
11 Dominion's fleet. Even North Anna and Surry had
12 some differences in the layout and how you can
13 physically install this piping.

14 So, we found that it was a continuous R&D
15 effort to figure out how to install the equipment
16 and how to test the equipment. Since they are all
17 unique, you can't use one test rig to test all the
18 different devices simultaneously, you had to do
19 different assumptions and get the different test
20 rigs.

21 We were manufacturing and installing the
22 strainer prior to confirming testing analysis.

1 The bottom line is we put the biggest
2 strainer we could put in the building and then went about
3 testing and analyzing to ensure ourselves and
4 assure the NRC that that was sufficient.

5 I'll also mention the parallel multi-loop,
6 multi-station testing. We couldn't do an incremental
7 series approach. We had to do it in parallel.

8 Next slide, please.

9 North Anna's essentially closed out
10 for the containment portion; the downstream effects
11 are still open.

12 Surry is basically there; once we install
13 the small modification we will be in the same
14 location.

15 So, how'd we get there?

16 How'd we have success on these plants?

17 Strong personnel commitment on both the
18 utility and NRC side was very evident and very
19 important for closure.

20 We had open and frank interactions with the
21 NRC during audits, which was very, very helpful for
22 us.

1 Since we were selected for two of our
2 plants to have audits, that was a phenomenal
3 process to allow us to have early engagement with
4 the NRC and come to some resolution on issues so
5 that we knew what the acceptance criteria was likely to be
6 while we were doing the testing and design work.

7 We were fortuitous in the selection of our
8 vendor that was good with R&D work.

9 Some vendors are less developed at this
10 than others, and as it happened since all of the
11 chairs were full, we picked someone else, and this
12 particular vendor did a really good job of doing
13 the R&D effort.

14 Then, the last element was happenstance, I
15 would say, and that's that we had sufficient open
16 floor space to install a strainer large enough to
17 accommodate all the conservatism that were
18 compiled.

19 The last slide is just the conclusions
20 slide here.

21 I think I've already said it that we have
22 made significant improvements that resulted in a

1 reasonable assurance that the sumps will perform
2 their design basis function.

3 That's already been done, including the
4 commitments we have made for future modifications.

5 Removing additional insulation results in
6 significant person REM of radiation exposure
7 without a commensurate improvement in the margin of
8 safety.

9 I think Amir said that quite well.

10 The range is quite large. If you have
11 asbestos in containment, for example, the exposure
12 is very, very high.

13 We don't have any asbestos in ours, that's
14 not a problem for us, but we do have a large amount
15 of insulation so if we have to go back in and take
16 steam generator insulation off our loop pipe
17 insulation, the dose levels are very high in
18 those areas.

19 The industry and NRC can close our this
20 generic letter of this year by allowing the
21 application of General Design Criteria-4, as Amir
22 has mentioned.

1 This methodology is already approved for
2 use in local dynamic effects and this would fall in
3 the category we believe that insulation, debris
4 generation is a local dynamic effect and could be
5 covered by General Design Criteria-4.

6 That will allow for prompt close out and
7 resolve all of the remaining issues including the
8 downstream effects on the fuel.

9 That is the end of my prepared remarks.

10 CHAIRMAN JACZKO: Thank you.

11 I will now turn to Jeff Gasser who is the
12 Executive Vice President and Chief Nuclear Officer
13 at Southern.

14 MR. GASSER: Thank you and good morning.

15 On the first slide -- the first slide there
16 is a picture of our new screens.

17 The original screen design was very basic,
18 it was a box with a four sides -- four screen
19 sides.

20 The new design much more complex of stacked
21 disc towers that provide significant additional
22 safety margin.

1 Go to the next slide.

2 It shows -- it gives a perspective of the
3 significant safety margin improvement that we have
4 seen at our two PWR sites, Farley and Vogtle, since
5 we have added these new screens.

6 On the next slide is a timeline similar to
7 Amir's timeline.

8 When the generic letter was approved in
9 late 2004, the staff set about their work of
10 developing the guidance, in parallel, we set about
11 the job of designing the screens, manufacturing
12 them, and testing them, and ultimately, installing
13 them.

14 The first two red diamonds to the --
15 starting from the left, those are the times that we
16 installed the screens at Vogtle, the end of 2006 and
17 spring of 2007 outages we installed those screens.

18 So, it shows that because we had to do all
19 of that before the guidance came out, much like
20 Dominion, we installed the largest screens that
21 would physically fit in the containment that we
22 had.

1 We were able to extract the largest safety
2 margin network that was physically possible in our
3 containment buildings.

4 Next slide.

5 Where we stand today, we significantly
6 improved over safety margin with the new sump
7 screens.

8 We added new -- we replaced the
9 injection needle valves and added flow orifices in
10 the injection lines in order to open up those lines
11 and resolve the downstream effects issue of
12 clogging in those lines.

13 We've removed the most problematic of the
14 insulation, micro porous insulation, from our
15 containment buildings.

16 Today, we have reasonable assurance of
17 public safety when it comes to ECCS sump
18 performance.

19 Next slide.

20 Again, we were required to design, build,
21 test, and install all in parallel with the staff
22 developing the guidance.

1 The major unresolved issue today that
2 prevents closure is this issue of debris generation
3 at the time of the loss of coolant accidents.

4 As Amir and Dave have stated, the analysis
5 currently being used by the staff assumes the worst
6 case scenario in every step of that analysis.

7 The worst-case location reactor coolant
8 system piping is picked, the largest field of zone
9 of influence or damage is selected, no credit is
10 given for the steel jacketing on the insulation.

11 It's assumed that 100% of the insulation is
12 destroyed into small pieces, no credit is taken for
13 any kind of settling or collection of any of that
14 material in corners in the building.

15 It's assumed that 100% of that material is
16 transported to one sump, and that it is evenly
17 distributed over the entire surface area.

18 At every point, the worst case scenario is
19 assumed, which gives this cumulative effect of
20 these assumptions that currently prevents us from
21 closing this issue in the near term.

22 As I said today, reasonable assurance does

1 exist. Public safety and compliance with 10 CFR
2 50.46(b)5, that exists today.

3 Further modifications, specifically
4 requiring licensees to remove the remaining
5 insulation, fibrous insulation, off of the reactor
6 cooling systems will result in significant dose to
7 workers.

8 Mainly, these workers, we're talking
9 about thousands of journeyman, carpenters, sheet
10 metal workers, insulators will pick up significant
11 dose with very little safety improvement at any of
12 the sites.

13 As my two colleagues stated previously,
14 General Design Criteria-4 is an NRC approved
15 methodology that is in use today that allows
16 closure of the GSI-191, and maintains consistency
17 with current design assumptions and regulation.

18 Next slide, my last slide.

19 So, the industry actions -- the actions by
20 the NRC staff, the great work by the staff to this
21 point, and the work by the licensees have resolved
22 the Generic Safety Implications that was the root

1 of GSI-191.

2 Commission action is needed to obtain
3 closure with no further undue worker radiation
4 exposure.

5 The current regulations, General Design
6 Criteria-4, provides the means for resolving this
7 issue without further delay.

8 Commission action is necessary. I would
9 urge the Commission to consider providing the
10 direction to the staff to allow use of General
11 Design Criteria-4 as an acceptable means of closing
12 out finally and in the near term GSI-191.

13 That concludes my prepared remarks.

14 CHAIRMAN JACZKO: Thank you.

15 I appreciate all of your presentations.

16 We will start with Commissioner Ostendorff
17 for questions.

18 COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman.

19 I appreciate your briefs, very helpful.

20 I've got a couple questions here, we will
21 see how much time permits.

22 Let me start, Jeff, back with you on the

1 conservative assumptions, but it's also a theme
2
2 both Amir and David had.

3 I've been around modeling and simulation
4 techniques in different capacities in prior work,
5 I've been involved in.

6 I'm not an expert in any event, but I'm
7 aware of the challenges of having a set of
8 assumptions and methodologies in place that can
9 lead to an appropriate rational outcome that people
10 can say that makes sense as to how you did it.

11 I know the criticism of the conservative
12 assumptions. Is it your sense that that's been done
13 by the staff because there's not been a
14 well-established pattern of how you model this
15 phenomenon, as far as the zone of influence and the
16 debris spreading and transport?

17 I'd be interested in any other comments you
18 have on this topic from the other panelists.

19 MR. GASSER: Yes. It is my belief that this is a very
20 difficult phenomenon to model.

21 With that -- without other guidance for the
22 staff, they are using the assumptions that they

1 believe are the best assumptions for that piece and
2 any one of those assumptions may be reasonable, but
3 it's the stack up of all of them that results in
4 the problem -- the final answer of loading on the
5 sump screens that exceeds what the current design.

6 I'll ask my colleagues to jump in.

7 MR. HEACOCK: I think that's exactly right.

8 I mean, when you are forced to look at this
9 incrementally in each piece one at a time, the
10 deterministic approach was taken.

11 For example, the instantaneous pipe break
12 creates a pressure wave, and then you have to deal
13 with the pressure wave once you do that, then you
14 have a spherical zone of influence rather than
15 being directional.

16 It then increases again the amount of
17 impact, and then Jeff mentioned other previous
18 conservatisms in that line all the way down.

19 I think that is exactly right, that in
20 order -- it's a complex modeling issue and it was
21 broken down into pieces and each of those pieces
22 deterministic very conservative assumption set was

1 made for that piece.

2 There is no credit given for the

3 compilation of all of those pieces.

4 Like you would with the root sum of the squares, or

5 a PRA type of approach where you would say, look,

6 these all things can't happen at the same time.

7 Another example is all of the debris

8 generation, the coatings are believed to come off

9 in the calculation instantaneously at the very

10 beginning when you're delta P requirements are the

11 most significant.

12 We've taken all those things and compounded

13 them, again in time as well as in space.

14 We've compressed all of the bad effects to

15 the first instant of the event.

16 COMMISSIONER OSTENDORFF: Amir?

17 MR. SHAHKARAMI: I just want to give you some

18 examples, real examples.

19 For the new con type of insulation with a 22

20 gauge 340 extended steel jacket.

21 Based on that, some of that analysis that

22 was done, a plant had used seven diameter as a basis

1 for its what you call its zone of influence.

2 Whereas, it is required by NRC because
3 of deterministic and understanding, and it needs to
4 be 17 diameter.

5 So, the difference between using 7
6 versus 17, it goes from conservatism translated to
7 500 cubic feet versus 2200 cubic feet.

8 It is not the linear way to look at it.

9 Then, what gets transported to the sump
10 is about 320 cubic feet versus 1100
11 cubic feet.

12 You can see with the small change in the zone of
13 influence, you can gain a lot of margin.

14 Again, I think review has been performed
15 in a piece wise fashion.

16 Each with its own level of conservatism.

17 I know we have metrics that shows under
18 everyone of these scenarios, several conservatism
19 that we capture.

20 I think about 28, if I'm correct, type of
21 conservatism built on top of each other.

22 COMMISSIONER OSTENDORFF: That's helpful, I know

1 personally I look forward to Commissioner Apostolakis
2 joining this group to help us with his background in risk
3 assessments and PRA principles.

4 Let me turn to a question -- I went through
5 and the staff's done a great job of providing us
6 with background information here, and again a very
7 complex topic. And I'm still trying to wade through
8 some critical issues, but if I can turn to the
9 question of the in-vessel effects.

10 I know that it's been -- there's been some
11 discussion debate based on what kind of fuel is
12 loaded in the core as to how that analysis comes
13 out.

14 I appreciate anybody's comments who wants
15 to speak here about your assessments of the
16 in-vessel effects, and any comments you may have as
17 to whether or not those effects were considered as
18 part of your license for your current plants.

19 MR. SHAHKARAMI: We have worked with both
20 Westinghouse and AREVA fuel at a test facility for both of
21 those, and basically what we have done -- we have used a
22 ratio of particulate vessel fiber in a liquid and try to

1 simulate what happens with the entrance of the fuel
2 assembly.

3 All the work that is being done on
4 Westinghouse has been reviewed and in good shape,
5 as far as acceptance.

6 There was a one-to-one ratio on AREVA fuel
7 that I am personally involved with the staff to
8 resolve that.

9 We are looking for alternatives either to do the test
10 at another facility or Westinghouse, or do some kind
11 of testing to really validate it's not the
12 apparatus and the test results are valid.

13 That is the piece that I indicated in my
14 last slide that I am working through, so we are
15 going to resolve that issue for the in-vessel scenario.

16 Is that what your question was?

17 COMMISSIONER OSTENDORFF: Yes. Any comments on that?

18 MR. GASSER: No further comments.

19 MR. HEACOCK: The only comments, we have both
20 Westinghouse and AREVA fuel in our units, so it's important
21 to resolve both vendors.

22 COMMISSIONER OSTENDORFF: Turning quickly to

1 man rem exposure.

2 I saw estimates in there and I know it's plant

3 specific and types of insulation specific.

4 I know I had been exposed to asbestos years

5 ago during some sea repairs -- in the late 1970s on a

6 submarine at sea, and I'm sensitive to the issues

7 associated with that.

8 I've seen ranges of 100 to 600 person rem per plant,

9 and I'm hearing an estimate from one of you

10 gentlemen about 200 rem per plant for insulation

11 removal as being a reasonable average. Is that a

12 good number for us to be thinking about?

13 MR. SHAHKARAMI: I think we got the information

14 from the units that still have a significant amount of

15 insulation installed.

16 It did range within that 100 to 600, but

17 when we narrowed down really based on our

18 experience that it is going to reside -- I would

19 say somewhere around 200 would be an average for

20 the remaining units to go to remove the insulation.

21 MR. GASSER: The key with the installation is that

22 first, it's the area or taking it off the reactor coolant system

1 piping and loops and equipment it's some of the highest dose
2 rates in the plant.

3 It is a very crowded area, very hard to move
4 around so it requires scaffolding to be erected,
5 rigging for some of these pieces.

6 It's very complex.

7 Getting it off, as you have heard some of
8 the older plants, the higher ranges of the
9 estimates are mainly from the plants with asbestos
10 insulation and all the safety requirements that go
11 into removing the asbestos material significantly
12 increased the time that it takes and then putting
13 the new insulation back on again is an art.

14 Every piece has to be cut specifically for
15 that location and fitted up around bends and
16 elbows and other pipes attached to the reactor
17 coolant system piping.

18 The numbers are so high. I was fairly
19 surprised when I started hearing the estimates myself, but
20 as I dug into them, there is a sound basis for
21 those numbers because it is a very, very
22 labor-intensive effort to remove and replace the

1 insulation.

2 COMMISSIONER OSTENDORFF: Is there any type of
3 technology, not necessarily robots, but some remote
4 operating devices, hot cells that the Department of Energy
5 had remote handling arms and so forth; is that practical for
6 any kind of a lagging removal from your experience, or has
7 that been used in industry at all?

8 MR. HEACOCK: Not in the loop rooms. I think Jeff described
9 it very well. They're very cramped spaces, sometimes
10 humans have a hard time getting in between the
11 pipes, the accoutrements, attachments, and so forth;
12 so it is very difficult.

13 It's an art to fit the new pieces back up
14 as well.

15 We haven't seen robotics used in this area.

16 MR. SHAHKARAMI: It really makes sense, we have
17 seen the units that have changed the large components such
18 as the steam generator recently at TMI and other places.

19 They have the right kind of insulation as
20 part of that modification.

21 That is really what we are looking at.

22 This is large enough impact to the craft,

1 not only from dose safety, but this is not a simple
2 activity in the field.

3 And really, we build margin as we go forward as
4 we change large component rather than wholesale replacement.

5 MR. HEACOCK: I want to clarify one more point.

6 We're talking about average for those that have
7 to remove large amount of insulation might be 200
8 rem, other units that don't have to do that of course would be anywhere near that.

9 COMMISSIONER OSTENDORFF: I understand, thanks for
10 the clarification.

11 Thank you, and thank you, Mr. Chairman.

12 CHAIRMAN JACZKO: Commissioner Svinicki?

13 COMMISSIONER SVINICKI: You were mentioning some
14 of the tight spaces, and I was thinking to myself maybe the
15 room is so warm so that we are all projecting ourselves back
16 in for these workers that have had to be in there crawling
17 between those pipes.

18 I know we all tour plants, or those of us
19 who tour, and it's frequently uncomfortably warm so
20 that's the environment we have and I know they are
21 working on it.

22 It's interesting to sit here and think

1 about what it would take to remove that insulation.

2 Commissioner Ostendorff has covered

3 that. Again I noted it was a

4 rather significant range you've talked

5 about and he's asked you

6 about, what is that sensitive to in terms of the

7 dose.

8 You've given us an understanding of some of

9 the considerations there.

10 I was also going to ask about how sensitive

11 the zone of influence was to the overall analysis,

12 and Amir, you've talked about that.

13 So maybe I will just move into some other

14 areas.

15 Mr. Heacock, you gave kind of a unit by unit

16 assessment and that was very helpful.

17 I think for Millstone and Kewaunee you said

18 that the status there of issue resolution is that

19 RAI response is ongoing; is that correct?

20 MR. HEACOCK: That is correct.

21 COMMISSIONER SVINICKI: So that was on your slide.

22 I think all of you gave a slightly

1 different perspective, not inconsistent, but a
2 slightly different representation of what you think
3 the issues are.

4 Mr. Gasser you said, "the major unresolved
5 issue is the amount of debris generation."

6 I'm trying to get a sense here, because the
7 staff has indicated, and I know they'll state
8 explicitly when they are presenting, that they --
9 their proposal they would move to the issuance of a
10 50.54(f) letters, and I have to laugh -- I told
11 myself I would never talk like that, but two years
12 into the job I said people don't talk these numbers
13 and these acronyms, but there I go.

14 I'm trying to understand where we are in
15 terms of issue resolution and your responding to
16 RAI's, and I'm trying to understand our practice.

17 I guess I'm like an engineer, I think
18 really linearly so I think that we generate questions,
19 we get responses, we analyze that and we move
20 through.

21 Is there anything that you all would react
22 to in terms of if you received the 50.54(f) letter

1 that caused you to commit to a resolution right
2 now; are you kind of in the process of trying to
3 resolve other issues right now, and you get this
4 letter and that would tell you to commit to an
5 issue resolution?

6 Can any of you react to the notion of
7 receipt of a 50.54(f) letter right now?

8 Or maybe not.

1 MR. GASSER: For Southern Company, the issue that's
2 open is this debris generation, and my reaction to a 50.54(f)
3 would be great disappointment because we would be
4 subjecting hundreds of workers to radiation exposure without
5 any real measurable safety benefit.

6 That would be my reaction, is that we would
7 comply and we would set forth, then we would go
8 remove the insulation and replace it with --

9 COMMISSIONER SVINICKI: I didn't mean to indicate
10 that you would not comply.

11 MR. GASSER: I understand that, but it would a
12 very great disappointment because I believe that there is
13 precedence here, prior NRC action.

14 We're using GDC-4 now on reactor coolant
15 system piping design and so there is precedent here
16 with the NRC to be an appropriate application.

17 COMMISSIONER SVINICKI: Can I ask you and I wanted
18 to give the others an opportunity to react but let me say,
19 you were most explicit in your prepared remarks about the
20 fact that the Commission needs to make a policy decision
21 here, and I would tell you, I know we received from NEI on
22 behalf of licensees, a proposal, I guess it was Friday of

1 last week.

2 I have tried to pour through that. Now I'm
3 a degreed nuclear engineer and I've done my best, I
4 have one reactor expert on my staff and so we've
5 tried to look at that.

6 I have asked the staff when we might
7 receive their assessment of that proposal.

8 I don't want to put words in their mouth,
9 I'll ask them when they're up here, but the answer
10 I think I got was that's a policy question in that
11 proposal and again it is extensive.

12 It's not just a letter, there are two
13 attachments and other things.

14 I'm doing my best, NRR has almost 600
15 employees, I've got one -- we do what we can.

16 You talked about the need for a policy
17 decision, can you help me understand what is in
18 that proposal?

19 There's a lot of attachments about alloys
20 and behavior and phenomenology, again I'm not a
21 person off the street and I'm not try to ask for
22 sympathy like I am, but what's the heart of the

1 issue there?

2 Is there anything technical in that

3 proposal?

4 MR. GASSER: I'm not prepared right now to speak

5 to the technical details of the proposal in the NEI letter.

6 It is my understanding that the staff

7 believes that the previous guidance that they've

8 been given from the Commission precludes them from

9 using GDC-4.

10 COMMISSIONER SVINICKI: Okay, but Amir said the

11 the history is -- that things are different now and I guess

12 that's another thing I don't understand.

13 I don't know what the difference is.

14 MR. SHAHKARAMI: Let me just touch maybe on a

15 couple of those issues in the past that were brought up.

16 One had to do with the defense in depth,

17 in respect to usage of that policy.

18 At that time, we didn't have the larger

19 strainer, we didn't have a lot of modification

20 that we have implemented.

21 We haven't improved our operational and

22 emergency procedure.

1 When I look at 2004, when this issue was
2 brought up, and I look at today, today the
3 configuration is much different.

4 I would disposition it that way.

5 Then there was also a concern about the
6 primary water and stress corrosion crack not being a
7 phenomenon that we can take credit for that policy.

8 As you know, there is MRP 139, the material
9 reliability program, that required inspection and
10 mitigation of all alloy 600 issues.

11 We are required by 2013 to mitigate and
12 inspect the hot leg and cold leg, we've already
13 done pressurizer.

14 All of the concern about that phenomenon, I
15 would say, is behind us.

16 We are talking about to refuel it now takes to change insulation
17 by that time we have mitigated pretty much the
18 concern with PWSC.

19 Those are just a couple of the items in the
20 past that I think today is different.

21 COMMISSIONER SVINICKI: Mr. Heacock, did you want
22 to make any comment on this --

1 MR. HEACOCK: I could say ditto here, but I think
2 I reflect Jeff's comments on 50.54(f) letter, I'd be
3 disappointed receiving that because our only course of
4 action would be to take action to remove insulation, that
5 would be the only thing left for the utilities to do and of
6 course we would do that.

7 I think that is the wrong course of action,
8 I think you have heard that clearly from us today.

9 The right course of action is to go back
10 and remove some of the conservatisms, and the
11 simplest ways to do that is to apply GDC-4.

12 We believe that can resolve all the
13 remaining issues in that fashion, rather
14 than radiation exposure in the field.

15 COMMISSIONER SVINICKI: I guess what I take away
16 from your answers is that I have some more work to do.

17 I've been here more than two weeks so I
18 don't have the same excuse, but there is a lot of
19 information here.

20 Amir, in your answer, although maybe I'm
21 not familiar with all the issues you raised, it was
22 clear to me that there is more than just a policy

1 up or down here.

2 I think there is some more technical work,
3 clearly that I need to understand and again I will
4 lean into that and do the best I can, and where the
5 Commission needs to alter a policy of the past
6 then that is ours to do.

7 I accept that.

8 I don't know that I feel equipped at this
9 moment.

10 Again, it falls to me to equip myself to
11 be able to do what we need to do.

12 I think I've covered things thematically,
13 thank you Mr. Chairman.

14 CHAIRMAN JACZKO: Commissioner Magwood?

15 COMMISSIONER MAGWOOD: Thank you, Mr. Chairman.

16 First, let me say I appreciate what the
17 industry has done so far to respond to the guidance
18 from the Commission regarding this issue over the
19 last several years.

20 I think there's been a lot of progress made
21 and we recognize that.

22 I also wanted to emphasize very strongly on

1 behalf of Commissioner Svinicki and Commissioner
2 Ostendorff and I have had some exchanges over the
3 last week or so about the doses associated with
4 this, and we're very concerned about that.

5 We take this very, very seriously.

6 I think whatever decision this Commission
7 makes, will be made in light of the recognition
8 that we are talking about significant exposures to
9 many workers.

10 Please be assured we are thinking about
11 that.

12 All of you have focused on General Design
13 Criteria-4 as the way out of this situation.

14 I wanted to talk about that a little bit.

15 Just yesterday we received a letter from
16 Union of Concerned Scientists, and I don't know if
17 you've seen this yet or not, if you have not seen
18 it we can certainly provide you copies, but let me
19 quote from part of the letter.

20 The letter in referring to the use of
21 leak-before-break to address this issue says, "...the
22 reality demonstrated over and over at PWRs is that

1 warning flags raised by reactor coolant pressure
2 boundary leaks are not heeded.--
3 PWRs with leaks are simply not being shut
4 down and depressurized."

5 The letter goes on to say, "The leak before
6 break notion only becomes leak-before-break
7 protective barrier when pressure boundary leaks are
8 responded to responsibly and timely."

9 That's a criticism I've heard before, and
10 I wanted to give you a chance to respond to it.

11 Particularly, I wanted to focus on Mr.
12 Heacock, because the letter we received points out
13 one of your plants, Oconee Unit I, and reports that
14 an event that took place in 2005 found boric acid
15 around nine control drive mechanism nozzles
16 ultimately signified the reactor coolant pressure
17 boundary system has occurred.

18 So, I just want to give you a chance to
19 respond to that and give us your thoughts.

20 MR. HEACOCK: First, Oconee is not mine, but I
21 will respond.

22 The interesting thing about the letter is

1 all the examples given never broke.

2 In fact, no pipes have ever broken on an
3 operating plant.

4 I think it validates the point that it
5 leaks, and it leaks for a very long time before it
6 breaks, is the reality of it.

7 The piping is very tough, doesn't tear
8 easily, if you will.

9 So, leak-before-break is a valid assumption
10 and I think it is validated by David Lochbaum's
11 letter in all reality.

12 MR. GASSER: I respectfully disagree with the
13 conclusions of the letter also.

14 The reality and the facts are that our
15 instrumentation for detecting any type of leakage
16 is extremely sensitive, and we have numerous
17 examples of units detecting changes on the orders
18 of hundreds of gallons per minute, .01, .03 kind of
19 changes in that.

20 I believe that the body of evidence shows
21 that our instrumentation is extremely sensitive and
22 capable, and that licensees take the appropriate

1 action.

2 As Dave said, the letter also supports the
3 idea that these pipes have extremely high safety
4 margins, and in every single case in the history of
5 reactor operation they have leaked before -- and
6 they have never broken.

7 MR. SHAHKARAMI: Several years ago due to some of
8 the alloy 600 concerns, the industry took on improving
9 detection of leakage.

10 Our diverse set of indications that we
11 have -- that we watch, and we could definitely
12 detect a small amount of leakage into our
13 containment.

14 I known in the letter it also mentions
15 about if the water that leaks is not contaminated
16 the radiation monitor are not going to pick it up,
17 and that is only one aspect of all the
18 instrumentation that is used to detect leaks.

19 So, I just wanted to state that industry
20 has gone and changed the way we used to measure
21 that several years ago through coordination with
22 NEI.

1 COMMISSIONER MAGWOOD: Thank you.

2 That is very helpful.

3 And let the record show that Duke Power has
4 not transferred responsibility for Oconee despite rumors.

5 One of the things you did say, Mr. Heacock,
6 though was that we have an unrealistic regulatory
7 schedule, unrealistic regulatory resource impact impacts;
8 could you elaborate on what you meant by that?

9 MR. HEACOCK: Yes.

10 You know, being in management myself, I
11 quite often establish unrealistic management
12 expectations that people strive to get to the point
13 I'm trying to get them to, and I think that's what
14 happened here.

15 I think the dates were established before
16 the entire scope of the project was well known.

17 I think once people got into the mechanism
18 of having to achieve the project and realize it
19 takes re-analysis to the containment sumps, the
20 different elevations and so forth, and then you
21 have to get that approved because now you've
22 changed your design basis.

1 So, just that element alone took several
2 years to get resolved.

3 That wasn't contemplated on, I don't
4 believe, in the original schedule for the generic
5 letter.

6 That was really my point in talking about
7 that.

8 There was a number of activities that had
9 to occur in parallel that should have occurred in
10 series.

11 COMMISSIONER MAGWOOD: One issue I've asked the
12 staff about, and we've had some discussion about this, is
13 whether there are some other approaches to dealing with this
14 issue.

15 Mr. Shahkarami, you mentioned that there should
16 be a holistic view of GSI-191.

17 With that perspective, is there another
18 approach that you've thought about, an
19 out-of-the-box solution to addressing this issue?

20 MR. SHAHKARAMI: I think if you look at the number
21 of conservatisms that has been built at every step of
22 this process and look at it really independently, you can

1 come up with an order of magnitude of conservatism that has
2 been built into the evaluation.

3 That is one way you can sit back and really
4 look at holistically what all of that as an
5 aggregate is going to give you.

6 That is one approach.

7 Are you talking about physical?

8 COMMISSIONER MAGWOOD: I was thinking physical,
9 yes.

10 MR. SHAHKARAMI: We have gone through -- I'm sure
11 there are exotic approaches you can use, but I know we have
12 exhausted what we could have looked at, and I'm not saying
13 there are no another solutions out there, we have not been
14 on that path.

15 Additional modification we did, for
16 example, changing a buffer was really outside of
17 the box type of thinking.

18 If we have some kind of chemical that would
19 aggregate and mix many materials to cover the
20 sump, maybe the solution is to go to different type
21 of buffer -- or diversion of the flow.

22 I know one utility actually drilled a hole

1 in the area that water had to go up and then come
2 down.

3 There are other ways that people have dealt
4 with this.

5 MR. GASSER: My staff has spent a good bit of time
6 trying to think of any type of change that we could do to
7 address this issue, some physical change.

8 They've explored modifying the screens that they
9 were flushable, back-washed to get anything off that built
10 up on them.

11 I mean, there's just nothing feasible that is
12 left.

13 We have done all the physical
14 modifications, we believe, that would actually work
15 in order to reach the safety margin we've got
16 today.

17 COMMISSIONER MAGWOOD: Okay, thank you.

18 One last question.

19 One of the factors in this that is
20 interesting is about half the PWRs have already
21 gone forward and met what the staff believes is
22 sufficient changes by making changes to the

1 insulation and of course adding the larger screens,
2 and about half have not.

3 Obviously, it's a little more difficult for
4 the ones that still remain to make these changes.

5 I wonder if you could talk a little bit
6 about that and what the differences are between the
7 plants that have gone forward and replaced insulation,
8 and the ones that have not.

9 MR. GASSER: For me, the main difference -- I've
10 got one plant that has mirror insulation, the other does
11 not.

12 It has mirror insulation because that was part of
13 the original design.

14 They didn't change it.

15 Also that plant when they replaced steam
16 generators that they came back with steam
17 generators that had mirror insulation, and to my
18 knowledge most of the plants that are in that
19 category, they've already replaced their steam
20 generators and removed a significant amount of the
21 fibrous material and that change out is why -- is
22 my understanding of why they're in the position

1 they're in today.

2 MR. HEACOCK: I think the same is true for us.

3 We have plants like North Anna and Surry
4 that have large amounts of fibrous insulation, we
5 had to go with a very large sump design for those,
6 and others like Kewaunee that have reflective metal
7 insulation almost entirely in containment.

8 Even the containments are much smaller, you
9 have a very, very small sump at Kewaunee that's
10 acceptable versus a huge sump at North Anna and
11 Surry that's acceptable.

12 MR. SHAHKARAMI: At TMI, as you know, we just
13 replaced the steam generator, put in the new insulation. We also
14 have insulation on the pressurizer, but the pressurizer has
15 a skirt and recently there has been an agreement that if you have a skirt over
16 the pressurizer you don't get the transport that originally
17 was thought.

18 That issue may go away for TMI.

19 COMMISSIONER MAGWOOD: All right, thank you very
20 much.

21 Thank you, Mr. Chairman.

22 CHAIRMAN JACZKO: Thank you.

1 I thought I would -- it's interesting, I
2 think sometimes we have all these discussions and
3 we sometimes get away from our roots.

4 As I was preparing for this meeting, I went
5 back and looked at, fundamentally, what is driving
6 what we are doing right now and that is the 50.46
7 regulation which is our regulation for emergency
8 core cooling system.

9 It's fundamentally 50.46(b)5 that
10 requires performance -- long-term cooling
11 performance.

12 I just wanted to read a piece of that
13 because there's been a lot of talk about
14 conservatisms, and I think that's an interesting
15 discussion.

16 I think it's important to understand the
17 context in which that discussion is being held.

18 I think if I could just, bear with me as I
19 read some of this complicated rule language.

20 This is the fundamental requirement in
21 50.46 that "ECCS cooling performance must be
22 calculated in accordance with an acceptable

1 evaluation model and must be calculated for a
2 number of postulated loss-of-coolant accidents of
3 different sizes, locations, and other properties
4 sufficient to provide assurance..."

5 I think this is probably the most important
6 piece, or one of the most important pieces, "the
7 most severe postulated loss-of-coolant accidents are
8 calculated."

9 "Except as provided in paragraph (a)(1)(ii) of
10 this section, the evaluation model must include
11 sufficient supporting justification to show that
12 the analytical technique realistically describes
13 the behavior the reactor system during a loss-of-
14 coolant accident.

15 "Comparisons to applicable experimental data
16 must be made, and uncertainties in the analysis
17 method and inputs must be identified and assessed
18 so that the uncertainty in the calculated results
19 can be estimated.

20 "This uncertainty must be accounted for,"
21 and this is another important piece, "so that, when the
22 calculated ECCS cooling performance is compared to

1 the criteria set forth in paragraph (b)", and one
2 of those criteria in paragraph (b is the long-term
3 cooling requirement of the section, "there
4 is a high level of probability that the
5 criteria would not be exceeded."

6 That is the regulatory underpinning for
7 what we are trying to look at here and trying to
8 analyze.

9 I think it's important as we talk about
10 these conservatisms to keep that in mind that
11 there's an opportunity to reduce those
12 conservatisms, to demonstrate that through testing
13 and analysis.

14 Maybe we can talk about that a little bit.

15 The other piece I wanted to touch on is the
16 use of the GDC-4. I think maybe there's been a
17 misperception created.

18 The staff does allow the use of GDC-4.

19 That was a regulatory change that the
20 Commission made that said you can look at local
21 dynamic effects when you are dealing with loss of
22 coolant accidents.

1 That's, in many ways, already been

2 incorporated.

3 That's why we don't have pipe restraints,

4 we removed those in many cases, that's why we don't

5 have to have impingement shields and other kinds of

6 things.

7 We've actually built that in, in many ways,

8 to the analysis already.

9 What the issue here is, is at some point we

10 kind of shift, there is a line where we go from the

11 direct dynamic effects to kind of the global phenomenon of

12 ECCS recirculation.

13 The fundamental -- I think the policy

14 question -- and it is arguably a policy question, I

15 don't think anybody really -- there is no technical

16 answer to say where you draw the line.

17 But the issue is, if you have a loss of

18 coolant accident, which is the required design

19 basis accident, do you assume -- or what amount of

20 debris generation do you assume from the jet?

21 I mean, that's what this fundamentally comes down

22 to.

1 If we were to apply GDC-4 here, the
2 Commission policy fundamentally says, we do not
3 believe that's inconsistent with GDC-4 that you need
4 to include the effect of jet -- essentially of the
5 jet on debris generation.

6 And that is fundamentally the application
7 of GDC-4, I think that could perhaps help the Commission --
8 as I see it and certainly welcome if you have any
9 thoughts about -- but that's how I see where GDC-4
10 would play in; I don't know if you want to comment
11 on that.

12 Do you think that's an accurate assessment
13 of how that would be used?

14 MR. GASSER: My comment would be that much as you
15 said that GDC-4 has been used with pipe restraints and its
16 been used with impingement shields, it's also been used with
17 fuel design, and of course another one of the criteria is
18 cool before geometry and the effects of the fuel now in the
19 fuel design on a LOCA uses GDC-4.

20 It is my belief that the direct impact and
21 damage to local insulation in the area of a
22 break, is a dynamic local effect which is exactly

1 what GDC-4 was created to do.

2 CHAIRMAN JACZKO: I think that's a debatable point
3 exactly, and I appreciate that.

4 I think where I come out on that is I think
5 at some point, if we get to them we don't have
6 debris.

7 If we don't -- if we assume and make these
8 assumptions that eventually, if we assume through
9 GDC-4, all of these local dynamic effects are
10 excluded, then we are never generating debris.

11 I'm not sure in the end, if that's I think what the
12 Commission was trying to accomplish when it did GDC-4.

13 MR. HEACOCK: -- less debris.

14 CHAIRMAN JACZKO: Or less debris.

15 MR. GASSER: I do not believe that the staff or
16 the licensees should conclude that no debris is generated.

17 I do not agree that that is the answer.

18 CHAIRMAN JACZKO: That is helpful.

19 The issue then really is to what degree of
20 debris generation are we talking about?

21 If we look at that -- that to some extent,
22 seems like that's a technical issue.

1 Where is the technical issue here in which
2 what you are saying disagrees with what the staff
3 is saying?

4 Where -- have there been experiments that
5 were done to demonstrate how much debris would be
6 generated? Do we run various jets at different
7 pressures?

8 It seems like that's a solvable issue we
9 can agree on a specific set of technical facts
10 about, even without even going to GDC-4, but simply
11 to agree, what is technically the right answer for
12 debris generation? Has that testing been done?

13 MR. SHAHKARAMI: As I said, the way PWR Owners
14 Group works, we can add this issue generically, or we can
15 add this issue generically, or we can add this issue selected utility funds to do
16 experiments.

17 We are working on the zone of influence and
18 we had seven RAI on those, five have been answered
19 and two remain, and one had to do with a scaling
20 factor and the ANSI non-conservative, and if you
21 recall in my slide I said we were going to
22 continue to pursue really put our arms around

1 what's the realistic zone of influence that we can
2 use to really get more realistic.

3 CHAIRMAN JACZKO: I can ask the same question to
4 the staff, does the staff disagree with your experimental
5 results to date?

6 I mean, have there been experiments done to
7 determine what the appropriate zone of influence
8 should be so we can all agree?

9 It seems like if we can just answer that
10 question, we're done.

11 If everybody would agree what the zone of
12 influence is, then the final issue, and I think
13 Jeff you said it, that's the last issue is debris
14 generation and it comes down to the zone of
15 influence.

16 I think, Amir, you said somebody had 7,
17 somebody, in the staff's original SER, they looked
18 at what I think comes out to give you the 17 answer.
19 I don't know if it's a generic or a plant specific
20 calculation, but I think you mentioned one plant
21 was looking at 7 and the staff was at 17.

22 MR. SHAHKARAMI: The seven diameter spherical was

1 based on plant specific analysis that was done, but was not
2 accepted.

3 CHAIRMAN JACZKO: Why -- what was it that wasn't
4 accepted about that?

5 MR. SHAHKARAMI: What I would like to do, the
6 person that has been all over this is in the audience. I would ask Mo if you
7 want to explain.

8 CHAIRMAN JACZKO: We can we narrow down the issues
9 we might be up to figure out what -- so, I guess maybe
10 that's a specific question -- why did the staff not agree with
11 the seven pipe diameters and was --

12 MR. DINGLER: Right now, as Amir says, we combined all
13 the RAI's the plant got on the zone of influence testing to
14 seven major issues.

15 We reserve -- resolved five of them, two
16 of them are still -- we need to provide some
17 additional data to the staff to do.

18 CHAIRMAN JACZKO: What are those?

19 SPEAKER: Those are scaling for larger components
20 from what we tested with a 14-inch pipe, or a 6-inch or
21 8-inch pipe, scale it up to the steam generator, larger
22 components, larger pipes.

1 The other one there is the discussion that
2 is the ANSI standard 58.2 conservative in all
3 cases, and the staff wanted some additional
4 information to do that.

5 And that's what Amir is talking about, to
6 do some additional testing.

7 CHAIRMAN JACZKO: So, if we get that additional
8 information -- the staff is either going to agree or
9 disagree, and why does that not resolve this issue and when
10 are you going to provide that additional information I
11 should say?

12 MR. DINGLER: We are working on that right now,
13 the schedules and exactly what we need to do to answer those
14 two questions, and we are working on that now.

15 What it doesn't do is the double guillotine
16 break.

17 In other words, do we have to assume in our
18 testing the double guillotine break that you got
19 right now for the loop piping?

20 The leak-before-break will reduce that
21 double guillotine to a single, smaller opening that
22 we have to consider.

1 That's where some of the differences of how
2 big your ZOI goes is based on the double guillotine
3 break complete shear, at times zero to a slower
4 opening, let's say half the diameter of loop
5 piping.

6 That will have a ZOI of someone different
7 and that's where --

8 CHAIRMAN JACZKO: So, let me ask you on this
9 point, and again, it seems like -- these are very specific
10 technical issues which my experience with the staff is that they
11 are able to work through these issues in a reasonable way.

12 I guess the fundamental concern is why are
13 these issues coming up now?

14 This is an issue -- the generic letter was
15 originally issued in 2004.

16 The staff at that time in the safety
17 evaluation they did to accompany that, and they
18 made -- they had a discussion about zone of
19 influence, they had a discussion about, in fact,
20 the safety evaluation, they talked about GDC-4, and
21 about whether or not GDC-4 would be applicable.

22 I think at that time they said that for

1 debris generation, it's not really appropriate, it's
2 not consistent with the Commission direction.

3 Why today are we kind of now, you are
4 getting the testing and the results to the staff to
5 document the positions that have been taken. Why
6 wasn't this done earlier?

7 MR. DINGLER: We've been working on this for about two
8 to three years and resolved the RAIs.

9 I think some of the timelines that you have
10 from Amir, Dave, and Jeff, I think the staff has
11 time lines, in responding to the RAIs of the
12 individual plant submittals, we've been working on
13 this -- the plants did individual testing for a
14 reduction in ZOI.

15 So based upon the RAIs your staff has
16 generated, we've been working with that as an
17 Owners Group to generically answer those.

18 We've been working on that for probably a
19 year and a half to two years right now to do that.

20 Then, your timeline is starting to, to be
21 honest, squeeze us in to what we want to do.

22 CHAIRMAN JACZKO: One other thing as I was going

1 through the material the staff gave a briefing to our
2 technical assistance here, and sometimes I like to pretend
3 I'm a technical assistant so I read some of those things.

4 One of the things they talk about is some
5 of the zone of influence testing.

6 There is an ANSI standard which I think
7 establishes what the calculated pressures need to
8 be when you do the testing, or in order to do the
9 calculation, what the zone of influence is.

10 When you did the testing that some of the
11 testing you did to measure the zone of influence,
12 were the pressures in the jets that were actually
13 used, were they at the same level as the calculated
14 ANSI standard?

15 MR. DINGLER: I'm thinking.

16 There were some that were the same as
17 calculated, some were slightly different --

18 CHAIRMAN JACZKO: Were they larger or smaller and,
19 I think smaller being non-conservative?

20 SPEAKER: I can't remember.

21 In some cases it might be slightly
22 non-conservative and that is why the question of

1 resolving the differences of the ANSI standard is
2 still remaining.

3 CHAIRMAN JACZKO: That's helpful.

4 Again, just so we try to narrow down what
5 the issues are here.

6 The other issue, then, is the reason that
7 we have a disagreement with the staff right now is
8 that the testing that was done was non-conservative
9 to the ANSI standard, I think that's what I heard
10 you say.

11 Those are the areas in which the staff has
12 additional questions.

13 MR. DINGLER: We believe the testing was done
14 conservative, there is some inherent non -- the staff
15 believes there is inherent non-conservative in that ANSI
16 standard that we have to apply and we need some additional
17 testing to provide data to show that that is not an issue or
18 a sensitivity to show that doesn't affect the ZOI.

19 CHAIRMAN JACZKO: So, those tests in which the
20 pressures and the jet characteristics were consistent with
21 ANSI standards, did the staff have questions about those
22 test results?

1 MR. DINGLER: All I can remember is where we had the
2 discussion of the differences, I can't remember --

3 CHAIRMAN JACZKO: I can ask the staff too, because
4 they may have that.

5 I appreciate, and again I'm just trying to
6 get to kind of what the core issues are.

7 It seems like there's a path forward, right
8 now, with additional testing and data to
9 demonstrate some of these lower zones of influence,
10 which it seems, if we had the lower zones of
11 influence -- let's say we wound up with the seven
12 that was in the original submittal, and I can't
13 remember which plant that was, if that were done
14 would you be comfortable moving forward based on
15 that technical information?

16 MR. SHAHKARAMI: I know the reduction if the
17 generation -- I just don't know what the end product will
18 be.

19 We are going to go look at that to see
20 how -- this utility that used the 7d definitely
21 concluded that a strainer remained functional.

22 The difference is definitely within 7d and

1 17d.

2 MR. HEACOCK: That won't solve all the issues. That is not a
3 generic solution. That is just one utility, a couple plants
4 and that's it.

5 CHAIRMAN JACZKO: So, what are the remaining
6 specific issues that need to be resolved?

7 Jeff, you said it's debris generation.

8 MR. GASSER: That's right.

9 Except, I want to -- from everything I've
10 seen with the testing, the testing does not show
11 100% destruction.

12 The testing shows that the jacketed
13 material does provide defense, defense against the
14 debris generation.

15 So there's assumptions being made that are
16 extremely more conservative than the test results
17 show.

18 Where we have been -- the staff has
19 worked -- NRC staff has worked very hard to try to
20 bring closure to this and do their technical
21 review, licensee staffs have been working very hard
22 to supply those answers, and as we prepared for

1 this, what it came down to is when different
2 highly technical, dedicated, committed people are
3 working on this and there is differences of
4 opinions on what assumptions should be used, that
5 is why our conclusion is the path forward is to use
6 a different analysis methodology which is
7 already approved by the Nuclear Regulatory
8 Commission which is a GDC-4.

9 CHAIRMAN JACZKO: Well, I will close here, I've
10 taken far too much time.

11 If other Commissioners want another
12 opportunity I will open that up.

13 I appreciate that.

14 What that looks to me is we are just
15 avoiding the problem.

16 It seems like the issues are, we need to
17 come to an agreement on what the appropriate
18 assumptions are in the analysis.

19 Moving us into GDC-4 space seems to just be
20 completely avoiding that difficult question.

21 I've had this argument with the staff in
22 the past a lot on containment overpressure, or

1 containment accident pressure. Whether that's a
2 policy issue in there about whether or not -- I
3 know Bill Ruland is looking funny because he deals with
4 that too.

5 It fundamentally, comes down to an issue about
6 whether or not at that point is that an issue for
7 the Commission to decide.

8 Should the Commission be in the middle of
9 answering those assumptions?

10 I, personally, think that's the right way
11 for us to go forward.

12 There's a technical issue here and it's
13 coming to an agreement and understanding what the
14 assumptions are to do the calculations, the
15 calculations are done, you make the mods that the
16 calculations say you need to make, I mean I think
17 that's the preferred path forward.

18 Throwing in GDC-4, Jeff as you
19 characterized, is to avoid having to do that.

20 But at some point I think we need to do
21 that, and I don't know, maybe it's the Commission
22 that needs to weigh in and approve or disapprove

1 certain assumptions the staff's using.
2 That, to me, is a preferable path forward
3 and maybe in the end we wind up with assumptions
4 that aren't what the staff wanted to use, but it
5 seems like a better approach than throwing in a
6 whole other analysis that says, oh by the way,
7 there's not a problem here.

8 MR. GASSER: I think that's mischaracterizing it
9 because using GDC-4 does exactly what you said, it gets to
10 doing the calculations and answering -- getting the answer
11 to the problem.

12 It just has more realistic assumptions
13 built into the methodology for getting to the
14 calculation of the debris that is generated,
15 running it through the calculation, seeing what the
16 effect on the ECCS is, and whatever that answer
17 is -- that drives the staff and the licensees
18 actions from that point.

19 CHAIRMAN JACZKO: Thank you, that is very helpful
20 and I appreciate your willingness to answer my questions
21 this long a time, because it seems like we are narrowing
22 what the issues are here and maybe we do -- can work on a

1 path forward to do this.

2 It will probably require additional
3 information briefing from the Commission and we
4 will hear from the staff now.

5 Now, I took more than enough time. If the
6 other Commissioners would like to offer some other
7 comments.

8 COMMISSIONER SVINICKI: If I could, because you
9 are allowing this and I appreciate that very much.

10 I just want to compliment you, Mr.
11 Chairman, I think this has been really helpful
12 because what I heard in the opening, I think
13 unanimously on this side of the table is that we
14 want to get this issue closed.

15 You've got people with you that have the most
16 time here, so you have the most background on this.

17 I found your commentary very helpful. I need
18 to go back and study the history of the
19 Commission's positions they've taken on the
20 application or possible expansion of GDC-4.

21 I think it is important that we just drive
22 to narrowing it down somewhat and then, I'm

1 hearing, I don't know on GDC-4, I need to acquaint
2 myself with that history.

3 It sounds like you have a view. I haven't
4 yet formed a view of that, but on some of these I
5 just think we look at it and say, this is
6 overwhelming, there is so much here, but we've got
7 to push down if we need to get some testing done,
8 we have to define it.

9 I think we are going through this in some
10 design certifications right now.

11 We come to early agreement on the test --
12 the test methodology, get the data, and if there are
13 narrow things that the Commission is truly a policy
14 matter, and I didn't mean to express any reluctance
15 on that, but we need to have enough in front of us
16 and to get the staff to present that to us in an
17 informed way with alternatives so we can weigh the
18 pros and cons of that.

19 I don't feel like I'm.
20 at that point today.

21 So, that was very helpful, thank you.

22 COMMISSIONER MAGWOOD: Let me echo that.

1 I think your verbiage was actually quite
2 helpful.

3 I think one of the issues I want to spend
4 some time on is looking at these tests, because
5 that is something we haven't really been briefed on
6 yet.

7 I would like to understand how helpful
8 these tests really are in understanding the
9 phenomenon we are looking into.

10 It may well be, and I want to address this
11 with the staff, it may well be that something Mr.
12 Shahkarami mentioned -- I will get it right
13 eventually, Amir -- something Amir said that
14 actually may be most helpful for me is the idea
15 that what we're missing here is really the
16 application PRA to understanding this phenomenon.

17 I know the staff is giving a lot of thought
18 to you applying PRA to these sorts of things.

19 I think we will want to have a dialogue
20 with them about that.

21 I am sensitive to the concern that we are
22 applying conservatism on top of conservatism, on

1 top of conservatism in doing conservatism.

2 I've been through experiments like that
3 before, and they do skew sometimes where you come
4 out.

5 So I do want to make sure, as I said
6 earlier, I want to make sure we get this right and
7 the next time the Commission rules on this, I would
8 like to think that everyone believes that that will
9 be the final time we have to take this up.

10 COMMISSIONER OSTENDORFF: Quickly, thank you, Mr.
11 Chairman.

12 I'm glad I'm not the only one that has
13 questions.

14 I'll thank -- I really learned a lot from
15 your exchange, you're getting to the technical
16 issues on the pressure of the jet and where that
17 falls, and the range of conservatism above and
18 below the line for various ANSI criteria.

19 So, I thought that was very informative.

20 I think we have a great opportunity here as
21 the Secretary of the Commission works on the staff
22 requirements memorandum upcoming from this meeting

1 to look at those specific issues that will help us
2 bore down to a small list, hopefully, of issues
3 that will provide for further briefing topics in
4 the very near future to come to closure.

5 CHAIRMAN JACZKO: Thank you.

6 With that, thank you for your comments and
7 turn to the staff.

8 Thank you.

1 Now we will turn to the staff for their
2 comments and perhaps you heard some discussion here
3 that may help you focus your discussions as we go
4 forward, and I think certainly there's been
5 interest on the part of the Commission about
6 understanding some of this information further.

7 I will turn it over to Bill for your
8 presentation.

9 MR. BORCHARDT: Thank you.

10 What we will try to do with the
11 presentation is really go very quickly over a few
12 slides, but focus on some of the ones that respond
13 to the discussion and the status of some of the
14 current technical issues.

15 As was mentioned earlier, this issue was
16 initiated in 1996.

17 At the beginning, neither the NRC nor the
18 industry had a full understanding of all of the
19 related issues, or all that would need to be done
20 to resolve it.

21 However, the staff and the agency as a
22 whole determined at that time, that it was

1 important that some action be taken to promptly
2 address some of the safety issues.

3 That's why this is not the model for how we
4 would like to address generic issues, but it was
5 important at that time because there was a clear
6 recognition that there was a significant safety issue
7 that needed to be addressed, and we didn't feel
8 that it was appropriate to wait five years, six
9 years to do all of the testing so that we could
10 have all of the definitive acceptance criteria
11 established.

12 It is not the optimum situation, but I
13 think it was the right decision at the time.

14 Nonetheless, plants today have made
15 important design improvements and are safer today
16 than they were in the nineties.

17 More than 30 units have resolved the issue
18 completely.

19 As has been said, we are highly
20 motivated to bring this issue to closure.

21 The industry submittal that was -- NEI
22 submittal from last week deserves some serious

1 consideration, we are going to do that and expect
2 that we are going to be preparing some
3 communication to the Commission that will document
4 our assessment of what they submitted.

5 Now, I will turn over to Jack Grobe who
6 will begin our discussion of the progress that we
7 have had to date, the remaining issues, and our
8 plans to get to closure.

9 MR. GROBE: Thank you, Bill.

10 Good morning, Mr. Chairman and
11 Commissioners.

12 I've just been shortening this, taking out
13 the vegetables and the potatoes, so hopefully just
14 have the meat.

15 Clearly, this is much more complex than we
16 anticipated in 2004.

17 We have had many surprises in the testing
18 and the research that has been done.

19 The approach -- let me introduce Bill
20 Ruland, Bill is the Director of the Division of
21 Safety Systems in NRR, and Mike Scott.
22 Mike is the Chief of the Safety Issues

1 Resolution Branch. He only has one, not that we
2 only have one safety issue, but PWR sumps is enough
3 to keep Mike busy.

4 Mike has done an exceptional job of
5 bringing together a team of experts, literally the
6 best in the world, that are balancing the
7 uncertainties.

8 I think you heard some discussion of non-
9 conservatisms and conservatisms.

10 He calls it the integrated review team and
11 these are very highly experienced senior people
12 that listen to all of the various staff in roughly
13 over a dozen different technical areas that
14 comprise these reviews and try to bring some
15 balancing to what we know and what we don't know,
16 and whether or not the questions we are asking need
17 to be asked.

18 We have remained flexible and adjusted to
19 all of these new things we have learned over the
20 years.

21 Mike will get into that in a little bit
22 more detail.

1 Well over half of the PWRs are either
2 closed or on a clear path to closure.

3 In considering 50.54(f) letters, that is
4 simply a tool, it's simply a letter to collect
5 information much like a generic letter.

6 We anticipate that likely fewer than 20
7 plants will receive those letters.

8 There is fewer than a quarter of the
9 plants, the PWRs, that have significant fiber
10 problems.

11 To be able to estimate the dose that it
12 might cost to take the modifications that are
13 necessary, is highly premature.

14 I would anticipate that all of those plants
15 would do additional testing to try to refine at a
16 further level what insulation needs to be taken out
17 and what doesn't.

18 Then, you start doing the design mods and
19 start doing the ALARA planning and estimating the
20 dose.

21 It will be substantial.

22 There's been, unfortunately, several

1 occasions -- PWR had replacements, steam generator
2 replacements, BWR intergranular stress corrosion
3 cracking on large pipes, PWR primary water-stressed
4 corrosion cracking where we
5 didn't fully understand what we
6 thought we understood when we originally designed
7 these plants, and we had to go back into
8 containment and make major modifications.

9 This is not the first time, and hopefully
10 it will be the last.

11 We will continue to be responding to the
12 operating experience.

13 We've received extensive support from the
14 Office of Research.

15 They've done exceptional work supporting
16 the staff, as well as close cooperation with the
17 Office of New Reactors, in considering questions
18 that we should be asking, not only for this
19 specific designs we're dealing with, but making
20 sure we are asking the right questions for the new
21 designs.

22 NEI submitted a letter, there's a very

1 large attachment called expected behaviors, we've
2 been working on this for a long time.

3 There is nothing in that letter that we
4 haven't already explored.

5 There aren't technical bases for those
6 expected behaviors.

7 We've already exercised those issues, there
8 is nothing new in that letter.

9 It is necessary to set time limits on how
10 much more time we will spend on this.

11 Our approach to date has been a
12 generic approach to establish generic criteria, and
13 what we've concluded at this point is we've gone as
14 far as we can with that and it's time to move in
15 for those few remaining plants to a plant-specific
16 approach.

17 We will remain flexible, it is likely going
18 to require two refueling outage cycles to finish
19 the job, so that's a nontrivial amount of time,
20 three to four years, after completion of the
21 testing.

22 In our view, there is no more value, we

1 can't see any path forward with further generic
2 work.

3 It is time to move to a plant-specific
4 discussion and get these issues resolved and move
5 on with it.

6 Absent Commission direction, our
7 approach will be to issue those 50.54(f)
8 letters to a small number of plants to continue
9 working with the remaining plants, and by the end
10 of 2010, have a clear path forward for what
11 additional testing needs to be done and what
12 modifications will need to be done in the next two
13 outage cycles to bring those few remaining plants
14 back into a position where you can have a
15 technically defensible design basis and a technically
16 defensible safety margin.

17 At this point, let me kick it over to Mike
18 and he is going to try to simplify the remarks that
19 he's been practicing for weeks and go forth it,
20 Mike.

21 MR. SCOTT: Thanks for that, Jack.

22 Good morning Chairman and Commissioners.

1 As Jack said, I am going to kind of move
2 lightly over the first couple of slides here.

3 First of all, they speak in a fair amount
4 of detail to some of the information you've already
5 heard from the industry presenters.

6 Slight two, of course we're going to talk
7 about the status of completion of the issue, our
8 path forward, we are going to briefly talk about
9 BWR strainer activities because it naturally comes
10 up as a question.

11 Well, you are spending all of this time, resource
12 effort on PWRs, what is going on with BWRs?

13 We will talk briefly about that subject and
14 then we will wrap up.

15 Slide three, please.

16 Of course, as the Chairman referred to, the
17 purpose of the exercise here is to demonstrate
18 compliance with a deterministic rule, which is 10
19 CFR 50.46(b)5.

20 We acknowledge and we have said several
21 times that the industry has made major strides in
22 addressing the issue.

1 We're clearly in a better place than we
2 were in 2004.

3 Installation replacements, much larger
4 strainers, there've been plants that have
5 implemented changes to automatic initiation of
6 containment spray to reduce the amount of debris
7 that is generated and washes down to the sump.

8 A whole variety of different activities
9 have been taken, and they have made progress.

10 There have been some challenges along the
11 way, as well.

12 We have frequently been surprised by the
13 research that has been going on, as the speaker
14 stated earlier, in parallel with the work being
15 done to try to bring the issue to closure.

16 Those surprises have caused us to be where
17 we are today, almost but not completely, resolved.

18 Moving to the next slide, please.

19 We did have a plan in 2004, we still have a
20 plan.

21 We have had to revise it a number of times
22 to deal with the surprises that I mentioned and to

1 deal with the fact that we found that there are
2 various sensitivities of this issue associated with
3 how the vendors do the testing.

4 As the Commission is aware, it is not
5 possible to test these strainers with debris in the
6 actual plant.

7 So, vendor testing needs to be done to show
8 that the issue has been resolved.

9 As we have also talked about, it's an
10 extraordinarily complex phenomenon with many
11 tentacles to it and to try to model in a vendor
12 facility what is going on actually in the plant, is
13 a very complex exercise.

14 We discovered that in reviewing the vendor
15 testing that we had a lot of questions about the
16 way the tests were being run, and that has caused
17 some of the discussions that have occurred since.

18 However, substantial progress has been made
19 in resolving those, as one of the slides says here,
20 we generally accept at this point the strainer test
21 protocols that the vendors have developed.

22 That was based on extensive discussions

1 with the staff, REI's to the various plants, their
2 responses, we've largely worked through that with a
3 couple of exceptions.

4 We mentioned that we've resolved the
5 strainer issue for over half of PWRs, and when you
6 consider that over half are done with the exception
7 of the in-vessel issue and another half of those
8 that remain are approaching issue closure, then as
9 a Jack Grobe said a minute ago, the number of
10 plants that are really struggling with this issue
11 is a relatively small fraction of all the
12 licensees, but nevertheless, there are very several
13 plants that fall into that category.

14 Next slide.

15 So, what's left?

16 The slide says that our goal is issue
17 closure in 2010.

18 It being a sump issue sort of thing, we've
19 experienced a lot of changes, and the in-vessel
20 issue that we have talked about with you and that
21 the industry talked about earlier this morning has
22 led us to conclude that we probably won't quite get

1 to the finish line in 2010, because of the
2 questions that have come out about the differing
3 behaviors between the two vendor fuel types.

4 We are still working through that, as
5 Amir Shahkarami indicated, we are attempting to get
6 to a point where the vendors involved agree to run
7 a cross-test so we can remove the question from the
8 table as to whether the apparent difference in
9 behavior for the two fuel types is a test issue.

10 Because if it behaves the same way in the
11 other test rig, then probably the testing is not
12 what's on the table.

13 There are some issues involved with trying
14 to manage one vendor's fuel being tested in another
15 vendor's facility, as you can imagine.

16 That's caused us some delays, and we
17 believe that that will end up pushing the final
18 resolution of that in-vessel issue out into 2011.

19 Nevertheless, we are continuing to push
20 hard to resolve the issues, including that one.

21 We do have issues with the zone of
22 influence testing that the Chairman was talking

1 about.

2 As was mentioned by the
3 industry, we have asked RAIs of basically the
4 owners group as a surrogate for the licensees on
5 the issue -- the ZOI testing issue.

6 The way that the test was done was with a
7 jet impingement test, and the staff asked a number
8 of questions about that jet impingement testing and
9 the questions led the owners group ultimately to
10 conclude that there was a misunderstanding of the
11 configuration of the test rig that caused a
12 non-conservative result in the reports that were
13 ultimately issued that were intended to justify the
14 zone of influence reductions.

15 As was discussed earlier, those changes in
16 zone of influence make a big difference in how much
17 debris is assumed to get to the sump.

18 It is important, from the staff's
19 perspective, that if we are going to agree to a
20 zone of influence reduction, it needs to be well
21 supported.

22 We did not find that the reports that were

1 developed by the owners group provided that
2 adequate assurance.

3 We sent a letter to the owners group early
4 this year that basically concluded that we did not
5 accept the test results from that testing.

6 There was an alternate plan that has been
7 put forward to measure the test, pressure at the
8 test article and use the ANSI standard that was
9 referred to, to calculate the zone of influence.

10 The staff would accept that.

11 However, that standard is conservative to
12 varying degrees, depending on how far from the test
13 article -- how far from the pipe the test article
14 is located, and the industry was reluctant to
15 accept that as a path forward so they have proposed
16 an alternate analytical approach.

17 Our history with alternate analytical
18 approaches is that they take a lot of time and
19 discussion, and may or may not succeed.

20 With that history in mind, we believe, as
21 Jack Grobe talked about, that it is important that
22 we have a backup plan if the new analytical

1 approach, like the one before it, does not work
2 out.

3 That is why we talk in terms of if we don't
4 succeed with this analytical approach, let's have
5 made the changes to the plant within two
6 refueling cycles.

7 Next slide, please.

8 So, what is our path forward here?

9 Test the strainer performance using an
10 approach acceptable to staff.

11 Again, we believe the industry knows what
12 that approach looks like.

13 There are issues for plants that have a
14 large amount of fibrous insulation with being able
15 to make the tests in the way that the staff has
16 accepted, recognizing that's conservative, and
17 still show successful performance.

18 We do expect that the plants will do what
19 the testing tells them to do over the next two
20 cycles.

21 It is important to emphasize here that we
22 are not stating that the plant should remove all of

1 their insulation. As Mr. Heacock talked about.
2 he has a plant that has substantial fibrous
3 insulation, and the staff has considered his plant
4 done, with the exception of in-vessel effects.

5 It is an oversimplification to say that
6 where this naturally leads you is to remove all of
7 your fibrous insulation.

8 It may well not.

9 It may be a portion of that.

10 Maybe none at all.

11 Although for plants that have a lot of
12 fibrous insulation there may be a significant
13 amount of reduction needed.

14 So, where we are with that is expecting
15 that to occur.

16 Where we have a plant with significant
17 unresolved issues that the staff does not appear to
18 be coming to closure with, then we are
19 contemplating and planning for and have drafted 10
20 CFR 50.54(f) letters to bring about actions I talked
21 about.

22 Run a test with a method acceptable to the

1 staff, and do what the test tells you to do to your
2 plant.

3 We remain open to proposed alternatives as
4 long as we have that fallback plan.

5 Next slide, please.

6 MR. GROBE: Mike, I think -- in looking through
7 the remaining slides, it talks a lot about the enhanced
8 approaches we have been taking and also addresses BWR
9 implications.

10 I think, seeing the time, it might be best
11 at this point just to transition to responding to
12 your questions.

13 MR. SCOTT: Would the Commissioners be okay with
14 that, or do they want to hear about the BWR issue as well?

15 MR. GROBE: If necessary, we've already done TA
16 briefs on the BWR approach and we'd be glad to do another
17 one.

18 CHAIRMAN JACZKO: I would be fine with that,
19 unless there's any objection.

20 I think the BWR issue will probably --

21 COMMISSIONER SVINICKI: Is it possible to
22 summarize it, I know that's hard to do, but could you just

1 summarize the BWR approach?

2 MR. SCOTT: Surely.

3 The BWRs were resolved in the 1990s through
4 efforts by the industry and the staff, and the
5 questions that arose during that process led us to
6 ask the questions of the PWRs, and now the process
7 with the PWRs has caused us to have additional
8 questions for the BWRs.

9 So, we are going back and looking at that.

10 It's way premature to say that we're going
11 to have significant issues with the BWR
12 performance, and as was mentioned, they've already
13 made their strainers larger so they're in a better
14 starting place than the PWRs were.

15 Nevertheless, we worked with the BWR Owners
16 Group to bring about a proactive look at the issues
17 and the questions that were raised for the BWRs,
18 the owners group is doing that now.

19 We are evaluating their work and overseeing
20 what is going on with them and their schedule, and
21 we will base whatever actions we need to take on
22 our evaluation of their work, and that is ongoing.

1 MR. GROBE: And we have briefed the TAs in the
2 past, and we will continue to keep them abreast of how
3 that's progressing.

4 MR. RULAND: And I would just like to add that the
5 BWR Owners Group schedule has been slipping, but we are
6 keeping a close watch on that.

7 If the schedule continues to slip, we need
8 to take additional regulatory action.

9 MR. SCOTT: Can I ask just for one minor thing
10 here?

11 Can I do my conclusion slide before we
12 start?

13 CHAIRMAN JACZKO: Sure, of course.

14 MR. SCOTT: I am all dressed --

15 CHAIRMAN JACZKO: And I'm the one that took up a
16 lot of extra time, so I think I got us off course.

17 MR. SCOTT: I would like to conclude by again
18 acknowledging that the PWR licensees have taken major
19 actions to address the issue.

20 We in the industry have methodically
21 executed plans to resolve the issues and the
22 questions involved.

1 We are on the cusp of resolution and many
2 plants effectively are resolved.

3 But challenges remain, which reflect the
4 difficulty of this issue and the surprises that we
5 have encountered all along the way and those
6 surprises, of course, each one of them that occurs
7 leads us to more caution and care about making sure
8 that we really have addressed these issues
9 technically before we conclude or are ready to move
10 on.

11 Some licensees would have us, as you heard,
12 declare the issue resolved now.

13 They've done enough.

14 We, the staff, however, do not believe that
15 course of action is appropriate or defensible.

16 As we've said, we've taken effective steps
17 to ensure, and I had to skip some of this, but we
18 talked about the RIT process, the statement was
19 made that we are piling conservatisms on
20 conservatisms.

21 We have put a process in place that is
22 intended to overcome that and for many plants,

1 including, for example, North Anna, Mr. Heacock's
2 plant.

3 We have concluded that that process works.

4 It struggles if there are numerous, and we
5 talked about 1000 RAIs.

6 If there were 30 or 40 RAI's for a plant,
7 each one of which is potentially significant, it is
8 difficult for the RIT to balance those
9 conservatisms against and the potential
10 non-conservatisms, or uncertainties.

11 I think it is a mischaracterization to
12 state that the process that we put in place does
13 not deal with that situation of piling
14 conservatisms on conservatisms.

15 We do not expect excessive conservatism, we
16 do expect each licensee to provide a sound
17 technical basis for their methods to show adequate
18 strainer performance, coupled with an end date for
19 making any mods found necessary.

20 Then and only then, does the staff believe
21 we can close the sump performance issue for all of
22 the licensees.

1 When we've closed it, we will attempt to close
2 it in 2010, I believe that we will not quite meet
3 that date because of the in-vessel issue that we
4 talked about, but we're continuing to push hard,
5 subject to your direction, to try to get to that
6 point.

7 Others believe we should not establish a
8 firm end date, they note expense and exposure
9 associated with major insulation replacements and,
10 they want more time to propose analytical
11 refinements to avoid the necessity of doing
12 modifications.

13 I talked about -- I think there's a little
14 bit of an overstatement here about the implication
15 is you are going to have to remove all of your
16 insulation, that may or may not be true.

17 We believe that -- they believe we are
18 pushing harder than the risk of the issue warrants.

19 We acknowledge that the modifications have
20 real costs, and we have been very patient with the
21 licensees in working through these issues.

22 We have not been prescriptive regarding

1 doing particular modifications.

2 Our expectation of near-term closure is
3 based on our technical understanding of the issue
4 and its inherent uncertainties.

5 It is also informed by our past experience
6 with refinements, which is the discussions
7 regarding them go on for months or years, often
8 without a successful result.

9 When one eventually fails, another is
10 brought forward.

11 The credit that the industry now seeks for
12 leak-before-break, as you know, has been submitted
13 several times in the past and found inconsistent
14 with Commission intent.

15 We do not know what its state would be if
16 that is looked at again.

17 As I previously noted, given the large
18 uncertainties, the remaining performance questions,
19 and the potential consequences of sump
20 recirculation failure, the staff does not believe
21 it is prudent to allow the performance questions to
22 persist without a defined endpoint.

1 Further, 10 CFR 50.46 calls for assurance
2 that the most severe postulated LOCAS are calculated,
3 as the Chairman discussed, and a high-level
4 probability that the criteria will not be exceeded.

5 We will continue to listen, we will be as
6 pleased as the licensees if they can make a
7 successful argument, but we believe that the right
8 action is to move now towards near-term finality in
9 resolving this issue and showing compliance with
10 50.46(b)5.

11 We also believe it is appropriate to link
12 that endpoint to the upcoming Commission decision
13 on the proposed 10 CFR 50.46(a) to allow for the
14 possibility that licensees strainer evaluations can
15 benefit from that rule if issued.

16 Thank you very much.

17 MR. BORCHARDT: I would just like to thank Mike
18 for adjusting his presentation, and staff is complete.

19 CHAIRMAN JACZKO: Thank you, I appreciate that.

20 I think we will start with Commissioner
21 Ostendorff.

22 COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman.

1 I appreciate very much the briefings today
2 and the briefing we had last week with you at the
3 table, that was very helpful.

4 I can appreciate you've been involved in
5 these issues for many years as, as industry and got
6 a couple of people here at the table that are new
7 to this just in the last two weeks.

8 Please, bear with me if you will.

9 I have a couple questions, but I want to
10 maybe -- I know time could get away from me I want
11 to make sure that I will tell my colleagues.

12 I have open questions here that I think --
13 I am mindful of Mr. Grobe's comment about absent
14 Commission direction the plan is to issue 50.54(f)
15 letters, and I think that was your statement.

16 I'm trying to figure out because I'm new to
17 this process a little bit, but I have reservations
18 about doing so based on where we are today.

19 I'm mindful in support of the need to get
20 to closure and certainly do not want to be an
21 obstacle or burden to getting to closure on this
22 vital issue, but I personally do not have a good

1 enough grasp.

2 I do acknowledge that there are open
3 questions here that I think some other people have
4 acknowledged.

5 I see the zone of influence testing as
6 being an open issue that is of -- that directly
7 affects the amount of debris and Mr. Borchardt had
8 commented on the staff just got a few days ago a
9 letter from NEI dealing with the leak-before-break
10 GDC-4 application.

11 I acknowledge the statement that these
12 issues are not new for you and your team, and I
13 respect that, but it is new for me and I would like
14 to learn a little bit more about the staff's
15 assessment on this letter before coming to any
16 decision on 50.54(f) letter, if that's being proposed
17 today.

18 The in-vessel effects, I think Mike in your
19 comments, you acknowledged that there's still open
20 issues there.

21 I just wanted to capture at least those
22 three issues, the zone of influence testing open

1 question, the open question on GDC-4, and the NEI
2 letter, and the chance for the staff to evaluate
3 it, as well as the in-vessel effects; differences
4 between the types of fuel and where that plays out.

5 I need to get some more on those.

6 MR. BORCHARDT: Commissioner, we certainly would
7 not be issuing the 50.54(f) letter without coming to the
8 Commission, first of all.

9 We anticipate having extensive interaction
10 with all of the Commissioners and the Commission as
11 a body, as we proceed through the next several
12 months on this activity.

13 COMMISSIONER OSTENDORFF: I appreciate that.

14 CHAIRMAN JACZKO: I'm sorry, just to clarify.

15 Bill, I appreciate that, but I want to be
16 clear.

17 It requires the Commission decision, and I
18 appreciate your reservations at this point, and we
19 will see as the other Commissioners go forward, but
20 right now we don't have a majority of Commissioners
21 objecting to staff moving forward.

22 It takes a majority to do that.

1 At some point, we may get to the point of
2 having a Commission decision, but just to be clear
3 about it it's not a one objection to move forward.

4 COMMISSIONER OSTENDORFF: I understand.

5 CHAIRMAN JACZKO: The other Commissioners may
6 weigh in on that as well, but for now I respect your
7 opinion and your concerns, and I think we will have an
8 opportunity to work through that in the next couple of
9 months to get you the information you need to be prepared.

10 As of now, we don't have a formal
11 Commission -- a decision in front of the Commission
12 that would prevent the staff from moving forward.

13 Just to make sure we are clear on that.

14 COMMISSIONER OSTENDORFF: Thank you, I appreciate
15 that.

16 So, with that being said, let me ask a
17 question and I guess -- Mike, I will ask you this
18 and it deals with the conservatism issue.

19 You addressed it very briefly, and I was
20 going to ask you perhaps to expand upon that
21 because I think that was a core statement by the
22 industry panel that preceded you.

1 I would really like to hear a little bit
2 more about the staff's, NRC staff's technical thoughts
3 on the claim that maybe they've been overly
4 conservative that you and your team -- and I
5 acknowledge also the Chairman's statement, that was
6 very helpful about looking at worst-case
7 assumptions for a LOCA event.

8 MR. SCOTT: I would be happy to do that,
9 Commissioner.

10 First of all, let me mention we have the
11 NEI paper in front of us that refers to expected
12 behavior.

13 Our view of that is it presents one side of
14 the picture, which is the conservatisms in the
15 respective areas.

16 It really does not get into the potential
17 non-conservatisms and associated -- uncertainties
18 associated with those areas.

19 So, it's a little bit, our view, a
20 one-sided document in that sense.

21 Nevertheless, we recognize that you could
22 fall captive to individual effects assessments as

1 you go through these evaluations, because there are
2 a dozen of these areas, more or less, and if in
3 fact each one is conservative and you just pile
4 those conservatisms up, then clearly you would have
5 an over conservative solution.

6 We recognized that early on when we got the
7 licensee submittals in 2008.

8 We implemented what we call an integration
9 review team, which is three senior staff members,
10 basically experts, but who have not been involved
11 with the individual reviews.

12 They get the inputs from the reviewers and
13 they sit as a group and review that, and their
14 charter is one thing, which is to determine whether
15 given the conservatisms as well as the
16 uncertainties for a given plant solution set for
17 GSI-191; have they demonstrated, overall, that they
18 are compliant and that their strainer performance
19 would be successful?

20 If the answer is yes, then they pass that
21 plant, even if there are unanswered questions.

22 The licensee has answered all the

1 questions, but not all of the answers may be fully
2 satisfactory to the individual staff member, but if
3 the IRT concludes, nevertheless, the plant is
4 overall compliant then that is the end of it and we
5 send the licensee a letter to that effect.

6 North Anna, what was presented earlier, has
7 gotten one of those letters.

8 I won't name any other names, but a couple
9 of the other plants represented today will get a
10 letter too.

11 Actually, Mr. Shahkarami's Braidwood has
12 gotten a letter of that sort.

13 That process was brought about to overcome
14 this very issue of stacked conservatisms, and we
15 think it has been successful, but it has been
16 slow -- we've had to do it one at a time with the
17 plants, and if the plant has many questions about
18 it then the IRT will probably not be able to conclude
19 that they are done.

20 Did that answer your question?

21 COMMISSIONER OSTENDORFF: Yes, you did, thank you.

22 I'll leave this to maybe Mr. Borchardt to

1 decide if you want to answer this, or anyone else
2 at the table -- I welcome anybody's comments.

3 Just trying to look, and I'm not familiar
4 with the 10 CFR 46(a) proposed rule and so can you
5 give me some comments as to how that plays into
6 this decision process.

7 MR. RULAND: Thank you, Commissioner.

8 The 10 CFR 50.46(a) proposed rule, which
9 is currently due to be submitted to the Commission
10 for its decision in December, changes the
11 worst-case large break LOCA from the largest reactor
12 coolant system piping, which is typically around
13 30 inches for a PWR, to the worst-case as the
14 surge line typically for a PWR, which is like a
15 14-inch pipe, and that 14-inch pipe is called the
16 transition break size and under current rules, a
17 large break LOCA postulated event which is the design
18 criteria for these plants for their ECCS systems.

19 The way it works is licensees are required
20 a set of very stringent assumptions to make, they
21 have to assume the single worst act of failure of
22 their equipment, they can only use safety grade

1 equipment, and they are required to use very
2 conservative analyses.

3 With the -- if the rule was approved in its
4 current form, what licensees could do for leaks
5 above of the transition break size is, they could
6 use non-safety related equipment, they could use
7 more realistic analyses, they wouldn't have to
8 assume a loss of offsite power.

9 So, what that could provide a licensees,
10 for instance, is maybe to use a back flush
11 capability that is non-safety related, and that is
12 not single failure proof to combat a leak greater
13 than the transition break size.

14 It basically increases their flexibility to
15 address GSI-191.

16 Of course this is just a proposed rule, the
17 Commission has made no decision on it, and one of
18 the reasons we have elected to tie the endpoint, or
19 really the starting of the two outages to this
20 rulemaking, is we recognize the staff always deals
21 with the realities.

22 The reality is that this rulemaking will

1 be in front of the Commission in December, and we
2 are concerned that with that rulemaking in front of
3 the Commission, and if it is approved and we are in
4 the middle of this GSI-191 resolution process, what
5 were licensees to do at that point?

6 Are they going to come to us and say, I
7 want to use this now, or not?

8 We are just really basing our actions based
9 on what the current Commission policy is, which is
10 the current 50.46, and then putting a, what I call,
11 a minor contingency in place to address if in fact
12 50.46(a) is in fact approved.

13 That is kind of how 50.46(a) fits into
14 this.

15 COMMISSIONER OSTENDORFF: Thank you.

16 Thank you, Mr. Chairman.

17 COMMISSIONER SVINICKI: I will just state that the
18 issue of the ECCS rulemaking that is, I believe, to come to
19 the Commission later this year, but it was just something I
20 discovered in talking to both of you gentlemen yesterday and
21 we ran out of time so I appreciate that Commissioner
22 Ostendorff asked about that and its relationship to the

1 issues we're talking about today.

2 I also want to -- I want to thank both Mr.

3 Ruland and Mr. Scott.

4 We've talked a lot about -- Commissioner

5 Magwood talked about a general reaction to some of

6 the dose estimates for removal of insulation, and I

7 certainly had shared that view, but I want to be

8 clear that in talking to both of you, you're very

9 sensitive to that issue.

10 I don't want to by the comments that I

11 made with the previous panel leave any kind of

12 impression that the NRC staff, or you two

13 specifically, are not highly sensitized to that

14 issue, and so maybe this is a little point of pride

15 for me I'm going to say NRC

16 staff is -- I put no one above them in

17 terms of caring about worker exposure.

18 I know in talking to both of you that you

19 are very sensitized to that issue, if we impose a

20 requirement that ends up in occupational doses that

21 are significant, we will be very sensitive to that --

22 we will analyze that keenly, so I want to say that

1 both of you are a real credit to the
2 professionalism of the NRC staff in that aspect,
3 and I'm sure many others that I don't know about.

4 So, thank you both and I appreciate your
5 sensitivity to that.

6 That being said, we are trying to resolve
7 GSI-191 so that's a factor, but I didn't want to
8 leave an implication that somehow you would rush
9 headlong without considering, that's absolutely not
10 the case.

11 I will say one thing is that, Bill, I
12 noticed you said that the staff would analyze that
13 the NEI proposal merited some analysis and
14 certainly that the staff would communicate in some
15 form, whether it's giving us an informational copy
16 of however you document your assessment of that, I
17 might've indicated that I asked a question about
18 that last week and got kind of an answer of you
19 weren't going to do an analysis.

20 Either I didn't articulate that question
21 correctly last week, or perhaps this has been
22 something that's been thought about since I asked

1 that question, but thank you for clarifying that point.

2 I, personally, would benefit from staff's
3 views on that proposal, so I will look forward to
4 receiving that.

5 Jack, I want to say that -- and I think I
6 wrote this down carefully, you mentioned that a
7 50.54(f) letters, it was in plural when you said it,
8 50.54(f) letters are just a tool to collect
9 information.

10 I reacted a little bit, I thought it's a
11 good thing I'm someone who prides myself on not
12 reacting too strongly to something, because RAIs,
13 which stands for Request for Additional
14 Information, those are a tool to collect
15 information as well, and I think your statement --
16 again if I was the kind of person who reacted to
17 things, which I'm not, I think it understates the
18 huge difference between those two things.

19 I feel a need, you can react to that or
20 not, but these very -- yes, they are tools.

21 They are very, very different tools.

22 I might state that your further statements

1 about there's nothing new in the NEI letter, we
2 need to move forward because there is, I believe,
3 another direct quote "no value" to further generic
4 work, that sounds really profoundly like a profound
5 disagreement with some of the back-and-forth of the
6 previous panel about zone of influence and other
7 issues to be resolved.

8 I would like to give you a chance to tell
9 me whether -- are you really just -- your view is
10 180 degrees different than the previous panel?

11 MR. GROBE: Interesting question.

12 I've worked very closely with Jeff Gasser
13 and Amir Shahkarami on a variety of issues.

14 I need to say that their statements are
15 overstatements, in this regard.

16 We have tried to clarify some of that, but
17 we're talking about a fairly small number of
18 plants.

19 We have gone through years and years of
20 testing and research, both performed by the
21 industry as well as the NRC, to develop criteria in
22 all of these areas; the chemical effects, the net

1 positive suction head impacts of the integration
2 of fiber, and chemical gelatinous materials on the
3 sump screen, the downstream effects on components
4 that we're now testing on downstream impacts
5 in-vessel on the fuel itself.

6 We've developed clear criteria and the
7 bases for those criteria are in empirical testing.

8 Beyond that, I think there is no further
9 testing, with the exception of the in-vessel fuel
10 issues, that we have ongoing and Mo Dinger
11 talked a little bit about that.

12 There isn't any more testing that we see
13 that can help us.

14 The industry tried to do additional testing
15 last fall on the zone of influence.

16 That testing was unsuccessful.

17 Just to clarify, there's different zones of
18 influence for different types of material, there
19 was some question as to whether that's
20 plant-specific.

21 It's not plant-specific it's
22 material-specific.

1 There might be a different zone of
2 influence for certain kinds and designs of fibrous
3 material, different kinds of coatings; zinc-based
4 coating, polymer coating.

5 So, the difference in zones of influence has
6 to do with the material that would be impacted by
7 the blow down, but we don't see any additional --
8 and we haven't been provided by the industry, any
9 bases to go for additional generic testing.

10 At a point in time, you have to get in to
11 the different plants, because the designs of these
12 plants are very different.

13 So, we see our position right now as to
14 moving into a relationship with the individual
15 licensees and the very unique characteristics of
16 those specific plants and resolve those issues
17 within the context of what we learned over the last
18 six years.

19 We are all ears, as Michael said, many
20 times.

21 If there's something new that we think
22 there's a new phenomenon that we hadn't considered,

1 there's another surprise, which there could be
2 another surprise left in 191, but if there is and
3 generic testing is appropriate, we will engage with
4 our office of research, we will engage with the
5 industry, and we will do that testing, we will
6 understand those phenomenon, but there's none that
7 we are aware of today.

8 COMMISSIONER SVINICKI: I will react first by
9 saying something I mean most sincerely, which is the NRC has
10 an open and collaborative working environment and a strong
11 safety culture.

12 So, you're entitled to your view, I'm entitled to
13 a view as well.

14 Again, I am still learning about this
15 issue, but based on what I heard and again the very
16 productive, I thought, trying to narrow issues and
17 really scope them and confine them, I agree with
18 you that it is a matter of "at some point."

19 I think that there can be different views
20 on, is this the point at which you should use --
21 again you have multiple tools, 50.54(f) letter is
22 one of your tools.

1 Based on what I've heard, I don't think
2 you're at the point where you should utilize that
3 tool.

4 Commissioner Ostendorff expressed his view
5 on that, I will express my view as well.

6 I think we will have an SRM arising from
7 this meeting and, speaking only for myself and I am
8 not a one-woman majority, but I think that there
9 will be perhaps some articulation of some view on
10 that.

11 I will turn for one specific -- I did ask
12 for the summary on the BWRs, and I spent less time
13 looking that in preparation for this meeting
14 because it wasn't really our focus today.

15 Is it likely -- you talked about and we
16 have to do this, of course, as regulators that
17 coming out of the PWR work, I wrote down that it is
18 informing the BWR work, or what we thought was
19 closure of issues with the BWRs, is that likely
20 when we get around to feeding that information back
21 in, informing it, and engaging again with the BWRs
22 Owners Group -- is it likely that they would be

1 looking at a round a further plant modifications, or
2 is it too early to know?

3 MR. SCOTT: It is probably too early to know.

4 Remember, they are starting in a much
5 better place having already made a number of
6 modifications, and the plants are very different in
7 a number of ways.

8 COMMISSIONER SVINICKI: The PWRs have made -- a
9 lot of them have made modifications too, so I guess that was
10 another disconnect I had with that statement.

11 The BWR, are they more extensive
12 modifications?

13 MR. SCOTT: I wouldn't say that, no, but their
14 plants are very different, the Bs to the Ps, the whole
15 system is different.

16 It's certainly possible that there could be
17 additional modifications, but one thing we are
18 trying to do, it's what's referred to before -- the
19 last time out we felt we needed to make immediate
20 changes that were made, and at the same time the
21 research was ongoing.

22 We're trying to take a somewhat different

1 approach this time and get more answers before we
2 take a regulatory action if we feel it is prudent
3 to wait.

4 That's where we are with that.

5 I'm really not trying to dodge your
6 question, but we just don't know.

7 COMMISSIONER SVINICKI: Just briefly in my time
8 remaining, is it likely because for the PWRs the staff
9 documented as they had to a basis for continued operation,
10 is there anything that we are finding out of the PWR
11 work that concern you in terms of a basis for continued
12 operation of the BWRs; like an immediate issue that is of
13 such significance that you would need to do something
14 sooner?

15 MR. SCOTT: We have not seen that to date.

16 Work continues to evaluate
17 the phenomena associated, and
18 remember, there are a number of phenomena each one
19 has a different question associated with it.

20 For example, in-vessel effects is being
21 looked at now.

22 Questions could arise that take us to the

1 point that you mentioned, but we are not there
2 right now.

3 COMMISSIONER SVINICKI: Thank you.

4 Thank you, Mr. Chairman.

5 COMMISSIONER MAGWOOD: Thank you, Chairman.

6 I guess I've been at the Commission for
7 about a week and a half, has it been?

8 It feels a little longer than that, quite
9 frankly.

10 Preparing for this discussion was actually
11 the first opportunity I've had to interact with the
12 staff to talk about a specific issue.

13 I really want to thank the three of you
14 here, not that I'm leaving you out, Bill, but
15 particularly Mike and Bill for their briefings.

16 It's been very helpful, very informative,
17 and I really appreciate it.

18 It's been a good introduction to the staff
19 here.

20 I appreciate it.

21 Because we had actually two discussions
22 about this, I've actually had a chance to talk

1 about the BWR issue, and a few other issues in more
2 detail.

3 While I still have a lot of questions, I am
4 becoming increasingly comfortable with the staff's
5 technical approach to this.

6 I'm not -- while I don't think I'm ready to
7 make a complete decision about where GDC-4 fits in
8 to all this, I still want to ask more questions
9 about it.

10 I think the approach you've taken to deal
11 with the conservatisms has actually been reasonably
12 effective from the discussions we've had.

13 The one big concern that I still have is
14 something you raised, Mike, at the end of your
15 talk.

16 That is how you're going to tie in 10 CFR
17 50.46(a) revisions.

18 I don't see how you launch this process now
19 without getting closure on that.

20 I'm a little concerned about starting down
21 this path have the Commission take action on this in
22 December and then say, well, on second thought you

1 can apply these flexibilities midstream.

2 I don't see how you start this process now
3 without really completing that.

4 My initial question is, you obviously
5 anticipated this: What is your vision for how this
6 is all going to come together?

7 MR. RULAND: As I said earlier, Commissioner, the
8 staff is faced with the realities of the schedules and
9 what's happening both with GSI-191 and with the proposed
10 50.46(a) rulemaking.

11 We have two goals and to some extent, as
12 you have pointed out, are somewhat in conflict.

13 We are trying to meld those two pieces
14 together, so what you have heard from the staff
15 this morning is that we are trying to go forward
16 and put in place a schedule for licensees to make
17 the modifications to, basically, represent the
18 plant as successfully tested.

19 While still listening to them for other
20 different modifications, or as Mike likes to
21 call them, refinements.

22 So that two-pronged approach is just what

1 we've been doing for GSI-191, and you overlay on
2 top of that 50.46(a).

3 So, our thinking is, that we continue with
4 the GSI-191 goal, continue on that path.

5 Actually, licensees know that we are going
6 to tie the starting of the timing for the two
7 outages roughly with the 50.46(a) rulemaking
8 decisions that the Commission would make.

9 Licensees could anticipate, they could look
10 at what the rulemaking, where it's going today, and
11 they could develop their own contingency plans.

12 Licensees really do a fabulous job in working
13 on contingency plans today.

14 If they have to do a particularly critical
15 inspection of piping that might need repairs, they
16 typically hire the people to do the repairs, have
17 them sitting on site, and if the inspection goes
18 south, they can do the repairs virtually
19 immediately because they've already anticipated
20 those.

21 We are trying to build into the licensees
22 natural and really refined ability to do

1 contingency planning by just pointing to the fact
2 that 50.46 (a) is out there.

3 Other than that, it would be presumptuous
4 or premature for the staff to say anything more
5 than that because it is not a rule, it is just a
6 proposed rule and we're going through the process,
7 and we're particularly sensitive -- we wouldn't
8 want to put the Commission in a place where they
9 feel like the staff is imposing something on them.

10 We are particularly sensitive to that.

11 I think the staff, frankly since 1982 I've
12 been with the NRC, we really like to follow
13 Commission policy.

14 What is the policy today?

15 CHAIRMAN JACZKO: Can I just say, we really like
16 that the staff likes to follow Commission policy.

17 MR. RULAND: What is the policy today?

18 We are trying to follow it and we are
19 trying to anticipate a possible change in policy in
20 the future.

21 It's not the ideal situation, but it's the
22 best we can do given the circumstances.

1 COMMISSIONER MAGWOOD: Thank you if you want to
2 say anything else controversial let me know.

3 Bill, let me ask you -- we haven't had an
4 opportunity to talk about this at all, but is
5 there -- the schedule calls for this to come up to
6 the Commission in December, is there a way of
7 expediting that so that we could deal with that
8 issue sooner and bring these two together up front
9 instead of depending on contingency planning down
10 the road.

11 CHAIRMAN JACZKO: Commissioner, let me address the
12 question, I think that is probably more of a question for me
13 than for Bill.

14 We will have at the end of the month an agenda
15 planning session, and one of the things that we will provide,
16 or I will provide as part of that, is kind of a look for the
17 next six to 12 months of what kind of work is coming in
18 front of the Commission.

19 That is really a discussion that we would
20 have at that agenda planning session.

21 If there is interest among Commissioners to
22 take a look at that rulemaking in a different time

1 frame, that's something that we would do in that
2 context and then could give direction to the staff
3 to re-arrange other things and shift other
4 priorities to do that.

5 It is probably a question to hold for that
6 discussion in, actually, a couple of weeks.

7 COMMISSIONER MAGWOOD: Thank you, Mr. Chairman,
8 that is helpful.

9 I know we're behind schedule. Let me close
10 by simply saying given that I think I will support
11 what Commissioner Ostendorff and Commissioner
12 Svinicki suggest, that we hold off on sending the
13 letters until we have a chance to sort of conjugate
14 over the SRM and maybe what we can do is decide the
15 context of the schedule, whether it is practical to
16 bring these schedules together.

17 I'm really uncomfortable with launching this
18 process and depending on contingency planning to
19 fix it down the road when we know that the problem
20 exists.

21 If we can bring this together in some
22 logical fashion I would like to do that.

1 I would like to support holding off on the
2 letters until we have a chance to think this
3 through a little bit.

4 CHAIRMAN JACZKO: Thank you, Commissioner.

5 I appreciate that and I think certainly --
6 and I think, Jack, maybe you could clarify that the
7 staff was not intending to issue the letters now.

8 When is the schedule right now to issue,
9 assuming Commission support, when would the staff
10 at the earliest date issue the 50.54(f) letters?

11 MR. GROBE: Go ahead Bill.

12 MR. RULAND: Mr. Chairman, the staff has, while we
13 have prepared the Commission 50.54(f) letters, our intention
14 is to wait for an SRM coming out of this meeting.

15 CHAIRMAN JACZKO: But even if there were support
16 for doing -- which there clearly right now is not support to
17 move forward, what would be the earliest date that the staff
18 would intend to issue the letters?

19 MR. SCOTT: We could be ready in the next couple
20 of months.

21 The letters are drafted and I've actually
22 reviewed the draft.

1 CHAIRMAN JACZKO: So, it's not an action that is
2 pending immediately, the staff is not planning to issue this
3 tomorrow.

4 The plan had been to issue them in a month
5 or two.

6 I think that's helpful.

7 Certainly what I've heard from the
8 Commission I think is some interest in getting a
9 better lay of the land before we go forward.

10 It seems like what we can work on, we can
11 get some of our assistants to flush out in SRM is
12 what -- perhaps a schedule the Commission can work
13 to about establishing exactly the information we
14 need.

15 I think Commissioner Ostendorff, you
16 indicated some information about the zone of
17 influence and a few others I think that Annette captured.

18 If everyone is in an agreement we will work
19 through in the SRM then to figure out a schedule to
20 get the Commission the information it needs, in I
21 think a relatively short period of time to be able
22 to make that decision about whether we will be

1 supportive of the staff moving forward with those
2 letters.

3 Given your timeframe, I think there
4 should be enough opportunity to do that in the next
5 couple of months, so we can work through that
6 language on specifically what the Commissioners are
7 looking for in the SRM, if there's agreement on that.

8 I want to thank the staff for a very good
9 presentation.

10 I thank our representatives from the
11 industry for their presentations.

12 I think this is an interesting and exciting
13 meeting on GSI-191.

14 Thank you.

15 We are adjourned.

16 (Whereupon, the meeting was adjourned)

17

18

19

20

21

22