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1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

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4 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

5 + + + + +

6 562nd MEETING

7 + + + + +

8 THURSDAY,

9 MAY 7, 2009

10 + + + + +

11 ROCKVILLE, MD

12 + + + + +

13 The Committee convened in Room T2B3 in the
14 Headquarters of the Nuclear Regulatory Commission, Two
15 White Flint North, 11545 Rockville Pike, Rockville,
16 Maryland, at 8:30 a.m., Dr. Mario Bonaca, Chair,
17 presiding.

18 COMMITTEE MEMBERS PRESENT:

19 MARIO BONACA, Chair

20 J. SAM ARMIJO, Member-At-Large

21 JOHN D. SIEBER

22 SANJOY BANERJEE

23 JOHN W. STETKAR

24 DENNIS C. BLEY

25 DANA A. POWERS

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1 COMMITTEE MEMBERS PRESENT: (cont.)

2 WILLIAM J. SHACK

3 MICHAEL T. RYAN

4 OTTO L. MAYNARD

5 HAROLD B. RAY

6 CHARLES H. BROWN, JR.

7 MICHAEL CORRADINI

8 GEORGE E. APOSTOLAKIS

9 NRC STAFF PRESENT:

10 SAM DURAISWAMY, Designated Federal Official

11 TIM COLLINS

12 STEVE DINSMORE

13 ROB TREGONING

14 RALPH LANDRY

15 MICHELE EVANS

16 EMMETT MURPHY

17 DOUG HUYCK

18 SCOTT MORRIS

19 BILL GOTTF

20 LOUIS CUBELLIS

21 FRANK AKSTULEWICZ

22 STEPHANIE COFFIN

23 EILEEN McKENNA

24 TOM KEVERN

25 MIKE LEE

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1 ALSO PRESENT:

2 PETER HASTINGS

3 ROB SISK

4 ED CUMMINGS

5 DAVE WATERS

6 EDDIE GRANT

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PROCEDINGS

8:29 A.M.

3 CHAIR BONACA: Good morning. The meeting
4 will now come to order. This is the first day of the
5 562nd meeting of the Advisory Committee on Reactor
6 Safeguards.

During today's meeting, the Committee will consider the following: proposed rule on risk-informed changes to loss-of-coolant accident technical requirements; proposed resolution of Generic Safety Issue, GSI 163; multiple steam generator tube leakage; draft final Regulatory Guide 1.214; response procedures for potential or actual aircraft attacks; status and update concerning revisions to the AP1000 design control document; subcommittee reports; and preparation of ACRS reports.

17 This meeting is being conducted in
18 accordance with the provisions of the Federal Advisory
19 Committee Act. Mr. Sam Duraiswamy is the Designated
20 Federal Official for the initial portion of the
21 meeting.

22 We have received no written comments or
23 requests for time to make oral statements from members
24 of the public regarding today's session.

25 A transcript of a portion of the meeting

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1 is being kept and it is requested that speakers use
2 one of the microphones, identify themselves, and speak
3 with sufficient clarify and volume so that they can be
4 readily heard.

5 I will begin with some items of current
6 interest. Mr. Harold Vander Molen, who has been with
7 the Agency for 37 years of which about two years with
8 ACRS is retiring at the end of May 2009.

9 (Applause.)

10 MEMBER CORRADINI: Can we talk about that?

11 (Laughter.)

12 CHAIR BONACA: After I finish my
13 statement. During his tenure at the ACRS he has
14 provided outstanding technical support to the ACRS in
15 his review of numerous matters including ESBWR design
16 certification plan application, risk assessment
17 standardization projects, treatment of uncertainties
18 associated with PRAs in risk-informed applications,
19 risk matters for LWR risk-informed applications, and
20 international HRA empirical studies.

21 His dedication, hard work,
22 professionalism, attention to details, willingness to
23 accept additional responsibility, total knowledge of
24 the NRC regulation and regulatory processes and
25 exceptional and technical support to the Committee are

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1 very much appreciated. Thank you and good luck in
2 your future endeavors.

3 (Applause.)

4 MEMBER APOSTOLAKIS: Any other surprises?

5 (Laughter.)

6 CHAIR BONACA: With that, we'll turn to
7 the first item on the agenda and that's proposed rule
8 on risk-informed changes to loss-of-coolant accident
9 technical requirements. Dr. Shack will take us
10 through the presentation.

11 MEMBER CORRADINI: We had a Subcommittee
12 meeting yesterday. This is -- I forget what Tim's
13 actual terminology is to keep track of the different
14 versions of this rule. I think we're now back on the
15 current proposed rule which is about to go out for
16 public comment. So we're not discussing the final
17 rule, just a rule that --

18 MR. COLLINS: Revised proposed rule.

19 MEMBER SHACK: Revised proposed rule. On
20 the draft final rule which we reviewed back in
21 November '06, we had a number of comments on that rule
22 and suggested it not go forward and our comments, in
23 fact, the staff felt were contradictory with some
24 Commission policy, so in addition to reviewing our
25 recommendations, they felt they had to go back to the

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1 Commission to get some additional guidance and they
2 did and they got an SRM. And so they have made
3 substantial changes in the rule in response to the SRM
4 and to our recommendations and we're going to be
5 reviewing that proposed rule today and again, the
6 question only is whether it should be sent out for
7 public comment. They're actually not seeking a letter
8 at the moment, although we, of course, are free to
9 write one if we feel we have issues that need to be
10 dealt with. But with that, I'll turn it over to Tim
11 Collins.

12 MR. COLLINS: Good morning. My name is
13 Tim Collins. I work in the Division of Safety Systems
14 in NRR and I have with me Steve Dinsmore, PRA Branch,
15 and Rob Tregoning from the Office of Research.

16 I'll start off my presentation today by
17 outlining what we plan to talk about. First thing I
18 want to do is give a very high-level summary of what
19 the rule concept is, what I see as the Commission's
20 idea of what they were looking for when they started
21 this whole thing off.

22 Then I'll provide a bit of background on
23 where we've on the rule and the current schedule, and
24 this is primarily for the sake of any Members of the
25 Committee who are new to this rulemaking or members of

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1 the public who are new to the rulemaking.

2 Next, I'll follow with an overview of the
3 current version of the rule, the one we're hoping to
4 send out for public comment in the summer. I'm going
5 to refer to this version of the rule as the revised
6 proposed rule. I'll also use the term draft final
7 rule to refer to the version that the Committee
8 reviewed and commented on back in November of 2006.
9 I'll also to an original proposed rule which is the
10 version of the rule that actually went out for comment
11 in November of 2005.

12 MEMBER APOSTOLAKIS: On your previous
13 slide, in parentheses it says "Redefinition of Large-
14 Break LOCA." Can you explain what that means?

15 MR. COLLINS: The limiting design basis
16 LOCA in the past is a double-ended guillotine break of
17 the largest pipe in the reactor coolant system and the
18 Commission's direction at the very beginning was to
19 reduce the size of the pipe. That would be the
20 limiting large break LOCA, based on estimates of
21 frequency.

22 MEMBER APOSTOLAKIS: You are not
23 redefining the large break LOCA. You're doing other
24 things.

25 The large break LOCA is a large break

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1 LOCA.

2 MR. COLLINS: I think you got it right.

3 Is the confusion cleared up?

4 MEMBER APOSTOLAKIS: Yes, please. Thank
5 you.

6 MR. COLLINS: Okay, during my overview of
7 the rule, I'm going to try to emphasize the changes
8 that we've made based on the latest Commission
9 direction. That direction came in an SRM that
10 followed the ACRS comment on the 2006 draft rule.

11 And finally, at the end of the
12 presentation, I'm just going to summarize the changes
13 that have been made relative to the last version that
14 was reviewed by the Committee.

15 The rule concept and I'm referring here to
16 what the Commission's idea was of the rule at the very
17 outset, and their intent was to focus the regulatory
18 requirements and staff resources and industry
19 resources on more risk-significant events. And
20 ultimately, their hope was that would result in an
21 enhancement of safety.

22 So the staff was directed to develop an
23 alternative to the current requirements that are
24 specified in 10 CFR 50.46 which is the ECCS
25 performance requirements. And the alternative

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1 approach was not to be mandatory. It was to be an
2 alternative. Licensees would have the option of
3 sticking with the original 50.46 requirements or
4 adopting the new alternative.

5 And the new alternative would divide the
6 LOCA break spectrum into regions based on estimates of
7 LOCA frequency. And the Commission suggested a
8 guideline of about ten to the minus fifth as the
9 dividing line, ten to the minus fifth per year is the
10 initiating event frequency.

11 And then breaks in the region that has the
12 higher estimates of LOCA frequency would be treated as
13 design basis LOCAs and there would be no changes to
14 the treatment of these breaks. And all the current
15 50.46 requirements would continue to apply.

16 Now breaks that were estimated to have a
17 lower frequency of occurrence would still need to be
18 mitigated, but the demonstration of the mitigation
19 would not need to be performed with the same rigor as
20 the higher frequency breaks. You do not need to use
21 design basis LOCA assumptions, basically; more
22 realistic assumptions could be used.

23 A licensee adopted this alternative
24 approach, then subsequent changes that they made to
25 the plant should be reviewed by some sort of risk-

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1 informed process. This was the Commission's vision of
2 what the rule would be.

3 Now some background in history, where
4 we've been. This rulemaking has quite a long history.

5 I think I had brown hair when it started. It was
6 kicked off by an SRM back in March of 2003. And at
7 that time the staff had argued that the technical
8 basis wasn't ready to go forward with the rule, but
9 the Commission thought that we were far enough along
10 and they directed that we take it on. And ever since
11 then it's been a controversial rulemaking.

12 It took us two years to get the first
13 proposed rule to the Commission. It got there about
14 March of 2005 and the Commission was not particularly
15 happy with that version. They directed that we make
16 quite a few changes. And the proposed rule was
17 finally published for public comment in November of
18 2005.

19 Comments that we received on the original
20 proposed rule, primarily from members of the nuclear
21 industry, most felt that the change process was too
22 burdensome to be cost effective and the comments also
23 indicated that they thought the TBS was too large to
24 provide significant benefits. We held three public
25 meetings with industry and other members of the public

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1 to discuss these comments and in the process then we
2 took back the discussions, what we learned at the
3 discussions, how we tried to modify the rule in such a
4 way that we wouldn't compromise safety, but at the
5 same time, we could somehow reduce the burden that was
6 troubling the industry. The result of that was posted
7 on the NRC website in October of 2006. And it was
8 presented to the Committee in November of 2006.

9 A letter that we received from the
10 Committee recommended that the draft rule not be
11 issued in the form we had drafted. It identified
12 several significant concerns and included
13 recommendations as to how we might address those
14 concerns.

15 The Committee was satisfied with the idea
16 of relaxing the requirement that a single failure be
17 assumed coincident with the LOCA. The Committee was
18 also satisfied with relaxing the coincident loss of
19 offsite power. But there were concerns with the
20 remaining defense-in-depth for breaks larger than the
21 TBS and with the assurance of safety margins. There
22 were also concerns expressed with regard to the risk-
23 assessment process that would be used. The letter
24 noted that the process differed from the precedents
25 and practices that had been established through the

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1 use of Reg. Guide 1.174, particularly with regard to
2 treatment of bundling and cumulative risk.

3 The Committee also felt that the process
4 for licensee self approval of changes needed to be
5 tightened up and that the staff should be reviewing
6 more of the changes that licensees might proposed.

7 Finally, the Committee indicated that the
8 rule ought to require that the underlying studies, the
9 elicitation report on the frequency of breaks and the
10 staff's study of seismic effects, that individual
11 licensees who want to adopt the new rule need to show
12 that those studies were, in fact, applicable on a
13 plant-specific basis.

14 On the fact of these comments, the staff
15 decided that we should go back to the Commission for
16 more guidance since this was going to have a
17 significant impact on the proposed rule. So we sent
18 up a SECY paper in May of 2007 and in that paper we
19 discussed the comments of the Committee and we also
20 asked the Commission about the priority for the rule.

21 We had been treating the rule as a high priority
22 because of what we thought the potential for safety
23 enhancements were at the time we started. These
24 potential safety enhancements didn't seem to be
25 realized as more we studied it. So we asked the

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1 Commission if we should be treating this as a lower
2 priority based primarily on considerations of burden
3 reduction.

4 The Commission response was that we should
5 reduce the priority of the rulemaking and treat it as
6 a medium priority. The Commission also agreed with
7 the ACRS comments that the defense-in-depth ought to
8 be increased for breaks larger than the TBS and that
9 the elicitation report results ought to be
10 demonstrated applicable on a plant-specific basis.

11 We took the guidance on demonstrating
12 applicability to apply to the seismic study as well,
13 even though the SRM didn't explicitly say that. The
14 Commission left it up to the staff to decide the
15 specifics of how the defense-in-depth ought to be
16 beefed up and they also added a couple of other things
17 which we didn't really raise in the memo, in our
18 Commission memo, or the ACRS I don't think raised in
19 their letter, but the Commission also directed us to
20 seek ways to improve leak detection in piping larger
21 than the TBS. And they also indicated, actually
22 directed, this wasn't a suggestion, this was
23 direction, that the cumulative risk ought to be
24 limited to very small. The version of the rule that
25 the Committee reviewed had limited the cumulative risk

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1 to small. And in PRA space that's a factor of 10
2 reduction in what would be allowed in cumulative risk.

3 That was a little bit of a surprise to us, but it was
4 very clear in the SRM.

5 MEMBER APOSTOLAKIS: So let me understand
6 this. The total increase in the future?

7 MR. COLLINS: Yes, from the time that we
8 adopt the rule.

9 MR. DINSMORE: Yes, this is Steve
10 Dinsmore. The SRM said the total increases or changes
11 made under the rule could be limited to very small.

12 MEMBER APOSTOLAKIS: So under the rule,
13 what does that mean?

14 (Laughter.)

15 MR. DINSMORE: We eventually defined it to
16 mean the changes that are enabled by the rule or
17 changes that the licensees choose to bundle with
18 enabled changes.

19 MEMBER APOSTOLAKIS: So if I -- the staff
20 and industry are working now on risk-informing tech
21 specs, for that activity, this would not apply,
22 correct?

23 MR. DINSMORE: Yes.

24 MEMBER APOSTOLAKIS: Because it's not
25 enabled by the rule.

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1 MR. DINSMORE: Correct.

2 MEMBER STETKAR: But wouldn't that apply
3 to tech specs for low pressure injection systems?

4 MR. DINSMORE: If the change did not
5 require the new ECCS evaluations in 50.46(a), it would
6 not be considered to be enabled by the rule.

7 MEMBER CORRADINI: Can I say it
8 differently? So you're saying if the licensee in any
9 action takes advantage of the new definition of TBS,
10 this applies?

11 MR. DINSMORE: Yes.

12 MEMBER CORRADINI: That's correct.

13 MEMBER APOSTOLAKIS: If you need to invoke
14 this, then it applies.

15 MR. DINSMORE: That's correct.

16 MEMBER APOSTOLAKIS: And you guys will
17 tell us what very small is?

18 MR. DINSMORE: Ten to the minus -- to be a
19 little flippant, ten to the minus six is what we
20 normally -- for CDF.

21 MEMBER APOSTOLAKIS: This creates all
22 sorts of problems it seems to me, because 1.174 is for
23 individual actions. So you have to keep track of this
24 separately? Are you going to come back to this or is
25 this an appropriate time to talk about it?

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1 MR. DINSMORE: There's another place
2 later, but what we did, the draft final rule had dealt
3 with that complexity. And now that we have moved back
4 to 1.174 space pretty firmly, that difficulty
5 reappears. What we've done is we took text from the
6 NFPA 805, the fire, the new fire rule which talks
7 about how to deal with cumulative increases over time.
8 And we simply stuck it into this rule with the intent
9 that however we eventually figure out how to deal with
10 that for the fire protection program, the risk-
11 informed fire protection program rule, we will simply
12 do the same thing here.

13 Now the text, there's a paraphrasing of
14 the text later on in this presentation and the text in
15 the rule itself. It just says if you've made the
16 previous changes you have to evaluate the cumulative
17 effect. It says evaluate. It doesn't say calculate.
18 That's one of the things that we're trying to -- but
19 we're still working through that.

20 MEMBER APOSTOLAKIS: I still do not
21 understand why we need this?

22 Can you please enlighten me as to why we
23 are here. I know we cannot question.

24 MR. COLLINS: I think the idea, in
25 general, when the Commission started out on this

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1 rulemaking they were saying they're hoping that this
2 is going to result in safety enhancement. Now if
3 we're talking about allowing risk increases that's
4 hard to argue that's a safety enhancement and they're
5 saying we want to push ourselves back towards the idea
6 that this rule should be resulting in safety
7 enhancements. So by making it smaller, they're just
8 getting closer to that ideal, I think.

9 MR. DINSMORE: And also by applying it to
10 the cumulative change, if you don't apply it to the
11 cumulative change over time, there's no way to even
12 measure whether you're making safety enhancement or
13 not. They can come in at one point in time and
14 request one thing which meets the guidelines and six
15 months later they could request something else that
16 meets the guidelines. So there has to be some, at
17 least recognition --

18 MEMBER APOSTOLAKIS: Well, that is not
19 clear. We have been applying 1.174 for 30 years now
20 without that.

21 Has there been a PRA that has shown that
22 if this rule is implement and you assume reasonable
23 changes enabled by the rule that shows that there is
24 indeed a safety enhancement?

25 MR. COLLINS: No.

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1 MEMBER APOSTOLAKIS: Can there be one?

2
3 MR. COLLINS: A couple of years ago we
4 asked the industry to provide such a study and they
5 did a study which showed that they could potentially
6 allow diesel generator start times to be longer and
7 they could potentially allow longer times for operator
8 reaction for switchover into something and they
9 calculated a very small safety enhancement if people
10 implemented just the way they calculated and they
didn't do anything else.

11 So that's the best we have as far as the
12 studies go. The BWR Owners Group came into the
13 Committee with a presentation and they concluded that
14 it was basically risk-neutral for BWRs.

15 MEMBER SHACK: Ten to the minus seven.

16 MR. COLLINS: Yes, something like that.
17 Those are the only studies that --

18 MR. DINSMORE: There's other things. The
19 only one that they identified which could be a risk
20 decrease would be to realign in one ECCS train
21 injection and the other in recirc cooling. They could
22 get away with that perhaps. That probably would
23 decrease the calculated risk. But then there's other
24 things that nobody has thought of before which came
25 up, for example, if they want to switch to digital

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1 they need to have, there's a whole discussion about do
2 you need diverse digital?

3 However, if they implement this rule, then
4 because the temperatures and pressures are going to be
5 different because they've got a lower design-base
6 break size they could use this rule to not put in
7 diverse digital. So there's all kinds of changes that
8 we didn't, we couldn't think of. We gave up a long
9 time ago trying to figure out exactly what they were
10 going to do and just tried to make the rules
11 survivable or good enough to deal with anything that's
12 eventually discovered.

13 MEMBER BROWN: In other words, we're going
14 to reduce those systems that are the primary
15 protection function for the plant. I presume you're
16 talking about digital I&C?

17 MR. DINSMORE: Yes.

18 MEMBER BROWN: So now we get to the point
19 where this stuff from the safeguards and now we back
20 down and we now can justify or convince ourselves that
21 our digital I&C systems don't have to be as robust as
22 they were before.

23 MR. DINSMORE: Under the old rule.

24 MEMBER BROWN: Under the old rule.

25 MR. DINSMORE: That was the discussion.

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1 MEMBER BROWN: We're going to take now the
2 primary levels of protection, not all these other
3 pick-up things. The primary ones, we're going to make
4 those less robust. So this snowball just keeps
5 walking our way back.

6 MR. DINSMORE: Again --

7 MEMBER BROWN: I may be phrasing that
8 wrong.

9 MR. DINSMORE: Snowballs roll.

10 MEMBER BROWN: Rolling the snowball back.

11 MR. DINSMORE: I was just bringing that up
12 to try to point out -- nobody has done a study to
13 figure out what's going to happen and we gave up on
14 that a long time ago because we decided it wouldn't be
15 useful because whatever we came up with would probably
16 not be correct.

17 MEMBER BROWN: This is a similar
18 discussion we had yesterday about -- at the end of the
19 Subcommittee meeting relative to have we demonstrated
20 any safety benefit to this. And the answer is --

21 MEMBER APOSTOLAKIS: I hope the issues we
22 raise today were discussed yesterday. It's the
23 Subcommittee meeting right?

24 MEMBER BROWN: Yes.

25 MEMBER APOSTOLAKIS: I wasn't there.

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1 MEMBER BROWN: We missed you.

2 MEMBER APOSTOLAKIS: I should have been
3 there.

4 MEMBER CORRADINI: Since -- before you
5 move on, I thought -- I want to make sure. You used
6 the analogy of the fire protection, but the magnitude
7 of the absolute cumulative effect is different in that
8 than here. It's not ten to the minus six.

9 MR. DINSMORE: Yes, right. The total --
10 they're going to use a total of small.

11 MEMBER CORRADINI: Okay, I just wanted to
12 make sure. You used it as an analogy. I wanted to
13 make sure that the process you view it as similar, but
14 in terms of what will be the comparison point is
15 different.

16 MR. DINSMORE: Yes.

17 MEMBER CORRADINI: Okay.

18 MEMBER SHACK: But their self-approval
19 level will be the same, minimal.

20 MR. DINSMORE: Yes. That's what we're
21 working on.

22 MEMBER APOSTOLAKIS: Why would it be
23 difficult for you guys to do a mini study that indeed
24 it would result in safety enhancement? You said that
25 we didn't know something.

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1 MR. DINSMORE: When we first started this
2 process many years ago, we were trying to figure that
3 out.

4 MEMBER APOSTOLAKIS: That's not very many,
5 it's six. Six years.

6 MR. DINSMORE: Okay. So six years ago,
7 but this thing about digital I&C just came up in the
8 last six or seven months and we just -- you know, if
9 we tried to do a big study and reach a conclusion
10 based on that big study, and then design the rule to
11 accommodate just what that study resulted in and then
12 later all these other things come -- it just didn't
13 seem like the most appropriate way to move forward and
14 we described that process. We called it a tentacle
15 search if you ever --

16 MR. COLLINS: There is also the
17 consideration this rule could potentially result in
18 power uprates and we've never been very good at
19 estimating changes in risk based upon power uprates.

20 Power uprates clearly go in the wrong
21 direction of safety. How you quantify that has always
22 been a problem.

23 MEMBER APOSTOLAKIS: But if I change the
24 argument now, you and Steve, let's say have convinced
25 me that we cannot do PRAs that are realistic here,

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1 then why have this requirement that the risk increase
2 should be very small, if we cannot quantify risk.

3 MR. DINSMORE: I heard if we didn't
4 convince you we couldn't do realistic PRAs. I was
5 trying to say we -- I didn't think that we could do a
6 realistic evaluation of all the potential changes that
7 could arise from this rulemaking in the future.

8 MEMBER BLEY: So you can't envision all
9 the possibilities.

10 MEMBER APOSTOLAKIS: What's the point of
11 the last slide? Because in the future, there's going
12 to be the same problem.

13 (Simultaneous speakers.)

14 MR. DINSMORE: Probably not.

15 MEMBER APOSTOLAKIS: So it's open for all.
16 I can do whatever I want now because this requirement
17 does not constrain me.

18 MR. DINSMORE: Well, I would think it
19 does. It's the requirement that we put in to ensure
20 that over time any of these new things that have come
21 up when you look at the cumulative effect of them, we
22 have small and then the Commission said no, make that
23 very small.

24 MEMBER APOSTOLAKIS: I understand you have
25 to live with it, but I'm trying to understand what the

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1 purpose of this is and how useful it is.

2 MR. COLLINS: I think the purpose, in
3 general, is the Commissions idea that they don't want
4 this to be increasing as a result of this rule. They
5 are hoping that it was a safety enhancement and they
6 either have to say zero or very small or small.
7 Somehow we have to draw a line. Zero is a nice. clear
8 line. It's probably clearer than very small. But I
9 don't know how much difference, to tell you the truth,
10 very small is from zero in these types of
11 calculations.

12 MEMBER APOSTOLAKIS: What would be so
13 terrible if the risk increased by ten to the minus
14 six, accepted in other areas. Do you have a
15 perception here where this was the sacred rule for so
16 long that we are going very cautiously.

17 MR. COLLINS: I believe that's part of it.
18 Plants are not so impacted by this current rule that
19 they're not renewing their licenses. Every one of
20 them is out there renewing their license. Obviously,
21 the current set of regulation is not handcuffing
22 people to an extent that the industry is going out of
23 business.

24 MEMBER BANERJEE: So why are we going
25 forward with this rule?

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1 I mean everybody seems to want it.

2 MR. COLLINS: In the Commission paper we
3 sent up discussing the comments, the Committee's
4 comments, we put an option in there should we
5 discontinue the rule? And the Commission decided
6 continue. So we're continuing. They said reduce the
7 priority and continue.

8 MEMBER APOSTOLAKIS: So the current
9 Commission is favorable?

10 MR. COLLINS: The current Commission has
11 not voted on anything in this regard.

12 MEMBER APOSTOLAKIS: Made presentation?

13 MR. COLLINS: The Commission that we
14 presented the last paper to was a different
15 Commission. Mr. McGaffigan was still on the
16 Commission at that time.

17 MEMBER BANERJEE: I sort of was involved
18 in some of this in the early stage, but lost it after
19 that. But what were the industry comments? Did they
20 sort of feel this was --

21 MR. COLLINS: Industry comments were that
22 the process was too burdensome and that the TDS was
23 too large to provide significant benefit. They still
24 wanted the rule.

25 MEMBER APOSTOLAKIS: PWR.

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1 MEMBER BANERJEE: What was it for the --

2 MR. COLLINS: It is the largest attached
3 line to the reactor coolant system which is basically
4 the surge line, 12, 14 inches something like that.

5 MEMBER BANERJEE: Yes, that's what I
6 recall.

7 MEMBER ARMIJO: For a pressurized water
8 reactor. Just to make sure I'm understanding --
9 changing the subject. What do you mean by enhancing
10 the leak detection for large pipes? Is that flaw
11 detection, is that what's really intended there?

12 MR. COLLINS: What's intended there is
13 that they adopt the guidance in Reg. Guide 1.45.

14 MEMBER ARMIJO: Right.

15 MR. COLLINS: I don't know the specifics
16 of that Reg. Guide, but that was what the Commission
17 was getting at there.

18 MEMBER MAYNARD: I think it's to enhance
19 the ability to identify a leak at its earliest stages
20 that you can in the system.

21 MEMBER ARMIJO: In the system.

22 MEMBER MAYNARD: It's the various
23 monitors, the radiation monitors, the sump leak, how
24 ever you are going to identify that you have leakage -
25 -

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1 MEMBER BLEY: It's a little bit archaic
2 right now as to how you do the leak detection. It
3 will leak before it breaks so that you can --

4 MEMBER ARMIJO: Right, I understand that,
5 but you can't discriminate in a system test whether
6 it's leaking from a large pipe or a small pipe or
7 somewhere else.

8 MEMBER MAYNARD: That is true. I don't
9 think the intent was being able to discriminate that
10 but to discriminate whether you have a leak or not.

11 MR. TREGONING: Right, and I think Tim
12 Collins may want to comment on this. If you look at
13 the revision to 1.45, there were additional specs in
14 there to put in to discriminate and discern where
15 these leaks were coming from in a much lower level and
16 with much more rigor than had previously been done, so
17 that was something that was consciously entered into
18 with the 1.45 revision.

19 MEMBER ARMIJO: Okay, thank you.

20 MR. TREGONING: I don't know if you want
21 to --

22 MEMBER APOSTOLAKIS: Sorry. How does one
23 demonstrate that the elicitation results are
24 applicable on a plant-specific basis?

25 MR. COLLINS: Well, the Office of Research

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1 is preparing a Reg. Guide on that very subject.

2 We are working on developing a Regulatory
3 Guide. It's not the purpose of today's meeting, but
4 we'll certainly be in from the ACRS discussing that at
5 a later date.

6 MEMBER APOSTOLAKIS: So it can be done.

7 MR. COLLINS: I believe it can be done.

8 MEMBER SHACK: I think you might want to
9 point out, Rob, that you're not intending for them to
10 redo the elicitation in any sense.

11 MR. TREGONING: Right, all that this Reg.
12 Guide will do would be to have them assess their plant
13 conditions, their design, their operation and
14 demonstrate that it is consistent with the
15 assumptions, general industry practice, the
16 regulations that we have out there and that there's
17 nothing unique about their plan that would cause an
18 elevation in LOCA frequency that might be outside the
19 general body of the rest of the population. That's
20 how it's set up or it will be set up.

21 MEMBER BLEY: Tim, something completely
22 off track. Two years ago, we got the SRM and since
23 then you've been operating at medium priority instead
24 of high priority. Can you give me a sense of what
25 those mean to staff? If you had stayed on high

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1 priority, we'd be setting here a year ago? How much
2 different in effort --

3 MR. COLLINS: If we stayed in that high
4 priority, we would have probably been back here in
5 December of 2007.

6 MEMBER BLEY: So it's a substantial
7 difference.

8 MR. COLLINS: Oh yes. We basically had a
9 year where the only work that was being done was the
10 Office of Research studies on seismic. We weren't
11 doing anything else on this rule.

12 MEMBER BLEY: Thank you.

13 MR. COLLINS: Given that guidance in the
14 SRM, we resumed our work in early 2008 and put
15 together the revised proposed rule that you have right
16 now. And during the OGC review of that revised
17 proposed rule, the lawyers recommended that we
18 renotice it for public comment because of the nature
19 of the changes that had been made. And staff also
20 considered that this on-going lack of consensus with
21 regard to the rule and the fact that there is no real
22 urgency for this rule. It's an alternative. It's
23 strictly a business decision for any licensee, that we
24 thought we should put the whole rule out for comment
25 again and just give everybody another bite at the

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1 apple. And we advised the Commission of that in a
2 paper in December and we didn't hear back, so that's
3 our current plant.

4 Now with regard to our schedule going
5 forward, the version that you're reviewing was put on
6 the public website in April of this year. We're
7 having our meeting right now, the ACRS. Our plan is
8 to have the EDO sign the renoteice at the end of June.

9 We then expect to have comments in from the public by
10 the end of the summertime, after a 45-day comment
11 period. Then we expect to have another series of
12 public meetings to discuss the comments that we
13 receive and then we'll take the input from those
14 meetings, put together another draft final rule,
15 version 2 and come back and meet with the ACRS
16 probably in the spring of 2010 with the hopes of
17 getting the final rule to the Commission in June of
18 next year.

19 Now what the revised proposed rule
20 actually looks like, the easiest thing is the
21 transition break size. We haven't done a thing to
22 that in the last few years. It's still the largest
23 attached pipe for PWRs, the largest attached pipe to
24 the main coolant system. And for BWRs, it's the
25 largest feedwater or RHR line inside containment.

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1 And mitigation must be demonstrated for all the LOCAs,
2 whether or not it's a matter of differences of
3 assumptions in the mitigation analysis between the two
4 areas.

5 Now if a licensee wants --

6 MEMBER APOSTOLAKIS: Can you explain that
7 a little bit. What it means, mitigation must be
8 demonstrated --

9 MR. COLLINS: That's the deterministic
10 ECCS calculation.

11 MEMBER APOSTOLAKIS: Okay.

12 MR. COLLINS: For less than the TBS, you
13 have to demonstrate 2200 degrees F. and the oxidation
14 criteria, whatever that turns out to be when we're
15 done with it.

16 MEMBER APOSTOLAKIS: Conservative --

17 MR. COLLINS: Conservative assumptions.
18 For a valve, you don't have to assume a single
19 failure. You don't have to assume loss of off-site
20 power. You can take credit for some safety equipment.

21 MEMBER APOSTOLAKIS: But there are
22 uncertainties there, it's just straight forward. It's
23 a deterministic calculation, show that the temperature
24 is below 2200, right?

25 MR. COLLINS: Which are you -- are you

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1 below the TBS --

2 MEMBER APOSTOLAKIS: How do you do best
3 estimate of uncertainties?

4 MR. COLLINS: Best estimate, you have to
5 have a high probability, so you have to do
6 uncertainties as well.

7 MEMBER APOSTOLAKIS: So the 95th.

8 MR. COLLINS: You're about a slide or two
9 ahead of me.

10 MEMBER APOSTOLAKIS: Thank you.

11 MR. COLLINS: If a licensee wants to adopt
12 the 50.46(a) alternative, the current rule would
13 require a license amendment under 50.90 and the
14 initial license amendment would require that the
15 licensee show the applicability of the elicitation
16 report at their plant. They have to demonstrate the
17 applicability of the staff's seismic study and if they
18 can't do some sort of applicability study, they would
19 have to do a plant-specific study on the seismic
20 analysis.

21 They need to describe the process that
22 they used for a risk-informed evaluation of plant
23 changes, if plant changes came in with their initial
24 submittal. They could theoretically come in and just
25 adopt 50.46(a) without proposing any plant changes at

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1 the time. But if they have any proposed changes that
2 are enabled by 50.46(a) they need to describe the
3 risk-informed process that they used.

4 If they're taking credit for any safety
5 equipment, or nonsafety equipment for breaks larger
6 than the TBS, they need to include that in the tech
7 specs. And then they need to provide the revised ECCS
8 analysis as well.

9 MEMBER APOSTOLAKIS: So this is a possible
10 potential issue in the future, because if I want now
11 to risk-inform those tech specs --

12 MR. COLLINS: These tech specs are very,
13 very light. They're simply a listing of the equipment
14 that they're accrediting and nothing else. No other
15 requirements associated.

16 MEMBER APOSTOLAKIS: Minimum defense-in-
17 depth kind of --

18 MR. COLLINS: Yes.

19 MEMBER APOSTOLAKIS: Stuff, right.

20 MEMBER RAY: Let me just underscore what
21 he just said, George. You talked about this listing
22 of something in the tech specs with no other
23 information yesterday. We'll probably talk about it
24 again.

25 MR. COLLINS: Probably in the next slide.

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1 (Laughter.)

2 MEMBER RAY: Not here, but among the
3 Committee at some point, because it's a controversial
4 issue.

5 MEMBER APOSTOLAKIS: Was there anybody
6 else who was not here yesterday? Okay.

7 MR. COLLINS: Now the ECCS analysis
8 requirements, first for great breaks less than the
9 TBS, nothing has changed in this version of the rule
10 from the previous version of the rule. All
11 requirements of 50.46 still apply.

12 For great breaks larger than the TBS,
13 we've made some changes from the draft final rule.
14 First of all, there's things that we didn't change.
15 Let me go over the things that we didn't change.
16 There's still no requirement to assume a single
17 failure. You can still take credit for off-site power
18 in the analysis. You can still take credit for
19 nonsafety equipment and you can still propose
20 alternative metrics for the coolable geometry
21 criteria, alternative to 2200 degrees F. and the
22 current oxidation requirements.

23 But some things have changed with regard
24 to nonsafety equipment. If they take credit for it,
25 we're requiring that they list it in the technical

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1 specifications, but it's just a listing. It's not an
2 LCO that has testing requirements or has availability
3 requirements associated with it. It just basically
4 alerts the staff to the equipment that they may want
5 to credit so that we get a chance to review it at the
6 time that they propose to use it. But there was no
7 other requirements intended here when we say we're
8 putting in a tech spec.

9 MEMBER APOSTOLAKIS: Now do they have to
10 periodically do something to make sure they're
11 functional?

12 MEMBER RAY: George, we had this
13 discussion yesterday.

14 MR. COLLINS: The tech specs don't require
15 anything.

16 MEMBER APOSTOLAKIS: The Subcommittee
17 discussion --

18 MEMBER RAY: I'm just trying to tell you
19 what we said.

20 MEMBER APOSTOLAKIS: So we'll come back to
21 it? Did you conclude anything?

22 MEMBER RAY: We concluded we should
23 discuss it with the full Committee here which is what
24 we're doing.

25 MEMBER APOSTOLAKIS: Yet, you're stopping

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1 me.

2 (Laughter.)

3 MEMBER RAY: I am? You're asking a
4 question and I'm trying to answer it.

5 MEMBER APOSTOLAKIS: Oh, I'm sorry. Go
6 ahead.

7 MEMBER RAY: The issue is precisely that
8 these things are listed in the tech specs as it's
9 proposed with no information about what's required on
10 the part of the licensee or the NRC overseeing it to
11 demonstrate that you're in compliance with the
12 assumptions that caused them to be listed there in the
13 first place. And that's an anomaly, at least to
14 somebody who has operated plants before.

15 MEMBER APOSTOLAKIS: Sounds like it.

16 MEMBER RAY: And it's a problem it. Jack
17 and I share that view. I don't know what others
18 might. I think there are others. And so it might
19 lead us to write a letter when otherwise none is
20 required.

21 That's why I said we'll come back to this,
22 I think.

23 MR. COLLINS: This was the question of
24 supposedly this equipment is very low-safety
25 significance basically because of the initiating

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1 event. And the spectrum is well, you can make it
2 safety grade and have all the same requirements we
3 have on current ECCS stuff, or we can just ignore it
4 completely. As we debate where in the middle do you
5 end up, we came up with this camel where we just list
6 it in the tech specs and so it gets some attention,
7 but it doesn't get a whole lot of attention. Is it
8 enough? Is it not enough?

9 MEMBER APOSTOLAKIS: I thought, in our
10 letter, Bill, two years ago or so, when was it, we
11 said that the licensee should make sure that this
12 equipment was functional.

13 MR. COLLINS: The rule does have language
14 along those lines, but what that actually means is
15 space is the issue.

16 MR. DINSMORE: Just bear in mind, of
17 course, on the quantitative side of this, this didn't
18 seem to impress the Subcommittee very much. They have
19 to periodically update the PRA every two refueling
20 cycles and when they do that, they have to go out to
21 the plant and get the operational data that's
22 available, including from this equipment and put that
23 into their models and then they go back and
24 recalculate -- they have to compare this very small --

25 MEMBER APOSTOLAKIS: But, I thought Steve,

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1 when you say including from this equipment, what does
2 that mean? If I never test it, for example, what kind
3 of data am I going to have?

4 MR. DINSMORE: There should be some way
5 for them to --

6 MEMBER APOSTOLAKIS: That's the issue.

7 MEMBER STETKAR: Zero failures and zero
8 demands.

9 MEMBER RAY: That is one of the demands.
10 There is another issue and this is retrospective and
11 you find out that you're satisfied with the
12 assumptions after you failed to satisfy them. You
13 don't know how to satisfy them or avoid not satisfying
14 them. You just know that you didn't satisfy them.
15 And so we had a little discussion about whether that
16 would be okay or not and I think that's where he was
17 referring to it not having taken with it to the
18 Subcommittee.

19 To some of us finding out that you didn't
20 satisfy the assumptions in that safety analysis, no
21 matter now improbable or risk significant they are,
22 after the fact is unacceptable.

23 MR. COLLINS: That's the issue. Also,
24 with regard to nonsafety equipment, for breaks larger
25 than a TBS, you're allowed to credit off-site power in

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1 your analysis, but we're saying that we've added a
2 requirement into the rule that says that if you credit
3 equipment, you need to be able to hook it up to on-
4 site power in a short time for accident management
5 purposes. That's new in this version of the rule.
6 It's strictly a defense-in-depth consideration. The
7 performance demonstration will still credit offsite
8 power.

9 Now other changes that we made have to do
10 with the analysis methods for breaks larger than the
11 TBS. The current rule requires that the ECCS methods
12 must be approved even for breaks larger than the TBS.

13 It was the recommendation of the Committee in their
14 letter that staff ought to review methods.

15 And we also modified the acceptance
16 criteria to require high probability that the
17 acceptance criteria are met. The previous version of
18 the rule was softer than that. I think it used
19 language like reasonable confidence that the criteria
20 was met. Something like that.

21 MEMBER BANERJEE: What does alternatives
22 to coolable geometry mean?

23 MR. COLLINS: Right now, the metrics are
24 peak cladding temperature of 2200 degrees. The
25 oxidation criteria in 50.46(b), it's currently 17

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1 percent. Those are basically the metrics that are
2 used for coolable geometry.

3 If a licensee wanted to propose some sort
4 of alternative to those and demonstrate coolable
5 geometry, the staff would consider reviewing that.

6 I want to point out that yesterday,
7 however, we put a question in this version of FRN as
8 to whether or not that was practical. In view of all
9 the trouble we're having with 50.46(b) trying to
10 redefine the oxidation criteria does it make sense to
11 try to slice it again and define another metric for
12 coolable geometry. So it's a question that we're
13 putting out.

14 MEMBER BANERJEE: Does this help in some
15 way or does it just put more confusion?

16 MEMBER SIEBER: It gives you another
17 alternative that you would have to explore.

18 MR. COLLINS: You would have to
19 demonstrate why --

20 MEMBER SIEBER: You would have to explore
21 if there was another geometry that would work. Right
22 now, I don't know of any.

23 MR. COLLINS: Yes. We don't have anything
24 particular in mind, but the idea was if a licensee had
25 some great idea and could demonstrate coolable

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1 geometry, let him go for it.

2 MEMBER BANERJEE: How about the molten
3 salt reactor?

4 MR. COLLINS: Yes, it's a matter of -- I
5 mean the statement of considerations says that we
6 expect people to use 2200 in the oxidation criteria,
7 but it just left the door open. And now we've, like I
8 say, we've asked the question is it worthwhile leaving
9 that door open? Is there any practical reason that
10 anybody is going to do it? We'll see.

11 MEMBER BANERJEE: And what does ECCS
12 methods must be approved mean?

13 MR. COLLINS: That the staff has to
14 approve the codes that are going to be used to
15 demonstrate that they meet the acceptance criteria.
16 Currently, in 5046, the staff has to pre-approve any
17 methods that are used for ECCS analysis. The previous
18 version of this rule would have allowed licensees to
19 choose their own analysis methods for breaks larger
20 than the TBS without staff review. The Committee has
21 later recommended that we should review. It has
22 concerns with encroachment of safety margin if we go
23 to an understanding of models are being used and the
24 Commission agreed that that was a good idea.

25 MEMBER BANERJEE: Sure, but does this mean

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1 that they can do something like a best estimate
2 calculation?

3 MR. COLLINS: Yes, sure.

4 MEMBER BANERJEE: Do they have to then go
5 through the sort of CSAU methodology?

6 MR. COLLINS: That's what -- when I said
7 we modified the criteria to acquire high probability,
8 that would mean that they would need to do an
9 uncertainty assessment as well.

10 MEMBER APOSTOLAKIS: Not necessarily CSAU.

11 MR. COLLINS: Uncertainty assessment.

12 MEMBER BANERJEE: Sufficiently rigorous.

13 MR. COLLINS: Yes.

14 MEMBER BANERJEE: Is there any guidance as
15 to how they would do this or do we just look at every
16 case, case by case?

17 MR. COLLINS: Just like we do it with
18 below 5046 right now, the methodology would have to be
19 submitted for staff review and we'd have to approve
20 it.

21 MEMBER BANERJEE: We have a methodology
22 that can be used?

23 MR. COLLINS: Right now for large break
24 LOCAs, Westinghouse has an approved methodology, I
25 think. AREVA has an approved methodology.

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1 MEMBER BANERJEE: Right.

2 MR. COLLINS: We would just expect they
3 would use the current methodologies. We really don't
4 expect them to use anything different. It's another
5 case of slicing the bologna again. How thin do you
6 want it.

7 MEMBER APOSTOLAKIS: And the high
8 probability means the 95 percentile?

9 MR. COLLINS: Yes, yes. There's also the
10 concern, you define best estimate below 5046; define
11 best estimate differently above 5046; define high
12 probability below -- it gets to be too many slices of
13 the bologna I think. So we need to simplify things a
14 little bit. That's all we're trying to do with this
15 revision.

16 MEMBER APOSTOLAKIS: If you are going to
17 approve a particular method, does that mean that you
18 have to come to the Committee or just a staff action?

19 MR. COLLINS: You know, typically, we come
20 to the Committee, I think, with ECCS analysis models.
21 I believe we do. There's no requirement that we do
22 that, but historically, we always have. I mean if you
23 ask to see it, I think we probably would want to come
24 here anyway. It's fun.

25 MEMBER CORRADINI: Could the person

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1 walking up to the microphone explain an example of one
2 that might be coming up?

3 MR. LANDRY: Ralph Landry from the staff.

4 I think there is a requirement that we come to the
5 Committee with an ECCS model.

6 Transient models, stability models, other
7 TH-type models we are not required to, but we do have
8 to have Committee approval or Committee comment on
9 LOCA models. So I don't know of any model that we
10 would approve for a LOCA that we would not present to
11 the Committee at some point.

12 MEMBER CORRADINI: But if I might just
13 clarify it, we had a discussion yesterday after the
14 session and you gave an example of one that may be
15 coming up, is that correct, to give an example of what
16 you're speaking about?

17 MR. LANDRY: Right. At this point in time
18 there were no approved best estimate models, realistic
19 models, whatever term you want to use for the small
20 break LOCA spectrum. All of the models that have been
21 reviewed and approved for realistic LOCA are large
22 break models.

23 There have been small breaks that have
24 been submitted and withdrawn. They have not been
25 submitted and retained long enough to go through the

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1 approval process.

2 MEMBER APOSTOLAKIS: Why do we care about
3 models for small local in this context?

4 MEMBER BANERJEE: Below TBS.

5 MEMBER CORRADINI: Because they might be
6 limiting for a certain design.

7 MR. LANDRY: George, that's really why --

8 MEMBER APOSTOLAKIS: Not best estimate.
9 There is no best estimate.

10 MR. LANDRY: There is no best estimate
11 approved for a small break LOCA, probably because it's
12 not required. There are only a few plants in the
13 country that are limited by their small breaks. It
14 just hasn't been cost effective.

15 MEMBER APOSTOLAKIS: Okay.

16 MR. LANDRY: But in the future and
17 especially with this rule, it may become cost
18 effective to submit for approval a small break best-
19 estimate LOCA. And when throw into the mix the
20 50.46(b) work where we are revising the clad
21 embrittlement criteria, there may be again an impetus
22 to submit for approval a best estimate small break
23 because we're putting so much emphasis then on time
24 and temperature, not just temperature for the
25 calculation of the cladding oxidation and long

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1 burnups, things of that nature. So much is coming
2 into play now that the small breaks may become more
3 important and it may be cost effective to submit for
4 review and approval best estimate small break.

5 MEMBER BANERJEE: Ralph, the first two
6 assumptions that no single failure in the credit for
7 off-site power, how much easing of burden does that
8 give to the applicants?

9 MR. LANDRY: You have to look at change
10 plant by plant.

11 MEMBER BANERJEE: Just give me an idea.

12 MR. LANDRY: For some plants, it won't
13 make a difference. For instance, if you -- when we're
14 talking about large break LOCA space, if you have a
15 plant on the degraded ECC, you can feel the downcomer.

16 These assumptions won't do anything for you because
17 all you're going to do if you have more ECC is pump it
18 out the break.

19 If you have a plant for which you do not
20 feel the downcomer on the degraded ECC, it will be an
21 enhancement because you'll have more water that you
22 will then have available to the core. So you really
23 have to look on a plant-by-plant basis to determine if
24 your plant will gain or not gain by this assumption.

25 MEMBER BANERJEE: There will be a few

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1 plants that will gain something.

2 MR. LANDRY: There will be plants that can
3 gain by this.

4 MEMBER BANERJEE: Because the other
5 requirements, I mean I don't know if the credit for
6 nonsafety equipment, but coolable metrics and ECCS, I
7 mean it sounds like you're pretty much going to do
8 what you're doing now.

9 MR. LANDRY: Right. The name of the game
10 in the first three bullets is how much water can you
11 make available to the core.

12 MEMBER BANERJEE: Okay, thanks. But if it
13 does shift -- I just wanted to say if it does shift to
14 making best estimates for small break LOCAs more
15 desirable that would probably be a fairly positive
16 outcome I think.

17 MR. LANDRY: Yes. It may, Sanjoy, make it
18 a positive outcome for a vendor to maintain one code.

19 If they have one code that is used for the entire
20 range of breaks, then -- I don't work for a vendor, so
21 I can't tell you if that's cost effective, but it
22 strikes me that it may be cost effective now to train
23 people on only one methodology and to maintain one
24 methodology rather than an Appendix K methodology and
25 a realistic methodology.

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1 MEMBER MAYNARD: We are not really making
2 changes that shifted to where the small break -- a
3 small break LOCA may become more limiting only because
4 of the changes in the analysis, not because there's
5 been any real configuration changes to cause that.

6 MEMBER CORRADINI: But just since we're on
7 this, this is something that Bill brought up yesterday
8 that I guess we should at least emphasize here. If a
9 licensee gets past or gets formulated in approximately
10 in the form you guys are talking about, and now it's
11 enabling and a licensee chooses to do it. For those
12 sizes below TBS, the licensee may choose to use a
13 realistic approach that has no risk informed at all.
14 It simply does a best-estimate calculation with
15 uncertainties, then moves with the same model and
16 takes it above TBS, uses the same model, different
17 assumptions about boundary conditions and available
18 systems, and must do a risk-informed calculation.

19 So to me, that's an interesting
20 inconsistency. That is, you might get to a point
21 where a licensee has one tool, trained the people on
22 it. The physics supposedly is appropriately tuned and
23 yet for things which are in the licensee base, there's
24 no risk-informed calculation and you're hoping that
25 the conservative assumptions bound it. Same tool,

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1 pipe gets one inch bigger and all of a sudden I do a
2 risk-informed calculation with a different set of
3 assumptions.

4 It would make me curious to see where --
5 am I benefitted by safety or not benefitted by safety
6 by that common tool, different assumptions across the
7 boundary and I get a different whole set of
8 calculations. As I understand how this could evolve,
9 that's where you could evolve too.

10 MR. LANDRY: Mike, for the calculation, it
11 doesn't matter which end of the spectrum you're
12 sitting on. When you do the LOCA analysis, it doesn't
13 matter if you're risk-informed or not in the
14 calculation. It's the assumption of the equipment
15 available to mitigate during that analysis.

16 MEMBER CORRADINI: Right, but the meta
17 analysis never changes the safety status of the plant.

18 The changes that you make and response to that
19 analysis can, in fact, change the safety status of the
20 plant.

21 MEMBER SHACK: No.

22 MEMBER CORRADINI: I'm just simply trying
23 to talk through the idea, as you've said it, Ralph,
24 one could evolve to a single tool with assumptions and
25 analysis and you make changes and depending upon

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1 whether I'm below TBS with conservative assumptions,
2 supposedly, or above TBS with realistic assumptions,
3 supposedly, it would change how I might make the
4 decision. That's all.

5 MR. LANDRY: The majority of the
6 assumptions that go into the analysis really aren't
7 going to change above and below other than the
8 hardware that's available.

9 MEMBER CORRADINI: Right, right. Correct.

10 MR. TREGONING: And conceptually the
11 acceptance criteria could change if you made a case
12 for alternative criteria --

13 MR. LANDRY: I am talking about the way
14 you do the analysis, how you evaluate the results of
15 the analysis.

16 MEMBER CORRADINI: That's a fair point.
17 You're correct. I'm sorry.

18 MR. COLLINS: Okay, well, once a licensee
19 has adopted the 50.46(a) alternative, they make
20 changes to their plant. They may make changes to
21 their plant and if they do that, then there's a
22 process that they're going to have to follow for
23 approval of changes.

24 If a licensee wants to make a change
25 that's enabled by the rule and when we say enabled we

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1 mean it would meet the criteria when assessed under
2 50.46(a); would not meet the criteria assessed under
3 50.46. Okay? If that's the case, they want to make a
4 change like that, then the submittal would have to be
5 risk-informed. Or if they needed a submittal. It's
6 possible they don't need a submittal. They would
7 still have to do a risk-informed evaluation.

8 The staff will become involved with the
9 review, unless three conditions are met. First of
10 all, the licensee would have to have an approved
11 review process. They would have to submit it to us.
12 We would have to review and approve their risk-
13 evaluation process. When they apply that process,
14 they would have to find that the risk is less than or
15 equal to minimal which Steve has a number for. And
16 50.59 also has to be satisfied. If all three of those
17 criteria are not met, then the staff will have to
18 review it.

19 Also, when they make changes to the plant,
20 they have to do a review to show that those plant
21 changes don't invalidate the applicability of the
22 elicitation studies or their seismic studies. If they
23 made some sort of a change of seismic supports or
24 something they would have to consider the impact on
25 the applicability of the seismic study.

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1 MEMBER BANERJEE: So you can give us some
2 sort of a concrete example of what might invalidate
3 the applicability of the elicitation report?

4 MR. LANDRY: The classic example that we
5 use is potentially a power uprate. We've seen
6 evidence in BWRs certainly where you could argue the
7 power uprate has increased pump speeds, vibration
8 within the main system and certainly we've seen
9 increased steam dryer failures. Now those aren't
10 LOCAs, per se, but one could foresee situations where
11 you could different thermal fatigue striping or
12 stratification loadings, maybe increase vibration
13 loadings. It would affect LOCAs. And essentially
14 what we would require them to do would be to evaluate
15 those plant changes and if there would be any
16 implications on LOCA frequencies. If you were going
17 to increase the temperature, you're either going to do
18 a change and all of a sudden the temperature of your
19 primary system increases, that has ramifications for
20 many of the stress corrosion cracking mechanisms that
21 are in play in some of these locations. So those are
22 the types of things that we want them to consider.

23 MEMBER BANERJEE: The elicitation study,
24 if I remember, was very broad-brushed, wasn't it? It
25 wasn't very sort of plant-specific or condition-

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1 specific?

2 MR. TREGONING: It was brought in the
3 sense that it was not plant-specific, but it did
4 consider the different vendor designs that are out
5 there in terms of the different types of GE plants, as
6 well as the three PWR vendors and the types of plants
7 associated with each of those vendors. And it looked
8 generally at the operating experience, the types of
9 plant transients that are experienced and had been
10 envisioned or had been seen in the past, but it didn't
11 look at one specific plant and very definitively look
12 at okay, here's measured loadings in the reactor
13 coolant loop for this particular plant.

14 MEMBER BANERJEE: It did set sort of
15 bounds on conditions and things? I mean I'm just
16 trying to think, imagine that I'm coming to do
17 something about this and I have to show that the
18 elicitation report applies. Now are there sort of
19 boundaries set in the -- I don't recall that.

20 MR. TREGONING: There were assumptions
21 that were made. The report was pretty dense.

22 MEMBER BANERJEE: Enormous.

23 MR. TREGONING: You may have glossed over
24 that part of it.

25 No, there were assumptions that were made

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1 in terms of the scope of the study itself and then
2 there was also statements made about the applicability
3 of the results, the fact that they were generic and
4 what the term generic meant in the sense of that
5 study.

6 So as a result of that when we're
7 developing this Regulatory Guide, there will be very
8 specific guidance in that guide to tell a plant how
9 they have to demonstrate, qualitatively, most of it
10 will be qualitative demonstration, but it may need to
11 be buttressed by quantitative analysis as well and how
12 they will demonstrate that they meet all the
13 assumptions and approach and analysis requirements
14 that are -- or analysis procedures that were done
15 within that elicitation work.

16 MEMBER SHACK: One of the things that gets
17 me is that the most plant-specific thing you leave out
18 is really the changes in piping geometry which make a
19 difference with fracture mechanics and a leak before
20 break. You guys keep resisting my suggestion that you
21 make them do it deterministically before break
22 analysis. And I'm willing to buy that now because as
23 far as I can tell with the seismic study you're going
24 to end up doing that because you're going to have to
25 go off and find out what crack size I can really live

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1 with which means -- so all the things you've talked
2 about are the local conditions for leak-before-break,
3 but you're not getting degradation.

4 The thing that might vary most from plant
5 to plant is the piping geometry which could make a
6 difference in my leak before break susceptibility
7 which wasn't being addressed except now in terms of
8 the seismic analysis, it seems to me, that it is.

9 MR. TREGONING: When you say geometry, you
10 really mean configuration.

11 MEMBER SHACK: Configuration.

12 MEMBER CORRADINI: You're talking about
13 how it's hung --

14 MEMBER SHACK: How it's hung, how flexible
15 the piping is, how stiff it is. And that seemed to me
16 could be plant specific that really isn't accounted
17 for in 1829. It certainly would be accounted for when
18 the guy goes through and has to do the seismic
19 analysis, I think.

20 MR. TREGONING: I would agree that it
21 wasn't explicitly considered in 1829. However, we did
22 a very comprehensive review of operating experience
23 and it certainly factors into operating experience in
24 that sense.

25 MEMBER SHACK: Yes, but I mean when you

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1 talk about average, I'm willing to believe that most
2 of these configurations are leak-before-break is in
3 effect. I think all PWRs for these piping systems
4 have done the leak-before-break analysis.

5 MR. TREGONING: Not all, but a substantial
6 --

7 MEMBER SHACK: Not all, but a substantial
8 faction.

9 For BWRs, that's not true. Nobody has
10 done it because you haven't allowed them to do it.

11 MR. TREGONING: We haven't precluded them
12 from doing it.

13 MEMBER SHACK: No, but the question in my
14 mind is in 1829 did everybody have in mind that you
15 knew most PWRs have done leak-before-break and you
16 knew that it took a big crack to do it. BWRs, who
17 knows just how big the crack is that you can tolerate
18 in a leak-before-break situation because you haven't
19 done the analysis.

20 MR. TREGONING: True, but the other thing
21 with BWRs and this was discussed in the elicitation,
22 they've also mitigated most of the cracking that
23 they've had in service where when we did the
24 elicitation, the PWRs which are starting down that
25 road --

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1 MEMBER SHACK: Still, there's a big
2 difference if I've mitigated a 4-inch pipe and I've
3 mitigated a 24-inch pipe. My leak-before-break
4 tolerance is certainly not the same. The
5 configuration has as a great deal of influence over
6 that as well as the local conditions.

7 MR. TREGONING: You know better than I, a
8 leak-before-break tolerance of a 4-inch pipe is not
9 nearly as --

10 MEMBER SHACK: Right, right, we both know
11 that. But to me, that was -- I always had a problem
12 with that. I was happy with the white paper because I
13 thought the seismic was going to capture all of that,
14 whether you agreed with the notion that you need the
15 leak-before-break and in effect, you're going to do
16 that because you're going to be looking at how big a
17 flaw you can tolerate under the seismic loads.

18 MR. TREGONING: Right, but it won't be a
19 classic leak-before-break calculation.

20 MEMBER SHACK: It won't be a classic leak-
21 before-break, but it will tell me that I need a big
22 womping crack.

23 MR. TREGONING: We've got other issues and
24 that will be the subject of other meetings with our --
25 with the way we've done leak-before-break analyses

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1 historically as well. And we've got efforts to try to
2 look at I'll say risk informing those analyses as
3 well. But that's a longer term issue.

4 MEMBER SHACK: I have got a great deal of
5 comfort out of the pure deterministic analysis that
6 says I need this great big crack and that pushes the
7 problem back from deciding okay, how likely is it.
8 Can I have one of these great big cracks without
9 somebody detecting it? And that's something I have a
10 better feel for than most of the things that you
11 discuss in 1829 where it's an expert elicitation.

12 I get more comfort out of the seismic
13 analysis where you tell me it has to be almost 180
14 degrees and 35 percent through-wall and I have a great
15 deal of comfort that that's a pretty big crack.

16 MEMBER CORRADINI: So you are
17 fundamentally a determinist.

18 MEMBER SHACK: No, I agree with Rob on
19 where he's going with leak-before-break. I mean
20 they're really trying to push this thing back a
21 further step to really build that probabilistic
22 fraction in, but at the moment, the best we can do is
23 a deterministic analysis, but I think that's covered
24 in the white paper because of what you're going to do
25 for the seismic studies.

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1 MR. TREGONING: I don't disagree.
2 Certainly, for the record, we all take great comfort
3 in demonstrating that it takes large cracks to leave a
4 fracture in these pipes and I think to be honest,
5 that's a fundamental tenet that really buttressed the
6 elicitation from the beginning.

7 MEMBER SHACK: But again, I wasn't quite
8 sure why that wasn't part of the plant-specific
9 demonstration, but now I'm sort of convinced it is via
10 the seismic studies.

11 MR. TREGONING: Well, they do. If you
12 read the white paper, they do have to look at their
13 geometry and their configuration and make sure that
14 they meet all the code requirements, make sure that
15 they don't have a configuration that's resulting in
16 I'll say unusually high loads or stresses in any
17 section of the pipe. So it is something that they
18 have to consider. I would agree that it's not a very
19 high bar that they have to cross at this point, but
20 it's something that they at least have to evaluate and
21 consider.

22 MEMBER BANERJEE: That would be part of --
23 the Reg. Guide has been issued?

24 MR. TREGONING: No, we have a white paper
25 that Bill alluded to that's been -- it's publicly

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1 available. It's in ADAMS and it's been shared with
2 the public through a meeting and we've actually got
3 some informal comments on that white paper. The white
4 paper, if you read it, that will form the basis of the
5 draft Reg. Guide and there's sections of it that read
6 very much like a Reg. Guide. So I think it would be
7 clear what things in that white paper could be
8 translated into regulatory positions, for instance.

9 MR. COLLINS: Okay, once a proposed plant
10 change is determined to fall into the category of
11 needing a risk-informed evaluation, the rule has
12 specified the criteria for that evaluation and
13 basically those criteria mirror the criteria that are
14 in Reg. Guide 1.174, that you have an acceptable risk
15 increase, that you have maintained adequate defense-
16 in-depth and safety margins and that you have a
17 monitoring program in place.

18 The rule also requires that licensees
19 periodically confirm that the cumulative increase from
20 plant changes remains very small and that's done via
21 periodic PRA update.

22 Is that every two cycles or something?

23 MR. DINSMORE: Two operating cycles.

24 MR. COLLINS: Every two operating cycles
25 they have to provide periodic PRA update. And then

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1 PRA methods must be of sufficient scope and quality
2 for the decision at hand. There's nothing really new
3 there.

4 Other requirements in the rule, I think we
5 mentioned most of these things already. They need to
6 maintain leak detection capability, piping larger than
7 the TBS to reduce the likelihood of breaks. That was
8 the Commission addition. Operation is limited to 14
9 days. It's less than 14 days per year for a 12-month
10 period, if you're in a condition where you haven't
11 analyze the breaks larger than a TBS and shown them to
12 meet the acceptance criteria. That's kind of a
13 backstop for any nonsafety equipment that doesn't have
14 a specific availability requirement. Fourteen days is
15 a de facto backstop.

16 MEMBER APOSTOLAKIS: Can you elaborate on
17 this a little bit? What does that mean? That one of
18 the equipment that are supposed to be used when break
19 greater than TBS occurs.

20 MR. COLLINS: Basically, I think the
21 simplest way to describe it is they always have to be
22 in an analyzed condition for breaks larger than the
23 TBS, except for up to 14 days in a year. They could
24 theoretically have an unanalyzed condition for breaks
25 larger than the DBS only for up to 14 days in a 12-

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1 month period.

2 MEMBER APOSTOLAKIS: Fourteen comes from
3 where?

4 MR. COLLINS: Well, the Commission
5 initially said that we're supposed to provide
6 mitigation to breaks all the way up. So in one sense
7 you can say they always have to have equipment
8 available. On the other hand, that could take away
9 any possibility of benefits for the rule because if
10 you have to have say both of your LPCI trains
11 available you can't take one out of service, you
12 couldn't mitigate up to the full defined break.

13 On the other hand, we considered that
14 these are breaks of such low-risk significance that
15 they ought to be allowed a reasonable time to make
16 corrections, all right? Fix equipment, do analyses
17 that's necessary to show that they're in compliance.
18 And when we discussed it with the industry, they
19 thought that 14 days was probably enough time to fix
20 most things that could be fixed and do analyses that
21 could be done.

22 We originally had seven days in there.

23 MEMBER APOSTOLAKIS: Okay.

24 MR. COLLINS: Actually, originally, we had
25 zero and then the Commission came back and said give

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1 them a little time and we gave them 7 and then the
2 industry said that's not enough and so we ended up
3 with 14.

4 MEMBER CORRADINI: But the definition,
5 just to cover it from yesterday. I took away from
6 yesterday's discussion the definition of 7 and when
7 the clock restarts on 7 is different than the way
8 you're defining 14 and when the clock restarts on 14.

9 MR. COLLINS: Fourteen is cumulative over
10 a year.

11 MEMBER CORRADINI: Correct.

12 MR. COLLINS: Fourteen days total in a 12-
13 month period.

14 MEMBER APOSTOLAKIS: This comes back to
15 the earlier discussion of how will they know something
16 is out of service?

17 MR. COLLINS: This is part of the problem.

18 MR. DINSMORE: But this one, again, I'd
19 like to use examples. The example would be if you
20 have two LPCIs and a fire pump and you're using your
21 fire pump as a backup to the LPCI. You could take
22 your LPCI out and you're still not in this unanalyzed
23 condition. You're just under your LPCI AOT. But if
24 you took your LPCI out and your fire pump was
25 unavailable for some reason, you would be in this 14

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1 days.

2 I think if the fire pump might fail when
3 you start, I don't think that puts you in the -- you
4 have to know that the fire pump was unavailable.

5 And the 14 days actually came from a
6 couple of calculations. There's a few situations
7 where we recognized that there's no mitigative
8 capability available and we did some calculations and
9 there's numbers like 3 days, 18 days. And so we
10 decided the thing should be measured in days and then
11 the question is how many days? The request was for 14
12 and that seemed reasonable.

13 MR. COLLINS: With regard to future
14 reactors, the rule does allow future reactors to adopt
15 the provisions of 50.46(a). It doesn't have much
16 discussion in the rule other than to say that a future
17 plant that wants to adopt it would need to demonstrate
18 its similarity in design and operation to current
19 plants and that they would have to propose an
20 appropriate TBS. And this is going to launch us into
21 a design-specific review with regard to similarity and
22 what constitutes appropriate TBS.

23 So we're going to have a real challenge
24 there to try to write guidance that we would use to
25 determine similarity. Certainly, there would be a lot

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1 of the stuff that's in Rob's expert elicitation paper.

2 This is an area in which I think is going
3 to need a whole lot of guidance development. The rule
4 only addresses it at a very high level.

5 CHAIR BONACA: With regard to the 14 days,
6 the licensee really doesn't have to go back and try to
7 analyze that configuration. He simply can try to
8 restore his equipment?

9 MR. COLLINS: Sure, he could -- if he
10 hadn't exceeded the 14 days cumulative throughout the
11 year, he could restore his equipment in. Right.

12 MEMBER MAYNARD: And that would be 15
13 days.

14 MR. COLLINS: He needs to be in a
15 condition that's analyzed at that point, meaning he
16 would have to reduce power potentially.

17 MEMBER MAYNARD: Okay, but now that he
18 gets it fixed, does that mean he has to sit there
19 until the end of the year or I mean do you restart the
20 clock for 14 days?

21 MR. COLLINS: The 14 days associated with
22 any 12-month period, so as long as he restores the
23 equipment, you know, he can continue to operate with
24 the restored equipment. If he gets to the 14-day
25 point again, he's in trouble.

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1 MEMBER MAYNARD: If he goes over the 14
2 days, based on 303, if anything else --

3 MR. COLLINS: To a large extent, yes.

4 MEMBER RAY: Maybe in 303 not doing it.
5 We seem to be going over the same ground again.

6 MR. COLLINS: Okay, and our last two
7 slides just to kind of summarize changes that we made
8 to the proposed revised rule relative to the last rule
9 provision that you reviewed.

10 First of all, things that are associated
11 with defense-in-depth, no change to the single failure
12 requirement. There's really no change to the loss of
13 off-site power requirement relative to the analysis
14 that you have to do. However, if you credit non-
15 safety equipment for breaks larger than the TBS, you
16 need to be able to provide on-site power for accident
17 management technique credited equipment.

18 Also, non-safety equipment will need to be
19 identified in the tech specs and they need to provide
20 an arguments as to why it will be available when
21 needed.

22 With regard to the methods that are being
23 used for the ECCS analysis, the draft final rule
24 didn't require prior staff review and approval for
25 breaks larger than the TBS. The current rule requires

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1 prior approval by the staff.

2 And the acceptance criteria in the
3 previous rule where a reasonable representative of
4 system response and the proposed rule demonstrates
5 high probability that the criteria will not be
6 exceeded.

7 Relative to the risk-assessment process,
8 in the draft final rule all changes to the facility
9 had to be evaluated with an approved risk-informed
10 process.

11 In the current version, only changes that
12 are enabled by the rule, unrelated bundle changes,
13 will need to be evaluated by a risk-informed process.
14 If you were able to do a change on a 50.46 anyway, you
15 don't need a risk-informed process for 50.46, you
16 don't need a risk-informed process.

17 MEMBER APOSTOLAKIS: What does
18 mean unrelated bundled changes?

19 MR. COLLINS: Okay, this
20 continues the desire that we would recognize that they
21 could make changes to decrease risk at the same time
22 that they make changes that increase risk and that we
23 would like to ensure that they can credit that
24 increase and decrease. And so the unrelated bundle
25 change would be some change that they've decided to

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1 make that's not required when it's not enabled by
2 50.46(a), but that they're going to make it because
3 they want to use the risk decrease associated with
4 that change to help offset a potential increase from
5 the change that they're trying to make under 50.46(a).

6 MR. COLLINS: Good. With regard to
7 changes that could be approved by licensees, it would
8 not have to come in for staff review and approval.
9 The draft final rule is more lenient. It would have
10 allowed self-approval for all changes that were not
11 required to be submitted under another specific
12 regulation like 50.59.

13 That was not covered by the maintenance
14 rule scope and did not exceed the total risk increase
15 criteria. But in the current rule, self-approval for
16 changes enabled by the rule only after you've got an
17 evaluation process approved by the staff, the change
18 has less than a minimal risk increase and 50.59 is
19 satisfied.

20 CHAIR BONACA: So the first bullet up
21 there, so what you're saying is that the Applicant
22 could propose a change totally unrelated from the
23 50.46 just to provide some reduction in risk.

24 I mean I don't understand the logic.

25 MR. DINSMORE: Well, the logic is that if

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1 -- we want to encourage changes that decrease risk,
2 but in order to support that encouragement, they have
3 to be able -- the licensees have to be able to gain
4 some benefit from that other than just simply
5 decreasing their risk.

6 And if we provide them with a benefit that
7 they can use that decrease in risk to offset something
8 that they really wanted to --

9 CHAIR BONACA: I understand the licensees'
10 interest. I'm trying to understand the logic behind to
11 accepting it.

12 MEMBER APOSTOLAKIS: This appears like
13 compensatory measure, right?

14 It's not a compensatory measure, but to
15 compensate for increasing the risk under the rule, so
16 they're doing something else to decrease it, but
17 automatically, that's something else falls under this
18 umbrella of cumulative risk and everything.

19 MR. DINSMORE: Not automatically. It did
20 in the --

21 MEMBER APOSTOLAKIS: Not automatically?

22 MR. DINSMORE: In the draft final rule
23 that was automatic. In this rule, they have to
24 actually say well, we're putting these two things
25 together.

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1 MEMBER CORRADINI: I don't understand the
2 difference.

3 MEMBER APOSTOLAKIS: Yes, but putting them
4 together and the net result is this.

5 MR. DINSMORE: Right.

6 MEMBER APOSTOLAKIS: That net result from
7 now on is part of the cumulative risk of this rule
8 control.

9 MR. DINSMORE: That's right.

10 MEMBER APOSTOLAKIS: Okay, in that sense,
11 it comes under -- but I don't know that Mario got his
12 answer.

13 CHAIR BONACA: That is okay. I'm thinking
14 about the fact that you can have significant reduction
15 in the ECCS effectiveness and you compensated with
16 something else.

17 MR. DINSMORE: Significant, yes. That's
18 why that they can't do it -- they can't do this under
19 self approval because this is permitted in 1.174. They
20 call them combined change requests.

21 And when they do that, we want to make
22 sure that they don't dispute the risk profile and
23 change out one -- a real big increase with the -- and
24 so that's why we said you can't do that on your own.

25 CHAIR BONACA: All right.

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1 MEMBER SHACK: 2.12 gives you guidelines
2 for developing combined requests in 1.174 and there
3 are restrictions on how you put that together.

4 CHAIR BONACA: Okay, thank you.

5 MR. COLLINS: Two other changes related to
6 the risk-assessment process. The previous version,
7 total increases in CDR and LERF from all facility
8 changes were supposed to be smaller than the overall
9 risk, remains small.

10 Now in the proposed revised rule, the
11 total increases in CDF and LERF are very small. It's
12 a factor of ten difference.

13 MEMBER SHACK: What does the overall risk
14 remains small mean? That sounds like something like
15 -- a step up on the safety goals.

16 MR. DINSMORE: We have never really come
17 up with an implementation process for that phrase.
18 Except that if you keep the total increases small,
19 then the overall risk can't be increased by much as
20 long as you're controlling the total increase to be
21 small.

22 MEMBER SHACK: Small, is ten to the minus
23 five. That sounds like CDF will be less than ten to
24 the minus five. That's pretty restrictive.

25 MR. DINSMORE: Well, that small we didn't

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1 associated with the guideline values. That small was
2 kind of well, whatever it is. It's now whatever the
3 total is is now small and it should kind of stay
4 there.

5 MEMBER APOSTOLAKIS: 1.174 does not
6 address that issue.

7 MR. DINSMORE: Yes. Small means different
8 things in different places.

9 MR. COLLINS: And the last change is how
10 we do an assessment of total accumulative risk
11 increase and I really have to ask Steve to explain
12 this one, because I always get it wrong.

13 MR. DINSMORE: So do I. The draft final
14 rule, the total cumulative increase estimate required
15 was required which -- and that was actually pretty
16 simple. You could just take your current CDF and LERF
17 minus your CDF and LERF at the time of implementation
18 and the ACRS quite rightly pointed out this was a
19 significant, like you'd need a big S on that one.
20 Departure from the 1.174 guidelines.

21 We agreed that it was just the way it
22 seemed to all fit together in the draft final rule and
23 then we made several changes to the proposed revised
24 rule. And again, that would have to deal with the
25 total increases in CDF and LERF for changes made under

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1 the rule are very small. And what we did is there's a
2 50.48(c) the NFPA 805. NFPA 805 is also a pretty
3 brutal risk-informed rule. And we decided however we
4 actually figure out how to do this in fires, we'll
5 just simply do it here too.

6 So we kind of took the same language to
7 the extent we could, which was quite a bit and so what
8 we put in this rule is that the cumulative effect of
9 previous changes made under the rule that have
10 increased risks but haven't met the acceptance
11 criteria shall be evaluated. It puts that in,
12 everybody on notice that this is something we've got
13 to deal with. Exactly how we're going to deal with it
14 we don't -- we'll work it out as we're moving through
15 the process.

16 MEMBER APOSTOLAKIS: Why does it have to
17 be in the rule?

18 MR. DINSMORE: Well, you have to have some
19 way to satisfy the requirement that the total
20 increases made under the rule are very small. If you
21 have absolutely no -- then you have to know what they
22 are over time. If you do one every three years, you
23 could do one every three years, it's small. But then
24 after six or nine years, you're getting up to being
25 larger than the acceptance criteria. So if you came

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1 in with all three of them at once, you wouldn't let
2 them do it, but if they came in once every three years
3 you would permit them to do it.

4 That kind of regulatory process is not
5 very comfortable. It's much more satisfactory to say
6 look, it doesn't matter how you want to do it. You
7 can do it how you want to do it, but the net effect of
8 either way you want to do it is going to be the same.

9 MEMBER SHACK: Yes, I mean it's clear what
10 you're aiming here for, it's just a matter of how you
11 actually sort of do the tracking of these things
12 within the PRA while other changes are going on. I
13 mean somebody has to --

14 MR. DINSMORE: That's right. It's much
15 more difficult when it's a small subset of changes
16 than when it was the total PRA.

17 MEMBER SHACK: Right, but even with the
18 total PRA, you had to separate the changes do I really
19 do the risk versus the changes that were due to
20 changes in modeling assumptions and things like that.

21 MR. DINSMORE: Yes, but that could have
22 been done just by saying well, you can't do those both
23 types of PRA changes at the same time. That would
24 solve it a little bit. But they're both pretty
25 complicated ideas. As I said, we're hoping to work it

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1 out as we move through the process and we just need
2 the right text in there to make sure that it's not
3 forgotten, at the same time not violate any current
4 guidelines and --

5 MEMBER APOSTOLAKIS: So this is going to
6 go out for public comment?

7 MR. COLLINS: Yes, that's the plan. In
8 June.

9 MEMBER APOSTOLAKIS: You've got a plan.
10 so we're going to see this again?

11 MR. COLLINS: Probably next spring, who
12 know what it will look like by then. It changes every
13 time. We're going to go through public comments.
14 We'll go through the cycle of public comments and
15 changing the rule in accordance with those comments
16 and bring it back to you with a draft final rule,
17 round two.

18 MEMBER APOSTOLAKIS: Okay.

19 MEMBER RAY: One more time, because we'll
20 be discussing this, I think, further. Can you say as
21 succinctly as you can what the purpose of this camel
22 as you rightly called it in which you list things in
23 the tech specs, but say nothing more about them?

24 MR. COLLINS: Yes.

25 MEMBER RAY: What's the point that you're

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1 trying to achieve?

2 MR. COLLINS: Well, there is two things.
3 First of all, the Commission first of all said that
4 equipment which is credited for mitigation of events
5 larger than TBS should not be removed without prior
6 staff approval. Putting things in tech spec requires
7 that we review it before we can remove it.

8 It also provides a -- it gives the staff
9 an identification equipment that supposedly low-risk
10 significant equipment that the staff can review when
11 the licensee identifies it as something they're going
12 to use for beyond the design basis accident analysis.

13 And if it stands out as something very
14 peculiar and unusual, I think we'll give it a harder
15 look and if it looks like equipment which is
16 reasonable, we -- you know, remember, we're trying to
17 get away from too much attention on equipment
18 associated with low safety significance, right, so
19 we're trying to find a middle ground.

20 MEMBER RAY: It's a convenient location it
21 sounds like to me.

22 MR. COLLINS: Yes.

23 MEMBER RAY: As opposed to being
24 consistent with other things that are already in the
25 tech specs.

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1 MR. COLLINS: Right. Well, I think we're
2 being inconsistent in a lot of ways here, you know, by
3 introducing this new beyond design basis accident that
4 requires mitigation, right?

5 If the Commission says by requiring
6 mitigation you have to demonstrate that you meet it,
7 yet it's not a design-basis accident, well, that --
8 well, what it is then? It's a new category of stuff.

9 MEMBER RAY: Well, that I think
10 philosophically we can get our mind around. This is a
11 more pragmatic problem of just how things get done in
12 the real world.

13 MR. COLLINS: I think it's going to draw a
14 whole lot of comments.

15 MEMBER RAY: I think it's better for us to
16 take a position now and let people comment on the
17 outcome of that than to later on say well, we'll
18 revisit this next time it comes back here because by
19 then it's -- the concrete is really set.

20 CHAIR BONACA: After the presentation is
21 completed, we'll talk about whether we should have
22 the time to do it now.

23 MEMBER SHACK: If there are no more
24 questions -- thank you very much. Back to you, Mr.
25 Chairman.

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1 CHAIR BONACA: We have time now, I think
2 we should talk about whether or not we should write a
3 letter.

4 MEMBER SHACK: How about a five minute
5 break?

6 CHAIR BONACA: Let's take a ten-minute
7 break.

8 (Whereupon, the above-entitled matter went
9 off the record at 10:00 a.m. and resumed at 10:10
10 a.m.)

11 CHAIR BONACA: Let's start this morning's
12 session. We said specifically five minutes. Okay.

13 So we need to talk about whether or not we
14 need to write a letter. And there are a number of
15 issues that have raised, a couple of issues that we
16 should discuss.

17 One is the credit for no safety equipment
18 and how do we monitor availability. And the other one
19 is the 14 days. It seems to me is the change. So
20 Bill, do you want to start giving your thoughts?

21 MEMBER SHACK: Okay, I guess I'm in the
22 mode that I don't think that we need a letter. The
23 fact that -- the comment that I actually had back on
24 the Federal Register notice was that for PWRs there
25 was no nonsafety equipment that they would credit.

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1 It's not clear what this equipment might be, but in
2 fact, we have nonsafety equipment that we credit in
3 PRAs all the time. It doesn't appear in the tech
4 specs.

5 I could understand going through a 50.69
6 kind of process where we look for all the real
7 Category 3 components that were nonsafety, but risk-
8 significant and you know why we picked these
9 particular ones out which probably -- if the only use
10 of this equipment is to mitigate a large break LOCA,
11 it probably wouldn't be a Category 3 50.69 component.

12 Anything that's risk-significant will be
13 captured, I think, by the maintenance rule, among
14 other things, but if this is nonsafety equipment that
15 is truly only used for a large break LOCA, it wouldn't
16 be risk-significant by almost any categorization we
17 use. And I don't see why it particularly has to -- I
18 like the notion that we don't -- they have to come in
19 and ask if it can be removed, but I don't know that we
20 have to add any more restrictions and requirements on
21 it.

22 MEMBER BROWN: How do you come to that
23 conclusion? If something is nonsafety, but yet it's
24 being utilized to demonstrate that you meet the
25 requirements in that range? I don't --

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1 MEMBER SHACK: It's only being used -- you
2 know, again, if it is only being used to mitigate a
3 large break LOCA, then I'm talking about something
4 that doesn't even initiate until I get to ten to the
5 minus five. So it's a relatively small contributor to
6 risk.

7 MEMBER BROWN: So you don't care if it
8 fails?

9 MEMBER SHACK: I don't require the same
10 degree of assurance that I do for something that's
11 required to mitigate a ten to the minus three
12 initiator.

13 MEMBER BROWN: I understand that, but the
14 rules have been separated into 50.46 and 50.46(a) and
15 it allows credit to allow you to proceed into that
16 regime without doing anything. Effectively, you're
17 allowing the credits so that you can take advantage of
18 it so -- whatever the analysis is, you meet the terms
19 and conditions of your analysis. And I'm not arguing
20 against what it is, I'm just -- it's a piece of
21 equipment you said now you have to have in order to
22 show compliance with the new rule. And now we're
23 saying well, if it's not there, that's okay. I'm just
24 trying to get the rationale.

25 MEMBER MAYNARD: Basically what we've done

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1 is we put this in a break over the transition break
2 size. We're putting that accident into the same
3 category as station blackout, ATWS and some of the
4 others that have been treated, I think appropriately
5 within the regulatory space. It's something still
6 important to us, but it doesn't fall into the normal
7 design basis type accident, what we're basically doing
8 with these transition break sizes.

9 MEMBER APOSTOLAKIS: This is a little bit
10 more demanding though than ATWS over station blackout.

11 I mean over there all they had to do was show that
12 they can manage the ATWS or the station blackout, yes,
13 we have an extra portable diesel, we're going to do
14 this.

15 MEMBER MAYNARD: Some of them -- they have
16 to identify the equipment that they're taking credit
17 for that and you know, there's --

18 MEMBER APOSTOLAKIS: I think that this is
19 more demanding, beyond TBS. It says that you have to
20 show with analysis that you still don't melt the core.

21 MEMBER SHACK: You can do that, but the
22 question now is do we add additional requirements on
23 any of the equipment.

24 MEMBER APOSTOLAKIS: We already asked for
25 some confidence that these things would work. I think

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1 a previous letter had something like that. So how do
2 we do that now?

3 MEMBER SHACK: We push for it.

4 MEMBER APOSTOLAKIS: Somehow they have to
5 show that every now and then, don't you think?

6 MEMBER RAY: Because of what Bill said
7 about we don't put everything in the tech specs that
8 we rely on which is perfectly true, thinking about
9 having to write a comment about this I tried to do,
10 over night, I tried to do it to see if I could do it.

11 And that's why I asked him the question why are you
12 putting this in the tech specs? And the two things
13 listed was visibility to the low-risk equipment being
14 relied on. Well, this is just some of it. It's not
15 all of it.

16 And they want it in the tech specs so they
17 couldn't take it out of the plant without approval or
18 disable it or abandon it, whatever. And maybe this
19 isn't something that the ACRS should worry about.
20 It's an administrative convenience. But I do worry
21 about it because I don't think you can just use the
22 tech specs as a place to put lists of things that you
23 want to have visibility to. Inevitably, the tech
24 specs in my view anyway need to be capable of
25 demonstrating that you satisfy.

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1 Now when I asked about that yesterday, he
2 said similar to what he said today, every two
3 refueling cycles you'll look back and you'll have to
4 show that you satisfied. But that is where I jump off
5 the boat. That is no good. To say I'm going to look
6 back every two refueling cycles and figure out whether
7 or not I met the assumptions in this risk analysis.
8 To me, that's over the line. If you just said I'm
9 putting it there just so you can't get rid of it
10 without my approval, and stopped, that would be okay.

11 But if you say I have to now demonstrate that I met
12 and if I don't meet it and I know I don't meet it,
13 I've got to shut the plant down or back it down or
14 something and we need to agree on where I'm going to
15 go with that. Now you're into a whole different world
16 in my opinion.

17 I'm done.

18 MEMBER SHACK: Is that so different from
19 the way you manage a steam generator though, where you
20 project ahead, then you get to the end of the cycle
21 and you find out that you really meet all those
22 requirements and if you didn't you were in trouble,
23 and you will then change your procedures to make sure
24 that the next time you will make it.

25 MEMBER RAY: I think it is. But I don't -

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1 - don't force me to describe exactly how it is. I
2 just think it is, yes.

3 (Laughter.)

4 You know, again, if you just said this is
5 nothing but a list for visibility purposes, but that's
6 not where they go. They go beyond that. You actually
7 need to show that you satisfied the analysis
8 periodically on a look-back basis. That's just not
9 any good.

10 MEMBER SHACK: It's not any good in what
11 sense?

12 MEMBER RAY: In the sense that you can be
13 in noncompliance --

14 MEMBER SHACK: But isn't it up to the
15 licensee to adapt procedures that when he does that
16 look-back he's okay? That's what the steam generator
17 guy does.

18 MEMBER RAY: As I said yesterday, that's
19 what I would do in running a plant, yes. Is that the
20 way we're going to end up on this that if you guys are
21 smart you'll find a way to avoid violating this on an
22 on-going basis.

23 MEMBER SHACK: It's performance-based.

24 MEMBER RAY: I'm not sure, Bill, because I
25 think that the issue of those who don't choose to

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1 monitor their on-going compliance with their analysis
2 assumptions and to then wind up having to acknowledge
3 that they were not in compliance during the time but
4 nobody knew because they weren't required to, and keep
5 track on the outage time on these nonsafety-related
6 equipment, I just don't think that that's a proper --

7 MEMBER SHACK: What change would you make?

8 MEMBER RAY: I would put it in there and
9 say there is no operability requirement on this
10 equipment. It's being listed here simply to ensure
11 that the equipment remains in the plant until it's --
12 I would characterize why it's being listed there in a
13 way that would avoid the implication that the
14 reliability of this equipment is important to safety
15 from a compliance standpoint.

16 Now does have a little importance to
17 safety, but I would try and distinguish it from the
18 other stuff in the tech specs and to ensure that it
19 didn't take on the characterization -- steam generator
20 tubes may be a good example. Take on the
21 characterization of ah, you're in noncompliance during
22 this time. You should have shut down. You didn't.
23 Here's your fine and citation.

24 That's what I would do. Or I couldn't put
25 it in the damn tech specs to begin with.

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1 MEMBER CORRADINI: Can I just summarize?

2 MEMBER SHACK: That would be a popular
3 position. The question is would they say nothing
4 about -- is that what you would say, say nothing about
5 it?

6 MEMBER CORRADINI: Harold, what I am
7 hearing Harold saying is if you're going to go through
8 the effort of putting it in the tech specs, you better
9 put in some sort of monitoring and surveillance --

10 MEMBER SHACK: I'm not sure I hear that
11 from him, Mike.

12 MEMBER CORRADINI: Wait, I didn't finish.
13 He said it's kind of you're in the middle and that
14 gets him disturbed. Either they shouldn't be in or if
15 they're in, they ought to have more specificity in how
16 you determine their status.

17 MEMBER RAY: Or, if you're going to put
18 them in as a camel, call it a camel and say this is
19 just listed here for this very limited purpose. And
20 it can be out of service for the whole two refueling
21 cycles.

22 MEMBER APOSTOLAKIS: No.

23 MEMBER RAY: I know you are going to say
24 no.

25 MEMBER CORRADINI: Therefore it shouldn't

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1 be there or it should be --

2 MEMBER RAY: That's right. That
3 illustrates the problem.

4 MEMBER BLEY: If we go back to 50.69 for a
5 place just to put this in perspective, it breaks
6 things into four categories. The first two are the
7 ones you want to track somehow and it's either the
8 safety-related risk-significant or the nonsafety-
9 related risk-significant. All the risk-significant
10 things you want to try.

11 If it's nonsafety-related and not risk-
12 significant, you don't have to do anything with it.

13 MEMBER SIEBER: Right.

14 MEMBER BLEY: We've built kind of a
15 conundrum here. We've essentially said these are
16 nonsafety-related and not risk-significant, but
17 they've got to be there.

18 (Laughter.)

19 Which doesn't quite make any sense.

20 MEMBER RAY: Fourteen days go by.

21 MEMBER BLEY: So if they're not risk-
22 significant, they really shouldn't be there. If they
23 are risk-significant, then it ought to be --

24 MEMBER SHACK: This is a defense-in-depth
25 thing.

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1 MEMBER BLEY: If I'm in a plant and if I
2 don't need that thing for anything, I can leave it in
3 pieces and I've seen a lot of places where that
4 happens. If it's essentially an installed spare and
5 you use it for parts -- if you're tracking the 14
6 days, so that is a treatment.

7 MEMBER SHACK: That is a treatment.

8 MEMBER BLEY: That is a treatment.

9 MEMBER SHACK: Is that an appropriate
10 treatment for a component that's really needed only
11 for defense-in-depth?

12 MEMBER MAYNARD: I think we need to focus
13 on whether we need a letter for that.

14 MEMBER SHACK: We don't need a letter
15 unless we have an issue to discuss.

16 MEMBER APOSTOLAKIS: What is the issue
17 right now?

18 MEMBER MAYNARD: But we're talking about
19 going out for public comment. I think there is going
20 to be extensive comments on all these areas. I think
21 it's going to be --

22 MEMBER SHACK: I think that's safe to say.

23 MEMBER MAYNARD: Quite a drawn out
24 process. So I'm not overly excited about us trying to
25 decide within the next two days our position, detailed

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1 positions on a couple of these things.

2 I am against putting it in the tech specs.

3 I think that's a misuse of the tech specs. I think
4 that's totally the wrong thing to do. I think that
5 would get all kinds of comments from the stakeholders
6 about that too.

7 I just can't believe we would put a list
8 in the tech specs like this. I'm totally against
9 putting it in the tech specs for 14 days per year for
10 something like this is also -- we have other models
11 like the maintenance rule and some other things that
12 would be, I think, more appropriate ways to track and
13 handle some of this stuff than putting a list in the
14 tech specs and then putting a 14-day cumulative
15 requirement --

16 MEMBER SHACK: But I'm not sure that the
17 maintenance rule --

18 MEMBER APOSTOLAKIS: It does not apply,
19 does it?

20 MEMBER SHACK: -- has our defense-in-depth
21 concerns explicitly. The maintenance rule is a risk-
22 significance thing and we're really in a different
23 space here.

24 MEMBER APOSTOLAKIS: We are in a different
25 space.

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1 MEMBER MAYNARD: But defense-in-depth also
2 should not take any equipment. There's ways to handle
3 a list or a commitment or a requirement so that you
4 don't take some of this equipment out without NRC
5 approval. There's other ways of doing that.

6 CHAIR BONACA: That is right. Let's get
7 back to the point you focused on before. Do you feel
8 that we should write a letter?

9 MEMBER MAYNARD: I would be willing, if
10 staff knows our position, if they want to go ahead and
11 put it out for public comment, you know, and then --
12 I'm not strong either way on that.

13 MEMBER APOSTOLAKIS: If you put the
14 requirement of 14 days, cumulative, and you leave it
15 at that, wouldn't the licensees have to figure out a
16 way of finding whether they are in an unanalyzed
17 condition?

18 MEMBER SIEBER: Some would.

19 MEMBER APOSTOLAKIS: So let them do it.
20 We don't have to put it in the tech specs. We don't
21 have to say anything. The 14-day requirement --

22 MEMBER SHACK: No, but you have to
23 identify which equipment is subject to that 14-day
24 requirement and that's just a listing, a listing of
25 the equipment.

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1 Whether they put it in the tech spec or not, maybe
2 there's some other way to do that. I don't know.

3 MEMBER APOSTOLAKIS: Some other way, but
4 it seems to me --

5 MEMBER SHACK: The licensees presumably
6 can address that.

7 MEMBER APOSTOLAKIS: The 14-day
8 requirement will impose some sort of inspection or
9 something.

10 MEMBER SIEBER: Surveillance.

11 MEMBER APOSTOLAKIS: Surveillance, yes.
12 Would that be okay?

13 MEMBER RAY: Well, but you're making an
14 assumption about the 14-day requirement is going to
15 provide some clarity. I wrote and I'll read this very
16 briefly, Mario, because this is a hard thing to figure
17 out whether to comment on and how.

18 I said licensees and the NRC should have
19 clarify regarding what is required to satisfy
20 requirements included in technical specifications on a
21 going-forward basis. Listing nonsafety-related
22 components for which credit has been assumed in
23 analyses without including any definition of what is
24 required to demonstrate that actual component
25 performances consistent with the assumed credit is

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1 therefore inappropriate. This includes definition of
2 the action required if the performance for the assumed
3 credit cannot be maintained. Which is reference to
4 the 14 days.

5 What do you do?

6 MEMBER BROWN: The 14 days, if you know
7 it's out of service, that's when you start, you add up
8 the days. If it's sitting there and you don't know
9 because you haven't tracked it, your point was valid.

10 You could go two refueling cycles and not know it's
11 not operational.

12 MEMBER RAY: That's why I say this
13 includes, meaning that in addition to knowing whether
14 it's out of service, you've got to know what to do if
15 it's not.

16 CHAIR BONACA: Go ahead, George.

17 MEMBER APOSTOLAKIS: Let's start at the
18 beginning. A utility says we're going to implement
19 it. They have the TBS, right? PWR, 14. The rule
20 requires that they do a best estimate calculation for
21 beyond TBS breaks.

22 MEMBER SHACK: They could an Appendix K.
23 They actually have a choice.

24 MEMBER APOSTOLAKIS: I thought it was best
25 estimate. But anyway, okay, whatever they do.

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1 MEMBER SHACK: They have a choice.

2 MEMBER APOSTOLAKIS: That implies that
3 they make some assumptions about equipment. So there
4 is your list, Bill. They put that equipment down.
5 Then we put this 14-day requirement with nothing else.
6 At some point the NRC asks the licensee, did you meet
7 the requirement? The licensee says yes. How do you
8 know? Aren't you forcing them then at that time to
9 tell you yes, because we're doing this, we're doing
10 surveillance, we're doing something. If they say
11 well, gee, we didn't do anything the last fuel cycle,
12 then the staff will be right to ask and how the hell
13 do you know that you're meeting the 14 days?

14 MEMBER BROWN: No, whether you're meeting
15 the credit even. You don't even know that.

16 MEMBER APOSTOLAKIS: Okay, so it seems to
17 me there is a logical progression here that will --
18

19 MEMBER SHACK: Well, you're saying we're
20 right, but we don't need to say anything because
21 they'll be confronted with this.

22 MEMBER APOSTOLAKIS: And they don't have
23 to put down anything in the tech specs.

24 MEMBER SHACK: That may be. I'm looking
25 at it from the standpoint of the people in the plant

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1 and the plant who they interact with in the regulatory
2 space. You're looking at it from the standpoint of the
3 analysts and the staff here in White Flint and I guess
4 -- that's why I said, I'm not sure if this is
5 appropriate for ACRS to even worry about, which is how
6 these things are actually implemented in the field.

7 But what you described, George, look, this
8 is going to have to happen anyway, so let's just
9 recognize that and let it be. I don't know if I'm
10 putting words in your mouth or not, but that's the way
11 I would describe it.

12 I don't know. It's hard for me to -- I'm
13 done.

14 MEMBER APOSTOLAKIS: It depends on how the
15 14-day requirement is stated.

16 MEMBER BANERJEE: Can I ask a question?

17 CHAIR BONACA: Please.

18 MEMBER BANERJEE: When did the best
19 estimate large break LOCA calculation enter the arena?
20 Was it before we started work on this rule?

21 MEMBER SHACK: Oh yes.

22 MEMBER BANERJEE: So this rule was brought
23 in spite of the fact that applicants could do best
24 estimate LOCA calculation?

25 MEMBER SHACK: That's right.

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1 MEMBER APOSTOLAKIS: It's the assumptions
2 that are different.

3 MEMBER BANERJEE: I know, but you don't
4 gain that much. You can do a best estimate. I don't
5 think you can --

6 MEMBER APOSTOLAKIS: No, no, the
7 assumptions regarding current loss of power, that's a
8 given.

9 MEMBER BANERJEE: That's a given. You
10 don't make much out of the other stuff.

11 MEMBER APOSTOLAKIS: Even from that? I
12 thought they did?

13 MEMBER BANERJEE: No, I don't think so. I
14 think what Ralph was saying.

15 MEMBER APOSTOLAKIS: The famous spray
16 system, we were told, it won't have to be --

17 MEMBER BANERJEE: My impression from what
18 Ralph said was that you don't make a lot of gain in
19 the --

20 MEMBER APOSTOLAKIS: It depends on how you
21 define the TBS.

22 MEMBER BANERJEE: It's a 14-inch --

23 MEMBER APOSTOLAKIS: If you are very
24 conservative there, then the licensees come back
25 saying well --

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1 MEMBER BANERJEE: I am wondering whether
2 is that all essential? I have sort of a -- maybe we
3 have to do it anyway, but how important is it?

4 CHAIR BONACA: I personally don't see a
5 need for writing a letter now. That's my view.

6 MEMBER CORRADINI: I agree.

7 CHAIR BONACA: Okay, and just --

8 MEMBER BANERJEE: Give ourselves more work
9 than we need to do.

10 CHAIR BONACA: We know that the issue is
11 of significance, okay, and it doesn't deserve to write
12 a letter for us now or should we just go forward and
13 see --

14 MEMBER APOSTOLAKIS: The staff has been
15 informed.

16 CHAIR BONACA: Those who are in favor of
17 writing a letter now, please raise your hand? Those
18 in favor of writing a letter.

19 (Show of hands.)

20 MEMBER BROWN: I've got that second issue.

21 I probably would vote for writing a letter also
22 because to me, there's the 14 days. You can go
23 through and list them in the tech specs. I still fall
24 down on the side relative to once you've taken credit
25 for a set of equipment, it doesn't have to be

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1 redundant. It doesn't have to meet all the single
2 failure and all that. Once you've taken credit for it
3 in order to move yourself and allow yourself to go
4 into this new mode of operation, you have to do
5 something with those pieces of equipment.

6 And you've got to know that they're
7 operational. They may break and then you go into the
8 14-day rule or you might go into no 14-day if that's
9 the case, whatever it is. But you've got to know
10 whether those are available or not. That's the other
11 point.

12 They know that. If this comes up again,
13 no, when it comes up again, I will raise that issue
14 and be a little bit more forceful than I am now, even
15 though I'm not trying to yell. That's the way I talk
16 all the time, okay? My wife tells me that all the
17 time.

18 MEMBER ARMIJO: I think when we get to the
19 next time around, these issues should be in our
20 letter. I just don't think we have to write a letter
21 now. I agree with Harold that if something is wrong,
22 you can't have it both ways. And that's what we're
23 trying to do.

24 CHAIR BONACA: Let me ask the other
25 question, okay? Go ahead.

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1 MEMBER SIEBER: If we leave it as a list
2 in the tech specs, I think we need to write a letter
3 then because that introduces an element of confusion
4 about what you do about surveillance and how do you
5 know whether you're good or bad.

6 If it's left out all together, and there's
7 no special treatment, no surveillance requirement, no
8 listing in the tech specs, then I think you don't need
9 the letter.

10 MEMBER SHACK: If this is a make it or
11 break it concern for our approval of the letter, then
12 we need a letter. I mean we should not let any issue
13 that would -- that we think needs to be addressed go
14 past.

15 MEMBER RAY: That was my problem. Is this
16 really going to be in concrete by the time it comes
17 back here?

18 MEMBER SHACK: I think it's probably going
19 to change by the time it gets back here.

20 MEMBER RAY: That's what we're counting
21 on. I understand that. Because I know there's a lot
22 of people here who would like to make a comment.

23 MEMBER BLEY: If it's make or break then,
24 we should telegraph it now.

25 MEMBER SHACK: I can live with it either

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1 way. I guess --

2 MEMBER APOSTOLAKIS: The problem with
3 writing a letter, I mean if we could just write a
4 short one addressing this issue, I would vote for
5 writing a letter. That implies that the rest of the
6 rule is okay. So if we write a letter, we really have
7 to address the whole rule.

8 MEMBER RAY: Okay, well, that's a problem.

9 (Laughter.)

10 MEMBER RAY: We can say we're not
11 addressing --

12 MEMBER MAYNARD: I question whether -- the
13 items that we're talking about are whether it's in the
14 tech specs or not, I'm against that, but is that
15 safety issue or not? I'm not sure which ones are
16 these we're really having concerns with. Some of them
17 seem to be a little bit more implementation-like type
18 issues that maybe dealt in a reg. guide. They're not
19 necessarily -- I'm struggling with this -- tying to
20 safety for whether we should -- something we're
21 required to comment on at this time.

22 MEMBER SHACK: As I say, if it's something
23 that we think will change our position on approval of
24 the rule, then we should comment on it now.

25 MEMBER APOSTOLAKIS: It seems to me that

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1 if you -- we have to be very careful how the rule
2 states whatever requirements there will be regarding
3 beyond TBS. Because it's a matter of defense-in-depth
4 and we don't want to have a rule that can be
5 interpreted as beyond TBS you do nothing. So the
6 language that is used for beyond TBS is extremely
7 important in my mind. So it is really a make or
8 break, eventually.

9 MEMBER SHACK: We have addressed certain
10 things here. You know, we now have codes that have to
11 be reviewed and approved.

12 MEMBER APOSTOLAKIS: But I mean if --

13 CHAIR BONACA: Are you concerned about the
14 fact that if we just focus on this issue it's a silent
15 approval of the rest of the --

16 MEMBER APOSTOLAKIS: Yes, that was my
17 worry too. If it was only -- if we write a letter
18 like the --

19 MEMBER SHACK: What other parts do we
20 disagree with?

21 MEMBER APOSTOLAKIS: -- that Ed sends,
22 that would be fine, but you can't do that in a
23 Committee letter. You are addressing the whole rule.
24 So I would say no at this point.

25 CHAIR BONACA: First of all, this is Mike

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1 and there's another Mike.

2 MEMBER RYAN: You know I think Harold
3 raises an important point. Something is going to go
4 into the tech spec without any real clear protocol for
5 its treatment. That's some way to say it. So I'm
6 nervous about that.

7 I mean I hear you, George, but you can
8 also put a caveat in the letter and say this is a very
9 specific letter about this issue and should not be
10 taken as tacit approval or silent approval. You can
11 cover that base with an exclusion.

12 MEMBER APOSTOLAKIS: That would be an
13 unusual letter.

14 MEMBER RYAN: Well, okay.

15 MEMBER APOSTOLAKIS: But --

16 MEMBER RYAN: So what?

17 MEMBER ARMIJO: Would the purpose of the
18 letter to be hold up the issuing it until this
19 particular issue is solved?

20 MEMBER RYAN: My last point is it really
21 is to indicate to me that, to the staff, the summary
22 of the discussion that went on yesterday and today,
23 the Subcommittee.

24 MEMBER SIEBER: Will this really end up
25 being important? The transition break size is still a

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1 big thing. We're still going to need a whole array of
2 equipment and nonsafety equipment that you might use
3 someplace along the line. Is that going to be really
4 significant?

5 MEMBER RYAN: I don't think so.

6 MEMBER SIEBER: For satisfying the overall
7 requirements? Or is it just a risk question?

8 MEMBER APOSTOLAKIS: I think, Jack, the
9 spirit of our letter last time was that if you have
10 some defense-in-depth in the space beyond TBS, you
11 could afford to lower the TBS.

12 If you insist on a very conservative TBS -

13 MEMBER SIEBER: Then you have to start the
14 diesels faster.

15 MEMBER APOSTOLAKIS: Yes, and you are back
16 to square one. So to keep the current TBS and also
17 impose requirements beyond this goes against the
18 spirit of the letter. Right? We said that last time,
19 that the defense-in-depth requirements remove some of
20 the burden on being very conservative on the TBS
21 definition.

22 MEMBER SHACK: But we still are very
23 concerned --

24 MEMBER APOSTOLAKIS: That's my comment.
25 So you see the letter automatically expands. You

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1 can't just address one.

2 CHAIR BONACA: Mike, Mike Corradini.

3 MEMBER CORRADINI: So we had a straw vote
4 that we're not going to do a letter. Are we past
5 that?

6 CHAIR BONACA: It was interrupted by
7 discussions. There will be some changes.

8 MEMBER SHACK: I hear things that people
9 are unhappy with the rule and if we're unhappy with
10 things in the rule, then we ought to comment or at
11 least we ought to discuss whether the Committee is
12 unhappy with the rule.

13 MEMBER CORRADINI: So can I at least
14 address that? I'm not unhappy with the rule as they
15 explained it yesterday in the Subcommittee. I think
16 the one issue that we're worried about is what Harold
17 expressed. I don't think it rises to the point of a
18 letter at this time. That's kind of my -- where I'm
19 sitting on this.

20 So if that's the only way to communicate
21 this, other than verbally, I would be satisfied. If
22 others are not satisfied, then we might, if the only
23 other choice is a letter, then we have to write a
24 letter.

25 MEMBER BROWN: But the staff made the

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1 comment yesterday they're not going to do anything
2 relative to the discussion. I remember that. Did I
3 phrase that properly? I mean they're not going to do
4 anything with that.

5 MEMBER BANERJEE: I think we should wait
6 until the public comment.

7 CHAIR BONACA: I think so too.

8 MEMBER BANERJEE: Then let's get on with -
9 -

10 MEMBER APOSTOLAKIS: I think the issue of
11 what the TBS is deserves a comment and it's tied to
12 the requirements that you put beyond TBS. I mean, we
13 can't have a conservative TBS or very conservative TBS
14 and then still say do a lot of things for breaks
15 greater than that. And that was what our letter said
16 last time. It takes away some of the burden in
17 defining the TBS. So I think if we're going to write
18 a letter at this time, it's going to be a letter that
19 will be rushed and we haven't really discussed all
20 these issues.

21 MEMBER SHACK: We don't have to write it
22 today. We can write it for next month. I mean we
23 have to decide what issues we have.

24 I mean I feel that they went off and tried
25 to address our comments.

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1 MEMBER APOSTOLAKIS: They did. They did.
2 The only thing that worries me is if the Committee
3 has serious concerns, it would be really unfair to the
4 staff to raise them late in the process.

5 MEMBER POWERS: And this, of course, would
6 be the first time we've ever been unfair to the staff.

7 (Laughter.)

8 MEMBER SHACK: It is sort of like Harold's
9 -- maybe we will be unfair at that time, but at least
10 looking ahead we tried to be fair.

11 (Laughter.)

12 MEMBER BROWN: They know we're going to be
13 unfair in this case also.

14 MEMBER APOSTOLAKIS: All this is on
15 record.

16 MEMBER POWERS: I will remind you that the
17 staff did point out in their presentation following
18 the public comment period they're going to be revising
19 things in response to the public comments and they
20 will probably not be addressing things orally
21 communicated to them by the Committee.

22 CHAIR BONACA: I am sure that the industry
23 will comment on this issue.

24 MEMBER BANERJEE: Harold, you could make a
25 public comment.

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1 MEMBER RAY: I was thinking that very
2 thought, actually, the issue of not being able to have
3 just a limited comment that doesn't by silence endorse
4 other things I think is a serious problem.

5 MEMBER SHACK: If we married this to other
6 things, we ought to say so now is my view.

7 MEMBER APOSTOLAKIS: I can see the first
8 conclusion, we're not endorsing anything.

9 (Laughter.)

10 MEMBER BROWN: We can still say we're not
11 taking issue with the rest, it's just these issues.

12 MEMBER CORRADINI: We can't be a little
13 pregnant on this one.

14 MEMBER APOSTOLAKIS: We are about to start
15 the next session, right?

16 CHAIR BONACA: Yes, we are. Do you want
17 to think about it until this afternoon? We can pick
18 up the issue again and --

19 MEMBER APOSTOLAKIS: That is a good idea.

20 MEMBER RAY: I am done. I don't have any
21 reason to --

22 CHAIR BONACA: So all of those who do not
23 want to write a letter now, please raise your hand.

24 (Show of hands.)

25 Okay, that's one, two, three, four -- not

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1 writing a letter now, okay?

2 MEMBER SHACK: I think we ought to take a
3 vote as to whether we have serious issues with the
4 proposed rule first. If we have serious issues, then
5 we should certainly write a letter.

6 MEMBER BROWN: But not necessarily at this
7 time.

8 MEMBER SHACK: Not right now. It doesn't
9 have to be this meeting, no, but some time, June,
10 July. Before the public comments come in and they
11 begin revising the rule. This is essentially our shot
12 at the public comment. Now whether we do it this
13 meeting, next meeting.

14 CHAIR BONACA: That is why we take a vote.

15 MEMBER SHACK: The question is do we have
16 serious reservations about elements of the rule that
17 we think to write a letter on, if not at this time.

18 MEMBER APOSTOLAKIS: Why don't we discuss

19 --

20 MEMBER SHACK: I think we can discuss that
21 later.

22 MEMBER APOSTOLAKIS: We need more
23 discussion.

24 CHAIR BONACA: I was trying to get a leg
25 up in case we have to write a letter, there isn't

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1 much time to do that and we want to give time to Bill.

2 MEMBER SHACK: But I mean I don't think we
3 need a letter this meeting. This week. But we do
4 need a decision as to whether we have serious
5 objections.

6 MEMBER APOSTOLAKIS: Can we agree we need
7 an hour, two hours of discussion this time or next
8 time and then we make a decision?

9 CHAIR BONACA: Best time is tomorrow
10 afternoon.

11 MEMBER APOSTOLAKIS: Okay, tomorrow
12 afternoon, then we spend an hour, hour and a half and
13 discuss this issue.

14 MEMBER BANERJEE: Mario, you said we could
15 get away tomorrow, right?

16 CHAIR BONACA: Well, if we finish our
17 business.

18 (Simultaneous speakers.)

19 CHAIR BONACA: All right, so we'll leave
20 it to tomorrow, we'll discuss it.

21 MEMBER APOSTOLAKIS: Did we take our
22 break?

23 CHAIR BONACA: Yes, we did.

24 MEMBER APOSTOLAKIS: We did?

25 MEMBER SHACK: I would suggest five

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1 minutes. I didn't get any coffee.

2 CHAIR BONACA: Let's be back here at five
3 minutes of 11, okay? Ten-minute break.

4 (Whereupon, the above-entitled matter went
5 off the record at 10:45 a.m. and resumed at 10:53
6 a.m.)

7 CHAIR BONACA: Back into session. We're
8 going to look now at the Generic Safety Issue 163,
9 multiple steam generator tube leakage. Dr. Powers is
10 going to lead us through the presentation.

11 Before that, Dr. Shack has a statement to
12 make.

13 MEMBER SHACK: I have a conflict of
14 interest here. I can't participate since I've worked
15 on this issue while I was at Argonne National
16 Laboratory.

17 CHAIR BONACA: Okay.

18 MEMBER POWERS: Does that help or hurt?

19 (Laughter.)

20 MEMBER APOSTOLAKIS: In the old days --
21 but this is a different -- I'm sorry.

22 MEMBER POWERS: Steam generator tube has
23 been an issue that the ACRS has been involved in for a
24 very long time. And the staff was established a
25 rather comprehensive steam generator action plan that

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1 they have been going through a variety of issues.

2 Unfortunately, many members of the
3 Committee are new to the Committee and consequently
4 may not be familiar with all that's gone on in the
5 past in connection with this issue.

6 The staff has reached a point where their
7 work leads them to suggest that they can close out one
8 of the generic issues and the staff will go through
9 that generic issue.

10 I have asked in their presentation that
11 they forego plunging into a lot of the technical
12 details in favor of giving you some perspective on the
13 issue as a whole and background and how it interacts,
14 rather than some of the stuff that the Committee has
15 gone through in a great deal of detail in the past
16 which may precede your membership in the Committee.

17 But trust me, this is a persistent area of
18 interest to the Committee and although we are deprived
19 of the services of the esteemed Dr. Shack in going
20 through this, we have a continuing interest in the
21 area and so we'll get to see lots and lots of further
22 details.

23 At this point, I propose that we just go
24 ahead with the presentation and I understand Michele
25 Evans wishes to give us some introductory comments.

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1 MS. EVANS: Yes, thank you. My name is
2 Michele Evans. I'm the Director of the Division of
3 Component Integrity in NRR.

4 I'd like to thank the Committee for giving
5 us the opportunity to talk today about our closure
6 plans for the GSI-163. I think Dr. Powers has kind of
7 set the stage here for just basically moving forward
8 with our presentation. There is one thing I'd like to
9 add though. We are looking for a letter from the
10 Committee to support or endorse our closure of this
11 Generic Safety Issue.

12 So with that, I'd like to introduce Emmett
13 Murphy. He's the Senior Materials Engineer in the
14 Division of Component Integrity.

15 MEMBER POWERS: I can assure you the
16 Committee has been unflagging in its ability to
17 generate letters in this area.

18 MR. MURPHY: Thank you, both. NRR has
19 completed its technical review of Generic Safety Issue
20 163 entitled "Multiple Steam Generator Tube Leakage."
21 A package consisting of a draft closeout memo to the
22 NRC EDO and technical enclosure has been prepared.

23 On March 9th of this year we provided this
24 package to the ACRS requesting its endorsement of our
25 proposed closeout.

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1 (Pause.)

2 GSI-163 was opened in June 1992 in
3 response to a differing professional opinion which was
4 first filed in December of 1991. The DPO concern was
5 -- or the DPO was prompted by widespread stress
6 corrosion cracking at the Trojan plant and the staff's
7 approval of a voltage-based tube alternate repair
8 criteria which allowed somewhere between hundreds and
9 thousands of tubes with such cracks to remain in
10 service. That then was the background for the DPO.

11 The GSI, GSI-163 addresses a principal
12 assertion in the DPO --

13 MEMBER SIEBER: Sir, could you pull your
14 microphone up a little closer, please?

15 MR. MURPHY: Yes.

16 MEMBER SIEBER: Thank you.

17 MR. MURPHY: How is this? Can you hear
18 me?

19 MEMBER SIEBER: Yes.

20 MR. MURPHY: GSI-163 addresses a principal
21 assertion in the DPO that there's the potential for
22 multiple SG tube leaks during a not isolatable main
23 steam line break outside containment. The assertion
24 was that leakage could be of sufficient volume such as
25 to lead to core damage that could result from the loss

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1 of all primary system coolant and safety injection
2 fluid in the refueling water storage tank.
3 Specifically, the GSI focuses on the adequacy of tech
4 spec requirements relating to SG tube integrity to
5 address this concern.

6 It's important to understand here that the
7 GSI and the DPO are two different things. Although
8 the GSI was opened in response to the DPO concerns,
9 the GSI is not part of the DPO resolution process.

10 DPO concerns which evolved considerably
11 through the 1990s after the initial filing, were
12 ultimately reviewed by an ACRS ad hoc subcommittee
13 which served as the DPO Review Panel. The
14 subcommittee issued its conclusions on February 1,
15 2001 and there was an accompanying NUREG-1740 which
16 fully documented in their findings.

17 Among the conclusions of the report was
18 that there was -- they concluded there was no
19 immediate safety issue, that condition monitoring and
20 the alternate repair criteria can adequately protect
21 public health and safety, a number -- however, the
22 ACRS did identify a number of follow-up actions which
23 it recommended the staff pursue. The subcommittee
24 conclusions were endorsed by the full ACRS.

25 MEMBER BLEY: Emmett, just for my benefit,

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1 is this an unusual way to deal with the DPO?

2 MR. MURPHY: I believe it is, yes.

3 MEMBER BLEY: I'm sorry?

4 MR. MURPHY: Yes, I believe this was
5 somewhat unusual.

6 MEMBER BLEY: I don't recall hearing about
7 it before.

8 MEMBER APOSTOLAKIS: The Subcommittee
9 produced a thick report.

10 MEMBER BANERJEE: It was a very good
11 report.

12 MEMBER APOSTOLAKIS: I think it was very
13 good.

14 MEMBER SHACK: We know it was thick.

15 (Laughter.)

16 MEMBER BANERJEE: I also said it was one
17 of the few NUREGs I've read that have been written in
18 English. You couldn't help yourself.

19 MEMBER APOSTOLAKIS: My God, you've got
20 all comments. But there was never any doubt it was
21 going to be thick.

22 MEMBER POWERS: It is 38 pages long,
23 that's all. Not very thick.

24 MEMBER APOSTOLAKIS: It was like 200.

25 MEMBER POWERS: Emmett, please continue.

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1 MR. MURPHY: The Subcommittee
2 recommendations in NUREG-1740 were incorporated into
3 what's become known as the SG Action Plan for purposes
4 of tracking our progress on the individual items.

5 In March 2001, EDO, NRC EDO issued a
6 memorandum concluding that the Steam Generator Action
7 Plan resolved the DPO, that with the issuance of the
8 -- or with the establishment of the SG Action Plan to
9 the ACRS comments that the DPO was closed.

10 So the technical basis for GSI closure is
11 relatively straight forward. As of September 30,
12 2007, new performance-based technical specifications
13 are in place at all pressurized water reactors that
14 (1) ensure all tubes will exhibit acceptable
15 structural margins against burst or rupture under
16 normal operating and design basis accidents, including
17 main steam line break, and (2) these new requirements,
18 ensure leakage from one or multiple tubes under design
19 basis accidents will be limited to very small amounts,
20 consistent with the applicable regulations for off-
21 site and control room dose.

22 In addition, the staff has completed all
23 Steam Generator Action Plan tasks directly relevant to
24 the GSI, namely addressing the issue of whether NRC
25 requirements and the certifications for ensuring steam

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1 generator tube integrity, whether those requirements
2 adequately address the concern of the GSI.

3 (Pause.)

4 Until recently NRC surveillance
5 requirements for ensuring steam generator tube
6 integrity were prescriptive. These requirements
7 basically were a cookbook. They established required
8 inspection frequency. They defined inspection
9 sampling plans. You had to inspect, for example,
10 between 3 and 100 percent of the tubes, depending upon
11 what you found during the inspection. And you were to
12 plug all tubes with greater than 40 percent through-
13 wall flaws.

14 These requirements were not directly
15 focused on ensuring that all tubes would maintain
16 their integrity. There was wording in the tech specs
17 that stated that upon completion of this prescriptive
18 set of requirements, the steam generators were
19 continued operable. So these prescriptive
20 requirements were assumed to provide tube integrity,
21 if you completed these.

22 MEMBER APOSTOLAKIS: So what was missing
23 to make it applicable?

24 MR. MURPHY: For a variety of reasons,
25 shortcomings.

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1 MEMBER APOSTOLAKIS: If you are addressing
2 it later, that's fine.

3 MR. MURPHY: For a variety of reasons,
4 including limitations of the inspection methods,
5 limitations of unanticipated crack growth rates, crack
6 growth rates, for example, are outside, let's assume
7 the plugging limits. Inadequate inspection samples.
8 There may be any one of a number of reasons why these
9 requirements were not always -- if this is all you
10 did, why they would not be sufficient to ensure tube
11 integrity.

12 MEMBER APOSTOLAKIS: So it was the method
13 of inspection that was defective?

14 MR. MURPHY: That was a common problem,
15 that the shortcomings of the inspection methods
16 available at the time were not fully compensated for -
17 - by the utilities in dealing with the issues at their
18 plant.

19 There was a general recognition very early
20 on back in the 1970s, 1980s, that the text spec
21 requirements contained these shortcomings and this
22 forced utilities to take actions beyond minimum tech
23 specs to ensure tube integrity was being maintained.
24 Initially, these actions were very ad-hoc. No
25 consistency among the different utilities. The wheel

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1 had to be reinvented every time a plant went down for
2 an inspection.

3 During the late '70s, early '80s, NRC and
4 the industry began various initiatives to improve the
5 consistency and effectiveness of utility programs.
6 EPRI, for example, began the development and
7 publication of a number of guideline documents
8 relating to control of secondary water chemistry,
9 guidelines for performing in-service inspections,
10 later on in the '90s, guidelines for managing tube
11 integrity.

12 NRC, in the mid-'90s issued Draft Reg.
13 Guide 1074 which inspired ultimately in the
14 development of the NEI 97-06 guidelines for ensuring
15 steam generator tube integrity.

16 In May 2005, the NRC staff approved a
17 generic template for new tech specs for ensuring steam
18 generator tube integrity. These tech specs were
19 generally aligned with the NEI 97-06 guidelines. The
20 guidelines have since been revised to be fully in line
21 with the tech specs. As of September 30, 2007, the
22 new tech specs were in place for all US PWRs.

23 We briefed the ACRS on these new
24 requirements back on September 9, 2004. I think it
25 would be helpful to go through some of the high-level

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1 requirements here again to show how the requirements
2 address the concern of the GSI.

3 I'll also make some observations
4 concerning the effectiveness of the approach. I think
5 we do now have some good experience that does make the
6 point that the performance-based approach is working,
7 is providing for an effective management of steam
8 generator tube integrity.

9 The new requirements incorporated a
10 performance-based framework. It places the focus on
11 the bottom line, ensuring SG tube integrity, rather
12 than on how you get there. It's adaptable to new or
13 unexpected problems. This adaptable to new inspection
14 technology. It provides flexibility to utilities to
15 implement cost effective strategies for managing tube
16 integrity while ensuring -- for managing the tubes
17 while ensuring tube integrity will be maintained.

18 The requirements include a new LCO,
19 namely, SG tube integrity shall be maintained. This
20 LCO ties SG operability directly to maintaining tube
21 integrity rather than completing certain specific
22 steps. The accompanying surveillance requirement
23 states that -- requires verification of SG tube
24 integrity in accordance with the SG Program which is
25 also set forth in the new tech specs.

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1 The SG Program is defined in the tech
2 specs. The requirement is that an SG Program shall be
3 established and implemented to ensure tube integrity
4 is maintained. In addition, the program shall include
5 a number of provisions. We have -- they include
6 provisions -- they include tube integrity performance
7 criteria, i.e., the attributes defining what SG tube
8 integrity is. What does it mean to have tube
9 integrity?

10 There are to be provisions for condition
11 monitoring, to confirm that the performance criteria,
12 tube integrity performance criteria are, in fact,
13 being met. The SG Program specifies the applicable
14 tube repair criteria, including any alternate tube
15 repair criteria such as voltage based, with provisions
16 for SG tube inspections and provisions for monitoring
17 operational primary to secondary leakage.

18 The performance criteria for tube
19 integrity, there are three of them: one pertaining to
20 structural integrity; one relating to accident induced
21 leakage integrity; and finally, operational leakage
22 integrity.

23 MEMBER STETKAR: Emmett, can I interrupt
24 you for just a second? The accident leakage criteria,
25 is that -- I looked at the Working Group version of

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1 the tech specs, so I'm not sure I saw the final one.
2 They seem to require that the licensee must perform an
3 analysis to determine whether the primary to secondary
4 accident induced leakage rate is less than the leakage
5 rate assumed in the accident analyses which is usually
6 about a GPM pristine generator. Is that that accident
7 --

8 MR. MURPHY: I'll be coming to that.

9 MEMBER STETKAR: You will? Okay, thanks.
10 Never mind. I'll keep quiet.

11 MR. MURPHY: In developing these
12 performance criteria, the attributes we were looking
13 for were that the performance criteria deal with
14 parameters that were measurable, either directly or
15 indirectly; and where the consequences for failure to
16 meet the criteria would be tolerable.

17 The second performance criteria were
18 intended to be consistent with the current design and
19 licensing basis.

20 The process for coming -- for developing
21 these performance criteria, that is, coming to a
22 consensus with the industry and among ourselves here
23 at the NRC as to what the licensing basis, the design
24 basis required in the way of safety margins was a long
25 and arduous path.

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1 MEMBER BANERJEE: Does this 1.4 take into
2 account shock waves with the main steam line break?

3 MR. MURPHY: To the extent that any
4 primary stress in the tubes should be addressed
5 relative to the 1.4 criteria.

6 MEMBER BANERJEE: How do you do this
7 calculation? Because it's quite complicated.

8 MR. MURPHY: Well --

9 MEMBER BANERJEE: You certainly can't do
10 it with RELAP.

11 MR. MURPHY: The dynamic loads on the
12 tubes were addressed as part of Generic Safety Issue
13 188.

14 MEMBER BANERJEE: Was it resolved
15 satisfactorily?

16 MR. MURPHY: Yes. Among the conclusions
17 of that study was that such loads did not need to be
18 factored into the GSI-163, that the dominant loads
19 during the DBA the impact to integrity are, in fact,
20 the pressure loadings on the tube.

21 There are a couple of situations where
22 bending due to vibration or shock might -- could
23 potentially be a limiting situation, but those cases
24 are unusual.

25 MEMBER SIEBER: It seemed to me those ones

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1 were minor.

2 MR. MURPHY: Yes. One can hypothesize in
3 a specific situation where a bending load associated
4 with a transient could potentially be eliminated.

5 MEMBER BANERJEE: I was just reading this
6 ad committee report which has to do with the DPO
7 rather than with specific issue, but of course,
8 intimately connected. And my impression was that this
9 was a significant issue.

10 MR. MURPHY: Yes, the ACRS in his report,
11 as you said, did express concerns in this area, did
12 recommend that this issue be evaluated by the staff
13 and so that was one of the topics that was folded into
14 the SG Action Plan. And then that was part of a group
15 of topics that got picked up by a new Generic Safety
16 Issue, GSI-188 and I offhand don't remember the title
17 of that GSI. That GSI was closed out with the
18 conclusions that I just described.

19 MEMBER SIEBER: My understanding of the
20 safety factors is a little different than what you
21 said. The safety factor of three is the differential
22 pressure between RCS pressure or steam generator
23 pressure. The 1.4 assumes the steam generator has
24 blown down, but the RCS pressure is still 2250.

25 MR. MURPHY: For steam line break or feed

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1 line break, yes.

2 MEMBER SIEBER: Right, and the 1.2 has all
3 these dynamic factors factored into it.

4 MR. MURPHY: That's correct.

5 MEMBER SIEBER: So you still have a safety
6 factor greater than 1, but the margin now is 20
7 percent. So that's where --

8 MEMBER BANERJEE: I'm having problems
9 because -- I would love to see how you calculated
10 these loads and how you resolved the previous GSI.

11 MEMBER POWERS: I think that's the
12 operational statement in the previous GSI.

13 MR. MURPHY: GSI-188 was closed.

14 MEMBER BANERJEE: Any experiments or was
15 it just --

16 MEMBER POWERS: There were --

17 MR. MURPHY: I believe the ACRS concurred
18 with the close out --

19 MEMBER BANERJEE: The reason I ask this
20 that in bodily flows shock waves actually amplify.
21 This is very well known. It's due to an equation
22 which is non-linear.

23 MR. MURPHY: Right.

24 MEMBER BANERJEE: It's not just the
25 rarefaction wave. So it's not obvious to me.

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1 MEMBER POWERS: The much more thorny issue
2 in this was just actually lifting of the plates, the
3 support plates. And because they are in most cases
4 locked, it became a non-issue. They subsequently
5 tested that.

6 MEMBER SIEBER: There are two effects when
7 tube support pipes flex. One of them is you uncover
8 cracks and you can blow out crud. The other one is
9 you start twisting the tube that the flecture which to
10 my memory was an intercept was -- the flecture of the
11 tube was not a great effect. And with the one volt
12 signal, the chance of blowing out crud seemed to be
13 relatively negligible also.

14 MEMBER ARMIJO: All of these safety
15 factors, do they include that 40 percent crack in
16 their pre-existing crack or did they --

17 MEMBER SIEBER: That's the baseline
18 assumption.

19 MEMBER ARMIJO: So 1.2 includes a tube
20 with a pre-existing crack.

21 MR. MURPHY: This is a definition of
22 structural integrity from a structural standpoint.
23 And basically, these factors are intended to be and
24 were developed to be consistent with the construction
25 code, Section 3, stress limits. That's where it comes

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1 from.

2 MEMBER ARMIJO: I guess I still didn't
3 understand. The 1.2 factor, the lowest one, is
4 representing, represents a pristine tube with no
5 damage, no corrosion damage, no stress corrosion
6 damage.

7 MR. MURPHY: These are performance
8 criteria for evaluating degraded tubes.

9 MEMBER ARMIJO: Okay, degraded tubes.

10 MR. MURPHY: So a degraded tube is
11 considered to retain structural integrity when it can
12 still comply with these safety margins.

13 MEMBER BANERJEE: So, Dana, so you are
14 reassuring me, this GSI came to the ACRS and we looked
15 at it?

16 MEMBER POWERS: We looked at it and when
17 they close it out, otherwise disposition them and part
18 of our report said we wanted to see it. We kind of
19 followed it fairly closely. It's been a while since
20 things have come here, but that's just the normal
21 progression of events. I think we're going to get a
22 burst of activity here.

23 MS. EVANS: With regard to that burst of
24 activity, our intent is to and I believe it's being
25 arranged to have some Subcommittee discussion on the

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1 remaining action items. I think there's probably a
2 few that haven't been discussed here over the last
3 couple of years. That, I believe, is going to be
4 occurring in the next few months.

5 MEMBER POWERS: We have one on risk
6 analyses that our risk committee needs to look at and
7 I think in a fair amount of depth because it's a
8 fairly important one, but it's different than the
9 metallurgical perspective, so I thought that was -- a
10 lot of these things have been -- I mean in some cases
11 action items really never disappear. They get
12 dispositioned into different research activities or
13 maintenance activities because of data collection
14 things, pursuant to some of the criteria that Emmett's
15 going through here.

16 Some of them actually get resolved and
17 actually quite a few of them have been resolved. Now,
18 for instance, there was an issue on whether when
19 you're blowing things through the hole, you can carry
20 along particulate. You get an erosion of the adjacent
21 tubes and you get progression that way and they
22 actually did some fairly bounding experiments to show
23 that this didn't really occur.

24 The steam generator tube is part of the
25 pressure boundary, so you need to look at it very

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1 carefully.

2 MEMBER BANERJEE: I think that the concern
3 looking at this was with a main steam line break
4 whether there was incipient failures in the tubes due
5 to shock waves and rattling around and vibration.
6 Failures. If that's been resolved, then I think my
7 main issue to this is that.

8 MEMBER POWERS: Yes, we spent quite a
9 while looking at a blown down, talking to people about
10 blown down that occurred at Turkey Point and the
11 associated shock and vibrations that occurred in that
12 and understanding how that played, it figured
13 prominently in our recommendations to the staff. They
14 set up a little experimental facility and indeed they
15 found that they could use I think it was RELAP to set
16 the boundary conditions, but they subsequently have to
17 do a specialized analysis in order to handle the shock
18 waves.

19 MR. MURPHY: Okay. This next vu-graph
20 gets to Mr. Bley's question, the performance criteria
21 for accident induced leakage. Accident induced
22 leakage shall not exceed values assumed in the
23 licensing basis accident analyses nor to ensure
24 acceptable dose consequences.

25 We also have a second criteria, namely

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1 accident leakage shall not exceed 1 GPM.

2 This is to ensure -- it is not uncommon
3 for people to submit license applications where
4 they've revised the input assumptions on their
5 accident analyses. They might assume a different leak
6 rate, for example, in evaluating their dose
7 consequences. And this generally would not come to
8 the attention of my branch or my division. This would
9 be just in the domain of the dose assessment people,
10 NRR.

11 But it occurred to us that if somebody was
12 going to revise our accident analyses to permit 50 GPM
13 or 100 GPM leakage on grounds that the dose associated
14 with such leakage was acceptable, that we might be
15 introducing a risk concern that would need to be
16 evaluated. So we have the second criteria here that
17 even if you have, even if you can show that a higher
18 number meets the appropriate dose criteria, you can't
19 assume more -- you can't allow more than one gallon
20 per minute leakage to ensure that you don't get into a
21 risk issue.

22 Or to put it another way, if somebody
23 wants to allow more than one gallon per day leakage,
24 we would certainly want to address the risk issue.
25 The thing about the one gallon per day of course is

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1 that plants have always operated, they've been
2 analyzing -- that was pretty much the limit on the
3 amount of leakage that was included in the licensing
4 basis, so it's only when we're allowing leakage more
5 than one GPM that one is worried about incremental
6 risk.

7 MEMBER BLEY: I am a little confused about
8 the language on this slide. How do you calculate a
9 model accident induced leakage and have any idea that
10 you're limiting it to one gallon.

11 MR. MURPHY: I was going to get into that
12 in two slides from now.

13 MEMBER BLEY: I'll wait. When you were
14 talking it sounded like allowable continuing leakage
15 like an operational limit, but you say --

16 MR. MURPHY: This is accident induced
17 leakage. This is how much you --

18 MEMBER BLEY: I'll wait for the slide,
19 thanks.

20 MR. MURPHY: -- steam line break.

21 MEMBER STETKAR: Just so I make sure I
22 understand. This -- that one GPM leak rate is the
23 maximum leak rate that you would --

24 MEMBER SIEBER: All sources.

25 MEMBER STETKAR: That you would expect

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1 given an induced tube rupture following some sort of
2 accident?

3 MR. MURPHY: It is the maximum leak rate
4 that you can tolerate or that's allowable. How we --

5 MEMBER STETKAR: How you determine that --

6 MR. MURPHY: I'll talk about it --

7 MEMBER SIEBER: During normal operation.
8 It could be a valve patch.

9 MR. MURPHY: Operational leakage is the
10 third criterion. No operational leakage is an
11 indicator. It's not a direct indicator, but it is an
12 indicator of tube integrity and clearly if you get
13 leakage above the allowable limit, then your previous
14 assessments of tube integrity and your projections on
15 how well you were going to maintain it over time are
16 potentially -- you need to revisit that issue. So
17 operational leakage is an indicator you need to keep
18 an eye on.

19 The performance criterion is consistent
20 with the LCO limited in the tech specs which today is
21 150 gallons per day.

22 Okay, condition monitoring. The SG
23 program requires that the as-found condition of tubing
24 shall be evaluated during each outage. During each
25 outage, tubes are inspected, repaired, or plugged to

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1 confirm that the performance criteria are met.

2 MEMBER POWERS: You want to change your
3 slide.

4 MR. MURPHY: Thank you. Now this is
5 usually done on the basis of the eddy current test
6 results. As part of the eddy current test, when you
7 find an indication, you try to characterize the
8 indication in terms of its length, its depth, that
9 kind of thing. Once you've characterized the flaw in
10 this manner, then you can apply various burst
11 equations to assess whether or not you need the
12 structural criteria. You can apply leakage
13 correlations that have been developed, as a function
14 of cracked length, for example, to assess how much
15 such cracks might leak, were they to be challenged by
16 a steam line break or feed line break or what have
17 you.

18 So usually this is done on the basis of
19 eddy current results. However, sometimes if you find
20 larger cracks, because of the uncertainties and
21 knowing what the depth is or what the length is, you
22 may resort then to an in situ pressure test where you
23 directly pressurize the tube to demonstrate one, main
24 steam line break pressure differentials, you're not
25 exceeding the accident induced leakage criterion. And

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1 then you would pressurize it up to either 1.4 times
2 steam line break pressure, differential pressure, or
3 three times normal operating pressure, whatever one is
4 higher to demonstrate to meet the structural criteria.

5 If the tube is leaking above the main
6 steam line break pressure, they'll stick a bladder in
7 to allow them to complete that test. So we refer to
8 that as in situ pressure testing.

9 Also, tube pulls is another way one can
10 acquire information on the flaws relative to the
11 performance criteria. That's not done very often, in
12 recent years. It's done more often when there's some
13 question about the nature of the indications. The
14 question may be whether these are real flaws or
15 artifacts.

16 Okay, tube inspections. We have two
17 levels of requirements here. One is performance based
18 as explained on this next slide. Namely, the
19 inspection scope, methods, and frequency shall be such
20 as to ensure that SG tube integrity is maintained
21 until the next scheduled inspection. So you're
22 looking at what kind of crack growth rate you're
23 experiencing, that kind of thing, to assess how
24 confident you are about your ability to detect flaws
25 at an early stage. You look at issues such as those

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1 and making the determination as to how long you can
2 operate between inspections.

3 The inspection scope and methods shall be
4 performed with the objective of detecting flaws of any
5 type that may exist and that may exceed the applicable
6 repair criteria. Degradation assessment is done
7 before the inspection to provide the basis for
8 determining needed inspection methods. The
9 degradation assessment basically is identifying
10 potential mechanisms you may be dealing with in the
11 upcoming cycle. That's just based on what's known to
12 be going on at that plant, but at similar units around
13 the country, they should be considering everybody's
14 experience in making these kinds of determinations.

15 Back when we began exploring this
16 performance based approach with the industry, it
17 became clear that a number of people in the industry
18 were thinking that they could justify over 20 years
19 between inspections for some of these replacement
20 units with the 690 tubing.

21 We felt from the standpoint of ensuring
22 the timely detection of problems should they occur,
23 that we needed to backstop the performance based
24 requirement with a few minimal prescriptive
25 requirements just to ensure that things didn't get

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1 stretched too far. So we have a one cycle limit
2 between inspections for tubes with the old 600
3 millannele tubing, a two-cycle limitation for the 600
4 thermally-treated tubing. And a three-cycle
5 limitation for 690 thermally-treated tubing.

6 In addition, they have to -- they can
7 implement -- they can operate for that long between --
8 the specs have provided. They also show that they're
9 going to meet the performance criteria.

10 MEMBER ARMIJO: Emmett, do all of these
11 materials, for all of these materials do you inspect
12 the same percentage of the tubes in the steam
13 generator?

14 MR. MURPHY: We don't have specific
15 requirements -- we have a performance-based
16 requirement. There's a logic that says based upon the
17 number of tubes you're looking at, what method you're
18 employing and so forth, and with the cracked growth
19 rates that you're experiencing that you're going to be
20 meeting the performance criteria at the end of the
21 next cycle. So this is called a tube integrity
22 assessment.

23 MEMBER ARMIJO: Okay.

24 MR. MURPHY: And the tube integrity
25 assessment considers not just what you're finding

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1 during the inspections, but how many tubes you didn't
2 look at. You have -- if you have something going on
3 in the tubes that you've inspected, then you have to
4 make some sort of assumption about what's going on in
5 the tubes you haven't inspected.

6 MEMBER SIEBER: The sample size starts at
7 3 percent and expands depending on --

8 MR. MURPHY: Depending on the condition of
9 --

10 MEMBER ARMIJO: Those are the old rules.

11 MR. MURPHY: Those were the old rules.

12 MR. MURPHY: Now we don't have specific
13 sampling requirements.

14 MEMBER SIEBER: The principles are still
15 there.

16 MEMBER ARMIJO: I would think so.

17 MR. MURPHY: And finally, on the subject
18 of inspections, even a 690 plant, if cracking were to
19 be found, you must expect that the next refueling
20 outage inspection.

21 MEMBER SIEBER: The interesting thing is
22 the crafting is only 12 mechanisms, a welding rod stub
23 laying on a tube sheet is another mechanism which is
24 accounted for maybe 3 tube ruptures. So -- but that's
25 the principle concern is cracking at the drilled hole

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1 tube support plates.

2 MR. MURPHY: Okay. The final topic, I'll
3 cover is about these new tech specs here. The SG tube
4 repair criteria, we've maintained from the old tech
5 specs the traditional 40 percent of the nominal tube
6 wall criterion beyond which tubes must be plugged or
7 repaired. But we also, the tech specs may also
8 contain alternate repair criteria such as the voltage-
9 based that were the subject of the original DPO.

10 Okay, I'd like to talk a little bit about
11 the effectiveness of the approach compared to many
12 years ago. One must understand these new tech specs
13 went into place between 2005 and 2007, depending upon
14 the plant.

15 However, the approach has actually been
16 implemented at all PWR facilities since roughly 1980
17 as part of the industry's NEI 97-06 initiative. And
18 even then the adoption of the performance-based
19 approach was more evolutionary than it was a step
20 function change. Because ever since the late 1970s,
21 there's been a gradual evolution among utilities
22 toward being more and more focused on the bottom line,
23 tube integrity, and so the change in management
24 practice has been evolutionary rather than abrupt.

25 Operating experience indicates an

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1 improving trend in tube integrity performance. Two
2 indicators of that are leakage frequency and SGTR
3 frequency. This is a plot of forced outage frequency
4 due to SG leakage. And first, I'd like to correct a
5 mistake I just discovered last night. The vertical
6 axis is mislabeled as SGTR frequency. It's actually -
7 - should be labeled forced outage frequency per
8 reactor-year.

9 The red bars on this plot represent all
10 steam generators with Alloy-600 or 690 tubing. The
11 only one that's not included here, Yankee Rowe which
12 is stainless steel. The blue represents only those
13 plants with the old 600 millannele tubing. There are
14 roughly, five or take, about ten of those left, ten
15 plants still operating with steam generators with that
16 type of tubing.

17 What's interesting here is, I think, is
18 that we have an improving trend here, not just among
19 the entire population of PWRs that perhaps is being
20 driven by replacement, but it's also true if we just
21 limit the statistics to the plants with the millannele
22 600 tubing.

23 MEMBER ARMIJO: Is that because the water
24 chemistry --

25 MR. MURPHY: I'm going to get back to

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1 there. We see the same trend -- we looked at SGTR
2 frequency. We've had eight steam generator tube
3 ruptures in this country since 1975. We can see that
4 whether we're talking about the whole population of
5 PWRs or we're just -- if we just limit consideration
6 to PWRs that have millannele 600 tubing, there's a
7 declining trend.

8 MEMBER BLEY: I'm just curious. If I look
9 at these two charts together, it looks like -- I'm
10 kind of surprised that the forced outage rate is
11 higher than the steam generator tube rupture rate for
12 the same thing. So we're getting some forced outages
13 because I guess there's leakage rather than a rupture
14 and they've decided to shut down. Is that right?

15 MR. MURPHY: That's correct. They get
16 leakage and they decide to shut down.

17 MEMBER BLEY: So that is both rupture and
18 --

19 MR. MURPHY: Ruptures would be included in
20 these leakage statistics, yes.

21 MEMBER BLEY: Okay, and the second one is
22 strictly ruptures?

23 MR. MURPHY: Strictly ruptures.

24 MEMBER BLEY: And you define that as --

25 MR. MURPHY: It's normally defined as

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1 primary to secondary leakage in excess of the normal
2 makeup capacity.

3 MEMBER ARMIJO: But on the millannele, if
4 you accounted for the reduced population year by year,
5 that curve wouldn't be --

6 MR. MURPHY: Yes, that does account for
7 the reduced population. It's per reactor year of that
8 type of plant.

9 Backing up to page 21, so we have this
10 improving trend in tube integrity performance in terms
11 of the indicators of tube integrity performance. And
12 this reflects a number of things. It reflects
13 improved water chemistry practices which were quite
14 dramatic in the late 1970s and into the early '80s.
15 Since that time a big driver of the improved
16 performance clearly has been the improved design of
17 materials that went into the replacement steam
18 generators.

19 Finally, and undeniably, as indicated by
20 the statistics on the millannele 600 plants, improved
21 tube integrity management has played a very important
22 role and there are two components to that. We've had
23 the substantially improved inspection technology and
24 practice through the years. Improved technology, of
25 course, relating to the eddy current probes and the

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1 data analysis capability. And then the practice that
2 is exemplified by industry guidelines that began to
3 come out in the very early '80s.

4 But secondly, a second element of the
5 improved tube integrity management clearly is related
6 to the improved focus on maintaining tube integrity,
7 the adoption of condition monitoring practices,
8 evaluating the condition of the tubes, not just
9 against a plugging limit, whether or not you need to
10 plug the tube, but evaluating the condition of tube
11 relative to the safety margins you're trying to
12 maintain.

13 MEMBER BLEY: Which number of plants have
14 changed out steam generators?

15 MR. MURPHY: The population of PWRs is 69
16 plants. I think we have roughly ten plants with the
17 millannele 600, so the rest will have replaced.

18 MEMBER SIEBER: They are based on 1980s
19 plants.

20 MR. MURPHY: So the operating experience
21 trends for the Alloy-600 millannele underscore the
22 contribution of improved tube integrity management to
23 improved tube integrity performance.

24 Up until 2000, we don't have a systematic
25 way, there's been no systematic effort to really

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1 figure out each and every time we may have failed to
2 meet the performance criteria. It's only since 2000
3 that we really have a good record.

4 Since 2000, there have only been three
5 known instances where one tube was found not to meet
6 the structural and accident induced performance
7 criteria. This example is Indian Point in 2000, had a
8 steam generator tube rupture. There have been a
9 couple of other circumstances, not ruptures, but
10 circumstances where after the eddy current inspection
11 it was realized that the performance criteria were not
12 met.

13 MEMBER BLEY: Was that the last tube
14 rupture we've actually had?

15 MR. MURPHY: Indian Point in February 2000
16 was the last tube rupture.

17 MEMBER BLEY: Okay, so what we see on that
18 other chart then are projections rather than after
19 2000.

20 MR. MURPHY: Well, no, because the way
21 that chart was calculated was up to a given year you
22 just take the total cumulative reactor years and
23 divide that -- I'm sorry, you take the number of tube
24 ruptures and divide it by the number of accumulated
25 reactor years up to that point.

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1 MEMBER BLEY: Okay.

2 MR. MURPHY: And these curves were
3 regression curves. If you were to do this exactly it
4 would be kind of a scallop-y curve that would go
5 through a bit of a step function change every time you
6 had a tube rupture.

7 MEMBER BLEY: Well, this one is going to
8 do something a little funny the next time.

9 (Laughter.)

10 MR. MURPHY: The next tube rupture will
11 not significantly change the appearance of these
12 curves.

13 MEMBER ARMIJO: Well, it was on an Alloy
14 690 tube, it would have an impact, wouldn't it?

15 MR. MURPHY: Not on these curves.

16 MEMBER ARMIJO: Others, in fact.

17 MR. MURPHY: Okay, so we have three known
18 instances where one tube was found not to meet the
19 structural and accident-induced performance criteria.

20 Now of course there may be unknown situations. At
21 Indian Point, for example, the tube that ruptured, the
22 reason it ruptured was that flaw had existed in prior
23 inspections. It was not detected. And even at the
24 prior inspections, we realized was hindsight, it
25 wasn't meeting the performance criterion even then.

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1 The other two known circumstances also
2 involved missed indications at a prior inspection. So
3 it's hard to know in real time -- there's always the
4 possibility that you may miss a flaw that turns out to
5 be significant. So it's difficult to say in real time
6 how well you're doing.

7 However, these problems never take care of
8 themselves. They always get worse. And if you're not
9 finding the significant flaws, then eventually the
10 problem is going to bite you. So looking back gives
11 us the best sense for how well we're doing in
12 maintaining tube integrity.

13 Anyway, the main point to be made here, I
14 think is that the conditional probability of rupture
15 or of induced leakage in excess of leak rates assumed
16 in a licensing basis safety analysis appears to be
17 small, relative to values assumed in NRC risk studies
18 as NUREG-00844 or -1570. In some of these historical
19 risk studies conditional tube rupture probabilities in
20 the order of .05 were utilized and this experience
21 would suggest that were orders of magnitude less than
22 that.

23 Okay, we also and as we prepared to close
24 out the GSI, we took a look at all the work that was
25 being done in the SG Action Plan to make sure that any

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1 issues that might have potential relevance to the
2 adequacy of the requirements that we have in place to
3 address tube integrity, see if there was anything
4 there that we needed to pay attention to.

5 The technical report that we prepared to
6 support GSI closure has a detailed discussion of all
7 those tasks that relate to the GSI. Ones we looked at
8 in particular included those issues relating to the
9 damaged progression issues, some of the jet
10 impingement studies that were done, the dynamic
11 effects that were evaluated.

12 There were a number of issues pertaining
13 to voltage-based alternate repair criteria, growth
14 rates, adequacy of some leakage correlations, that
15 kind of thing, eddy current probability detection.
16 Iodine spiking issues, that was relevant because our
17 accident-induced leakage limits in the performance
18 criteria is a function, in part of the appropriate
19 iodine spiking assumption.

20 And based on the results of these tests,
21 no changes -- we concluded there were no changes to
22 existing requirements were needed to ensure tube
23 integrity under design-basis conditions. We believe
24 the results of these SGAP items support close out of
25 GSI 163.

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1 So in conclusion, operating experience
2 shows that effective management of SG tube integrity
3 can be achieved through a performance-based strategy
4 focused on satisfying tube integrity performance
5 criteria. The new tech specs relating to SG tube
6 integrity provide reasonable assurance that all tubes
7 will exhibit acceptable structural margins against
8 bursts or ruptures during normal operating and
9 accident conditions and that leakage from one or
10 multiple tubes under DBAs will be limited to very
11 small amounts, consistent with the applicable
12 regulations for off-site control room dose.

13 So NRR concludes that GSI 163 is closed
14 and we request our endorsement.

15 MEMBER ARMIJO: I had a question on the
16 eddy current inspection methods. From the time of the
17 ad hoc subcommittee review, have these inspection
18 techniques improved? Are they capable of inspecting
19 the same reliability out of --

20 MR. MURPHY: They're always improving.

21 MEMBER ARMIJO: Small diameter and larger
22 diameter, it seemed like there was some differences in
23 detection capability, you know the diameter of the
24 tubes. Has it reached a stable point where the NRC is
25 satisfied that these techniques are reliable?

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1 MR. MURPHY: A couple points we made here.
2 The evolution, the technology is constantly evolving.
3 It's like IT, it's just -- it's constantly improving.

4 In terms of how you want to define
5 reliability, I guess I prefer to define reliability in
6 terms of how effectively we're maintaining tube
7 integrity. Do the tools available -- do the available
8 tools allow us or allow the industry to effectively
9 maintain tube integrity to the extent that those tools
10 allow that objective to be met, then I would argue
11 that they are reliable.

12 There are significant limitations of the
13 technology, even today, in terms of the ability to
14 characterize the depth of stress corrosion cracks, for
15 example. So methodologies for evaluating these cracks
16 relative to the performance criteria tend to be rather
17 robust.

18 You rely very heavily on what the crack
19 length measurement is as an indicator of the strength
20 of the tube. There are voltage correlations that
21 people rely on as well, in addition. So you don't put
22 all your eggs into your ability to accurately measure
23 depth. So yes, there continue to be shortcomings in
24 the technology and it's really to detect and excise
25 flaws, but in terms, as I tried -- the point I tried

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1 to make earlier is the techniques do appear to allow
2 us to reliably meet our goals, ensure tube integrity.

3 MEMBER SIEBER: Actually, the voltage
4 criteria came about because they wanted to be able to
5 do the inspection fast. You can fly through a tube
6 with a reasonable fill factor and look for the voltage
7 spike and then go back, characterize what that spike
8 really is and one volt was -- for the smaller tubes
9 and the two volts for the larger tubes was sufficient
10 to be able to flag out all those points where
11 additional inspection were necessary. And that turned
12 out to be pretty effective.

13 And so a way to look at is to gain speed
14 in the inspection and maintain accuracy that the
15 technology actually went down, in my opinion, a little
16 bit, supplemented by a more thorough examination. Of
17 course, the mixed signal probes that they now use and
18 better fill factors due to the geometry and all that
19 have resulted in a sort of an improvement over the
20 years of ET testing and the accuracy of it and I think
21 the big factors have been the changes in chemistry and
22 replacement of steam generators, getting rid of
23 crevices, better tubes, all that kind of stuff.

24 MEMBER ARMIJO: On that issue of the
25 materials, are there any Alloy 690 tubes that have

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1 been reported to you that have cracks?

2 MR. MURPHY: No cracks to date.

3 MEMBER ARMIJO: And that's thousands and
4 thousands and thousands of tubes and locations. So
5 that's pretty convincing. Stuff cracks.

6 (Laughter.)

7 MEMBER POWERS: No, they still haven't
8 done it.

9 MR. MURPHY: Past performance is no
10 insurance --

11 MEMBER STETKAR: Can I ask one last
12 follow-up? I think I understand. I've read a little
13 bit, but I'm by no means at all familiar with
14 materials or cracks or anything like that, but as I
15 understand it, the new performance criteria in the
16 tech specs, back to this one GPM leakage, rely on an
17 empirical correlation between measured crack size and
18 leakage as you explained it, but it's my simple-minded
19 understanding.

20 What -- I understand that our ability to
21 detect cracks is improving. What can you tell me
22 about the data that are available to support that
23 empirical correlation? Do we have -- some of the
24 things that I've looked at show quite a bit of scatter
25 in that data. Quite a bit of uncertainty to -- in

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1 that correlation to be able to give me confidence that
2 I indeed have .9 GPM leakage versus .06.

3 MR. MURPHY: You may be referring to some
4 of those voltage-based correlations. When you look at
5 correlations that are based upon the length of
6 through-wall crack, that kind of thing, you tend to
7 not have so much scatter.

8 Both the industry, Argonne has developed a
9 fair amount of data and developed models.

10 MEMBER STETKAR: I can't ask them though.

11 MR. MURPHY: The industry is well, there's
12 a lot of data, a lot of data from pulled tubes.

13 MEMBER STETKAR: When you say a lot, are
14 you talking about hundreds of data points?

15 MR. MURPHY: Yes.

16 MEMBER STETKAR: Or thousands or tens?

17 MR. MURPHY: Hundreds, I would say.

18 MEMBER POWERS: I mean, it's still fair to
19 say and I think it's the 7/8 inch tube leakage
20 correlations, there is still scatter as you well might
21 think leakage would be because of ligaments across the
22 crack and things like that.

23 But it's unusually scattered relative to
24 the ability in particular. And everybody throws up
25 their hands and Argonne has done things to try to

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1 refine our understanding there, but I mean especially
2 with respect to leakage, your example.

3 MEMBER STETKAR: It's performance-based
4 criterion in the tech spec, especially the basis for
5 closing out the GSI when you come down to it is --

6 MEMBER POWERS: The basis is a cadre --
7 the leakage criterion and the projection is
8 projection. The monitoring during normal operation is
9 a real thing.

10 MEMBER STETKAR: That's true, but the
11 projection is based on accident-induced leakage which
12 is secondary or tertiary. It is a projection.

13 MEMBER POWERS: No question about it. But
14 it's also very conservative.

15 MEMBER STETKAR: I just want to get our
16 hands on our feeling of comfort and that conservatism.

17 Thank you.

18 MEMBER SIEBER: This is --

19 MEMBER POWERS: Any other questions for
20 the speaker?

21 Are there any comments on the overall
22 issue?

23 Emmett, thank you. Thank you all. I'll
24 turn it back to our chairman.

25 CHAIR BONACA: Thank you, Mr. Powers. We

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1 will take a break now for lunch and I guess we'll come
2 back at 1:15 p.m.

3 (Whereupon, at 12:04 p.m., the meeting was
4 recessed, to reconvene at 1:15 p.m.)

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1 A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

2 1:16 p.m.

3 CHAIR BONACA: All right, let's go back
4 into session. The next item on the agenda is
5 Regulatory Guide 1.2.14, Response Procedures for
6 Potential or Actual Aircraft Attacks and Mr. Maynard
7 will take us through the presentation.

8 MEMBER MAYNARD: Thank you, Mr. Chairman.
9 This is on Reg Guide 1.214, Response Procedures for
10 Potential or Actual Aircraft Accidents (sic). This
11 portion of the meeting is open/closed. We'll start
12 out at open session and discuss as much as we can, but
13 if we get into questions or answers that need to get
14 into the safeguards information, then we will close
15 the meeting and we should not be hesitant to do that
16 because it's important that we get to the answers to
17 the questions that we need.

18 But anyway, we'll start out in open
19 session, but I would ask the staff to help and if our
20 questions or the answers need to get into that, then
21 we will go into closed session and have people leave
22 who do not have the appropriate clearance for that
23 discussion. This Reg Guide provides an acceptable
24 method to the staff for implementation of 50.54(HH)(1)
25 which again, addresses the preparations for a once

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1 notified or become knowledgeable of a potential or
2 actual aircraft threat.

3 The Reg Guide only deals with the
4 preparations. It does not address the actual
5 mitigation activities after an attack were to occur.
6 So this is just in preparation for a potential
7 aircraft attack. It should also be noted that this
8 Reg Guide will apply to both the current and future
9 licensees whether it's under Part 50 or 52. So it
10 will be applicable to all the plants.

11 We discussed this Reg Guide yesterday in
12 detail. I think we had a really good discussion and I
13 don't believe there's any overall fundamental
14 disagreements on the intent of what the Reg Guide was
15 doing. I'd say that the biggest issues that we have
16 was with some of the wording and I think probably the
17 specific area that gave us the most concern was in the
18 area of whether the list in the appendix is treated as
19 a requirement or just as an example or template and I
20 think we'll probably want to air some of that out
21 again, today. I think it's more in that aspect of it.

22 If that list becomes a requirement, then I think we
23 would have a much -- we'd have a lot more comments
24 about the specific items then.

25 So with that, what I would like to do turn

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1 it over to the staff, let them get in the presentation
2 and I guess, Doug, I'll turn it over to you.

3 MR. HUYCK: Yes. Good afternoon, Mr.
4 Chairman and fellow committee members. I'm Doug
5 Huyck. I'm the Branch Chief for Reactor Security
6 Rulemaking and Licensing Branch within the Division of
7 Security Policy at NSIR and one of our
8 responsibilities, of course, is power reactor
9 rulemaking and associated guidance development, which
10 this guide here is part of that.

11 I do acknowledge and recognize the
12 successful meeting that we had yesterday with the
13 Subcommittee. I appreciate the feedback comments that
14 you provided to us yesterday. Through the course of
15 our presentation today, as we go through some slides
16 and some further discussion, it's our intent based on
17 the feedback questions we were asked yesterday, we
18 hope to address you know, those that were provided to
19 us yesterday. So again, thank you very much.

20 We do recognize this is a public meeting,
21 an open meeting. Myself and fellow staff members, we
22 will be sensitive to the information that we provide
23 or what's being discussed and if at that point, we get
24 into a sensitive safeguards nature, definitely let
25 everybody know, stop the meeting and proceed as far as

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1 conducting a closed meeting. So at this --

2 MEMBER MAYNARD: And excuse me for -- I
3 would like to point out one other thing and it's the
4 ACRS' role in this, we're to review the technical
5 aspects, items dealing with potential plant safety or
6 operational thing and we're really not to concern
7 ourselves with some of the actual security matters and
8 this is consistent with a Commission SRM that -- let
9 me just -- "The ACRS should not involve itself in
10 issues associated with threat assessment, physical
11 security or force-on-force". That what we should
12 concern ourselves with is the technical aspects. And
13 Mario, I think, you can maybe help with that, too.
14 You have a little more history in this.

15 Our role is a little limited, but anything
16 to do with plant safety and the interface on the
17 operations is certainly within our scope.

18 MR. HUYCK: Okay, and one final thing as
19 far as our presentation today, again, is to present to
20 you the proposed Reg Guide that we're developing that
21 we're presenting that would be acceptable as far as
22 implementation of 10 CFR 50.54(hh)(1). Ultimately,
23 our goal on this meeting is to articulate and answer
24 your questions and ultimately, I would characterize as
25 receiving your endorsement. So at this time, we'll go

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1 through some further introductions before we proceed
2 on with the presentation.

3 MR. MORRIS: I'm Scott Morris, Deputy
4 Director for Reactor Security at NSIR.

5 MR. GOTTF: I'm Bill Gott. I'm the Branch
6 Chief for the Operations Branch which is our
7 headquarters operations officers.

8 MR. CUBELLIS: I'm Lou Cubellis. I'm a
9 Team Leader in Division Security Policy under Scott
10 and I'm the one that's the technical representative
11 here for this Reg Guide.

12 MEMBER APOSTOLAKIS: Otto, are we writing
13 a letter of this meeting?

14 MEMBER MAYNARD: Yes, yes, we are
15 requesting a letter on this.

16 MR. MORRIS: If I could just maybe
17 interject briefly, when the Commission approved the
18 power reactor security rulemaking, back in December of
19 last year, the SRM associated with that approval of
20 the rule, indicated that it would be appropriate for
21 the ACRS to review the reg guides that are associated
22 with the rule to the extent they fall within the ACRS
23 purview and this was identified specifically as being
24 one of those reg guides.

25 MR. HUYCK: Thank you. Next slide,

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1 please. As far as my introduction, I think it's
2 definitely appropriate in providing a little bit of
3 background as far as what's transpired to get us to
4 this point as far as the actual -- the Reg Guide.
5 Following the events of September 11th, it was
6 recognized by the Agency, concurred on by the
7 Commission that a change to the threat environment
8 based on the events of 9/11. With that change, the
9 need, the necessity to re-evaluate adequate protection
10 requirements, adequate protection requirements
11 associated to the power reactors and power reactor
12 security, being the subject matter here today.

13 With that re-evaluation, security orders
14 were issued, what we call post-9/11 security orders
15 and one of those security orders was the ICM Order,
16 the Interim Compensatory Measures Order. Within that
17 order was a B.5 section, B.5 alpha, B.5 bravo,
18 associated to mitigating measures, loss of large area.

19 And really this guide, well, this rule and
20 in particular this guide that we're presenting today,
21 addresses the B.5 alpha portion of the order which is
22 -- will be as published, 10 CFR 50.54(hh)(1) is really
23 what we're talking here today. We -- the NRC
24 published a power reactor security rulemaking March
25 27th, 2009. That is published effective date May 26th

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1 of this month, I think it is with a compliance date no
2 later than for the operating power reactors, March 31,
3 2010. And, again, as I just mentioned, even though
4 it's not a Part 73 Rule, it was decided earlier on
5 that the B.5.a and B.5 bravo, B.5.a being the subject
6 matter today, to list that in Section 50.54 of the CFR
7 and it currently resides in 50.54(hh)(1). Next slide,
8 please.

9 MEMBER APOSTOLAKIS: So everything we're
10 discussing today has been declared as addressing
11 adequate protection.

12 MR. HUYCK: Yes, yes.

13 MEMBER APOSTOLAKIS: Adequate protection
14 is what the Commission says it is.

15 MR. HUYCK: Yes, that's my understanding,
16 yes.

17 MR. MORRIS: The other key point on this
18 slide, I think is that as part of the domestic threat
19 recognized after 9/11 you know, there was a lot of
20 consideration about aircraft, the aircraft threats, et
21 cetera and just, we wanted to make it clear here that
22 the aircraft attack is outside or beyond the design
23 basis threat but the Commission, nonetheless,
24 determined that mitigation measures to deal with loss
25 of large areas of the plant due to fire explosions,

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1 which you know, often is used as a euphemism for an
2 aircraft attack, is required and so this -- those
3 mitigation measures are basically what you'll find in
4 B.5.b and what's now (hh)(2) of the rule.

5 So this rule and this Reg Guide today is
6 focused on what we call pre-event notification, you
7 know, once the licensee learns that there's a
8 potential they're going to be hit, what do they do to
9 get ready? And it's a very short window, potentially.

10 MEMBER APOSTOLAKIS: That, it seems to me,
11 falls into that class of events that are beyond design
12 basis but we're asking you to do something.

13 MEMBER MAYNARD: I don't think this falls
14 into adequate protection because it is a beyond design
15 basis. The rule requires certain actions to be taken
16 to enhance your ability to deal with and to mitigate
17 and stuff, but I don't think it in any way implies
18 that you have to be able to meet all of the current
19 requirements for a design basis accident.

20 MEMBER APOSTOLAKIS: Right, so it is
21 similar to the SBO rule?

22 MR. MORRIS: In a sense. I mean --

23 MEMBER APOSTOLAKIS: There we don't tell
24 them, "Do A, B, C". We just tell us, "Have I thought
25 about it? Do you have means of handling it?" This is

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1 the same kind of rule, is it not?

2 MEMBER MAYNARD: Again, keep in mind,
3 we're not really reviewing the rule here today.

4 MEMBER APOSTOLAKIS: I understand.

5 MEMBER MAYNARD: This is the Reg Guide.

6 MEMBER APOSTOLAKIS: We have to place it
7 in the right context, I mean, it's --

8 MR. MORRIS: It was originally -- when we
9 proposed the rule, it was in Part 73 which 73.55 which
10 was, you know, things that were within design basis.
11 That was obviously -- that was a mistake, so that's
12 why it got pulled out of the things that are required
13 for adequate protection in Part 73, and put in 50.54
14 which is conditions of operating licenses. So it's
15 just, yeah, we realize it's not design basis but
16 you've got do this stuff anyway.

17 MR. HUYCK: Next slide, please. The
18 intent of the rule definitely -- number one, the
19 intent of the rule is to insure -- have licensees take
20 appropriate actions to the facilities basically to
21 mitigate or place the facility in the best condition
22 possible to mitigate a consequence of a possible
23 aircraft attack. And as we just mentioned, you know,
24 this isn't the Part 73 security rule. Basically, a
25 decision was made earlier on to not include it in the

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1 Part 73 rule but to place it in the 50.54 which is the
2 condition of license section of the regulation. I
3 think it's very important that we emphasize that and
4 point that out.

5 The rule and the proposed Reg Guide here
6 today definitely emphasis on the pre-event
7 notification period. What we're expecting the
8 licensee to do once they're notified of a potential or
9 an actual aircraft attack threat. The regulatory
10 guidance that we developed going into the development
11 of the Regulatory Guidance really from a staff
12 standpoint consistent with the SRM that we received
13 from the Commission, really the staff in developing
14 the regulatory guidance really goals of providing
15 acceptable methodologies, making those methodologies
16 available in the Reg Guide for establishing,
17 implementing, maintaining procedures as far as actions
18 and the measures that they would implement at the site
19 and to include the training aspect and a little bit
20 later on in our presentation, we'll talk a little bit
21 more about that.

22 Next slide, at this time, I'll turn the
23 presentation over to Lou Cubellis.

24 MEMBER MAYNARD: Hold on. Some of your
25 papers are over the microphone there.

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1 MR. CUBELLIS: Good afternoon, I'm Lou
2 Cubellis. Doug just eluded to one of the things
3 that's important in this Reg Guide and that is the
4 training aspect of these types of procedures. We want
5 to make sure that being responsive to some of the
6 discussion we had yesterday with the Subcommittee that
7 we clearly articulate that it's our intent for sites
8 to incorporate training for this particular event into
9 existing drill and exercise programs and other types
10 of training programs. For example, we anticipate
11 sites entering this scenario into the recurring
12 operations training cycle for simulator training and
13 for the emergency preparedness drill and exercise
14 program to include this type of hostile action-based
15 in what -- in that particular program that will become
16 regulatory in 2010, the hostile action-based drills.

17 We anticipate that the site will do those
18 types of things to incorporate the training for this
19 event into its existing structure. That being said,
20 this Reg Guide does provide methodologies for site
21 specific considerations to be able to plan, prepare
22 and actually respond following a potential or actual
23 aircraft threat notification, regardless of whether
24 that notification comes from the agency or from
25 another threat notification source, in this case we

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1 could use for instance, Federal Aviation
2 Administration or directly from the North American
3 Airspace Defense Command. Some of the things that
4 this Reg Guide specifically talks about is we will
5 have verification of these notifications. That's to
6 prevent licensees from taking action in response to a
7 hoax so that we don't destabilize electrical grids,
8 especially in areas that we have clusters of sites
9 within a geographical proximity.

10 MEMBER RAY: On that regard, your point
11 was made yesterday and was well-taken, but you do have
12 also individual sites, Palo Verde is an example. We
13 have three units and many other place, San Onofre,
14 Diablo Canyon and so on, where presumably action to
15 shut down all the units at the site would have a
16 similar grid disturbing impact like you're describing
17 here wanting to avoid. And so I think it's really
18 important that the guidance that's in the Reg Guide be
19 somehow qualified with regard to taking into
20 consideration the impact on the grid if tripping
21 multiple units at a single site.

22 A single unit, of course, is a regular
23 occurrence or not an infrequent occurrence but
24 simultaneous tripping of multiple units is not
25 something that grids are prepared to withstand without

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1 -- and loss of off-site power under these
2 circumstances, I don't think improves the situation.

3 MR. CUBELLIS: I think our focus here has
4 been to try to tailor the response to such an extent
5 that you do not start tripping or scramming the plants
6 until you get well within the event. It's -- well, I
7 can't really discuss the specifics here in this open
8 forum but --

9 MEMBER RAY: Well, I did reread the Reg
10 Guide and I will tell you that if I implemented it
11 just the way it's written, I think it would have the
12 effect that I'm saying I'm concerned about.

13 MR. CUBELLIS: Well, again, our focus here
14 is on making sure we protect public health and safety
15 so that if -- if it's an actual event, if it's an
16 actual threat to the site and the site does
17 essentially take all of its units off-line, it's a
18 multi-unit site, you will have a potential grid
19 destabilization. You are going to have some effects
20 from that. We were focused on the protection of
21 public health and safety from the safe shutdown of the
22 plant.

23 MEMBER RAY: Well, I'm focused on the
24 protection of public health and safety as well and I'm
25 just saying to you that dealing with this event with

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1 off-site power available, is in some ways better than
2 dealing with it with a loss of off-site power. And
3 that there ought to be some explicit way to take that
4 into account, even in the eminent condition stage.

5 MEMBER APOSTOLAKIS: The way I understand
6 it, you are focusing on protecting public health and
7 safety from radiation.

8 MR. CUBELLIS: Yes, and putting the --
9 yes.

10 MEMBER APOSTOLAKIS: I believe Mr. Ray is
11 broadening it.

12 MEMBER RAY: No, I really am saying,
13 George, that I believe that coping with the event is
14 going to be potentially easier with off-site power
15 available than with it not.

16 MEMBER APOSTOLAKIS: But then there may be
17 other consequences if you lose the grid.

18 MR. CUBELLIS: Yes, yes.

19 MEMBER APOSTOLAKIS: And you don't
20 consider that because it's not part of the Nuclear
21 Regulatory Commission? Why don't you consider the
22 whole impact on society?

23 MR. CUBELLIS: Well, I think we do. I
24 think what we're saying in the Reg Guide and in the
25 rule as well, that if you leave the reactors on line,

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1 all the way up until you have an impact at the site,
2 you're going to lose potentially your power source
3 anyway and you're going to potentially have
4 radiological conditions, a release, if you will, that
5 you may not have had, had you taken some of the
6 preparatory actions that we outlined in the Regulatory
7 Guide. I think that's what we're trying to say.

8 MEMBER RAY: Well, let's just take Palo
9 Verde for a second. I think the ability to cause a
10 loss of off-site power due to an aircraft impact is
11 very, very limit with those three units sitting there.
12 You are going to have a loss of off-site power if you
13 trip all three units. And I'm just saying that you're
14 better off after the event, which has impacted
15 presumably, one of these three plants, if you still
16 have off-site power available. That's my only point.

17 MEMBER APOSTOLAKIS: I thought they were
18 arguing that you would not.

19 MEMBER RAY: He said we were concerned
20 about aircraft paths over multiple sites having a good
21 impact. I'm telling you that that same problem can
22 arise with --

23 MR. MORRIS: I think we -- I certainly
24 understand your point. I'm struggling here for the
25 last two minutes, listening to this, trying to assess

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1 how you stack up the relative worth of not tripping it
2 and, you know, having all that heat still there with
3 power available and tripping the reactor and reducing
4 the amount of decay heat with potentially no power.

5 MEMBER RAY: It's subject to analysis is
6 all I'm saying. I don't want to try and do it here.

7 MEMBER SIEBER: And you aren't saving all
8 that much. You still have decay heat and the source
9 term is still there.

10 MEMBER RAY: Yeah.

11 MEMBER MAYNARD: I think that from what
12 we've talked about, I think that the thing we've got
13 to do which we can flesh out, it needs to be done,
14 almost on a case-by-case basis because a single unit
15 site out in the middle of nowhere is a totally
16 different situation than either a site that has three
17 units or even we have areas of the country where we
18 have multiple sites fairly close and it's very
19 difficult sometimes to say it's only that site that
20 it's going to.

21 MR. MORRIS: I think it's a great comment
22 actually and it's one that I don't think we've
23 necessarily considered before.

24 MEMBER RAY: I'm just saying it should be
25 analyzed.

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1 MR. MORRIS: Yeah.

2 MEMBER RAY: I'm not telling you I have
3 the answer but I can guarantee you you're going to
4 have a loss of off-site power if you trip three units
5 at Palo Verde for sure. And at that point, you're
6 going to then have to deal with that as a complicating
7 event, part of the problem.

8 MEMBER BROWN: But your point's even more
9 valid, I mean, from another standpoint. You're going
10 to have radiological consequences regardless of
11 whether the plant is shut down or not. I mean the
12 heat's there, the energy. You're not going to do it
13 till the last few minutes anyway, whatever that is,
14 so, I mean, I hate -- I'm going to phrase this in a
15 manner that sounds really funny but it's almost known.

16 I would have thought, why don't you just leave all
17 three plants up, okay, and then after -- I mean, that
18 makes the -- you'll take a hit but now you've got
19 power available. You're able to deal with a lot of
20 things to have everything shut down in a grid --

21 MR. MORRIS: I think what I'm hearing is
22 that it's site-by-site and the interest here is making
23 sure there is no one-size fits all answer and the
24 point that is being made is --

25 MEMBER RAY: There are single sites that -

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1 - the single site that I was --

2 MEMBER BROWN: The point that is being
3 made is just look at it and evaluate it.

4 MEMBER RAY: Right. The single site that
5 Otto is talking about because this crosses barriers
6 and so on, it's beyond design basis, tripping the unit
7 might well be the right thing to do, but just saying
8 the loss of off-site power in a good blackout impact
9 is --

10 MEMBER MAYNARD: There are some other
11 options besides tripping the plant. I mean, reducing
12 power, anything you can do to lower the power does
13 help somewhat in the overall -- but taking it
14 completely off-line, not generating anything, again,
15 in areas where it's multiple sites, I just think that
16 it needs to be something that is done on an evaluation
17 on a site-by-site basis and not -- I think my personal
18 goal in this would be to not have the regulatory guide
19 require it when it really needs to be evaluated on a
20 case-by-case, site-by-site basis.

21 MR. CUBELLIS: I think this can be
22 alleviated. I was going to save this comment until we
23 get down to mitigate consequences which is -- which
24 are all of the onsite operation type actions that are
25 described in Appendix A. And we are -- as a staff are

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1 going to actually insure that we clearly articulate
2 that this is guidance and that these are examples of
3 considerations and this is not a cut and paste or copy
4 and paste procedure that we expect all sites to apply
5 in the country. That is not the expectation. We are
6 going to make sure we've very clear on that in the Reg
7 Guide. That that appendix is, with the exception of
8 the entry conditions, because that is standardized
9 across the industry at this point. For the last four
10 years we've used those entry conditions, what I would
11 characterize as successfully.

12 The remaining operational type actions
13 listed in that appendix under all three phases, we
14 will make sure that we articulate that those are
15 considerations that will still need to be analyzed,
16 using the site specific philosophies that were
17 described here yesterday, all of the risk knowledge
18 management that the site possesses, those types of
19 things when they develop the -- when they develop
20 their own procedures.

21 MEMBER STETKAR: I wanted to add something
22 and I think it's a great comment, Harold, because I
23 think I know probably why the emphasis was placed on
24 shutting down the reactor early in the process. And
25 that is that ATWS events at Boiling Water Reactors are

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1 a lot more interesting than ATWS events Pressurized
2 Water Reactors and if you look at the current Reg
3 Guide, some of the discussions that we had yesterday,
4 it's boiling water reactor-centric. So this whole
5 issue of a avoid in ATWS, shut the reactor down
6 because then you -- what do you gain by shutting the
7 reactor down? You avoid an ATWS. That may have been
8 part of that thinking and it sort of reinforces --

9 MEMBER RAY: All I've said is do some
10 analysis, that's all I'm asking for.

11 CHAIR BONACA: Yeah, and we, as a
12 Committee, reviewed a number of the analysis that were
13 done determine mitigating actions and boilers were
14 more limiting timing, timing-wise.

15 MR. MORRIS: Correct.

16 MEMBER MAYNARD: And again --

17 MR. MORRIS: You can't say any more than
18 that.

19 MEMBER MAYNARD: We'll probably get more
20 into it later, but I think if we can keep it that this
21 is examples and, again, rely more on the site-by-site,
22 case-by-case basis as to what's best for that
23 particular design, that particular site, there are a
24 number of factors to be taken into account there.

25 MR. CUBELLIS: We're going to make sure we

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1 clearly articulate that in the Reg Guide. The
2 continuous communications portion of the Reg Guide
3 describes why the site needs to be in contact and
4 essentially that's so that they can actively receive
5 and respond to threat information as it becomes
6 available to them, whether to accelerate their
7 mitigative actions and the process of those actions or
8 to cease or decelerate the rate of taking those
9 actions, depending on the threat and what it dictates.

10 They will be required, until they enter
11 the certain period to actually maintain that
12 communication with the threat notification source. We
13 expect at that point, that source will be the NRC and
14 then there's a specific time frame that they're
15 required to re-establish communication if there's not
16 an impact at the site. If there is an impact,
17 obviously, that's as soon as practical. So those
18 components are within this Reg Guide.

19 The contacting personnel deals with onsite
20 and offsite personnel. It's so that they can take the
21 appropriate protective measures and actions to protect
22 onsite staff as well as give offsite response
23 organizations an opportunity as they see fit, and this
24 is on an individual organization basis, whether to
25 mobilize resources, perhaps, pre-stage, implement

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1 augmentation plans, things like hospitals. If the
2 site is fairly remote, you know, it may take 30
3 minutes for a certain mutual aid department to reach
4 that site. They may want to start their resources
5 moving in that direction.

6 They obviously, will want to coordinate
7 with the site prior to or during the development phase
8 of this Reg Guide, I should say, so that they're not
9 arriving at the site prior to any impact and therefore
10 putting themselves in harm's way. We describe all of
11 that, those sorts of considerations in the Reg Guide.

12 It does have a section on the operations actions. We
13 did speak about this. Appendix A is predominantly the
14 way it does -- the Reg Guide covers this section.
15 And again, we are going to make sure that these are
16 clearly understood as being examples of
17 considerations, that it's not mandatory or not a
18 requirement to do all of these.

19 The only exception to that statement is
20 the entry condition tables which again, have been
21 standardized over a period of four years and the
22 industry and the NRC are -- and even NORAD at this
23 point, are very comfortable with that arrangement.

24 MR. MORRIS: And if I could just add, Lou,
25 I mean, one of the things we talked about with the

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1 Subcommittee yesterday was the language of, you know,
2 the best possible or I forget the exact language, but
3 we talked about what was, you know, do as much as
4 possible or something, and we're changing that
5 language to what's practical, you know, given the
6 constraints of the site and the timing associated with
7 the event, so to eliminate any thinking that, you
8 know, they've got to do anything and everything that's
9 humanly possible. That's not what we were going for.

10 MEMBER MAYNARD: Yeah, we probably all
11 understand it in the beginning but over time --

12 MR. MORRIS: It's whatever is practical
13 based on your analysis -- the individual analysis of
14 the site.

15 MR. CUBELLIS: We do appreciate the
16 feedback from the Subcommittee. The Reg Guide also
17 has a section on visual discrimination of buildings
18 within the protected area. This is going to be
19 determined by a site specific analysis, first off,
20 whether or not it's appropriate for sites to take the
21 action and then what actions within this section, the
22 sites would actually accomplish given different times
23 or whether they use other control mechanisms.

24 But again, that is a site specific
25 determination as all of these are.

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1 CHAIR BONACA: I have a question.
2 Yesterday, I could not ask it because I had another
3 meeting but is restricted airspace over a plant the
4 same all over the country?

5 MR. CUBELLIS: And the airspace is --
6 there's -- it's really -- it's not a restricted
7 airspace. It's a Notice to Airmen. It's NOTAM 04-118
8 I do believe, which is a standing notice since 2004.
9 It actually instructs pilots not to loiter, over-fly,
10 those kinds of things over any critical infrastructure
11 in the United States. Damns, nuclear power plants are
12 specifically listed on that list. It's not a
13 restricted airspace though. It's not prohibited
14 space.

15 CHAIR BONACA: Because what happened is
16 that we -- this committee was on Lake Michigan and we
17 were visiting a plant and the radio towers were there,
18 you know, with that machine gunners on it and I
19 remember we were looking at one of them and suddenly
20 this small plane flies right over the plant. And so I
21 was thinking about, you know, how this warning, you
22 know, instructions would relate the that kind of
23 event.

24 MR. CUBELLIS: Well, we call that, under
25 the rule and the Reg Guide, that would be a locally

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1 observed small aircraft threat.

2 CHAIR BONACA: Okay.

3 MR. CUBELLIS: There is not much you can
4 do within that -- I mean, if you're describing the
5 bullet resistant enclosure guard, if I understand you
6 correctly, you're talking about standing at the
7 protected area boundary. There's a bullet-resistant
8 enclosure with a guard in it and you have an over-
9 flight of a small aircraft, if that's the first time
10 that they've become aware that that aircraft is in the
11 area, there's not anything that site is going to be
12 able to do to prevent it or to mitigate the
13 consequences of the impact.

14 MEMBER MAYNARD: The NOTAM about airspace
15 is also not all that large. It's basically about
16 1,000 feet above and about three mile radius. It's
17 not going to provide any way to notify or do anything
18 before an aircraft could actually get over the site.
19 It does provide some margin so they're not loitering -
20 - I mean, even if they were, they may not be able to
21 see quite as good, but as far as -- it's not a far
22 enough distance where it would provide intercept
23 capability before it --

24 CHAIR BONACA: We were pretty shocked,
25 however. I mean, Dr. Wallace was a member. He was

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1 together with me and you know, this thing was low, and
2 we were told that the only restriction was that the
3 plane had to fly above 1,000 or something like that.
4 So anyway --

5 MEMBER CORRADINI: Can I just ask a
6 clarification question? You said something in
7 answering. So you said there is -- from just
8 generally, the set of critical infrastructures that
9 must follow this. So consistent with that, I'm
10 assuming chemical facilities, dams, et cetera, et
11 cetera, all have the same general consistent rule
12 about this sort of notification.

13 MR. CUBELLIS: I guess I need a
14 clarification. When you say "all these
15 infrastructure" --

16 MEMBER CORRADINI: Well, you said there
17 was a list, there was a critical list.

18 MR. CUBELLIS: Oh, on the NOTAM, you're
19 talking about?

20 MEMBER CORRADINI: Yes.

21 MR. CUBELLIS: I specifically remember
22 dams and nuclear power plants. I don't remember
23 seeing anything about chemical facilities.

24 MEMBER MAYNARD: Sporting events.

25 MR. CUBELLIS: Yes, the venues, while

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1 they're in -- like, for instance, they don't want
2 planes flying next to the Super Bowl, you know,
3 stadium. I mean, they have authorized craft that can
4 do that but --

5 MEMBER CORRADINI: Well, I guess I was
6 more thinking about industrial facilities.

7 MR. CUBELLIS: I did not see those listed,
8 sir.

9 MEMBER MAYNARD: It's kind of a mix and it
10 does not list all the industrial facilities and stuff
11 like that.

12 MR. CUBELLIS: It was more iconic type of
13 infrastructure, and when I say iconic, a nuclear power
14 plant is fairly recognizable. A dam is obviously
15 recognizable. The stadiums are obviously
16 recognizable. I think it was aimed more at the iconic
17 infrastructure than anything else.

18 MEMBER MAYNARD: To be honest, I don't
19 believe it's a very meaningful --

20 MR. CUBELLIS: I didn't want to say that.
21 I was first trying to get what's --

22 MEMBER RAY: As a private pilot, you can
23 comment on that.

24 MR. CUBELLIS: It's essentially relying on
25 voluntary compliance by the pilots. That's it, and

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1 the only thing it does do, if there's a suspicious
2 aircraft, because it loiters in the area, it does give
3 the power reactor site an opportunity to say, "Well,
4 that's out of the ordinary", as opposed to if there
5 was no NOTAM, you know, and there would be no
6 restriction on that kind of loitering, they wouldn't
7 potentially recognize that as a possible threat.
8 That's about the only value that makes sense.

9 MEMBER MAYNARD: If somebody is
10 identified, though but the FAA. I mean, if somebody
11 does get your tail number or they track you, you do
12 get -- have discussions with the FAA.

13 MR. MORRIS: Somebody will call you, yeah.

14 MR. CUBELLIS: The last two portions of
15 the Reg Guide talk about dispersing equipment and
16 personnel. They're -- the dispersal portion is
17 related to the survivability of different equipment
18 and people that are critical to post-impact actions
19 and it may be critical to post-impact actions which
20 dovetails fairly nicely into the 50.54(hh)(2) and what
21 used to be called B.5(b), and then there's a recall
22 personnel because as we discussed yesterday, depending
23 on the conditions at the site and how they choose to
24 meet some of these other requirements that are in the
25 rule, they may need to recall those critical skill

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1 sets depending on their staffing and other such
2 issues. Next slide.

3 MEMBER MAYNARD: I might point out that
4 slide pretty much was 50.54(hh)(1). It's not much
5 longer than that. It pretty much it lists the --

6 MR. CUBELLIS: Yes.

7 MEMBER MAYNARD: -- so you have that.

8 MR. CUBELLIS: Yes. And then real
9 quickly, the -- for the development of this Reg Guide,
10 I thought it would be prudent to talk about that we
11 did numerous what we call walk-throughs. They're
12 telephonic walk-throughs and what those are is we
13 presented at least one time to all 65 sites, some
14 cases more than that, a scenario that described this
15 type of event, so that they could react in a non-
16 hostile type environment, run through the procedures.
17 The staff could evaluate or I should say analyze the
18 reactions of the site and then determine the -- how
19 the guidance in Advisory 2005-02 were applied at that
20 time.

21 It was actually a fairly involved process
22 lasting more than an hour in each case and then a lot
23 of follow-up discussions with all of the sites and
24 corporate entities. Those lessons learned led to the
25 development of this regulatory guide. We did receive

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1 stakeholder input on March 17th, 2009 of year. We've
2 incorporated all appropriate input into this version
3 of the Reg Guide that the Committee reviewed and we
4 have been working on the rule and the Reg Guide for
5 more than two years in collaboration with not only the
6 Nuclear Industry Institute but also all of the site
7 representatives across the nuclear power industry.

8 MEMBER MAYNARD: John.

9 MEMBER STETKAR: Yeah, I don't recall,
10 just from yesterday, you told us a lot more about the
11 walk-throughs at that time.

12 MR. CUBELLIS: Yes, sir.

13 MEMBER STETKAR: I don't recall, were
14 those notified events? In other words, the sites knew
15 that you were going to --

16 MR. CUBELLIS: Were they pre-announced?

17 MEMBER STETKAR: Pre-announced.

18 MR. CUBELLIS: Yes, sir, they were. Yes,
19 they were.

20 MEMBER STETKAR: I didn't remember that.

21 MR. CUBELLIS: They were pre-announced at
22 least two weeks in advance for every site. Most
23 times, it was a month in advance.

24 MR. MORRIS: I need to just quickly say
25 something here. I don't want to leave anybody with

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1 the impression, including any members of the public
2 that may be here listening or reading the record of
3 this meeting, to suggest that we haven't had these
4 types of protocols in place yet. They've been in
5 place for a long time. We are merely capturing that -
6 - I don't want to give people the impression that here
7 we are eight years after 9/11 and we're just now
8 getting around to figure out how to do --

9 MEMBER STETKAR: We had a lot more
10 discussion yesterday about the history of the walk-
11 throughs and that whole process. I just didn't
12 recall whether the --

13 MR. MORRIS: I'm just worried about the
14 headline that might come out of this.

15 MEMBER STETKAR: No, no.

16 MR. MORRIS: "NRC finally gets on with" --
17 you know.

18 MR. CUBELLIS: And then finally, this Reg
19 Guide before the Committee review was coordinated by
20 NRR, NRO, General Counsel and several divisions within
21 the Nuclear Incident Response Office. Next slide.

22 I will turn the presentation over at this
23 point to Bill Gott.

24 MR. GOTTL: I thank you. It was felt that
25 discussion of how the notification is made and the

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1 NRC's processes would help in understanding the
2 actions that are listed in the Reg Guide. So here at
3 the NRC, we have two watch-standers on shift at all
4 times up on the fourth floor. The emergency response
5 officer is the individual who would normally take the
6 call and we have two sources of information that we
7 expect the call to come from, either Department of
8 Defense through the North American Aerospace Defense
9 Command or possibly the Federal Aviation
10 Administration. Specifically, for the Federal
11 Aviation Administration, we monitor the Domestic
12 Events Network which is the talk between their
13 headquarters and the different flight controllers
14 throughout the country.

15 So if something happens, we can hear that.
16 It's always on in the background. This Headquarters
17 Emergency Response Officer, then would pass this track
18 of interest information which is basically air traffic
19 control data where the airplane is, where it's going
20 its altitude, speed, that type of information, over to
21 the Headquarters Operations Officer. Next slide.

22 If it's determined that one of the
23 licensees could be effected or is in the flight path
24 of the aircraft, and it meets certain time gates which
25 are similar to the gates that are in the Reg Guide,

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1 the Headquarters Operations Officer, the other watch
2 stander, will then call the licensee and a senior NRC
3 manager and place them on a conference call, one of
4 our ready to go bridges that are in the Operations
5 Center, and then pass that information to the licensee
6 and our senior manager.

7 The decisions are then discussed between
8 NRC management and the licensee as to what actions the
9 licensee is taking. As time permits, as a secondary
10 requirement, the primary concern of those two watch
11 standers is to pass this information to the licensee
12 but as time permits, then we will make our
13 notifications and we have in our incident response
14 procedures, people like the other office directors,
15 the regional administrators and other federal agencies
16 that might be concerned, specifically the Department
17 of Homeland Security.

18 The process also allows for the
19 information to come from the licensee and we have the
20 exact opposite relationship with the North American --
21 or the NORAD Command and FAA, that we can call them if
22 a licensee provides us information that they've seen
23 an airplane that they are concerned about.

24 MEMBER MAYNARD: I think you said this
25 kind of -- this can be entered almost at any point. I

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1 mean, you may have 45 minutes notice, you may have
2 three minutes notice. It's not always going to go
3 through a progression. Notification may come at the
4 last minute. Something was just identified or
5 something.

6 MR. GOTTF: Right, they initiate these --
7 the NORAD initiates -- the Department of Defense
8 initiates this call as soon as they have a concern and
9 it may not be anywhere near one of our facilities.

10 MEMBER RAY: The Headquarters, this is
11 strictly a notification function, isn't that -- that's
12 still what I read out of the Reg Guide instructions.
13 It's not like there was going to be questions or
14 requests for, "What do I do." I mean, the site --
15 once they've been told, they now have the ball and
16 they go. I heard somebody say something and I might
17 have misinterpreted what you said when you were
18 talking about communications. It was a more generic
19 term. As opposed to notification, you used -- it gave
20 me the implication that maybe there was going to be
21 some other direction passed and --

22 MR. MORRIS: The point of this whole
23 thing, and please, Lou, jump in. The point of the Reg
24 Guide and the point of the direction that the rule is
25 trying to steer the licensed community to is, you

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1 know, we don't want you winging this thing the minute
2 -- bad word. We don't want you making this stuff up
3 on the fly. That doesn't work either.

4 (Laughter)

5 MR. MORRIS: But we don't want you to
6 just, you know, take an ad hoc approach once you hear
7 that, you know, there's a potential inbound. You
8 know, "Well, maybe I should do this". We're trying to
9 get them to think this whole thing through ahead of
10 time and so there shouldn't be any debate on the phone
11 about, "I'm doing this". "Well, I don't think you
12 should do that", you know.

13 MEMBER RAY: I understand. So he will be
14 pre-prepared. There was just one word that was stated
15 in the manner of using this and it was -- I didn't
16 hear the word "notification" which was single, one
17 direction based on at least not passed, as opposed to
18 communications which is -- implies two ways.

19 MR. MORRIS: I understand. I mean, Bill,
20 I don't know if you want to weigh in on this.

21 MEMBER RAY: It's a myth. I was just
22 making sure. You answered my question I think,
23 satisfactorily. You know when not to say anything
24 else. That's very good.

25 MR. MORRIS: Very good.

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1 CHAIR BONACA: But that's also the
2 starting point for intentional procedures to respond
3 to the event.

4 MEMBER RAY: The licensee, yeah, that's
5 what I gather. That's his cue, bang, go.

6 CHAIR BONACA: The point you're making --

7 MR. MORRIS: Exactly, because this is a --
8 potentially a very fast-moving event. There's really
9 no time to, you know, scratch your head and think
10 about what you might do and discuss it over with --
11 it's just go do -- whatever you pre-planned, go do it.

12 CHAIRMAN WALKER: Especially if they have
13 to disperse equipment and call personnel, it's all
14 here, you know, consistent with the procedures to
15 respond to the event, so there is -- that's the
16 beginning of the actions.

17 MEMBER RAY: Hopefully, they'd get this
18 equipment disbursed before they start this.

19 MEMBER MAYNARD: Oh, yeah, yeah.

20 MEMBER RAY: I mean, I didn't make the
21 observation yesterday. I went back last night and
22 took a quick look through the stuff. It just seems to
23 me almost everything in here is something that they
24 should just rearrange their normal operations so that
25 they don't have to try to move trucks from Point A to

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1 Point B with 20 or 30 minute's notification.

2
3 MR. MORRIS: Actually, I think if you look
4 at the requirements of B.5B and what's now
5 incorporated in every operating license now by
6 condition, and what ultimately will be captured as
7 part of (hh)(2), they're already doing that stuff. I
8 mean, they're already pre-positioning and moving
9 things around and they're looking at -- I mean, they
10 took certain footprints and said, "What if" -- "you
11 know, the damage area is this big. What's in there
12 that I really don't want to lose and let's move it
outside that foot" -- I mean, that's all been done.

13 MEMBER MAYNARD: And we did discuss this
14 quite a bit yesterday because that was -- you know,
15 the list of things to be done seemed to be long and it
16 was made very clear that really the expectation is
17 that if many of these things can be put as part of
18 normal operations or normal locations, that that will
19 be done so that it minimizes what is actually having
20 to be done in the short period of time there.

21 MR. MORRIS: I think it's my cue to
22 summarize, so --

23 MEMBER MAYNARD: I would like to point out
24 one other thing. Since we had the discussion on the
25 shut-down that we talked about yesterday that I think

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1 it's important for the committee to know, I don't have
2 a problem with this at all but, you know, the normal
3 process, the plant will have it in their procedures
4 and if there's a shut-down, they will come to their
5 procedures to do that. There are a few designated
6 people within the NRC that have the authority to
7 direct a plant shut-down.

8 And I'd just point that out. I don't have
9 a problem with that but it is something that does
10 factor into the overall what's best for a given site,
11 given location or whatever is that the --

12 MEMBER RAY: Yeah, that means on this
13 multi-site set-up, that means somebody here at
14 headquarters has to know the consequences and I think,
15 that has to be weighed.

16 MR. CUBELLIS: I need to make sure I
17 clarify this. Those folks do not tell the sites to
18 shut down. They can direct the sites to enter their
19 procedures, which the site would already have done the
20 specific analysis to determine what's appropriate.
21 All those people do are seeing that there's no action
22 being taken or they're hung up on something, those
23 people will actually give the immediately effective
24 order to enter the procedure. That's all they do.

25 MR. MORRIS: The Chairman does have the

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1 ability to issue immediately effective orders.

2 MR. CUBELLIS: Yeah, but these --

3 MR. MORRIS: Which could include something
4 more than that.

5 MR. CUBELLIS: Yes, but that's not the --
6 the folks we're talking about, they only tell them to
7 enter the procedure. They do not tell them any --
8 they don't have to know any site specific information.

9 MR. MORRIS: I may have misstated that.

10 MEMBER MAYNARD: All they can do -- I get
11 it, because I was operating under the wrong impression
12 yesterday also.

13 MEMBER ARMIJO: What's the difference?
14 What's the difference? You know, enter your
15 procedures. The procedures say shut the plant down
16 and --

17 MEMBER STETKAR: Not necessarily and
18 that's what I wanted to make sure I understand. Is
19 that from headquarters can come the directive to
20 immediately enter the eminent threat procedure.

21 MR. CUBELLIS: Yes, sir.

22 MEMBER STETKAR: Now, if that eminent
23 threat procedure at -- Harold used the example of Palo
24 Verde, so I'll use the same name. If that eminent
25 threat procedure, if that site has determined that it

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1 is most prudent for that site to immediately trip the
2 reactors, they will do that, but that's that site's
3 decision.

4 MR. CUBELLIS: Yes, yes.

5 MEMBER STETKAR: If that site has decided
6 that the most prudent thing to do is to keep all
7 three reactors operating, they'll do that.

8 MR. CUBELLIS: That's correct.

9 MEMBER STETKAR: But that's part of their
10 eminent threat -- site specific eminent threat
11 procedure.

12 MR. CUBELLIS: Yes.

13 CHAIR BONACA: Remember, mitigate
14 consequences here includes preventative actions.

15 MR. CUBELLIS: Yes.

16 CHAIR BONACA: By that I mean, for
17 example, isolate open loop systems.

18 MEMBER STETKAR: We had a lot of
19 discussion about that yesterday.

20 CHAIR BONACA: Okay, and yeah. So that
21 you put the plant in a way that, you know, you
22 mitigate consequences by taking preliminary or
23 preventative actions on equipment and those have been
24 studied, debated with the industry and essentially
25 accepted on a site -- on a plant-by-plant basis.

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1 MR. MORRIS: And implemented by order.

2 CHAIR BONACA: By order and so the NRC is
3 aware so what kind of procedures they have in place
4 for individual plants.

5 MEMBER BROWN: You mean today? Does that
6 mean they're already being told to shut down?

7 MR. MORRIS: Certain mitigation measures
8 that were identified as being very prudent stemming
9 from out classified studies, have already been
10 instituted by order.

11 MEMBER BROWN: Does that prohibit the
12 plant -- any of those prohibit a plant from staying
13 operating?

14 MEMBER MAYNARD: No.

15 MR. MORRIS: No.

16 MEMBER MAYNARD: Well, I'm glad we had
17 this discussion because it clarifies. Because I do
18 think it's best that they can order them to go into
19 the procedure but otherwise they're be required to
20 know what's best for each site. So I think that's --

21 MEMBER STETKAR: That's not -- yeah,
22 that's a much different implication.

23 MEMBER MAYNARD: The other thing I think
24 probably needs to be clarified a little bit because we
25 keep talking about the licensee does their analysis

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1 and decides what's best, but that also gets reviewed
2 by the NRC, so at some point there's an agreement that
3 comes that the NRC agrees that the licensee has done
4 an adequate evaluation and stuff there, too.

5 CHAIR BONACA: And the original analysis
6 was done by the NRC on plant specific -- on a plant
7 generic basis and then they were communicated to the
8 industry and the industry was supposed to refine for
9 the individual plants the analysis and the consequence
10 -- the actions to be taken. So I think it's all pre-
11 staged pretty well.

12 MR. MORRIS: Well, yeah, what you're
13 referring to is what would be captured under (hh)(2)
14 or otherwise known as B.5B mitigation measures. All
15 that -- one of the principal differences or things
16 that we're doing with (hh)(1) is to say, "Okay, once
17 you're notified, you know, you have to have a plan to
18 actually go do those implementations, mitigations",
19 right.

20 CHAIR BONACA: And they have them in place
21 and they know how successful they have to be.

22 MR. MORRIS: Okay. We'll I'll just
23 summarize. I appreciate the dialogue. Certainly, I
24 think we got some value-added comments and we'll make
25 some appropriate changes to the guidance document to

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1 make it more clear. It's a tough issue. It's a non -
2 -- it's a non-traditional issue in the sense that, you
3 know, we're dealing with beyond design basis and you
4 know, we're really looking at this from mitigating the
5 potential impact as opposed to preventing the bad
6 thing from happening in the first place. So it's
7 looking at the world a little differently.

8 And it's been a bit of a challenge but I
9 think in the final analysis, given the fact that we've
10 been to every site and walked them through this
11 procedure at least once. That we had some pretty
12 interesting conversations through the course of the
13 B.5B development and later in the Reg Guide
14 development, hashed out all the legal implications,
15 worked it out with DHS, visited NORAD. We did all the
16 things we thought were prudent to develop a
17 comprehensive guidance document and then certainly the
18 added benefit of the Committee's input. I think we've
19 come up with what is a pretty solid guidance document
20 and again, I just want to emphasize that many of the
21 things that are in here, if not all, are being done
22 already.

23 I mean, they've been in place for awhile.
24 We're merely capturing it in one single source
25 document that can be referenced and getting it back

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1 into a standard regulatory process instead of orders
2 and Safeguards Advisories and, you know, some of the
3 more non-traditional ways of implementing
4 requirements. So again, appreciate it. We'll
5 certainly welcome any further comments, but we're
6 done.

7 MEMBER MAYNARD: I'll open it up in just a
8 minute. For those who weren't at the Subcommittee
9 meeting yesterday, we went through each one of those
10 seven areas and talked about communications,
11 notifications, lighting, visual discrimination. We
12 aired a lot of that out so there were a lot of
13 discussions on those items. We chose to not go
14 through the entire laundry list today, but if anybody
15 has any questions about any of those or anything else,
16 now would be a good time to ask those. If we don't
17 we're probably going to end up spending time talking
18 about 50.46 here.

19 (Laughter)

20 MR. MORRIS: This is far more exciting.

21 MEMBER MAYNARD: All right, if there's no
22 other -- I really appreciate the discussion. I think
23 we had a good meeting and discussion yesterday. I
24 don't know how this is going to come out when we get
25 to writing our letter and stuff. I do think it went a

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1 long ways in committing to changing the wording there
2 to make it clear that those were not specific
3 requirements. Those were examples to be done and it's
4 a site specific analysis. I think that overall was
5 our biggest concern there, just some of the wording.

6 I don't think any of us disagreed with the
7 intent of where we were going or what we were trying
8 to do there. So unless there's any other questions,
9 I'll turn it back over to you, Mr. Chairman.

10 CHAIR BONACA: Well, we are a half an hour
11 ahead of time. First of all, I thank you all for the
12 presentations. They're valuable and then -- now we
13 have to decide what to do with the half hour we have
14 before the break.

15 MEMBER CORRADINI: We can always use
16 50.46. Let me tell you what's happening now. Dr.
17 Powers is going to leave tomorrow at noontime, so he
18 has his own letter that we have to review and I would
19 like to finish the letter tonight, so we don't have
20 the pressure of having to pick it up again in the
21 morning. After that, we have the letter on this issue
22 which I believe should be probably non-controversial,
23 I mean, from some of the comments I got from you.

24 And the third potential letter is the one
25 on 50.46. We talked about, you know, maybe discussing

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1 potential content of the letter beyond the issues that
2 we discussed this morning. The question is, are there
3 other issues that we should cover in the letter, and
4 the timing for that letter, too. We don't have the
5 pressure to issue it tomorrow.

6 So with that in mind, in the later part of
7 the day from 5:00 to 7:00, we will not have much time
8 beyond the one of reviewing Dana's letter and
9 approving it and getting feedback to you for this
10 letter.

11 But tomorrow afternoon, we should have
12 plenty of time to talk about 50.46. If you really
13 feel spoiled and you would like to have some more time
14 before we get a longer break or pick up -- break?
15 Let's take a 15-minute break and then come back and
16 talk about 50.46 until we get to the AP1000.

17 MEMBER BROWN: 2:30 then, is that what you
18 said?

19 CHAIR BONACA: 2:30.

20 (Whereupon, a short recess was taken.)

21 CHAIR BONACA: Let's go back into session.
22 The next item on the agenda is the Status and Update
23 Concerning Revisions to the AP1000 Design Control
24 Document and Mr. Ray will take us through the
25 presentation.

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1 MEMBER RAY: Thank you, Mr. Chairman. The
2 Subcommittee has not had an opportunity yet to meet,
3 the AP1000 Subcommittee. We're currently scheduled
4 for July 23rd and 24th and I would encourage all members
5 who can attend, to please try and do so. So my
6 comments are going to be limited now to introduction
7 of the presentation itself, which has been distributed
8 by Mike Lee. And the waste guides are being put out
9 as I speak. And if I can read correctly,
10 Westinghouse, one of the three individuals there
11 named, will begin the presentation.

12 First, however, sorry, he took away the
13 card and I didn't know why.

14 MR. UXTON: Only because I have so little
15 to say.

16 MEMBER RAY: All right, my apologies. I
17 didn't follow the hand signals. Please, Frank, go
18 ahead.

19 MR. UXTON: Okay, my name is Frank Uxton.
20 I'm the Deputy Director for Licensing Operations in
21 the Office of New Reactors and my introductory remarks
22 are just limited to the context of today's meeting and
23 then I'm going to turn it over to Pete Hastings to
24 kind of do the industry presentation.

25 Later on this year, the Committee will

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1 have the opportunity to review all of the chapters or
2 most all of the chapters of the AP1000 design
3 certification starting roughly in the July time frame
4 and working through to October and November. This
5 meeting is to kind of establish the groundwork, if
6 that's the right word, for those interactions. We're
7 going to describe the process of how the design
8 certification will blend with the R-COLA and how S-
9 COLAs will play out with the R-COLAs and the fact that
10 we have a transition in the R-COLA between Bellefonte
11 and Vogtle.

12 I think the discussion today will
13 hopefully provide some insight as to how that
14 information is going to be handled and the
15 opportunities for technical discussions will occur
16 later on in that particular process. So with that, I
17 will turn my -- I'll finish my remarks and turn it
18 over to Peter to start.

19 MR. HASTINGS: Thank you, Frank. As Frank
20 said, I'm Peter Hastings. I'm with Duke Energy and
21 I'm the NuStart Lead for the AP1000 Design Center. To
22 my left is Rob Sisk with Westinghouse and to my right
23 is Eddie Grant, who is one of our license leads for
24 the AP1000 design center.

25 I get the easy part of the presentation.

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I'm going to give you a brief introduction and then Rob will discuss the design certification amendment review process and Eddie will conclude with the COLA review before we hand it back to the staff for remarks from them. Next slide.

This is a visual representation of the AP1000 Design Center. We lovingly refer to it as the frisbee diagram. And the AP1000 design centers work very closely with the staff in implementing the design center review approach and it's been very successful for us and we hope for the staff as well. The AP1000 design center consists of Tennessee Valley Authority for the Bellefonte 3 and 4 Plant, Florida Power and Light for Turkey Point 6 and 7, the application for which is pending, South Carolina Electric and Gas for the Summer 2 and 3, Duke Energy, my company, for the Lee 1 and 2 Plant, Southern Nuclear for Vogtle 3 and 4, and Progress Energy has two applications for Harris 2 and 3 and Levy County 1 and 2.

As a vagary of organizations, I'll point out that the AP1000 design center happens to exist entirely within NuStart which is one of the consortiums operating under the DOE MP2010 Program. I say happens to because the AP1000 members all happen to be members of NuStart. If there were an AP1000

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1 applicant who was not a member of NuStart we'd have to
2 do that a little bit differently but it happens to
3 work out that the difference between a NuStart meeting
4 and a AP1000 Design Center meeting is not much. Next
5 slide.

6 The AP1000 Design Center is characterized
7 by a very high level of standardization which we will
8 -- you'll see reflected in our subsequent remarks by
9 both Rob and Eddie. We enjoy a design that has a
10 significant design finality associated with it. While
11 there is a design certification amendment underway, it
12 represents a relatively small portion of the design
13 which was previously certified, an amendment to a
14 previously certified design. We integrate the design
15 control document and the COL applications through
16 liberal use of incorporation by reference from the DCD
17 to the COL applications.

18 And then the use of standard content
19 between the R-COLA or the reference COL application
20 and the various S-COLAs or subsequent COL applications
21 and we'll talk about that in more detail later. We
22 do, within our Final Safety Analysis Report which is
23 Part 2 of the application, actually explicitly
24 identify virtually every paragraph as to whether it's
25 standard content of site specific and Eddie will touch

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1 on that in a fair amount of detail.

2 As to status of our applications, we do
3 have, as I mentioned, a design certification amendment
4 that is under review and we have had six COL
5 applications that I referred to and one that's pending
6 that will be coming in fairly soon. We do reference -
7 - the COL applications reference and incorporate by
8 reference the AP1000 design control document in its
9 current amended state and then the S-COLAs and R-COLAs
10 all leverage off of the same standard content and
11 again, we'll go into that in some detail to help
12 orient you to what the applications look like.

13 Incorporation by reference is a relatively
14 straightforward process that I think you're all
15 familiar with and that is that we don't repeat DCD
16 content in the COL applications unless we're amending
17 it or unless we need to repeat it for contextual
18 reasons because the discussion in the COL application
19 simply would be nonsensical without repeating some
20 content from the DCD. But for the vast majority of
21 DCD content that we don't either amend or have to
22 supplement for whatever reason, we simply incorporate
23 it by reference and we don't repeat that information.

24 And so as a consequence, the COL
25 applications, and you'll appreciate this were about

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1 half the size that they normally would be for an FSAR.
2 Next slide. We achieve a very high level of
3 standardization by the way through the high degree of
4 use of incorporation by reference of the DCD and then
5 we also achieve the balance of our standardization
6 through the use of standard content among all of the
7 COL applications. The difference you'll see in the
8 visual representation here versus the previous slide
9 is that the lines are dotted and all that means is we
10 don't incorporate by reference the standard content
11 from the R-COLA into the S-COLA. We actually repeat
12 that information because mixing the COLA dockets like
13 that would be just too confusing. But we do make --
14 take great effort to keep the standard content well
15 aligned between the COL applications. We've had a
16 tremendous amount of success in that regard. We have
17 very little information that varies from application
18 to application when it's labeled as standard content.

19 There's obviously, a fair amount of site
20 specific content as well, as you would expect but
21 again, that's all labeled explicitly in the FSARs.

22 MEMBER RAY: Excuse me. Take care with
23 regard to the microphones. It makes it difficult for
24 the transcription.

25 MR. HASTINGS: Thank you. You've probably

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1 heard that in consultation with the staff, we recently
2 announced a transition of our R-COLA, our reference
3 COLA from the Bellefonte Plant, Bellefonte 3 and 4 to
4 the Vogtle Plant. We made that change, the change
5 actually is in progress from Bellefonte to Vogtle to
6 facilitate resource alignment on the part of the NRC
7 to get the alignment with a COL application that had
8 a definitive announced construction schedule. And
9 again, that's an arrangement we made with the staff.

10 There won't be any change in the structure
11 of the design center. All the players remain the
12 same. Vogtle is the reference COLA. Vogtle has
13 always been an active member of the DCWG TVA,
14 Bellefonte will transition out of the R-COLA but
15 they're still an active member of the design center,
16 so that there won't really be a change there.

17 MEMBER CORRADINI: So what that really
18 means is who goes first.

19 MR. HASTINGS: Correct. And the way that
20 we're effecting the transition to avoid any -- avoid
21 to the extent practical logistical impacts on the
22 review schedule, is the staff will issue the SER with
23 open items on a per chapter basis on the Bellefonte
24 application. Standard content open items will then be
25 closed on the Vogtle docket and so that transition

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1 will occur during the review of the open items from
2 the SER.

3 The site specific issues will be handled
4 fairly predictably. The Bellefonte site specific
5 issues that are identified in the SER as open items
6 will be addressed in the Bellefonte SER as with any
7 other S-COLA. By the time the SER gets closed out,
8 the open items on site specific content get closed
9 out. TVA will be just another S-COLA. The only
10 vagary associated with Vogtle as the R-COLA and that
11 they do have an ESP and so that addressed the majority
12 of the significant site specific issues for Vogtle
13 already. There won't be many site specific issues
14 remaining for Vogtle, at least not that we know of.

15 Vogtle will also appear slightly different
16 because unlike the other COLAs, there is some
17 incorporation of their ESP that the rest of us don't
18 have, but where that impacts standard content that
19 will all be explained very thoroughly in our Part 11,
20 which will facilitate the review of the standard
21 content.

22 MEMBER POWERS: As I recall, our letter on
23 the Early Site Permit for Vogtle there's a line to say
24 that we cannot attest that the site parameters bound
25 the requirements of the AP1000 reactor or something to

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1 that effect.

2 MR. HASTINGS: I have to confess, I'm not
3 familiar with that aspect of the Vogtle ESP. We can
4 get you an answer on that, though. We have some
5 Southern people here and we can either address that
6 off-line or we can try to get an answer --

7 MEMBER POWERS: My point being that it's
8 not obvious to me that the only site permit for Vogtle
9 has shown itself to be capable of accepting the
10 standard AP1000 result.

11 MS. COFFIN: If I could speak to that,
12 this is Stephanie Coffin. The finding that we need to
13 make in the Early Site Permit is related to the site
14 suitability for a power plant. It's at the COL stage
15 where we'll make the finding that that site is
16 suitable for the particulars of this AP1000 design.

17 MEMBER POWERS: Yes.

18 MS. COFFIN: And that review is underway.

19 MEMBER MAYNARD: If I recall, the
20 discrepancy was in the seismic.

21 MEMBER POWERS: It was in the seismic area
22 that they weren't able to attest that the site could
23 accommodate a standard AP1000 design because they came
24 in with a design specific early site permit. They
25 were the first ones. Everybody else had come in with

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1 a plant parameter envelope and we couldn't make that
2 judgment.

3 MR. HASTINGS: Well, we'll certainly pull
4 the thread on that and we'll discuss it when that
5 aspect of the review comes before the ACRS. Thank you
6 for the information. As I mentioned before the timing
7 of the transition from Bellefonte to Vogtle is being
8 coordinated with the staff. The earliest that we
9 expect you'll see the effects of that transition are
10 on Chapters 11 and 12 of the SER with open items which
11 are expected to be issued in June and those open items
12 could be closed as early as July on the Vogtle docket.

13 So with that brief introduction, I'm going
14 to turn it over to Rob Sisk to walk through some
15 information on the DCD amendment review.

16 MR. SISK: Thank you, Peter. I am Rob
17 Sisk and I am the Westinghouse manager for AP1000
18 licensing. I'd like to take just a brief moment to
19 recognize Mr. Ed Cummings, the Vice President of
20 Regulations and Standardization and start off by
21 saying this summer, Westinghouse will be submitting to
22 the ACRS an amendment for -- an amendment to the
23 AP1000 certified design.

24 Westinghouse has -- this amendment --
25 excuse me, the AP1000 was certified January 2006 and

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1 represents one of three design certified or held by
2 Westinghouse, including the AP600, the System 80+ and
3 AP1000. One of Westinghouse's key objectives is the
4 development -- in the development of the AP1000 is to
5 maintain to the maximum state practicable
6 standardization. While the AP1000 design
7 certification based on revision 15 of the DCD, remains
8 valid, in working with out customers and consistent
9 with the philosophy of the AP1000 Design Center
10 Working Group, Westinghouse opted to submit an
11 amendment to the AP1000 certified design to close out
12 to the extent practical generically applicable CRI
13 information items, design acceptance criteria items,
14 DAC and to incorporate standard design changes
15 resulting from the AP1000 design process.

16 These include addressing issues brought up
17 through NRC review of the COLAs and of the amendment
18 itself. I'd like to point out that the amendment
19 builds on the certified design. Much of the design,
20 as documented in the DCD remains unchanged. Some of
21 the key issues that were addressed in the amendment is
22 addressing the security requirements that have come up
23 recently, addressing the design acceptance criteria,
24 the original certified design had three DAC in it, the
25 I&C, HFE and piping. We're addressing GSI-191

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1 contained some downstream effects issues, structural
2 design, seismic concerns, control --

3 MEMBER SHACK: Tell me about the DAC. I
4 mean, are you going to have now more explicit --
5 you're going to have explicit designs for the I&C or
6 the piping systems?

7 MR. SISK: Yes, sir. We had three DAC in
8 the Division in Certified Design, piping DAC, for
9 example, is one. We are taking the piping DAC out of
10 the design by completion of the design requirements
11 for the piping DAC. And we are also looking to
12 complete the activities for the human factors and for
13 I&C.

14 MEMBER CORRADINI: So you won't have any
15 DACs.

16 MR. SISK: Actually, we will. We are
17 working toward finishing the HFE DAC and the I&C DAK.
18 We're still working with the staff to determine to
19 what extent we will have the I&C DAK resolved by the
20 time we're through with this process.

21 MEMBER BANERJEE: Does the DAC then
22 include even how the piping will be sloped and
23 supported and things like that or just the --

24 MR. SISK: No, we are doing design
25 detailed piping packages. They have been provided to

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1 the staff for review.

2 MEMBER BROWN: When you do your I&C DAK,
3 in whatever form you present it, will it explicitly
4 address a specific design criteria such as
5 independence for reactor protection system channels
6 for instance, and how you show how you test to
7 demonstrate that independence so that there's -- so no
8 communication or however it's done or it's done in a
9 manner that you can't corrupt software? So there will
10 be specific items addressing along with I'd like to
11 say suitable sufficient documentation that it can be
12 reviewed independently?

13 MR. SISK: The intent is that, again, what
14 you're pointing to is a level of detail and --

15 MEMBER BROWN: Yes.

16 MR. SISK: And we're trying to find the
17 appropriate level of detail for the license
18 requirements and we are working with the staff to
19 complete that level of detail.

20 MEMBER BROWN: I just -- it's just an
21 observation. For instance, when I look at I&C, you
22 know, there's four areas I like to look at, and that's
23 redundancy, independence, defense in-depth and
24 determinacy. All the rest -- I should say it this
25 way, the rest is kind of window dressing. That's

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1 really not the case. There's a lot of other detail
2 that may be plant specific, but the architecture needs
3 to be fully -- with enough detail to fully understand
4 that you meet those four basic fundamental criteria.
5 So I'm not trying to tell you what that is. I'm just
6 saying that in your thought processes, you ought to
7 make -- it would be useful -- of course I can't tell
8 you what to do but it would be useful if sufficient
9 information was provided in sufficient detail to fully
10 describe that. That's just a suggestion.

11 MR. SISK: Well, I appreciate that and we
12 are working to that end. Now, it will be a good
13 discussion when we go to the Chapter 7 reviews, but we
14 are working on exactly those type of detail. We
15 believe we have a significant amount of detail
16 currently but whether it is sufficient to close out
17 the DAC completely or not is where we're working at
18 this stage.

19 MEMBER BROWN: All right. Thank you.

20 MR. SISK: Okay, in addition to the DAC
21 issues, we have, as I mentioned earlier, addressed
22 containment sump and downstream effects working with
23 the staff to resolve GSI-191. We have made -- been
24 working --

25 MEMBER BANERJEE: Does this include some

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1 testing as well?

2 MR. SISK: It has. We've done some screen
3 testing and we've also done some fuel assembly
4 testings, looking at impacts of debris and fibers as
5 it pertains to not only the screen itself but the
6 impacts on the core.

7 MEMBER BANERJEE: Is that the part of the
8 downstream effects work that's currently being done?
9 You're going to reference that.

10 MR. SISK: We are and we've been working
11 with the staff to make sure that we are consistent
12 with the industry expectations and the staff
13 expectations in that area.

14 MEMBER BANERJEE: Does the plant have much
15 fiber?

16 MR. SISK: I'm sorry?

17 MEMBER BANERJEE: Do you have much fiber
18 in the insulation?

19 MR. SISK: Do we have much fiber?

20 MEMBER BANERJEE: In the insulation?

21 MR. SISK: No, actually, we do -- you'll
22 be hearing more about that as we go forward but we
23 believe that the AP1000 has been designed from
24 beginning to minimize the fiber in containment. So
25 there's been a lot of effort to address that and keep

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1 it out of the impact area where it can be washed into
2 sumps.

3 MEMBER BANERJEE: On the buffer? Yeah,
4 what is the buffer that --

5 MR. SISK: I don't have that off the top
6 of my head right now.

7 MEMBER BANERJEE: But you've also
8 optimized that --

9 MR. SISK: That is correct. We've also
10 dealt with the chemical injection as well as fiber and
11 debris. We've taken the complete mix to assess in our
12 test on fuel. We've dealt with some issues in the
13 control room ventilation. We've introduced an
14 enhanced integrated head package and we have
15 transitioned to ASTRUM our best estimate LOCA analysis
16 methodology.

17 MEMBER CORRADINI: Well, that's a code.

18 MR. SISK: That is a code.

19 MEMBER CORRADINI: I was trying to figure
20 out what that was.

21 MR. SISK: Best estimate LOCA.

22 MEMBER BANERJEE: It's a methodology.

23 MALE PARTICIPANT: Which one is this?

24 MR. SISK: ASTRUM.

25 MEMBER ARMIJO: Is it a set of codes or is

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1 it just one code?

2 MR. SISK: I guess it depends on how you
3 break down the word "code", but it is one code,
4 ASTRUM.

5 MEMBER CORRADINI: Use the word
6 "platform", that confuses everybody. It's a platform.

7 (Laughter)

8 MEMBER BANERJEE: You say that that's a
9 key review issue?

10 MR. CUMMINGS: This is Ed Cummings. It's
11 not even a code. It is a way of probabilistic
12 treating code results so that you can get 95 percent
13 certainty of 95 percent --

14 MEMBER APOSTOLAKIS: You're dealing with
15 code uncertainty?

16 MR. CUMMINGS: Yes, because it's the best
17 estimate large break LOCA code. It's a way of
18 processing code results.

19 MEMBER BANERJEE: It's simply a way to do
20 the -- sort of a SCAU methodology.

21 MEMBER APOSTOLAKIS: You guys and CSAU, I
22 mean, it was not on the tablets, you know, it was not
23 an eleventh one.

24 (All speaking at once)

25 MR. CUMMINGS: Think of it as a post-

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1 processor.

2 MEMBER APOSTOLAKIS: Are you propagating
3 uncertainness in the inputs to get the spectrum of
4 outputs and see what happens?

5 MR. CUMMINGS: Yes, since it's a best
6 estimate code, you have to run the code, I don't know,
7 100 times and you --

8 MEMBER APOSTOLAKIS: I've been looking at
9 tons of probability books, the words "best estimate"
10 appear nowhere. Zero, but that's for another time.

11 (All speaking at once.)

12 MEMBER RAY: Gentlemen.

13 MR. SISK: Our play out on this list was
14 that in our amended design, we had addressed all the
15 non-plant specific tech specs and provided the numbers
16 for the tech specs in the amended design.

17 MEMBER CORRADINI: So I have a question
18 that has nothing to do with your list, but more a
19 matter of how it fits into your thing. So there are
20 particular topics that are scattered throughout the
21 chapters. Are you and the staff on the same page,
22 then, as to what is opened up for discussion for
23 review? That is I'm most trying to understand if
24 there's a part of Chapter 7 and a part of Chapter 8
25 and a part of Chapter 6 that -- of the DCD that is

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1 being modified by the topics. Where are -- where the
2 review begins and where the review ends, are you on
3 the same page with the staff on that?

4 MR. SISK: Well, I should probably defer a
5 little bit to Eileen in the back over here, but
6 generally speaking, I would say, yes, we work closely
7 with the staff to understand the changes that are
8 being made, recognizing we have a certified design.
9 What we're really looking at are the deltas between
10 the certified design and what's in the amended design,
11 and it's those deltas that we're working closely with
12 the staff to make sure that we address any delta
13 between the certified and amended design.

14 MEMBER APOSTOLAKIS: Wasn't there a news
15 item recently somewhere in the publications, there are
16 five or six of those where a new rule would be
17 required and there's about 10 or so where -- Eileen,
18 go ahead.

19 MS. McKENNA: Okay, let me first answer
20 the first question. I think in general yes, we do --
21 this is Eileen McKenna, NRC staff, Office of New
22 Reactors. I think, in general, there is an
23 understanding that we are looking at a design
24 certification amendment. Obviously, when somebody is
25 looking at changes within a paragraph, you know, the

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1 question about, well, what about the rest of the
2 paragraph and how do those changes effect other
3 information is something that the staff is going to
4 consider and we do, on occasion, have slightly
5 different views of exactly how much of the
6 certification is open for the amendment process, but
7 we try to work through those issues with that
8 understanding.

9 I'm not sure, George, specifically what
10 you're talking about in terms of this --

11 MEMBER APOSTOLAKIS: Publications,
12 somebody from the staff announced that it would take
13 15 months to complete this and --

14 MS. McKENNA: Okay, that's -- okay, we're
15 talking about some articles, I think, that came out on
16 the Levy County schedule and there was some
17 misunderstanding between the staff and the reporters
18 on the --

19 MEMBER APOSTOLAKIS: Does that happen?

20 MS. McKENNA: In terms of when -- if you
21 chose the date for the issuance of the final safety
22 evaluation report versus changing the date of the
23 rulemaking, you know, and they're not the same
24 milestone, so the delta that they came up with was not
25 the delta that we had reported with respect to

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1 issuance of the design certification and then
2 furthermore, they didn't appreciate that the schedule
3 on the individual COL was not solely driven by the
4 design certification amendment schedule and so they
5 came up with that 15 months, despite our efforts to
6 tell them that really wasn't the right number.

7 MEMBER BANERJEE: So what is the right
8 number?

9 MS. MCKENNA: That's something that the
10 staff is still looking at, you know, because you may -
11 - as you'll hear when you get to my slides, we
12 recently reissued our schedule for the Westinghouse
13 design certification and we're now looking at the
14 schedules for the COLs and particularly with the R-COL
15 transition. So we don't have a revised schedule for
16 Levy at this point, but certainly don't expect it to
17 move by 5 months.

18 MEMBER APOSTOLAKIS: Fifteen is too low?

19 MEMBER CORRADINI: Don't answer that
20 question.

21 MEMBER RAY: We have an hour and five
22 minutes.

23 MALE PARTICIPANT: Can I ask a question
24 just for clarification?

25 MR. WATERS: Excuse me, my name is Dave

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1 Waters. I'm from Progress Energy and if I could
2 provide hopefully some clarification. The
3 announcement that we made for the movement of the Levy
4 schedule from the original schedule was that we would
5 move the schedule out at least 20 months and that was
6 due to many factors, economic as well as technical,
7 but it had no relationship to what the DCD schedule
8 was. So it's totally independent of the DCD schedule.

9 MEMBER RAY: Thank you.

10 MEMBER BROWN: One thing on the revised
11 DCD, when you submit the Chapter -- for instance
12 Chapter 7, presumably, you will identify those areas
13 that are different from the original certified so it's
14 clear in the review that we don't have to do a line-
15 by-line comparison to see what's changed and what's
16 not. Is there some way to identify that?

17 MR. SISK: We have provided what we call a
18 reviewer's aid to the staff.

19 MS. MCKENNA: And we will make that
20 available to the Committee so it will be clear what is
21 changed and what was in the original certification.

22 MEMBER BROWN: Thank you.

23 MR. SISK: Okay, the last point I was
24 going to make, as we do make all of these changes or
25 address changes, the conclusion of the AP1000 safety

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1 analysis has remained unchanged.

2 We talked about it a little bit, the
3 drivers, just a minute ago here, but --

4 MEMBER APOSTOLAKIS: The conclusions of
5 the AP1000 have not changed even though there are
6 several key reviews.

7 MR. SISK: As we do the reviews of the
8 changes that are going in, we do those so that they
9 are consistent with the conclusions of Chapter 15.
10 That these changes have not caused us to go outside of
11 the --

12 MEMBER APOSTOLAKIS: Okay.

13 MR. SISK: Okay, I'd like to put this
14 review -- this amendment into context globally, for
15 just a brief minute, if I can. On the next slide, the
16 slide here, you'll note that Westinghouse has signed
17 contracts and is building its first units in China.
18 It really is kind of nice to talk about building units
19 instead of just a paper process. It's particularly
20 important to note that the first units in China will
21 begin operation more than two years ahead of the
22 schedule for the first AP1000 in the US. And in fact,
23 all four units will be in operation ahead of the first
24 AP1000s.

25 This will provide us with a tremendous

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1 opportunity for applying lessons learned, looking at
2 operating experiences and bringing that into the
3 design and the construction of plants here. And of
4 course, as a part of that process and the continuing
5 process, we'll be taking operating experience lessons
6 learned back to China and into the future plants as we
7 continue to move forward.

8 I will note -- we talked briefly, just a
9 minute ago, about the -- where we were with the US
10 schedule. Westinghouse also has three contracts under
11 -- pre-construction contracts underway as we speak.
12 You'll note the operational dates on these, 2016, 2017
13 for Southern, the time frame. The 2016 time frame is
14 a real driver for us to finish up with the
15 certification on the amended design with an
16 expectation that we'll be taking the next major steps
17 this summer, August time frame of 2011.

18 The map here is just really to kind of
19 give you an idea of where those utilities are being
20 built. In closing on the Westinghouse aspects.
21 Westinghouse is working to address NRC concerns and
22 we're working on a schedule to support the ACRS
23 meetings coming up this year, I think the first one,
24 July 23rd. We've got a couple this year where we hope
25 to be able to present all the chapter SERs for review

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1 as necessary through this group. Again, I want to re-
2 emphasize the AP1000 design was certified in January
3 of 2006 and the amended design continues to build on
4 that certification.

5 We do focus that our -- the amended design
6 continues to comply with the requirements of 10 CFR
7 52.63 finalities and very bluntly, Westinghouse is
8 ready to present the material to the ACRS and looking
9 forward to doing so. At this point, I'd like to turn
10 it over to Eddie Grant from NuStart to talk a little
11 bit about the R-COLA.

12 MEMBER BANERJEE: Can I just ask you, what
13 is the extended heat transfer factor or whatever --
14 the enhanced heat transfer --

15 MR. SISK: No, that was the enhanced head
16 package.

17 MEMBER BANERJEE: Oh, head package, what
18 is that?

19 MR. SISK: It is actually a head that we
20 currently are using on some of the CE fleet. And what
21 it boiled down to is, we took the Head Package,
22 certified Head Package, and we --

23 (All speaking at once.)

24 MR. SISK: It's the top of the reactor
25 core where the control rod drive mechanisms and

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1 instrumentation come in through the head and really
2 what the integrated head package did is we, working
3 with the best of class, if you will, within the
4 industry, took the head package that is currently
5 certified, put an integrated head package in which
6 basically reduced 40 penetrations in the head package
7 which was we felt a real improvement in the
8 reliability on the head.

9 MEMBER BANERJEE: And why did you have to
10 invoke ASTRUM? Haven't you, in your certification,
11 done this already or what's new about that?

12 MR. SISK: It was a time before when
13 ASTRUM was available to be incorporated into our
14 design.

15 MEMBER BANERJEE: As a part of the design
16 process. I mean, ASTRUM is a methodology, is that
17 right?

18 MR. SISK: Correct.

19 MEMBER BANERJEE: So, I'm not clear as to
20 what its role in this review is. Like you say, it's
21 one of the review items.

22 MR. SISK: ASTRUM provides the best
23 estimate LOCA.

24 MEMBER BANERJEE: Right, but it's already
25 a way of doing things which has been approved, right?

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1 MR. SISK: But it was not certified in the
2 DCD.

3 MEMBER BANERJEE: I see. So now, you're
4 going to be able to use it in the future, is that it?

5 MR. SISK: As a part of the standard
6 package for the DCD. Part of the standard design will
7 include the ASTRUM methodology.

8 MR. CUMMINGS: Ed Cummings, so just to get
9 a sequence of events here, the -- actually, the
10 certification was issued for AP1000 before ASTRUM was
11 approved for operating plants. So ASTRUM had to go
12 through an NRC approval process for operating plants
13 and what we're doing here is applying it to AP1000,
14 the same kind of probabilistic methodology. The
15 benefit to AP1000 is that it decreases the peak
16 centerline temperature for large-break LOCA about 250
17 degrees. So it gives you margin in large-break LOCA
18 which we didn't have a tremendous amount of margin.
19 So that's the rationale.

20 MEMBER BANERJEE: But what is the need for
21 it? You are certified within whatever with the --

22 MR. CUMMINGS: Well, the need for it comes
23 when, you know, every year we have to tell the NRC
24 that, you know, we had an error in the code and the
25 peak centerline temperature went up five degrees or

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went down five degrees or whatever. It's a reporting function, and you know, if you want to get away from being a real problem, you want to have margin in your peak centerline temperature as large as you can. And really, it was the -- the thermal hydraulic analysis is the same COBRA TRACG analysis and you determine the probabilistic use of the selected multiple runs in a more intelligent way. That's what ASTRUM does.

And why do we do it? Because we wanted margin and peak centerline temperature for large-break LOCA.

MEMBER BANERJEE: As it stands, your certified design meets the requirements.

MR. CUMMINGS: It does. It does.

MEMBER BANERJEE: Okay.

MEMBER SHACK: Doe it mean that you can now deal with the large-break LOCA with just your non-safety grade equipment?

MR. CUMMINGS: No, and we weren't trying to do that. We're trying to look ahead for 40 or 60 years of changing codes and saying, "Gee, we only had, I don't remember 30 degrees or 20 degrees margin to the limit".

MEMBER BANERJEE: You're getting ready to uprate the --

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1 (Laughter)

2 MR. CUMMINGS: No, I wouldn't say we'll
3 never do that.

4 (Laughter)

5 MR. GRANT: Good afternoon, my name is
6 Eddie Grant. I'm with NuStart and supporting the
7 licensing for the reference COLA. And we've done one
8 presentation, I believe, on COLAs in the past and
9 you've probably seen this slide before. Where the
10 reference COLAs are the COLAs for under Part 52 are a
11 little bit different than the applications that you've
12 seen for operating licenses under Part 50, and part of
13 that's just in structure here. As it indicates here,
14 we've got 11 parts that we've put together.

15 All of these parts you were seeing under
16 the Part 50 evaluations and applications but they're
17 structured a little bit differently. The colors I
18 point out here are partly related to standardization.

19 The red discussions, Part 2, Part 4, Part 7, Part 10
20 have quite a bit of standardization in them. The blue
21 items, the general administrative stuff, environmental
22 report, emergency planning, limited work
23 authorizations, withheld information and some other
24 documents, not so much. Those are primarily plant
25 specific documents and then there's one last set here,

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1 the green items, safeguards information and the
2 quality assurance report or program document. Those
3 are based on NEI templates. They do have a little bit
4 of plant specific information in them, as you might
5 expect, but primarily they're standard information and
6 they were built from NEI templates that all of the
7 applications were using.

8 Emergency planning, Part 5, you see only
9 part of that is green and that's because part of that
10 information is based on a template, the emergency
11 action levels. The rest of it is plant specific
12 information and the emergency plan in general. What
13 I'd like to cover most on the next slide is the DCD
14 and reference COLA integration primarily in Part 2
15 because this is the FSAR, that's the -- where most of
16 the safety information resides.

17 The way that we do this integration is, as
18 Peter indicated earlier, a lot of it is incorporation
19 by reference. We incorporate the DCD directly. We
20 don't want to repeat that information for a number of
21 reasons. Mostly we're concerned about not getting it
22 in there exactly the way it was written in the DCD and
23 every time it changes, we would have to, again, amend
24 it and make sure it matched up again. So --

25 MEMBER BLEY: So the FSAR would be kind of

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1 a shell for the most part.

2 MR. GRANT: A lot if it will be an for
3 instance, Chapter 7, Chapter 4 are pretty much a
4 single line that say "We've incorporated by reference
5 this portion of the DCD." There's a little bit more
6 in Chapter 4 because there was a COL item in there but
7 that's it. Chapter 7 one line per section that says,
8 "Incorporated by reference".

9 MEMBER POWERS: You're saying it's going
10 to be impossible to review because you're going to
11 make bouts in between them.

12 MR. GRANT: Well, there will still be
13 plenty of information.

14 MALE PARTICIPANT: Harder to find.

15 MR. GRANT: But it is all electronic these
16 days, so it does -- you can get there quickly if you
17 understand the search mechanisms in the pdfs. The
18 subsequent COLAs will include the standard content
19 reflected in the reference COLA and I'll get to a
20 little but on how that's done with the next bullet
21 there, in fact.

22 The content is labeled, as Peter
23 indicated, practically every paragraph and the way
24 we've done that is use a line item to separate
25 sections or a line across the page and within each

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1 section, there should be a left margin annotation or
2 an LMA and that will indicate that it is standard or
3 plant specific. On the Bellefonte COLA we used a
4 three-letter designation of BLN for the plant specific
5 information.

6 Three of the types that we have here are
7 COL information items and you can see how we would
8 designate those using standard COL and a numbering
9 system. The departures and supplemental information
10 are very similar to that. On the next slide we have a
11 list of all of the left margin annotations that we
12 use. Next slide, please. Thank you.

13 Standard, again, departures, COL
14 information, supplemental information, there are a
15 couple of different ones down at the bottom. CDI, for
16 instance, is conceptual design information. This is
17 one of the places where Peter referred to earlier that
18 we might actually repeat the DCD information and
19 that's because they had interspersed a number of
20 bracketed things within that text and it was just
21 simpler to go ahead and repeat it, put in the
22 information that was plant specific than it was to try
23 to explain where the bracketed material was included.

24 And when we'd done that, some paragraphs
25 will actually be word for word directly from the DCD.

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1 So we have a DCD left margin annotation as well.

2 Next slide, please.

3 Part 4 is another place where it is almost
4 entirely standard information. We did not incorporate
5 by reference the generic tech specs that were provided
6 in the DCD but we did repeat them word-for-word,
7 period-for-period, format, the whole thing is repeated
8 there, partly so that we have a consolidated full set
9 of the technical specifications to be provided, again,
10 a full copy of the specs. The plant specific
11 information was included, as Rob indicated earlier.
12 They have, within the DCD, completed all of the
13 technical specifications that were technically related
14 that had been previously identified within the
15 certified document as plant specific information.
16 They've been able now to complete those.

17 There were still a few brackets that were
18 purely plant specific such as the exclusionary
19 boundary description and/or the low population zone
20 description. We have completed those items and so we
21 have no brackets within our tech specs. We have a
22 full clean copy of the tech specs or the reference
23 goal for the AP1000.

24 Part 7, another area where we've
25 integrated things here. We have identified any

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1 departures or any exemptions that are necessary.
2 There are some -- there is one standard departure.
3 It's a fairly minor thing related to the organization.

4 There were some original rule that requires that you
5 prepare your FSAR exactly the way that the DCD was
6 prepared. Well, we didn't think ahead real well when
7 we wrote the DCD, so there are a few places where we
8 needed to renumber some things in order to add some
9 information. So it's a minor numbering departure and
10 exemption. The rest of the departures and exemptions,
11 I believe, are plant specific but some of them are
12 common and one of those examples, for instance, is a
13 relocation of the Technical Support Center within the
14 emergency planning information.

15 The Tech Support Center was a part of the
16 of design certification within the plant but you may
17 recall the AP1000 was designed to be a single unit
18 plant but we're selling them as dual -- or
19 Westinghouse is selling them as dual-unit plants. So
20 it is to our advantage to have a single tech support
21 center, somewhere outside of those two buildings. So
22 that's a departure from the DCD. That is common to a
23 number of the plants, but we didn't all put it in the
24 same place. So we didn't call it a standard departure
25 or exemption, even though you will see that departure

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1 in most of the applications, R-COLA and S-COLAS.

2 Again, differences that we might take if
3 it's tier two star, that does require NRC approval.
4 You also see that we've identified some tier two
5 departures that did not require NRC approval. We
6 still identify those departures, but in accordance
7 with the rule, they meet certain criteria that's a
8 50.59 like criteria such that they don't require -- we
9 can take those departures without NRC approval. We
10 still identified those departures because that's
11 required by the rule, so that's in there as well.
12 Next slide, please.

13 Part 10 is proposed license conditions.
14 This may be unique to the AP1000. I'm not sure that
15 all the other design centers propose license
16 conditions but we did take a shot at it because we
17 know we're going to have some and we had some proposed
18 wording that we wanted to provide. One of those, of
19 course, is to incorporate by reference the DCD Tier 1,
20 the ITAAC, the Inspection Test, Analysis, and
21 Acceptance Criteria that have to be completed some
22 time after the COL is issued, but before you can
23 actually start the plant up and a lot of this is
24 related to as-built confirmation, did you build the
25 plant exactly the way the DCD said it was going to be?

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1 We've also got some plant-specific license
2 conditions related to ITAAC in the security area and
3 in emergency planning and then we will have a couple
4 of items with regard to plant specific systems. For
5 the most part, the plant specific items say, "We
6 looked at this system and it really doesn't require an
7 ITAAC", but again, that information is there.

8 Holder items, these are again some --
9 where there were some COL information items within the
10 DCD that required that the Applicant do something.
11 However, we found that there are a number of those
12 things that we can't do again, until after COL
13 issuance. Some of them are related to doing start-up
14 testing and/or doing as-built inspections. Well,
15 again, obviously, we can't do those until afterwards,
16 so one way around that is to propose a license
17 condition to complete those actions afterward.

18 Again, we've got a license condition on
19 inspection milestones. One for -- to tell the staff
20 when we're ready for them to do some inspections and
21 various other things that you can see here on the
22 slide. I'll let you read through those as necessary.
23 Next slide, please.

24 These are just a couple of examples of
25 things that we looked at with regard to

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1 standardization. The left side is a representation of
2 Chapter 1 in particular from the FSAR. You can see
3 that we incorporate by reference in just about every
4 section, 1.10 being the exception. It's a new section
5 that wasn't covered by the DCD, so it is not an
6 incorporation by reference item, and you can see again
7 that there is standard material beyond the
8 incorporation by reference in a number of these
9 sections and then there is plant specific material in
10 some of these. There's no indication in that left
11 side about relationships of how much information is
12 standard or plant specific, just that there is some in
13 that section.

14 On the right side, I've looked at each of
15 the -- at least the first -- well, I'm sorry, there's
16 two sets of columns in that right side table so that
17 you get all 19 chapters and then there's an overall
18 number for the FSAR that show on a relative quantity
19 basis, how much of it is standard information, how
20 much of it is -- well, the rest of it would obviously
21 be plant specific information. Now, this is actual
22 information that was provided by the R-COLA that the
23 staff is going to have to review and write something
24 up.

25 Chapter 2, for instance, you can see zero.

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1 There's almost -- there is a couple of sentences, but
2 when you look at it on a bulk, it comes out to be .0
3 something so that it turns out on a numeric level to
4 be zero percentage. It is practically 100 percent.

5 MEMBER RAY: What's the metric?

6 MR. GRANT: Metric?

7 MEMBER RAY: Yeah, I mean, these are
8 pretty precise numbers. What it is?

9 MR. GRANT: They're not all that precise.

10 Let me say that for starters.

11 MALE PARTICIPANT: These are by weight,
12 not by volume.

13 MR. GRANT: Actually, they were. The
14 metric for getting this was going through on a page-
15 by-page basis, counting pages that had standard
16 information and pages that showed plant specific
17 information and if it has both, it just gave it a, you
18 know, half page for each one and going down through
19 that. It's a pretty rough number, frankly.

20 CHAIR BONACA: I have a question.

21 MR. GRANT: Yes, sir.

22 CHAIR BONACA: This is clearly a
23 standardized plant and new start deals with
24 standardization of different sites and different
25 companies. Is there a role for the traditional AE at

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1 some point?

2 MR. GRANT: There is but it's a much
3 smaller role than it used to be.

4 CHAIR BONACA: Yeah, I'm just curious to
5 know because I mean, clearly there are different
6 designs and they effected, you know -- they had their
7 own design. Here the AE would essentially be required
8 to implement whatever you or NuStart has decided to be
9 the standard product. There is still some impact,
10 right, coming from different ways of doing things. I
11 mean --

12 MR. GRANT: Yes, but again, not nearly as
13 much. The scope, the traditional scope of the NSSS
14 vendor is now much larger in the Part 52.

15 CHAIR BONACA: Yeah.

16 MEMBER BLEY: You're doing all of the
17 buildings.

18 MR. GRANT: We've got all the buildings
19 that are a part of, again, the package. You go all
20 the -- the turbine building, for instance, is all
21 within the Westinghouse scope. The diesel generator
22 building, the control building, all of those things
23 are within the Westinghouse scope. About the only
24 thing that isn't out there are things related to
25 service water. If you've got a pump house structure

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1 down at a lake or a river or something, that might be
2 under and architect/engineer. We might contract that
3 with Westinghouse and let them build that as well. So
4 that's a possibility.

5 MEMBER BLEY: All the cable runs all of
6 that will be --

7 MR. GRANT: Cable runs, inside the plant,
8 absolutely. Cable run out to the pump house, maybe
9 not. Maybe that's an architect/engineer.

10 MEMBER BROWN: So NuStart is an
11 integrator?

12 MR. GRANT: No.

13 MEMBER BROWN: Who's in charge technically
14 with being -- with all the touch points and all the
15 interfaces if you've got all this? Is that -- it's --
16 Westinghouse has got a piece and AE's got another
17 piece?

18 MR. SISK: I should point out the
19 Westinghouse, as we look at the contracts, I mentioned
20 we had three contracts. We worked with a consortium
21 and we have the Shaw Consortium as part of the
22 Westinghouse team that is building that plants for the
23 contracts we have. We work with them and they provide
24 inputs from a constructive viewpoint into the design,
25 but as a standard plant, it's much more prescribed

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1 than what you may have been used to or may have seen
2 in the early days when you turned over a basic design
3 and the constructor kind of completed the design
4 through the process in Part --

5 MEMBER BANERJEE: So the Shaw is part of
6 it. If you wanted to go to Bechtel or something now
7 what would happen?

8 MR. SISK: Again, those are contractual
9 issues. It wouldn't matter, the design is the design.

10 MEMBER BANERJEE: And that's completely
11 frozen, right?

12 MR. CUMMINGS: So let me try to help here.
13 Westinghouse manages the design process for the
14 standard plant. But Westinghouse doesn't have the
15 competency in every single AE function. So we hire
16 and supervise and manage AE's such as Shaw, Consoldo,
17 Cobeck (phonetic) and others to help us finish the
18 design. In the end, in the context of NuStart,
19 Westinghouse owns or managed and is responsible for
20 the design of the standard plant, though it wasn't all
21 performed by Westinghouse. It was performed by
22 Westinghouse and the team of other designers who had
23 competencies that we needed.

24 The site specific things, Westinghouse
25 tends not to touch, so -- because we don't

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1 particularly have competencies there. And so some
2 architect/engineer like Shaw or Bechtel or somebody
3 else, does for the utility the site specific things
4 like intake structures and switch yards and then
5 there's still a need, because Westinghouse isn't
6 competent at construction management, for a
7 construction management, not an engineering role here,
8 but a construction management role, and Rob was
9 talking about that we have in the US an agreement with
10 Shaw to have a joint venture, Westinghouse/Shaw
11 construction team to deliver projects.

12 CHAIR BONACA: The reason why I asked the
13 question is that different companies have different
14 ways of doing the same thing.

15 MR. CUMMINGS: Yes.

16 CHAIR BONACA: And the question I'm asking
17 myself is that in this process of implementing would
18 there be any deviations de facto from the standard
19 design resulting from different approaches to
20 resolving issues. I mean --

21 MR. CUMMINGS: There should not be.

22 CHAIR BONACA: -- functionally, I
23 understand they had to commit to the standard
24 approach, but there are a lot of ways to skin a cat
25 and --

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1 MR. CUMMINGS: Yes, so Westinghouse is
2 managing a complete standard design and so if there
3 was to be some new AE, would be the constructor and we
4 would say, "You must construct it in our team to the
5 standard plant design. You don't get to redesign it.

6 You get to use your talents of construction
7 management to manage the sequence, but you still much
8 use the standard design. You don't get to revise the
9 HVAC criteria based on your design."

10 CHAIR BONACA: Well, that's the HVAC. I
11 mean, that's typically from plant to plant there are
12 so many variations on how they would implement it.
13 That was tied to the tradition often times of a
14 specific aid. Now, have you specified in such a
15 detail the HVAC system that you're confident --

16 MR. CUMMINGS: Completely.

17 CHAIR BONACA: Okay.

18 MR. CUMMINGS: Completely.

19 MEMBER BANERJEE: Now, when you say
20 specified, that means that there could be many pieces
21 of equipment on the market that could meet those
22 specs, right?

23 MR. CUMMINGS: Yes.

24 MEMBER BANERJEE: So now there are going
25 to be some detail differences in that equipment. How

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1 will it meet the specs of -- you know, it's not exact
2 ever. How do you handle that?

3 MR. CUMMINGS: Yeah, there is a threat, a
4 tiny threat to standardization in that when you buy a
5 valve from Vendor A, and a valve from Vendor B, their
6 weight and center of gravity are not the same and you
7 have to do your analysis over again. I guess our --
8 we're not mature here. We're buying our first set of
9 valves. But our intention is to buy the valves from
10 the same vendor, but that intention will last as long
11 as that vendor is working with us in a rational way.

12 So it could be that we need to have
13 another supplier and that could mean a small change in
14 the design.

15 MEMBER BANERJEE: Now, does this also
16 extend to a more significant pieces of equipment like
17 water heaters --

18 MR. CUMMINGS: Turbines, diesels, pumps,
19 yes, all the way.

20 MEMBER BANERJEE: All the way.

21 MR. CUMMINGS: Everything.

22 MEMBER BANERJEE: You bid this process out
23 or you work with a specific vendor?

24 MR. CUMMINGS: Both. We do both of those
25 things.

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1 MEMBER BANERJEE: Keep the price.

2 MR. CUMMINGS: Well, we try to be
3 commercially sensitive. In the end, our customers
4 receive the benefit of our commercial sensitivity.

5 MEMBER RAY: There used to be an NRC
6 approved topical reports that describe how different
7 things were analyzed and do those still exist now
8 within this confined area of responsibility?

9 MR. CUMMINGS: Well, the design is
10 complete. It has specs and calculations and --

11 MEMBER RAY: The containment response, for
12 example, used as an example --

13 MR. CUMMINGS: Yes.

14 MEMBER RAY: -- Bechtel had a topical
15 report that described how they did a containment
16 analysis.

17 MR. SISK: The answer to that question is,
18 yes, you'll find that there are a lot of references in
19 the DCD to approve topicals and approved --

20 MEMBER RAY: So it's not like those have
21 gone away.

22 MR. CUMMINGS: No, approved methods are
23 like ASTRUM is one. It's an approved method. It's an
24 approved method, we're going to use it.

25 MR. SISK: ASTRUM right now, we've

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1 submitted as a separate topical for approval for the
2 AP1000. It would become a reference to the DCD.

3 MEMBER BANERJEE: So it would be
4 applicability of ASTRUM to AP1000 which is the issue.
5 ASTRUM has been approved.

6 MR. CUMMINGS: Right, ASTRUM was approved
7 for probabilistic treatment of large break LOCAs for
8 operating plants. It has not been approved for AP1000
9 and we're seeking that approval as --

10 MEMBER BANERJEE: It's an applicability
11 tool.

12 MR. CUMMINGS: It's an applicability
13 question, that's correct.

14 MR. GRANT: The last thing I'd like to
15 point out on this slide is in the bottom right-hand
16 corner there, the 20/70. Twenty percent represents
17 the percent that would be standard with all the
18 chapters. Chapter 2 is a very large chapter. It's
19 very plant-specific. In fact, as it indicates, it's
20 all plant specific. If you take Chapter 2 out and
21 just look at the remaining information, it's about 70
22 percent standard information. So it's quite a large
23 number again for the remainder of the document.

24 MR. HASTINGS: That's the weight versus
25 volume.

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1 MR. GRANT: Next slide, last slide, just a
2 summary here. Things we've talked about, we use
3 incorporation by reference quite a bit in Part 2 and
4 also in Part 10, the FSAR and in the proposed license
5 conditions, particularly with regard to ITAAC. Part
6 4, we have almost -- well, we have duplicated the
7 generic technical specifications and completed the
8 remaining brackets and it is very much standard
9 information. I don't know that any of our people or
10 any of our applications have done any deviations or
11 departures, other than Bellefonte has one minor one
12 with regard to containment leak rate testing.

13 MEMBER BANERJEE: I'm still back at the
14 piping diagram you were talking about. Suppose you
15 bid out your pump or whatever, and you get things
16 which have inlets and things in slightly different
17 places, how do you handle that? That's what I was
18 wondering what flexibility you have in these types --

19 MR. SISK: I think --

20 MR. CUMMINGS: If you change a pump and it
21 has a nozzle in a different place, then you have to
22 deal with the impact on the entire design. And
23 therefore, it certainly is going to impact the piping
24 analysis for that pipe that you get back somehow, and
25 then the pressure drop in the system and all those

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1 things. So if you change something, you have to deal
2 and create a new small bit of the design, which I'd
3 have to say, we would say is not standard or maybe
4 it's your new standard. If you've decided to give up
5 on Vendor A and go to Vendor B, in the long run, it's
6 a new standard. And hopefully those things are minor
7 things and they can be accomplished with 50.59 or
8 departure kind of descriptions if they're written
9 about in the DCD.

10 If they are written about in the DCD, then
11 as the COL applicant would apply, and they'd use this
12 new pump, they'd have to deal with the things in the
13 DCD that changed as a result of that.

14 MEMBER RAY: Thank you. We've got ample
15 time for the staff, Eileen tells me so --

16 MR. GRANT: Thirty seconds here to finish
17 up. I just wanted to run through these last four
18 bullets of information that is again, standard
19 material within the FSAR NEI templates provide much of
20 the standard information. Some of these are
21 incorporated again, directly by reference so that we
22 don't repeat or mess up repeating the document that
23 was already approved. Radiation protection training,
24 ALARA maintenance process control program and the off-
25 site dose calculation manual are some of those types

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1 of NEI templates that we have used and referenced or
2 incorporated by reference.

3 We have some others such as in-service
4 inspection, in-service testing, containment leak rate
5 testing programs that are very much, again, common
6 standard program descriptions. We've got a lot of
7 procedural information that -- where we describe the
8 procedures that we're going to use and indicate what
9 types of procedures. Those will be common for all the
10 AP1000s. Many of the COL information item closures
11 were standard information. There are a few where we
12 deviated and identified those as plant specific.

13 There were -- as we were going through and
14 looking at the new guidance that was developed, the
15 Reg Guide on how to develop a COL application, we had
16 identified that there were some requests for
17 information that hadn't been addressed by the DCD and
18 so we've added some supplemental material in order to
19 address those items. Again, much of that supplemental
20 material is standard information, again, a few items
21 that aren't that are plant specific. Again, the 70/30
22 split arrangement.

23 And then we've got a few items that are a
24 little bit different and I call these standard
25 methods. They won't be identified as standard in the

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1 discussion. They will show up as plant specific
2 information because there is plant specific
3 information in the discussion. An example of this
4 would be the cost benefit analysis, for instance, on
5 determining if you need to make a change in order to
6 reduce dose. All of those numbers are going to be
7 plant specific because you do that with a
8 consideration of the surrounding population. But the
9 methodology is the same. Each and every one of us did
10 those evaluations exactly the same. We just put in
11 our plant specific numbers. And so the numbers will
12 be different in each one of those.

13 PSHA for the seismic issues and
14 determination there of the appropriate seismic
15 valuations to be done, was done on a standard basis,
16 the approved basis. So those are done the same way.
17 The numbers come out different because they're site
18 related, but again, the evaluation methodology is all
19 the same. Hopefully, all this was clear and what I've
20 been able to do is express how much of this
21 information is actually standard material. So you'll
22 see this one time and hopefully the next time you see
23 another plant of this vintage or this type, you will
24 need only concern yourselves with the plant specific
25 materials. Any questions?

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1 MEMBER SHACK: Just one, you're updating
2 the seismic analysis. You will now have a bounding
3 hazard curve that will be applicable to all the
4 NuStart applicants? Is that the goal?

5 MR. SISK: Yes.

6 MR. GRANT: What we then do is identify
7 the plant specific item that shows it is bounded,
8 indeed.

9 MEMBER RAY: All right, anything else?

10 Now, we've got this time now for the staff
11 presentation. I guess Frank is gone, so Eileen?

12 MS. MCKENNA: Good afternoon. I'm Eileen
13 McKenna. I'm a Branch Chief in the Office of New
14 Reactors with responsibility for the AP1000 design
15 certification amendment review. As indicated in the
16 slide -- some of this will be a repeat of what you've
17 already heard and I will cover that material very
18 quickly. The design certification is Appendix D to
19 Part 52 and it's approved Revision 15 to the AP1000
20 design control document, and it was published in early
21 2006. The staff issued a safety evaluation report
22 NUREG-1793 to document its review of the AP1000
23 design.

24 After completion of the certification
25 rulemaking, the staff began some interactions with

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1 NuStart on what we refer to as technical reports which
2 were documents that discussed potential changes to the
3 design control document and the supporting basis for
4 those changes. It was kind of a pre-application
5 review in anticipation perhaps of being departures for
6 a COL. And so the staff did begin reviewing these
7 technical reports and had RAIs and exchanges with
8 Westinghouse on the content of those documents for
9 various design changes and resolution of COL
10 information items.

11 I mention it here primarily because when
12 you see the safety evaluation chapters, you will see
13 on occasion references to technical reports because in
14 many cases, that's where a lot of the detail about why
15 particular changes were being proposed was contained.

16 So, I didn't want you to be confused if you saw those
17 references to what these technical reports might be.

18 MEMBER BANERJEE: No, these technical
19 reports are informational. They're not methods that
20 require approval.

21 MS. MCKENNA: That is correct. One of the
22 reasons we call them technical reports is so they are
23 not confused with topical reports, which have a whole
24 different purpose in the regulatory process.

25 MEMBER RAY: Can you give us some

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1 examples, please, Eileen?

2 MS. McKENNA: Sure, there were issues on -
3 - I'll take one example. There were some changes made
4 to the pressurizer for a number of reasons, so there
5 was a technical report that explained, "Here's all the
6 changes that we're making to the configuration of the
7 pressurizer". There's some of the I&C areas where
8 topical report -- excuse me -- technical report, for
9 example, is a failure modes and effects analysis of
10 some of the I&C systems.

11 There's technical reports on, as was
12 mentioned earlier, the potential for relocation of the
13 technical support center, there was a report on that.
14 So there's a whole range of --

15 MEMBER RAY: Are these all anticipatory to
16 something that then would be reflected in an
17 amendment?

18 MS. McKENNA: Well, at the time that these
19 began, the amendment concept hadn't even been born.
20 So this was kind of the only way there was to deal
21 with these changes to a design certification would be
22 through departures as -- in the COL process.

23 MEMBER RAY: Well, they'd be picked up in
24 the COL.

25 MS. McKENNA: Yes. And -- but in parallel

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1 with the staff review of these technical reports, the
2 Commission was revising Part 52 and one of the
3 provisions that was included in there was a provision
4 to actually amend a design certification and as you'll
5 see say on the next slide, that's the route that was
6 chosen, was to send in an application to amend the
7 design certification and to put all of those design
8 changes we had seen in the technical reports into a
9 Revision 16 to the design control document and provide
10 that application to the NRC for review.

11 MEMBER CORRADINI: Just so I -- I mean,
12 just I guess maybe more legalism but I'm just kind of
13 curious, it requires an amendment when it effects Tier
14 1 or when it effects Tier 1 and Tier 2?

15 MS. McKENNA: It requires an amendment to
16 make generic changes to the design control document
17 which is the certification material.

18 MEMBER CORRADINI: But I thought the rule
19 was Tier 1.

20 MS. McKENNA: The rule is Tier 1, but it
21 also -- the rule also approves the Tier 2 information
22 and --

23 MEMBER CORRADINI: So any change in Tier 2
24 requires an amendment.

25 MS. McKENNA: On a generic basis, as was

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1 mentioned. Departure could be done on an individual
2 plant basis.

3 MEMBER CORRADINI: And those departures
4 would not require an amendment but the staff could
5 approve it --

6 MS. MCKENNA: It would depend on whether
7 they were Tier 1 or Tier 2 or not.

8 MEMBER CORRADINI: But I mean, just -- I
9 was going to take your example of the pressurizer just
10 to understand.

11 MS. MCKENNA: Yes.

12 MEMBER CORRADINI: So let's say nothing in
13 the Tier 1 description is a pressurizer change, but
14 something about the design of the pressurizer that
15 effected a Tier 2 description, if it was generic, it
16 requires an amendment.

17 MS. MCKENNA: Right.

18 MEMBER CORRADINI: If it was -- that's a
19 way to do it generically.

20 MS. MCKENNA: That's a way, yes.

21 MEMBER CORRADINI: If it was just for
22 Plant X, it could be a departure that the staff would
23 approve on the fly.

24 MS. MCKENNA: Correct.

25 MEMBER CORRADINI: Okay.

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1 MEMBER BLEY: But if -- this whole
2 process, if it's the lead plant, and it's included for
3 that plant, then other plants can do it by reference,
4 right?

5 MS. MCKENNA: Well, I wouldn't say by
6 reference. They would do it through the standard
7 content, perhaps, then they would have to take a
8 standard departure. For example, if that was the path
9 that had been chosen.

10 MEMBER CORRADINI: Okay, sorry, I just
11 wanted to understand.

12 MS. MCKENNA: Yeah, I know, this is -- one
13 of the reasons we're having this briefing is because
14 this amendment process is a bit unique and we wanted
15 to make sure before you actually saw the safety
16 evaluation sections that had some appreciation of what
17 it is.

18 MEMBER CORRADINI: Okay, thank you.

19 MS. MCKENNA: And I this bullet about
20 52.63, that's the provision that was changed in the
21 rule that provides the basis and criteria by which
22 people can seek to have an amendment to a design
23 certification. It includes a number of criteria, such
24 as resolving DAK (phonetic), increasing things that
25 would lead to increased standardization, things like

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1 that.

2 MEMBER CORRADINI: So since we're on
3 legalism --

4 MS. McKENNA: Yes.

5 MEMBER CORRADINI: When does a DAK turn
6 into a real DCD? In other words, the previous set of
7 speakers made this big pitch that piping is going to
8 get detailed enough that it isn't DAK any more. It is
9 part of the real DCD.

10 MS. McKENNA: Well --

11 MEMBER CORRADINI: When does green turn to
12 blue?

13 MS. McKENNA: What would happen in this
14 case is that one of the changes that's in the
15 application is to remove those sections right now that
16 are in Tier 1 in the ITAAC sections that say, you
17 know, piping deck and have to be done, and then to
18 take those away and instead have information that the
19 piping is all designed.

20 MEMBER CORRADINI: So it's what is removed
21 from the ITAAC and what is accepted by the staff as
22 closed after review --

23 MS. McKENNA: Correct.

24 MEMBER CORRADINI: -- in the normal Tier
25 1, Tier 2 structure.

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1 MS. MCKENNA: Right.

2 MEMBER CORRADINI: Got it.

3 MEMBER BLEY: And that's through the
4 amendment process.

5 MS. MCKENNA: Correct, yes. I just noted
6 here, which I think was mentioned, is that we received
7 Revision 17 in September that kind of brought the
8 application up to date on what had happened over the
9 course of that period and provided a few additional
10 changes that had been identified at that point in
11 time.

12 My last bullet on this page is just to
13 note that, you know, things haven't been static since
14 September. We've had changes to the design and new
15 information to the design control document have
16 occurred since then, so when you see the safety
17 evaluation chapters, you will see information that's
18 post-revision 17 that will ultimately appear in
19 Revision 18, but in the SER sections you will -- they
20 will point to what was the scope of review. Did the
21 review Rev 17 and these four RAI letters or whatever
22 was put -- information that that particular SER
23 reviewed.

24 MEMBER CORRADINI: I'm sorry to ask this,
25 but since we're on --

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1 MS. McKENNA: Sure.

2 MEMBER CORRADINI: -- all these sorts of
3 things, has the staff determined that there's going to
4 be a frozen Rev X and that's what you will essentially
5 have clean and present to the ACRS?

6 MS. McKENNA: I think at the time, -- the
7 time that we are having these meetings now it's not
8 frozen, because we have open items. The time we come
9 to you, that will be called Phase 5, which is when we
10 have the SER with no open items we will have a frozen
11 document.

12 MEMBER CORRADINI: Okay, thank you.
13 Thank you.

14 MS. McKENNA: Which brings me to my six-
15 phase schedule. I think you've heard this before the
16 six phases being the RAIs, SER with open items, ACRS
17 review of that document and advances SER additional
18 ACRS review on that, and issues of the final SER.
19 This next bullet, I think we touched on earlier in the
20 discussion, that our review was focusing on the
21 changes and we are using our, you know, standard
22 review plan to guide the staff in its review of the
23 changes. Our intent is that we are going to be
24 issuing to Westinghouse individual chapters while
25 we're in this Phase 2 SER with open items.

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1 And the reason -- one of the reasons is
2 that the review is -- the chapter is going to be
3 coming into closure over a period of time and we want
4 to get the information out to Westinghouse and in
5 front of the Committee over that period of time and
6 not wait and have one big pile of documents that has
7 to be processed at one time. Another key point in
8 this bullet is that what we're going to be issuing is
9 a supplement to the earlier NUREG. It is not a
10 complete reissuance of NUREG 1793. The SER discussion
11 will only look -- be discussing changes.

12 So when you see, kind of more like you
13 might have seen in the past with operating plants
14 where there was an initial NUREG that came out and
15 then there were supplements that talked about issues
16 that were still remaining. Here we were going to be
17 looking at just changes. So in a particular chapter
18 you might see a 5.1 and a 5.3 and a 5.7 because those
19 were the only parts of the design control document
20 that had any changes.

21 MEMBER CORRADINI: I might be the only one
22 that doesn't know this, what's NUREG 1793?

23 MS. McKENNA: That was the SER for the
24 certification.

25 MEMBER CORRADINI: Oh, thank you.

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1 MS. COFFIN: For Rev 15.

2 MS. McKENNA: For Rev 15, yeah. So that's
3 a key point here is that, it's not a re-issuance.
4 It's not a re-review of the entire certification.
5 It's not a re-issuance of the whole SER.

6 MEMBER CORRADINI: Thank you.

7 MS. McKENNA: You'll see this bullet
8 later. Our intention is to bring these chapters to
9 the ACRS with the same chapter from the R-COLA
10 applications. You can see how the pieces line up.
11 You can see what's changed in Chapter 4 of the design
12 control document. You will see this very small SER,
13 presumably on Chapter 4 because of the IBR that was
14 mentioned earlier, so you can see how the pieces fit
15 together.

16 MEMBER BANERJEE: You're going to give us
17 some context in this.

18 MS. McKENNA: We're going to try. I think
19 the context -- as I said, the Chapter 1 of the SER
20 will laid out the fact that this is a supplement and
21 that we're reviewing changes and then the SERs will
22 say, "These are the changes that are being reviewed in
23 this section", and they will describe very
24 specifically what they are. Then the staff will
25 present its evaluation of those changes and then its

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1 conclusions as to how those changes meet the
2 applicable requirements. And I hope that gives you
3 enough context. I mean, this is --

4 MEMBER BANERJEE: We'll see.

5 MS. McKENNA: We'll see, yeah, something
6 nobody's done before. So --

7 MEMBER RAY: Just going from light water
8 to sodium cooled. That's a small consequence.

9 MS. McKENNA: Small difference.

10 (All talking at once.)

11 MEMBER BROWN: I need a recalibration
12 here. Incorporate by reference --

13 MS. McKENNA: Yes.

14 MEMBER BROWN: -- does that mean it takes
15 the reference design and incorporates it into this
16 next whatever it is without change?

17 MS. McKENNA: Yes, the incorporation by
18 reference is that you're taking the information from
19 the design control document --

20 MEMBER BROWN: The reference design
21 control document.

22 MS. McKENNA: Reference -- the design
23 control document for the AP1000 design and that you
24 are taking, let's say a chapter or a large section of
25 saying that -- the COL applications says, "I am -- I,

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1 COL, am incorporating that information from the design
2 control document into my FSAR."

3 MEMBER BROWN: Is that like, well, Rev 15
4 was the --

5 MS. McKENNA: The certified design, yes.

6 MEMBER BROWN: -- certified design. So
7 you would take something out of that, incorporate it
8 by reference into whatever the next --

9 MS. McKENNA: What's happening in the
10 amendment is not an incorporation by reference
11 process. It is amending the initial certification.
12 When we're done, there will be a design control
13 document Rev X that will have the entire content of
14 what needs to be in a design control document. Some
15 of that information will come from Revision 15. Some
16 of it will come from this later revision, but it will
17 all be one complete, intact document. Then when you
18 move over to the COL side, the COLs will then kind of
19 -- generally, it's not a chapter or a large
20 subsection. They say, "We incorporate by reference
21 Chapter 7 of the design control document into our COL
22 FSAR", and it would be whatever revision is the one
23 that's being certified. Got that?

24 MEMBER BLEY: Let me try it and Eileen,
25 see if I --

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1 MS. McKENNA: Yeah, help me out here.

2 MEMBER BLEY: There are normally one DCD
3 for that design and that's it. That is the certified
4 design. Any time you talk about the certified design,
5 that's it. And it's the things that were the Tier 1
6 and Tier 2+ that are locked in. And when you want to
7 actually build a plant and get a license for it, you
8 have to license that, that's a COL and you write your
9 own FSAR but if you're smart, it will be essentially
10 everything that was in the DCD, so it doesn't have to
11 get reviewed again.

12 MS. McKENNA: Well, is that -- it comes
13 from the design and secondly, we'll talk about is the
14 rest of the information that wasn't in the design
15 certification.

16 MEMBER BLEY: That wasn't there.

17 MEMBER BROWN: As far as trying to -- when
18 you go to do the COL part, I realize, I knew, that's
19 why they were trying to explain this to me, because
20 I've only heard it on ESBWR and I lost it there six
21 months ago.

22 MS. McKENNA: That's fine.

23 MEMBER BROWN: The COL, you've got the
24 design, the DCD that was Rev 15. That's where we
25 started on this.

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1 MS. McKENNA: Right.

2 MEMBER BROWN: Now, you've got a licensee
3 who wants to go build one of these and he'd like to
4 take that entire DCD and incorporate that as part of
5 his COL, without change, if he could. If he can't
6 something has to change, then the sub-chapters of the
7 DCD have to be modified in some way; is that correct
8 or not?

9 MS. McKENNA: If -- it depends, if a
10 specific COL can't or chooses not to fully incorporate
11 the design control document, that's a departure. If
12 there's a decision to generically change the design
13 control document, that's a rulemaking, so we have the
14 amendment. If everybody chooses to make the same
15 plant specific departure, or similar plant specific
16 departure, that's multiple plant specific departures.

17 MEMBER BROWN: We've got to go on.

18 MS. McKENNA: I know. Yeah, I just --

19 MEMBER BANERJEE: The schedule is looking
20 more like two and a half years, right?

21 MS. McKENNA: Yeah, well, this schedule,
22 you know, we didn't try to fit it into the template
23 because you know, the schedule is what it is. That's
24 what we think it's going to take us to finish the
25 information that we have in front of us and move it

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1 through the process.

2 MEMBER CORRADINI: So that implication
3 there, it's a very significant set of changes, right?

4 MS. MCKENNA: I think the significance is
5 in the eye of the beholder. There is a lot of
6 changes. Some of them that we consider significant
7 and I think just the shear quantity is what leads to,
8 you know, the kind of schedule that we're on.

9 I think you saw some of these already. I
10 won't dwell on it, because these are some of the same
11 issues that were on the Westinghouse slide. These are
12 some of the things that --

13 MEMBER BANERJEE: You said there would be
14 four subcommittee meetings more or less. That would
15 be finished the end of this year.

16 MS. MCKENNA: That's -- that is if we have
17 the early 2010 if needed. And then if you look at the
18 schedule side, you see we say our last chapter.
19 Currently, our schedule shows the last chapter is
20 coming out in January. Obviously, Westinghouse is
21 hoping we can beat that schedule and that we can
22 finish the subcommittee reviews this year. We're not
23 sure yet whether we'll get there. So it may spill
24 over into next year.

25 And that's all I had on the design cert,

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1 unless there's any other questions.

2 MS. COFFIN: I've got 10 minutes.

3 MEMBER CORRADINI: You're doing great.

4 MS. COFFIN: All right, similar to
5 Eileen's presentation, my name is Stephanie Coffin and
6 I'm responsible for the COL applications that are in
7 and under review. It's a six-phase review schedule,
8 similar to the design cert. REIs are the first phase.

9 Second phase is safety evaluation with open items and
10 that's the phase that we're in now. On the COL side
11 of the house, our review is focused on a resolution of
12 COL items from the design cert amendment and here's
13 well over 100 of these that we need to review and
14 approve.

15 Operational programs are generally not in
16 a design control document. They're on the COL side of
17 the house and we will be reviewing -- there's about 15
18 operational programs that we'll be presenting to you
19 and then there's the site specific aspects, and those
20 are the ones that you have seen in early site permit
21 reviews; the meteorology, the hydrology, the
22 seismology, emergency plans.

23 The third bullet talks about how we're
24 going to structure our issuance of the SER with open
25 items. We're going to follow our design cert

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1 amendment lead and we're going to be issuing our
2 chapters on the reference COL at the same time or soon
3 after the design cert chapters are issued. We want to
4 make sure that the integration has occurred, that the
5 staff feels confident that the conclusions that
6 they've made on the design cert carry over
7 appropriately onto the COL side of the house.

8 The presentations that we'll be making in
9 front of you in July and October and November, we want
10 to give you an integrated presentation because we want
11 you to understand the licensing basis that's going to
12 be, you know, fundamental to issuing these licenses
13 and it's a combination of what's approved in the
14 design control document and what's approved in the
15 FSAR. We want to make sure you have a clear
16 understanding of how the whole picture, how it all
17 comes together. Can you go to the next slide, please?

18 Again, the key review issues, the first
19 one is that we demonstrate the AP1000 design is
20 suitable for that particular site. The second bullet
21 talks about the site safety issues. The third bullet
22 gives you some examples of some of those operational
23 programs. You're familiar with all of these programs,
24 so not anything particularly unique to this design
25 center but certainly they are customized to the AP1000

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1 design and then evaluation of COL items and I've
2 listed several of them there. Next slide.

3 Now, the structure of the safety
4 evaluation, I wanted to spend some time talking about
5 that because it's going to be a little unusual and
6 probably unique to what you have seen, you might be
7 accustomed to seeing in a safety evaluation report.
8 Here are -- essentially, we structure out safety
9 evaluation reports to mimic the safety analysis
10 reports that's in those applications and so as Eddie
11 Grant was talking to you about sections that are
12 incorporated by reference and which they simply point
13 to the design control document and that's all they do.

14 Then there are going to be sections of the
15 safety analysis report that talk about standard
16 content and that is common to every COL application
17 that we have in front of us, and you will be seeing it
18 for the first time on the reference COL.

19 MEMBER BANERJEE: So let me get -- these
20 are two things that are happening in parallel.

21 MS. COFFIN: They are.

22 MEMBER BANERJEE: But the design control
23 document is still not certified, so it's sort of in
24 like flux.

25 MS. COFFIN: Correct.

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1 MEMBER BANERJEE: Let's put it this way.
2 So but they can still refer to that while it's in
3 flux.

4 MS. COFFIN: Correct.

5 MEMBER BANERJEE: But if something
6 changes, then what happens?

7 MS. COFFIN: And how we handle that is
8 through a very important open item that essentially
9 says, "Our review on the design cert amendment is not
10 complete". And so what has to happen at the end of
11 the day -- and that's why it's important that in our
12 mind that we follow the design cert amendment. We
13 don't want to get ahead of the design cert amendment.

14 MEMBER BANERJEE: Right, you can't.

15 MS. COFFIN: We can't, to insure that
16 bookkeeping, which doesn't give it a proper
17 characterization how important it is, takes place. So
18 at the end of the day that --

19 MEMBER BANERJEE: This is sort of
20 expedited process in some sense.

21 MS. COFFIN: We never envisioned doing
22 that quite so concurrent.

23 MEMBER CORRADINI: But these are becoming
24 concurrent not just here.

25 MS. COFFIN: That's absolutely true.

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1 MEMBER CORRADINI: You have other
2 concurrent events.

3 MEMBER RAY: This is not unique in that
4 respect.

5 MEMBER BANERJEE: Yeah, but the scope of
6 the concurrence here is much smaller than in the other
7 one --

8 (All talking at once.)

9 MS. COFFIN: So you will see similar to
10 how the applications are presented in that they have
11 an incorporated by reference part, they have a
12 standard portion and they have site specific content,
13 similarly, our safety evaluation report is going to be
14 structured in a manner such that it's very clear to
15 you what was IBR, incorporated by reference, what was
16 standard, and what was site specific and our goal
17 here, again, is to make sure that all of this
18 information is clearly discernible in the SER and this
19 is particularly important because it's laying the
20 stage for when you guys see the subsequent COL
21 applications because we're not going to be coming back
22 to you to revisit standard material. So we want to
23 make sure you feel very comfortable and confident in
24 the incorporated by reference portion and the standard
25 portion, so that the subsequent COLs we can focus on

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1 the site specific content.

2 MEMBER BANERJEE: Which COL is going to
3 lead the way here?

4 MS. COFFIN: In the end it appears to be
5 Vogtle. But, again, I may be over-simplifying it but
6 in terms of which applicant is the reference, it's not
7 that critical. What's critical is that standard
8 content is clearly identified, and whichever docket
9 they want that review performed against is -- doesn't
10 matter to us in a sense. We just want to be very
11 clear what's standard and -- so this transition, I
12 think it's on the next slide, that the industry
13 presents, it's something about communication challenge
14 and I don't want to under-estimate that but it's
15 definitely workable and we support the transition from
16 this.

17 So again, to reiterate some of the
18 presentation that Peter did earlier today, the entire
19 safety evaluation of open items is going to be issued
20 against the TVA Bellefonte docket, but Vogtle is going
21 to respond to those open items that are related to
22 standard content and the staff is going to turn its
23 attention to developing the final safety evaluation
24 report against the Vogtle -- the Vogtle docket. So
25 our expectation is Phase 5, the first application

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1 you're going to see is Vogtle.

2 They also -- Vogtle also needs to resolve
3 any outstanding site specific issues and Dr. Powers
4 pointed out a very critical one for them to insure
5 comes to resolution. Can you go to the next slide?

6 The review schedule is being updated. The
7 design cert amendment schedule has been changed and so
8 we need to make sure our reference COL schedule
9 comports with that to insure the proper sequencing of
10 events here. I talked about Phase 2. We're in that
11 now and we'll be issuing the chapters on the same day
12 or soon after the Westinghouse design chapters are
13 issued. Again, we're coming to the meetings to give
14 you an integrated presentation at the same time. So
15 Phases 4, 5 and 6 we are still working on exactly what
16 those dates will be and we need to factor in the
17 design cert amendment review, the remaining open items
18 on standard content and we need to look at Vogtle's
19 site specific issues that are still outstanding to
20 kind of finalize the review schedules for Phases 4, 5
21 and 6. Next slide.

22 So here's kind of a preview of our next
23 meetings. This is the AP1000 subcommittee meeting. I
24 think we do expect the Applicant and staff to both
25 give presentations. We're focusing on key review

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1 areas and on the open items. We'll be issuing the
2 chapters at least 30 days prior to the meeting. Any
3 feedback that you have to give to us on any particular
4 topics of interest is very much appreciated. We're
5 always happy to make sure we address any of your
6 particular interests.

7 And one thing that -- I'm not sure if this
8 is an unusual request or not, but because these
9 meetings are spread out over quite a long period of
10 time, we're very much interested in getting early
11 feedback from you in the form of interim letters. I'm
12 not quite sure what the right way to characterize that
13 is, but if you have issues with the material that you
14 see presented at the July and subsequent meetings, we
15 really would like to hear from you so that we can
16 address it and come back to you at Phase 5 and give
17 you the answers to your questions.

18 MEMBER BANERJEE: Let me ask a question.
19 Is there going to be any change in the thermal power
20 of this system so the use of ASTRUM is only to buy
21 margin? It's not to cut into a piece of that margin.

22 MS. McKENNA: There is no change in the
23 proposed thermal power for the plant. That was, I
24 think, one of the comments about, you know, the safety
25 analysis that was said, you know, from that

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1 perspective, it's the same AP1000. Comments were made
2 about the reasons for ASTRUM.

3 MEMBER RAY: Other questions?

4 MEMBER SHACK: So just, on this July
5 meeting, you're going to do all the key issues?

6 MS. MCKENNA: No, no, the specific
7 chapters.

8 MS. COFFIN: Specific chapters.

9 MEMBER SHACK: Do you know which ones?

10 MS. COFFIN: We have a subset -- certainly
11 we want to --

12 MEMBER SHACK: I'm taking notes, too.

13 MEMBER CORRADINI: You know, it's like
14 coming attractions.

15 MS. COFFIN: Exactly. We have a subset,
16 Chapters 1 -- we certainly want to present 1 because
17 that gives kind of the overview and a context of the
18 review and so we certainly plan doing 1. Four and 5
19 look very likely, 10, 11, 12, 14, 17, 18, 19. Now
20 when you look at the number of chapters, that might be
21 too much. It might be too much for one day. And so I
22 think at a minimum, we're shooting for, I think eight
23 chapters might be a reasonable amount but it really
24 depends on --

25 MS. MCKENNA: Well, again, I think you

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1 have to keep in mind that a design cert amendment is
2 not the same scope of -- it's not your design
3 certification chapter. The COL information would be
4 comparable to what you'd see on any other design
5 center, so hopefully it's not as overwhelming as it
6 sounds.

7 MEMBER CORRADINI: So let me help you all
8 since we're talking about this; this will essentially
9 be the same approach taken with ESBWR.

10 MEMBER POWERS: Oh, God.

11 (Laughter)

12 MS. COFFIN: So you like that approach.

13 MEMBER CORRADINI: I'm basically
14 reflecting on what the staff has planned.

15 MS. McKENNA: Well, I think there is a
16 difference with respect to how we plan to package --

17 MEMBER CORRADINI: I mean, on the COL
18 side.

19 MS. McKENNA: Okay, on the COL side, I
20 can't really speak to what they're doing on ESBWR. I
21 know they're coming in June, I believe, with the North
22 Anna but Tom maybe you can speak more specifically to
23 that.

24 MS. COFFIN: Tom is the Lead Project
25 Manager for North Anna.

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1 MR. KEVERN: I'm Tom Kevern, the Lead
2 Project Manager for North Anna and I met with Mike
3 earlier this week and we were talking about the
4 schedule for North Anna. June 18th is the first
5 subcommittee date for North Anna and we intend to go
6 through approximately eight North Anna chapters,
7 similar to what Stephanie just said. And the chapters
8 are brief in content because most of the material is
9 incorporated by reference, exactly the same approach
10 that Eileen and Stephanie have been talking about.

11 The only difference is it's more
12 simplistic because there's no amendment, as you well
13 know. GSPGR (phonetic) is a little cleaner in that if
14 it doesn't exist --

15 (Laughter)

16 (All talking at once.)

17 MS. COFFIN: -- the amount of material
18 seems appropriate. We'll get that feedback. We want
19 it to be a meaningful information exchange.

20 MEMBER RAY: Mike Lee would like to make a
21 comment.

22 MR. LEE: Yeah, just before this meeting,
23 I received from Dave some SER chapters and I presume
24 what I received will be included in the July meeting.

25 MS. McKENNA: In general, yes. Yeah.

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1 MR. LEE: I just want to make sure we
2 don't get the --

3 MS. McKENNA: Oh, your talking about that
4 but I think one of the points is we want both chapters
5 to go together, the COL and the design cert. We want
6 to make sure both chapters are ready for the -- at the
7 July meeting.

8 MS. COFFIN: So let me give you an
9 example. On Chapter 2, the design cert may be ready
10 to go. They might be able to present it at the July
11 meeting but the site specific part is not ready and
12 again, I think it's helpful to present an integrated
13 approach.

14 MEMBER RAY: Mike, Stephanie, let me
15 interrupt. It sounds like something you guys should
16 talk --

17 MR. LEE: I think what we need is just --

18 MEMBER RAY: We don't need to take up the
19 committee's time here on this. We're overtime.
20 Anything else that has to be done? Okay, Mr.
21 Chairman?

22 CHAIR BONACA: Thank you for the
23 presentation and with that we'll take a brief break.
24 I mean it.

25 (All talking at once.)

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1 CHAIR BONACA: Hey, we have a letter to
2 approve tonight, because Dana won't be available
3 tomorrow so we have -- you know, I don't know how long
4 it will take.

5 MEMBER APOSTOLAKIS: Is that Dana is
6 leaving?

7 CHAIR BONACA: Yeah, and then also -- so
8 10 of 5:00 we start again.

9 (Whereupon, a short recess was taken.)

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10 CFR 50.46a Rulemaking

Risk-Informed Change Control Process

Advisory Committee on Reactor Safety

May 6-7, 2009

Stephen Dinsmore

Senior Reliability and Risk Analyst
Office of Nuclear Reactor Regulation



10 CFR 50.46a Rulemaking

Risk-Informed Change Control Process

Overview of the risk-informed change control process

- Risk-Informed evaluation must be performed for all facility changes made under the rule
- Submittal required
 - For all changes made under the rule (unless self-approval is authorized)
 - To request optional self-approval authorization
- Change in risk acceptance criteria and estimates
- PRA update and reporting
- Risk assessment quality requirements
- Defense-in-depth, safety margins, and performance monitoring



10 CFR 50.46a Rulemaking

Risk-Informed Change Control Process

Risk-informed evaluation for changes made under the rule

- **Draft final rule:**

A staff reviewed and endorsed risk-informed evaluation process required for all facility changes after implementation of rule
- **Revised proposed rule:**

Risk-informed evaluation required for all facility changes made under the rule

 - Changes enabled by the rule – i.e., all changes that satisfy the revised ECCS analysis under the new 10 CFR 46a but do not satisfy the ECCS requirements under the original 10 CFR 46.
 - Other changes licensees choose to bundle in the change in risk estimate



10 CFR 50.46a Rulemaking

Risk-Informed Change Control Process

Submittal requirements

- **Draft final rule:**
 - Initial submittal to implement the rule - including risk-assessment process
 - Afterwards, submittals only required for facility changes that must otherwise be submitted for NRC review or changes to SSC(s) within the scope of the Maintenance Rule
- *ACRS Comment: Licensees should submit all changes that cause greater than very-small risk increases*
- **Revised proposed rule:**
 - Submittal required for each change unless self-approval authorized
 - Submittal required to request optional self-approval process
 - With authorized self-approval, submittal required for each more-than-minimal risk increase
 - Submittal required to bundle unrelated changes into the change in risk estimate



10 CFR 50.46a Rulemaking

Risk-Informed Change Control Process

Change in risk acceptance criteria

- **Draft final rule:**

Total increases in CDF and LERF [from all facility changes] are small and the overall risk remains small.
- *ACRS Comment: significant departure from current risk informed guidance which should be reviewed for its implications.*
- **Revised proposed rule:**

Total increases in CDF and LERF [for changes made under the rule] are very small and the overall risk remains small.



10 CFR 50.46a Rulemaking

Risk-Informed Change Control Process

Change in risk estimates

- **Draft final rule:**
Total cumulative risk increase estimate required - which could be estimated from the “current” CDF and LERF minus the CDF and LERF at time of rule implementation
- *ACRS comment: significant departure from current risk informed guidance which should be reviewed for its implications*
- **Revised proposed rule:**
The cumulative effect of previous changes made under the rule that have increased risk but have met the acceptance criteria shall be evaluated



10 CFR 50.46a Rulemaking

Risk-Informed Change Control Process

PRA update and reporting (no substantive changes)

PRA update

- No less than every two refueling outages
- After the update, licensee shall take appropriate action to ensure that the acceptance criteria are met

PRA reporting requirements

- Corrective actions and schedule if acceptance criteria are exceeded after an update
- Every 24 months, a short description of all self-approved changes since last report (if applicable)



10 CFR 50.46a Rulemaking

Risk-Informed Change Control Process

Risk assessment quality requirements (no substantive changes):

- PRA must address internal events, external events, full power, low power, and shutdown that would affect the regulatory decision in a substantial manner
- The PRA must
 - (Draft final rule: calculate CDF and LERF)
 - reasonably represent current configuration and operational practices
 - have sufficient technical adequacy and level of detail
 - have been subjected to industry peer review process
- Risk assessment other than PRA must be developed using an integrated, systematic process (Draft final rule: non PRA assessments shall produce “realistic results”).



10 CFR 50.46a Rulemaking

Risk-Informed Change Control Process

Maintain defense-in-depth:

- **Draft final rule**

Includes specific defense-in-depth attributes from RG 1.174 to make them criteria

- **Revised proposed rule**

Includes the specific attributes plus additional criteria for credited non-safety-related equipment

- Identified in TechSpecs (TechSpec change precludes self-approval)
- Described in the submittal
- Readily connected to onsite power



10 CFR 50.46a Rulemaking

Risk-Informed Change Control Process

Maintain Adequate Safety Margins (no substantive risk assessment changes)

- Adequate safety margins are retained to account for uncertainties

Implement adequate performance-measurement programs (no substantive risk assessment changes)

- Programs shall be designed to detect degradation before plant safety is compromised



§50.46a Rule to Risk-Inform ECCS Requirements (Redefinition of Large-break LOCA)

ACRS Meeting
May 7, 2009

Tim Collins, Senior Level Advisor
Office of Nuclear Reactor Regulation
Division of Safety Systems
Timothy.Collins@nrc.gov

Overview of Staff Presentation

- Summary of §50.46a rule concept
- Rule background and schedule
- Overview of revised proposed rule and changes made in response to ACRS comments
- Questions/discussion

§ 50.46a Rule Concept

- Alternative to current ECCS req'ts (50.46)
- LOCAs divided into 2 groups based on break frequency
- Mitigation must be demonstrated for all LOCAs but requirements are relaxed for lower frequency breaks
- Plant changes should be evaluated using a risk informed process

§50.46a Rule Background

Rulemaking initiation

- Commission SRM (March 31, 2003) directed staff to prepare proposed rule
 - Technical basis not completed
 - Staff sought additional guidance (SECY-04-0037, March 2004)
 - Provided in July 2004 SRM
- Proposed rule to Commission (March 2005)
- Commission directed significant changes
- Published November 7, 2005 (70 FR 67598)

§50.46a Rule Background

Original Proposed Rule

- 13 commenters, 11 from nuclear industry
- Most felt process was too burdensome to be cost-effective
- Staff held 3 public meetings;
 - address public comments and reduce rule burden
 - posted revised rule language on website
- Provided draft final rule to ACRS October 16, 2006
- Met with ACRS subcommittee (Oct. 31); full committee (Nov. 1)
- ACRS views in November 16, 2006 letter

§ 50.46a Rule Background

ACRS Letter

- Rule to risk-inform § 50.46 should not be issued in its current form
 - Insufficient defense in depth for pipe breaks larger than the TBS
 - Concerns with risk-informed assessment process
 - Concerns with plant specific applicability of expert elicitation and seismic analysis

§50.46a Rule Background

Response to ACRS Letter

- Staff requested additional Commission guidance (SECY-07-0082, May 2007)
 - on issues and rule priority
- Commission SRM - August 2007
 - continue rulemaking on reduced priority basis
 - increase overall defense-in-depth for breaks >TBS
 - elicitation results must be shown to be applicable on plant specific basis
 - Seek ways to enhance leak detection for large pipes
 - Total risk increases limited to “very small”

§50.46a Rule Background

Recent Staff Efforts

- Work resumed early 2008
 - Final rule requirements drafted based on new Commission guidance
- OGC review
 - Need to re-notice portions of rule
 - Because of inter-related requirements, staff to re-publish entire rule

§ 50.46a Rule

Status and Schedule

- Revised rule language made public April 16, 2009 (www.regulations.gov)
- ACRS meeting May 6 -7, 2009
- EDO to sign re-notice – late June 2009
- 45 day comment period
- Public meeting(s)
- Meet with ACRS on final rule (ACRS letter)
- Final rule to Commission nine months after close of comment period (June 2010)

Overview of Revised Proposed Rule

- Transition break size (same as original rule)
 - PWRs – largest attached pipe to the main coolant piping
 - BWRs – largest feedwater or residual heat removal line inside containment
- Mitigation must be demonstrated for all LOCAs

Initial Conversion to 50.46a

- Demonstrate applicability of Elicitation Report
- Demonstrate applicability of staff seismic study or provide a plant specific study
- Describe process for risk informed evaluation of plant changes
- Add to Tech Specs any non-safety equipment that is credited in analysis of breaks >TBS
- Provide revised ECCS analyses

ECCS Analysis Requirements

- Breaks \leq TBS
 - No change from current 50.46
- Breaks > TBS
 - No single failure assumption
 - Credit for offsite power
 - Credit for non-safety equipment
 - Alternative metrics for “coolable geometry” may be used if justified
 - ECCS methods must be approved

Subsequent Plant Changes

- Must be risk informed if:
 - Enabled by the rule, or
 - Bundled with enabled changes
- Require staff review unless
 - Licensee has an approved review process, and
 - Increase in risk is < “minimal”, and
 - 50.59 satisfied
- Must not invalidate applicability of elicitation report or seismic studies

Risk Informed Plant Changes

- Meet criteria consistent with RG 1.174 (defense-in-depth, safety margins, monitoring program, and acceptable risk increases)
- Confirm “very small” cumulative risk increase via periodic PRA update
- PRA methods must be of sufficient scope and quality

Other Requirements (con't)

- Maintain leak detection capability for piping larger than TBS to reduce likelihood of breaks > TBS
- Operation is limited to < 14 days per year if breaks > TBS have not been shown to meet acceptance criteria
- Ability to readily connect onsite power must be provided if nonsafety equipment credited in analysis

Applicability to future reactors

- Rule may be used if
 - “similarity” in design and operation is demonstrated
 - appropriate TBS is specified
- NRC design-specific review
 - must approve similarity
 - must approve proposed TBS

Changes in Defense in Depth for Breaks >TBS

Draft Final Rule	Proposed Revised Rule
No single failure	same
No loss of offsite power	Provide onsite power for accident management to any credited equipment
Use of non-safety equipment with no special treatment	Equipment must be identified in TS and its availability supported by plant specific data

Changes in Defense in Depth for Breaks >TBS (con't)

Draft Final Rule	Proposed Revised Rule
No prior approval of ECCS methods	Prior approval required
Methods give reasonable representation of system response	Must demonstrate “high probability” that criteria will not be exceeded

Changes to Risk-assessment Process

Draft Final Rule	Proposed Revised Rule
All facility changes evaluated with an approved risk-informed process	Only facility changes enabled by the rule and unrelated bundled changes evaluated with a risk informed process
Self-approval for all changes a) not required to be submitted under current Regs, b) not in the MRule Scope, and c) do not exceed total risk increase criteria	Self-approval for changes enabled by the rule after evaluation process is approved, and change has less-than-minimal risk increase, and 50.59 is satisfied.

Changes to Risk-assessment Process (con't)

Draft Final Rule	Proposed Revised Rule
Total increases in CDF and LERF [from all facility changes] are small and the overall risk remains small.	Total increases in CDF and LERF [for changes made under the rule] are very small and the overall risk remains small.
Total cumulative risk increase estimate required - which could be estimated from the “current” CDF and LERF minus the CDF and LERF at time of rule implementation	The cumulative effect of previous changes made under the rule that have increased risk but have met the acceptance criteria shall be evaluated



Risk-Informed Revision of 10 CFR 50.46

Developing Regulatory Guidance for Applicants to
Demonstrate that the Transition Break Size is
Applicable to Their Plants

Robert L. Tregoning
NRC\RES

ACRS Subcommittee on Regulatory Policies and Practices
May 6, 2009

Presentation Objectives

- Provide brief summary of the research conducted which supported the development of the transition break size (TBS)
- Discuss motivation and objectives for developing regulatory guidance to ensure applicability of the research findings
- Present the scope, philosophy, and general framework envisioned for the regulatory guidance
- Provide the status and schedule for regulatory guidance development

Background: NUREGs-1829 & 1903

- Commission direction (SRM-02-0057)
 - "The staff should provide the Commission a comprehensive 'LOCA failure analysis and frequency estimation' that is realistically conservative and amenable to decision-making ... with appropriate margins for uncertainty ...".
 - "The staff should use expert elicitation to converge (whenever possible) service-data and PFM results ...".
- Application in 10 CFR 50.46a
 - NUREG-1829: Develop part of the technical basis for selecting TBS
 - NUREG-1903: Verify that risk associated with seismic-induced breaks greater than the TBS are acceptable

NUREG-1829: Executive Summary

- Elicitation used to estimate *generic* BWR and PWR passive-system LOCA frequencies associated with material degradation.
- Panelists provided quantitative estimates supported by qualitative rationale in individual elicitations for underlying technical issues.
 - Generally good agreement on qualitative LOCA contributing factors.
 - Large individual uncertainty and panel variability in quantitative estimates.
- Group results determined by aggregating individual panelists' estimates.
 - Uncertainty reflected in 5th and 95th percentiles about median estimates.
 - Confidence bounds used to quantify panel variability.
- **NUREG-1829 was published in April 2008.**

NUREG-1903: Executive Summary

- Reviewed prior PRA, seismic studies and earthquake experience
- Analyzed direct piping failure associated with rare seismic events (i.e., $10^{-5}/\text{yr}$ & $10^{-6}/\text{yr}$) in piping systems with diameters larger than the TBS
- Analyzed large component support failures that may lead to piping failure (i.e., indirect piping failure) associated with rare seismic events
- Results
 - Unflawed piping: Failure frequency is much lower than $10^{-5}/\text{yr}$
 - Flawed piping: Critical flaws for long, circumferential flaws ($\theta/n = 0.8$) are generally large
 - Indirect failures: Two cases analyzed have a mean piping failure probability of approximately $10^{-6}/\text{yr}$
- **NUREG-1903 was published in February 2008**

NUREG-1829 Regulatory Guide: Commission Direction

- SRM-08 10 on SECY-07-0082
 - “The final rule should require licensees to justify that the generic results in the revised NUREG-1829, ‘Estimating Loss-of-Coolant Accident Frequencies Through the Elicitation Process,’ are applicable to their individual plants.”
 - “The staff should develop regulatory guidance that will provide a method for establishing this justification.”
- Staff has interpreted that this guidance extends to NUREG-1903, “Seismic Considerations For the Transition Break Size”

Plant-Specific Applicability of NUREG-1829 and NUREG-1903 Results

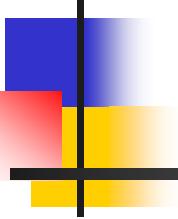
- Consider issues and implications associated with generic aspects of NUREGs
 - Assumptions
 - Approach
 - Analysis
- Guidance has been considered in several areas that may be affected by plant-specific factors
 - NUREG-1829 Applicability
 - Safety culture
 - *Continued operation*
 - *Changes in plant operation that may affect LOCA frequencies*
 - NUREG-1903 Applicability
 - *Risk associated with direct piping failures caused by seismic loading*
 - Risk associated with indirect piping failure caused by seismic loading

Applicability Guidance: Philosophy and General Framework

- Addresses breaks larger than the proposed TBS (i.e., primary loop piping and pressure boundary structural components)
- Use information submitted under other programs wherever possible (e.g., power uprates, license renewal, LBB submittals)
- Evaluation to address NUREG-1829 applicability
 - Intended to be largely qualitative
 - Consider plant-specific effects on variables that affect LOCA frequencies
 - Demonstrate adequacy of existing plant conditions/operation and insignificance of proposed plant changes
- Evaluation to address NUREG-1903 applicability
 - Provides options to maximize applicability of NUREG-1903 analysis
 - Provides detailed guidance and examples for conducting plant-specific analyses

Applicability Guidance: Status and Schedule

- 2009
 - Developed white paper for proposed reg. guide (ML090350757): Feb
 - Held public meeting to solicit feedback on white paper: Feb
 - Received stakeholder feedback: Apr
 - Provided information to support rulemaking FRN: Apr
 - Prepare draft regulatory guide: May – Jun
 - Brief ACRS on draft regulatory guidance: Jun – Jul, tentative
 - Publish draft guidance for public comment: Jul – Aug
 - End public comment period: Oct – Nov
 - Address public comments: Nov – Dec
- 2010
 - Brief ACRS on final regulatory guidance: Jan – Mar
 - Publish final guidance 6 months after final rule to Commission: Dec



GENERIC SAFETY ISSUE 163

MULTIPLE STEAM GENERATOR TUBE LEAKAGE

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
MAY 7, 2009

EMMETT MURPHY, NRR/DCI

Summary

- NRR has completed its technical review of Generic Safety Issue (GSI) 163, “Multiple Steam Generator Tube Leakage.”
 - A draft closeout memo to the NRC EDO, with technical enclosure, has been prepared.
 - ACRS endorsement of GSI closeout is requested (per Management Directive 6.4)

Summary

- GSI 163 was opened in June 1992 in response to a differing professional opinion (DPO).
- GSI 163 addresses a principal assertion in the DPO that there is the potential for multiple SG tube leaks during a non-isolatable main steam line break (MSLB) outside containment, leading to core damage that could result from the loss of all primary system coolant and safety injection fluid in the refueling water storage tank (RWST).

Summary

- Although the GSI was opened in response to the DPO concerns, the GSI is not part of the DPO resolution process.
- The DPO concerns were reviewed by an ACRS Ad Hoc Subcommittee, which served as the DPO review panel.
- Subcommittee conclusions (February 1, 2001):
 - No immediate safety issue; monitoring and ARC can be adequate.
 - A number of follow up actions by the staff were recommended.
 - The Subcommittee conclusions were endorsed by the ACRS
- The Subcommittee recommendations were incorporated into the SG Action Plan (SGAP)
- SGAP resolved DPO (March 2001 EDO memorandum).

Summary

- Technical basis for GSI closure:
 - New performance-based technical specifications (TS) are in place at all pressured water reactors (PWRs) that:
 - ensure all tubes will exhibit acceptable structural margins against burst or rupture under normal operating and design basis accidents, including MSLB, and
 - ensure leakage from one or multiple tubes under design basis accidents will be limited to very small amounts, consistent with the applicable regulations for off-site and control room dose.
 - The staff has completed all SGAP tasks directly relevant to GSI 163.

Background – New TS Requirements

- Until 2005-2007, NRC surveillance requirements for ensuring steam generator (SG) tube integrity were prescriptive.
 - Inspection frequency: 12 to 40 calendar months
 - Tube inspection samples: 3 to 100%
 - Plug all tubes with $\geq 40\%$ deep flaws
- Not directly focused on ensuring all tubes will maintain integrity until next scheduled inspection.

Background – New TS Requirements

- This shortcoming often necessitated actions beyond minimum TS requirements to ensure tube integrity was being maintained.
 - Initially, ad-hoc
- NRC and the industry began initiatives to improve the consistency and effectiveness of utility programs.
 - EPRI guideline documents
 - Draft NRC Regulatory Guide DG-1074
 - Nuclear Energy Institute (NEI) 97-06 guidelines

Background – New TS Requirements

- In May 2005, the NRC staff approved a generic template for new technical specification requirements for ensuring SG tube integrity.
- As of Sept. 30, 2007, the new TS are in place for all US PWRs.

Overview – New Requirements

- Incorporate performance based framework
 - Places regulatory focus on the bottom line, i.e., ensuring SG tube integrity, rather than on specific steps to accomplish this objective.
 - Adaptable to
 - New or unexpected problems
 - New inspection technology
 - Provides flexibility to implement cost effective strategies for managing the SG tubing while ensuring tube integrity will be maintained.

New LCO Requirement

- LCO – Limiting Condition for Operation in plant technical specifications.
- New LCO – SG Tube Integrity shall be maintained.
 - Ties SG Operability directly to maintaining tube integrity.
 - Surveillance requirement – Verify SG tube integrity in accordance with SG Program.

SG Program

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

SG Program

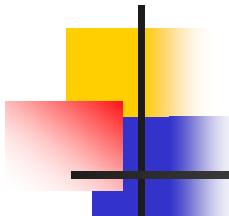
- Performance criteria for tube integrity
 - Structural criteria
 - Accident leakage criteria
 - Operational leakage criteria
- Attributes – Performance criteria
 - Measurable, tolerable
 - Consistency with current design and licensing basis

Structural Integrity Performance Criteria

- Safety factor (SF) of 3 against burst under normal operating pressure differential.
- SF of 1.4 under accident pressure differentials.
- SF of 1.2 under combined pressure and non-pressure accident loads (loads producing primary stress).

Accident Induced Leakage Performance Criteria

- Accident leakage shall not exceed values assumed in the licensing basis accident analyses.
 - To ensure acceptable dose consequences.
- Accident leakage shall not exceed 1 gallon per minute.
 - To limit risk under severe accident conditions.



Operational Leakage Performance Criteria

- As specified in the LCO specification for primary to secondary leakage.

Condition Monitoring

- The as-found condition of tubing shall be evaluated during each outage tubes are inspected, repaired, or plugged to confirm the performance criteria are met.
- If one or more of the performance criteria not met, this is reportable in accordance with 10 CFR 50.72/73.
 - NUREG-1022, Rev (with errata)
 - NRC Oversight Program

SG Tube Inspections

- Inspection scope, methods, and frequency shall be such as to ensure that SG tube integrity is maintained until the next scheduled inspection.
- Inspection scope and methods shall be performed with the objective of detecting flaws of any type that may exist and that may exceed the applicable repair criteria.
- Degradation assessment provides the basis for determining needed inspection methods.

SG Tube Inspections

- Inspect 100% of tubes at first refueling outage.
- For Alloy 600 MA tubing, No SG shall operate for more than 24 EFPM or one fuel cycle (whichever is less) without being inspected.
- For Alloy 600 TT tubing, no SG shall operate for more than 48 EFPM or two refueling outages without being inspected.
- For Alloy 690 TT tubing, no SG shall operate for more than 72 EFPM or three refueling outages without being inspected.

SG Tube Inspections

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

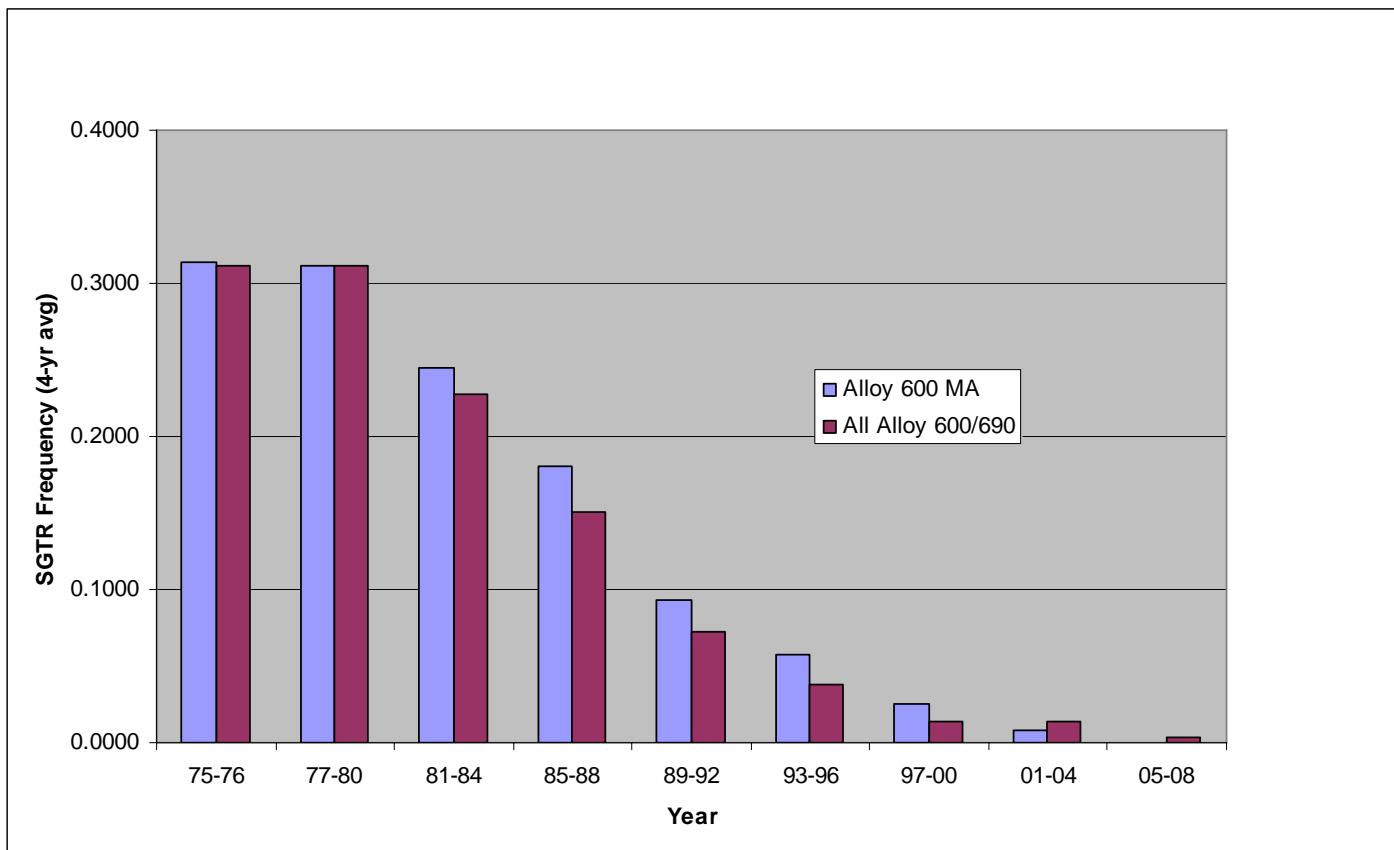
SG Tube Repair Criteria

- Tubes with flaws found by inspection to exceed 40% of the nominal tube wall thickness shall be plugged.
- [Currently approved ARCs (e.g., voltage-based ARC)]

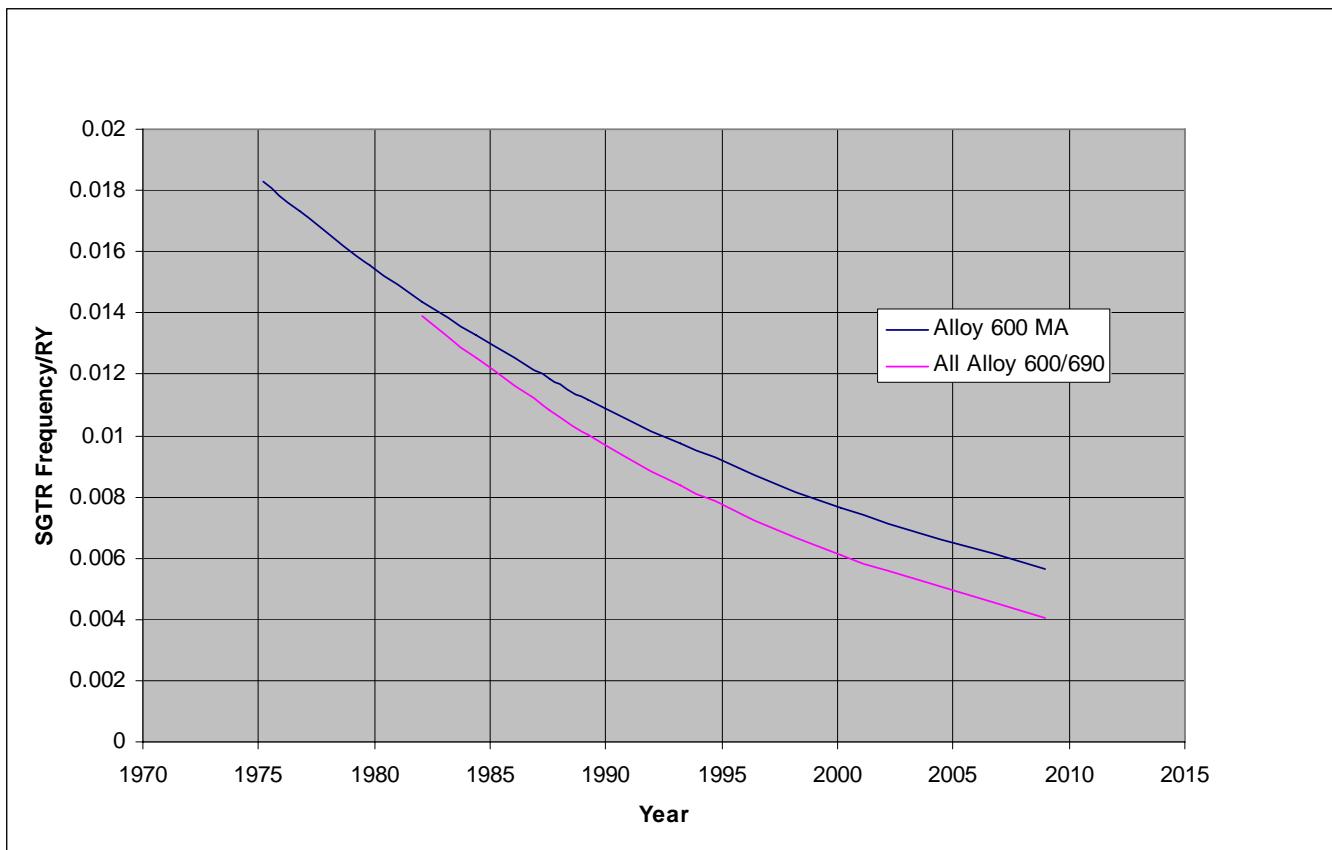
Effectiveness - New TS

- Operating experience (OE) indicates improving trend in tube integrity performance.
 - Improved water chemistry practices
 - Improved design and materials
 - Improved tube integrity management
 - Improved inspection technology and practice
 - Improved focus on maintaining tube integrity
- OE trends for alloy 600 MA underscore the contribution of improved tube integrity management to improved tube integrity performance.

Force Outage Frequency/SG Leakage



SGTR Frequency



Effectiveness - New TS

- Since 2000, there have only been three known instances where one tube was found not to meet the structural and accident induced performance criteria.
 - Thus, the conditional probability of rupture or of induced leakage in excess of leakage rates assumed in the licensing basis safety analyses under MSLB conditions appears to be small relative to values assumed in NRC risk studies (NUREG-0844, -1570).

SGAP Interfaces

- A number of tasks were incorporated into the SGAP to address the ACRS Ad Hoc Subcommittee recommendations and related topics.
- In the GSI 163 closeout report, the staff addressed those SGAP tasks relevant to the objective of the GSI.
 - i.e., those tasks relevant to assessing the adequacy of NRC requirements for ensuring SG tube integrity under design basis conditions, including MSLB, including:
 - Damage progression issues
 - Voltage-based ARCs
 - Eddy current probability of detection
 - Iodine spiking issues

SGAP Interfaces

- Based on the results of these tasks, no changes to existing requirements needed to ensure tube integrity under design basis conditions.
 - Results support closeout of GSI 163.

Conclusions

- Operating experience shows that effective management of SG tube integrity can be achieved through a performance-based strategy focused on satisfying tube integrity performance criteria.
- The new TS requirements relating to SG tube integrity provide reasonable assurance:
 - That all tubes will exhibit acceptable structural margins against burst or rupture during normal operation and DBAs, including MSLB.
 - That leakage from one or multiple tubes under DBAs will be limited to very small amounts, consistent with the applicable regulations for offsite and control room dose.
- NRR concludes GSI 163 is closed.
- ACRS endorsement is requested



Regulatory Guide 1.214

"Response Procedures for Potential or Actual Aircraft Attacks"

Advisory Committee for Reactor Safeguards
May 7, 2009

Introduction

- Since 9/11/01:
 - Changes to threat environment
 - Reevaluated adequate protection requirements
 - Aircraft beyond DBT but mitigative measures required
- NRC published a major rule for Power Reactor Security Requirements on March 27, 2009
- Includes requirements for 10 CFR 50.54(hh)(1), which is based on the 2002 ICM Order, paragraph B.5.a

Intent of the Rule

- Licensees take appropriate actions to place their facilities in the best condition to mitigate the consequences of possible aircraft impact
- 10 CFR 50.54, "Conditions of Licenses"
- Focuses on "pre-event notification period"
- RG 1.214 provides acceptable methodologies for licensees to establish, implement, maintain, procedures and train personnel accordingly

RG 1.214

- Provide methodologies for site-specific considerations to plan, prepare, and respond following a potential or actual aircraft threat notification
 - Verify notifications
 - Continuous communications
 - Contact personnel
 - Mitigate consequences
 - Visual discrimination
 - Disperse equipment
 - Recall personnel

Reg Guide Development

- Numerous site “walk-throughs”
- Stakeholder Input
- NRR, NRO, OGC and NSIR staff review

Event Communications

- Two Watch Standers at NRC Headquarters at all times
- Headquarters Emergency Response Officer
 - Monitors conference call from Department of Defense (NORAD)
 - Monitors Federal Aviation Administration Domestic Events Network
 - Passes Track of Interest (air traffic control data) information to Headquarters Operations Officer

Event Communications (cont'd)

- Headquarters Operations Officer
 - Conference Call
 - Licensee
 - NRC Senior Manager
 - Passes Track of Interest information to licensee
- Notify NRC and Other Federal Agencies (as time permits)
 - Similar to other Headquarters Operations Officer or Incident Response Procedures
 - Examples
 - Office Directors and Regional Administrators
 - Department of Homeland Security National Operations Center
 - Department of Homeland Security National Infrastructure Coordination Center

Summary



Bellefonte 3&4

Lee Nuclear 1&2

Summer 2&3

Vogtle 3&4

Harris 2&3

Levy 1&2

Turkey Point 6&7



NuStart Energysm

AP1000 DCD/R-COLA Integration, Development, and Standardization

AP1000 Design-Centered Work Group
Presentation to ACRS
May 7, 2009

Peter Hastings, NuStart

AP1000 DCWG Lead

Rob Sisk, Westinghouse

Manager, AP1000 Licensing & Customer Interface

Eddie Grant, NuStart

AP1000 R-COLA Licensing



AP1000
DCWG



**Duke
Energy®**

AP1000
Westinghouse

The AP1000 logo features the text "AP1000" in large blue letters with a yellow swoosh underneath, and the Westinghouse logo (a stylized 'W') to the right.

The SCE&G logo, which includes the company name in a bold sans-serif font and the text "A SCANA COMPANY" below it.

The TVA logo, which consists of the letters "TVA" in white on a dark blue square.

The FPL logo, which includes the letters "FPL." in blue and a grey circular icon with a stylized 'F' or 'M' shape.

Bellefonte 3&4

Lee Nuclear 1&2

Summer 2&3

Vogtle 3&4

Harris 2&3

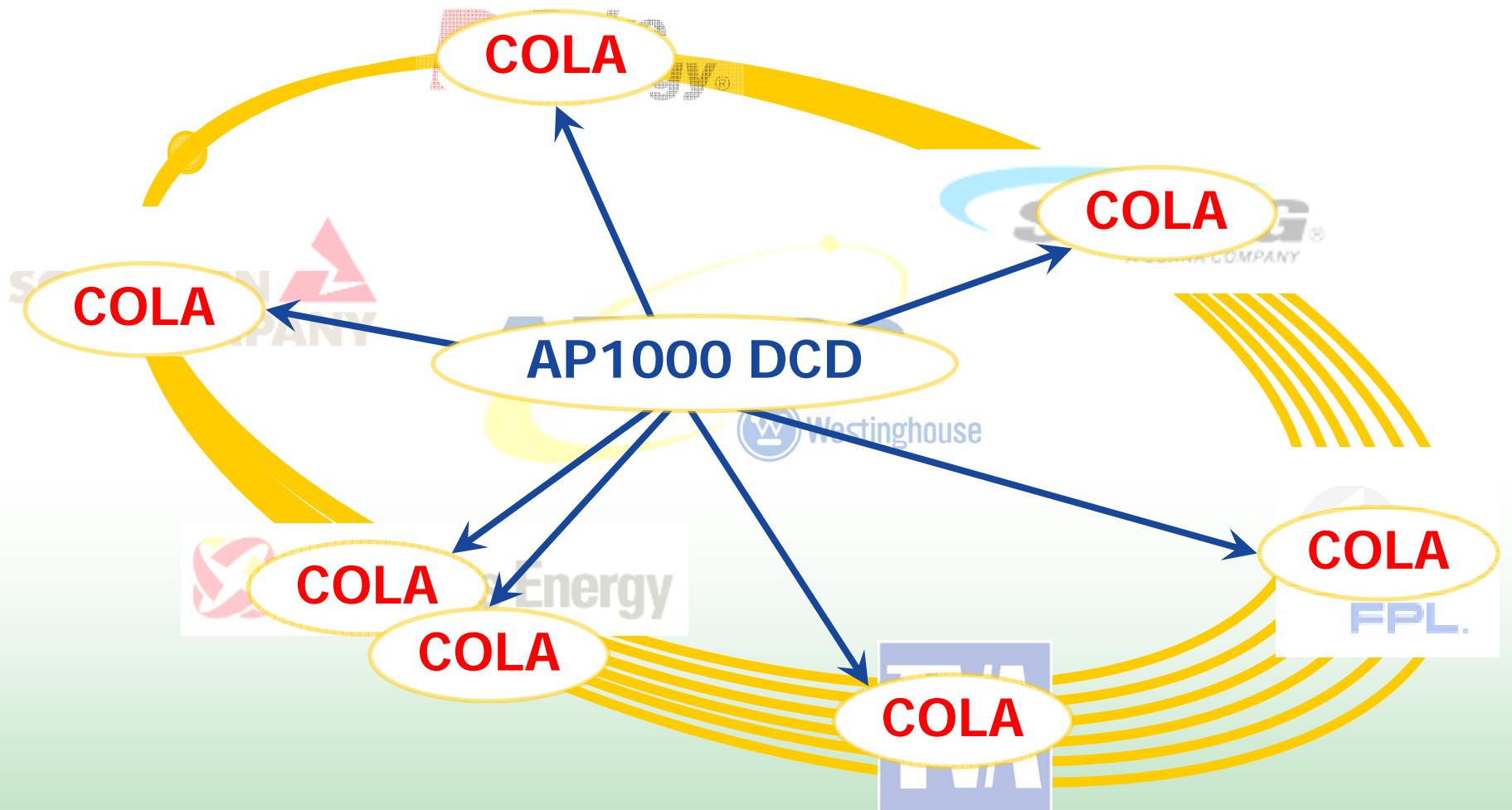
Levy 1&2

Turkey Point 6&7

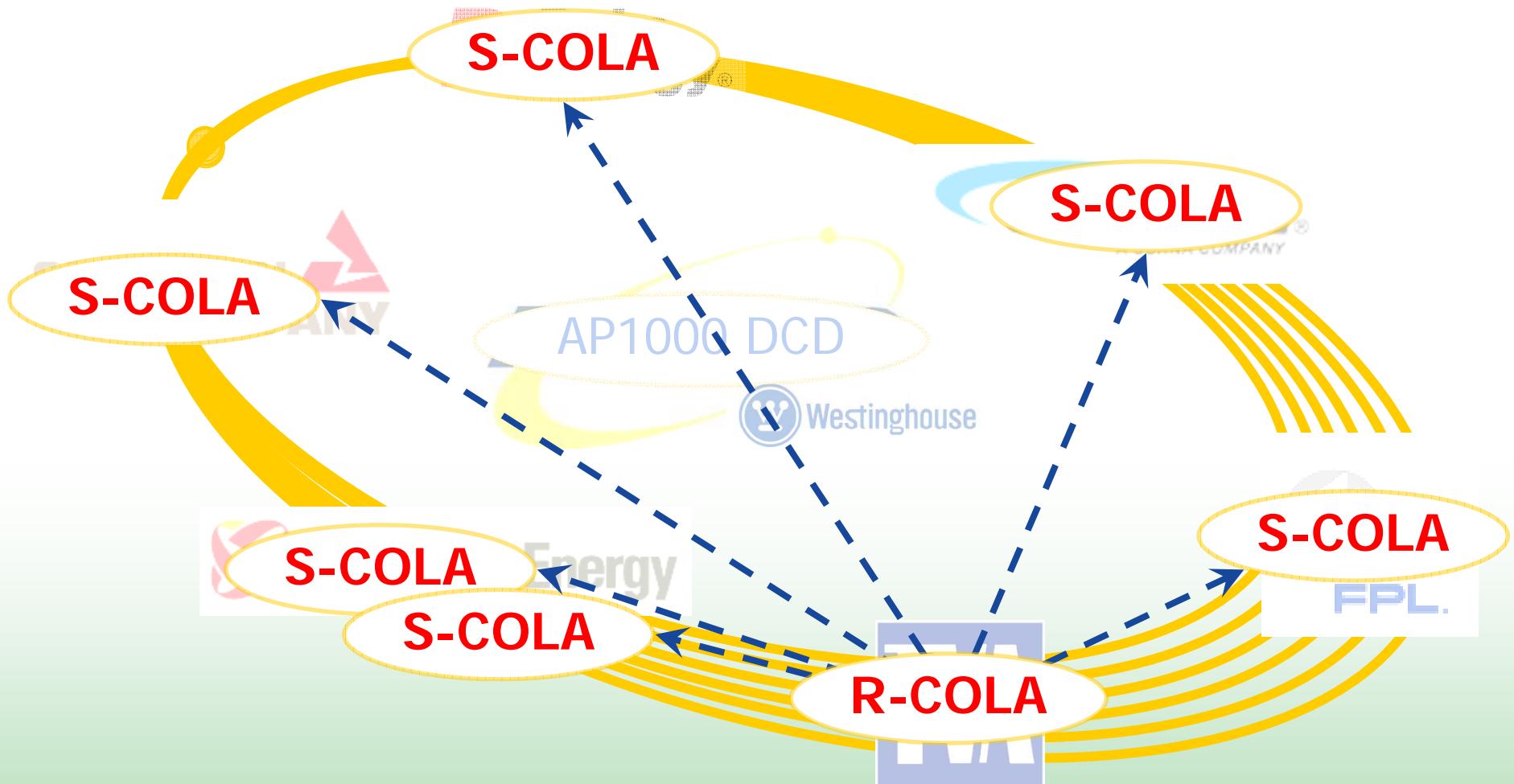
AP1000 Design Center

- **High level of standardization**
- **Design with significant finality**
- **Integration of DCD and COL applications through incorporation by reference**
- **Explicit identification of standard and site-specific information**
- **Status**
 - Design Certification amendment request under review
 - Six COL applications under review (each for two units), additional application expected in June
 - COL applications reference AP1000, as being amended
 - Reference/Subsequent COLA (R-COLA/S-COLA) approach being used for standard content

Use of Standard Content



Use of Standard Content (cont'd)



Bellefonte 3&4

Lee Nuclear 1&2

Summer 2&3

Vogtle 3&4

Harris 2&3

Levy 1&2

Turkey Point 6&7

R-COLA Transition

- **Change in dockets to facilitate resource alignment**
- **No change in DCWG structure**
- **SER with Open Items issued on Bellefonte**
- **STD Open Items to be closed on Vogtle**
- **Handling site-specific issues**
 - Bellefonte site-specific issues addressed in Bellefonte SER with Open Items
 - ACRS review and closure on Bellefonte (as with any other S-COLA)
 - Early Site Permit addressed majority of significant site-specific issues for Vogtle
- **Timing of transition closely coordinated with NRC Staff**



Overview of the AP1000 Certified Design Amendment

- AP1000 Design (Rev 15) was certified on January 27, 2006
 - 10CFR52 Appendix D – AP1000 Design (certified)
 - Preceded by 10CFR52 Appendix C – AP600 Design (certified) and 10CFR52 Appendix B – System 80+ Design (certified)
- An Amendment to the certified design was submitted May 26, 2007
 - Augmented in Sept 22, 2008
 - Consistent with 10CFR52.63 requirements
- Purpose of the Amendment:
 - Address COL Information items
 - Address Design Acceptance Criteria
 - Address NRC requirements
 - Enhance Standardization
 - Design Maturity
 - Incorporate Design Improvements



Amendment Overview

- AP1000 amendment builds on the certified design
 - Much of certified design as documented in the DCD remains unchanged
- Key review issues:
 - Address developing security requirements
 - DAC (I&C, HFE, Piping)
 - Containment sump and downstream effects
 - Structural design and seismic analyses
 - Control room ventilation
 - Enhanced Integrated Head Package
 - ASTRUM
 - Addressed non-plant-specific Technical Specification
- Conclusions of the AP1000 safety analysis remain unchanged



First AP1000 Plants Being Constructed in China

Contracts signed for first four units:

- Two units at Sanmen
- Two units at Haiyang

Contracts signed in July 2007

First unit (Sanmen 1):

Groundbreaking in Feb 2008

First concrete in March 2009

Fuel loading in May 2013

Operational in November 2013

Haiyang schedule 6 months behind
Sanmen





AP1000 Projects in the United States

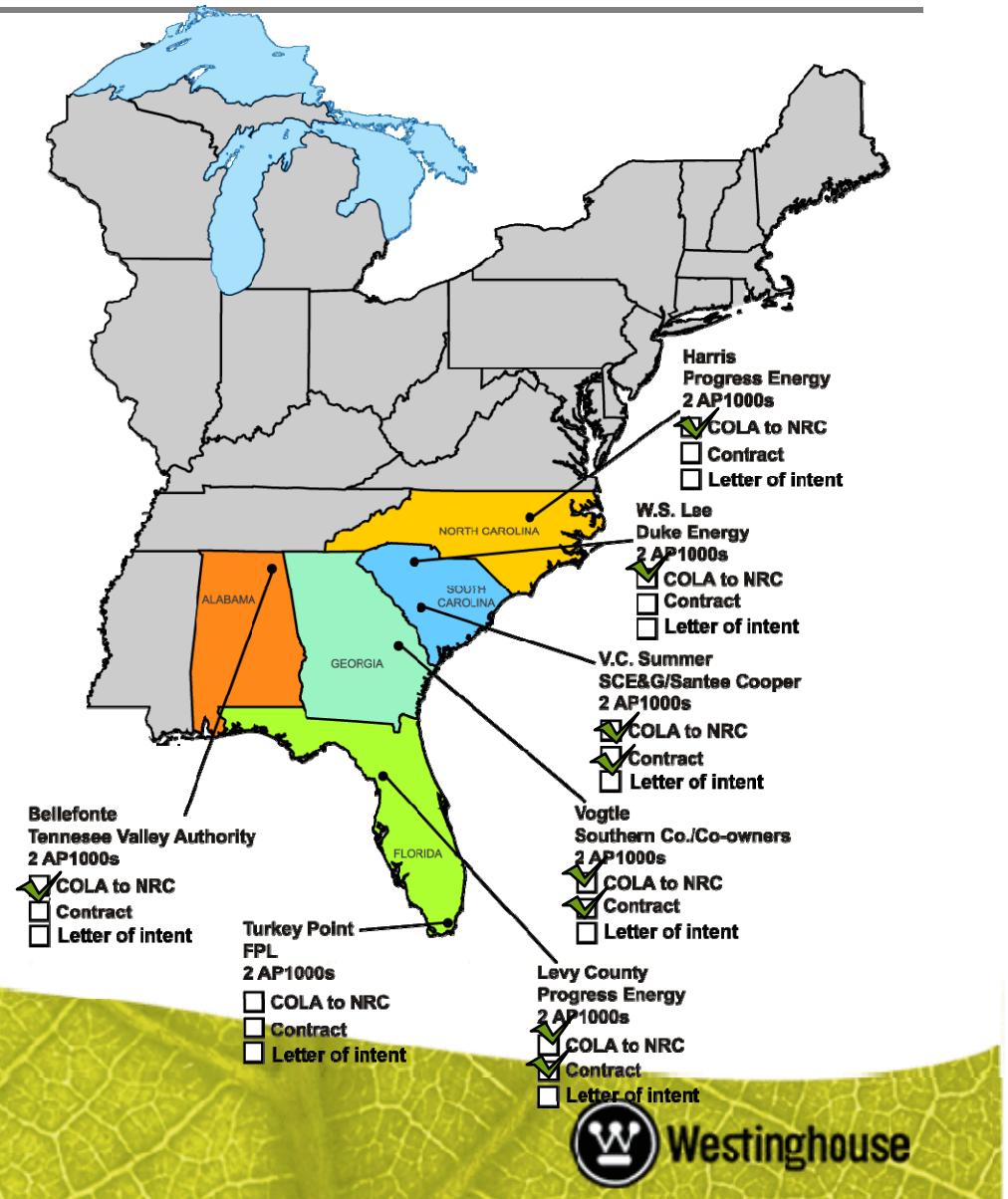
EPC contracts in place for 6 units:

Operational:

Southern Co.
Vogtle 3, 4 2016, 2017

SCE&G
VC Summer 2, 3 2016, 2019

Progress Energy
Levy County 1, 2 2018-2020*



Closing Remarks

- Westinghouse is working to address the NRC's concerns on a schedule to support the ACRS meetings:
 - July 23 &24
 - Oct 6 & 7
 - November 19 & 20
- AP1000 Design was certified on January 27, 2006.
 - Built on the Review and Approval of AP600
 - The amendment process incorporated two revisions (Rev 16 & 17)
 - A conforming revision (Rev 18) is anticipated to support rulemaking
- Focus is on reviewing changes to the certified design
 - Recognizing Design Finality applies (10CFR52.63)
- Westinghouse is ready to present the AP1000 amended design to the ACRS!





Combined License (COL) Application

- Cover Letter, Affidavits, etc. ("Part 0")
- Part 1 – General & Administrative Information
- **Part 2 – Final Safety Analysis Report**
- **Part 3 – Environmental Report**
- **Part 4 – Plant Specific Technical Specifications**
- **Part 5 – Emergency Planning Information**
- **Part 6 – Limited Work Authorization Information**
- **Part 7 – Departures & Exemption Requests**
- **Part 8 – Safeguards Information**
- **Part 9 – Other Withheld Information**
- **Part 10 – Proposed License Conditions, including ITAAC**
- **Part 11 – Other Documents (e.g., QAPD)**

DCD/R-COLA Integration in Part 2

- **Incorporation by Reference (IBR):** majority of DCD IBR'd into COLA (and not repeated)
- **S-COLAs includes standard content reflected in R-COLA**
- **FSAR content labeled explicitly with Left Margin Annotations (LMAs) as STD or site-specific (BLN):**
 - COL Information Items:
 - STD COL #.#-# or BLN COL #.#-#
 - Departures from DCD:
 - STD DEP #.#-# or BLN DEP #.#-#
 - Supplemental Information:
 - STD SUP #.#-# or BLN SUP #.#-#



Left Margin Annotations (FSAR)

MARGIN NOTATION	DEFINITION AND USE
STD DEP X.Y.Z-#	FSAR information that departs from the generic DCD and is common for parallel applicants. Each Standard Departure is numbered separately at an appropriate level.
NPP DEP X.Y.Z-#	FSAR information that departs from the generic DCD and is plant specific. NPP is replaced with a plant specific identifier.
STD COL X.Y-#	FSAR information that addresses a DCD Combined License Information item and is common to other COL applicants. Each COL item is numbered as identified in DCD Table 1.8-2.
NPP COL X.Y-#	FSAR information that addresses a DCD Combined License Information item and is plant specific. NPP is replaced with a plant specific identifier.
STD SUP X.Y-#	FSAR information that supplements the material in the DCD and is common to other COL applicants. Each SUP item is numbered separately at an appropriate subsection level.
NPP SUP X.Y-#	FSAR information that supplements the material in the DCD and is plant specific. NPP is replaced with a plant specific identifier. Each SUP item is numbered separately at an appropriate subsection level.
NPP CDI or STD CDI	FSAR information that addresses DCD Conceptual Design Information (CDI) . Replacement design information is generally plant specific; however, some may be common to other applicants. NPP is replaced with a plant specific identifier. STD is used if it is common. CDI information replacements are not numbered.
DCD	FSAR information that duplicates material in the DCD . Such information from the DCD is repeated in the FSAR only in instances determined necessary to provide contextual clarity.

DCD/R-COLA Integration (other Parts)

- **Part 4 – Plant Specific Technical Specifications**
 - Generic TS repeated to provide full, clean copy
 - Plant specific information included
- **Part 7 – Departures and Exemptions**
 - Tier 1 and GTS departures require exemptions
 - Tier 2* departures require NRC approval
 - Tier 2 departures require evaluation ~ 50.59
 - Some require NRC approval

DCD/R-COLA Integration (other Parts)

- **Part 10 – Proposed License Conditions**
 - ITAAC (IBR of DCD Tier 1 ITAAC)
 - Adds Security, Plant Specific, Emergency Planning
 - Holder items
 - COL Info Items that can't be completed prior to COL issuance (e.g., as-built or startup testing)
 - Program implementation milestones
 - Program readiness (for inspections)
 - Other items typical for Operating Licenses
 - Security program revision process
 - Startup testing change reporting
 - Environmental Protection Plan (Nonradiological)



FSAR Standardization examples

Sect.	IBR	STD	PS
1.1	IBR	X	X
1.2	IBR		X
1.3	IBR		
1.4	IBR		X
1.5	IBR		
1.6	IBR	X	
1.7	IBR		X
1.8	IBR	X	X
1.9	IBR	X	X
1.10	(New)	X	X
1A	IBR	X	

Chapter	% STD	Chapter	% STD
1	75	11	40
2	0	12	70
3	80	13	30
4	100	14	90
5	100	15	75
6	80	16	75
7	80	17	60
8	75	18	90
9	60	19	100
10	50	FSAR	20/70

R-COLA Standard Material Summary

- **DCD Incorporated by Reference**
 - Part 2 – FSAR
 - Part 10 – Proposed License Conditions
- **Part 4 – Technical Specifications**
- **Many Program Descriptions in FSAR**
 - NEI Templates (examples)
 - RP, Training, ALARA, Maintenance, PCP, ODCM
 - Others such as ISI, IST, CLRT
 - Procedural information
- **Many COL Information Item closures**
- **Much of the Supplemental material**
- **Standard methods used**
 - Examples - PSHA, Cost-benefit analyses

Overview of the AP1000 Design Center Reviews Presentation to the ACRS

Eileen McKenna
Stephanie Coffin
May 7, 2009

Briefing Purpose and Agenda

- Orientation for future Committee review activities for AP1000 design certification amendment (DCA) and reference combined license (RCOL) application

AP1000 Design Certification Amendment

- Current AP1000 Design Certification - Appendix D to 10 CFR Part 52 (Revision 15 to the AP1000 Design Control Document (DCD)) – effective 2006
- Safety Evaluation Report – NUREG-1793, “Final Safety Evaluation Report Related to Certification of the AP1000 Design”
- Post-certification Activities
 - NuStart Submittal of over 100 Technical Reports (TRs) beginning in 2006
 - Staff Review of TRs – which address aspects of AP1000 Design and COL information items (in support of specific DCD changes)

Application for Design Certification Amendment

- Application of May 26, 2007 based upon Revision 16 to the AP1000 DCD
- Reference to 10 CFR Part 52, Section 52.63 – Finality of Standard Design Certifications
- Submittal of Revision 17 of the AP1000 DCD – September 22, 2008
- RAI responses leading to DCD changes

Review of the AP1000 DCA

- Six phase review schedule
- Review is focused on changes proposed by Westinghouse, using SRP-based review
- Issuance of Individual Chapters in Phase 2 (SER with Open Items [SER/OIs]) to become a supplement to NUREG-1793
- Presentation of chapters at ACRS meetings paired with same chapter from RCOL application
- SC Meetings in July, October, November (and early 2010 if needed)

Current DCA Review Schedule

- April 3, 2009 NRC Schedule Letter
- Last chapter of SER/OIs - 01/2010
- Completed Final SER – 12/2010
- Rulemaking – 08/2011

Key Review Issues - DCA

- Structural design and other seismic analyses
- Containment Sump changes
- Control Room Ventilation System revision
- Progress on DAC matters (I&C, human factors, piping)
- Several other changes to maximize standardization

Review of the RCOL Application

- Six phase review schedule
- Review is focused on resolution of COL Items from DCA, operational programs, site-specific aspects
- Issuance of Individual Chapters in Phase 2 (SER with Open Items [SER/OIs]), following DCA chapters
- Presentation of chapters at ACRS meetings paired with same chapter from DCA application
- SC Meetings in July, October, November (and early 2010 if needed)

Key Review Issues - RCOL

- Demonstration that AP1000 design is suitable for the site
- Evaluation of site safety issues, such as:
 - Meteorology, hydrology, seismology, geology, etc.
 - Emergency plans
- Evaluation of operational programs, such as:
 - ISI and IST programs
 - Quality assurance program
 - Radiation protection program
- Evaluation of COL Item resolution, such as:
 - Containment cleanliness program
 - Initial test program
 - Conceptual design information (e.g., cooling towers, raw water system)

Structure of SE/OI for RCOL

- Incorporate by reference sections
 - Staff makes finding that IBR is appropriate
 - Refers to NUREG supplement
- Standard COL content
 - Staff evaluation of RCOL application will apply to all SCOL applications, as appropriate
- Site-specific COL content
 - Staff evaluation of RCOL application applies only to TVA/Bellefonte

RCOL Applicant Transition

- Entire SE/OI issued based on the TVA/Bellefonte application
- Southern/Vogtle responds to all OIs related to standard content
- Southern/Vogtle responds to all outstanding site-specific issues
- NRC staff evaluates responses and develops Advanced Final SER with no OIs based on Southern Nuclear application. This is expected to be first AP1000 COL application to come to ACRS for final determination.

Current RCOL Review Schedule

- Schedule dates being updated
- Phase 2 – chapters on Bellefonte COL issued in alignment with chapters on Westinghouse DCA
- Phase 3 – same meetings as for DCA on Bellefonte (integrated presentation)
- Phases 4, 5, 6
 - Completion of review of Vogtle COL application (standard and Vogtle site-specific content)
 - Bellefonte application review (for site-specific content) will be completed after Vogtle

Preview of July 2009 ACRS SC Meeting

- DCA and RCOL application and evaluation presented in an integrated manner
- DCA and COL applicants and NRC staff presentations
- Focus of staff presentations will be on key review areas and open items
- Chapters to be presented will be issued at least 30 days prior to meeting
- ACRS feedback on areas of interest prior to meeting day appreciated
- ACRS “interim” letters for each SC meeting appreciated