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1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

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4 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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6 SUBCOMMITTEE ON REGULATORY POLICIES AND PRACTICES

7 + + + + +

8 MEETING

9 + + + + +

10 WEDNESDAY,

11 MAY 6, 2009

12 + + + + +

13 ROCKVILLE, MD

14 + + + + +

15 The Subcommittee convened in Room T2B3 in
16 the Headquarters of the Nuclear Regulatory Commission,
17 Two White Flint North, 11545 Rockville Pike,
18 Rockville, Maryland, at 1:30 p.m., Dr William Shack,
19 Chair, presiding.

20 SUBCOMMITTEE MEMBERS PRESENT:

21 WILLIAM J. SHACK, Chair

22 JOHN D. SIEBER

23 JOHN W. STETKAR

24 DENNIS C. BLEY

25 DANA A. POWERS

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1 SUBCOMMITTEE MEMBERS PRESENT: (cont.)
2

3 MARIO V. BONACA

4 J. SAM ARMIJO

5 MICHAEL T. RYAN

6 HAROLD B. RAY

7 CHARLES H. BROWN, JR.

8 MICHAEL CORRADINI
9

10 NRC STAFF PRESENT:

11 DAVE BESSETTE, Designated Federal Official

12 TIM COLLINS

13 BILL RULAND

14 RALPH LANDRY

15 STEVE DINSMORE

16 ROB TREGONING

17 GIRIJA SHUKLA

18 JOHN FLACK
19
20
21
22
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P-R-O-C-E-E-D-I-N-G-S

1:29 P.M.

1
2
3 CHAIR SHACK: The meeting will now come
4 to order. This is a meeting of the Advisory
5 Committee on Reactor Safeguards Subcommittee on
6 Regulatory Policies and Practices and I am William
7 Shack, Chairman of the Subcommittee.

8 Subcommittee members in attendance are
9 Jack Sieber. Dennis Bley, John Stetkar, Dana Powers,
10 Mike Ryan, Harold Ray, Charles Brown, Mike Corradini
11 and Sam Armijo has just shown up. Dave Bessette is the
12 designated federal official for this meeting.

13 The focus of today's meeting is to
14 consider a proposed rule on risk-informed changes to
15 loss of coolant accident technical requirements. The
16 subcommittee will gather information, analyze relevant
17 issues and facts and formulate proposed positions and
18 actions as appropriate for deliberation by the full
19 committee in September.

20 The rules for participation in today's
21 meeting have been announced as part of the notice of
22 this meeting previously published in the Federal
23 Register. We have received no written comments or
24 requests for time to make oral statement from members
25 of the public regarding today's meeting. A

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1 transcript of the meeting is being kept and it will be
2 made available as stated in the Federal Register
3 Notice.

4 We request that participants in the
5 meeting use one of the available microphones when
6 addressing the subcommittee. The speakers should
7 first identify themselves and speak with sufficient
8 clarity and volume so they can be readily heard.

9 The Committee, of course, has been
10 following the development of a risk-informed 50-46 for
11 some time now. We wrote a letter back in November
12 2006 on an earlier version of the proposed rule that
13 had a number of comments and recommendations for
14 changes in the rule that we thought were needed. And
15 some of those were essentially to look through and
16 develop guidance so that people could essentially
17 assure that their large-break LOCA frequencies were
18 consistent with those that the staff had developed
19 through the expert elicitation in NUREG and in the
20 seismic studies that they'd done.

21 We also wanted them to have some rule
22 changes to increase defense-in-depth for beyond
23 transition size breaks and we thought there were some
24 necessary changes to be made for the risk assessment
25 process that would be used to determine what changes

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1 could be made under this rule. Again, it's an
2 enabling rule; in itself it makes no changes, it
3 merely permits a licensee to come in on a voluntary
4 basis and propose changes that would not be
5 consistent with the current version of reg guide 156.

6 Since we have some new committee members
7 who haven't heard any of the 50-46, I would encourage
8 them to ask any questions they have about the overall
9 development of the rule. I would like to focus on the
10 staff's responses to our recommendations so I may
11 limit the discussion at some point but feel free to
12 pursue whatever you want. If it's going on too long I
13 will then cut in but, again, since we do have new
14 members and they haven't had a chance to have the full
15 development, I think there's an opportunity here to
16 ask questions. But we do want to make sure that we in
17 fact do cover the changes in the rule in response to
18 the recommendations for our November 2006 letter.
19 Tim, are you going to lead off?

20 MR. COLLINS: Yes, I am. Actually,
21 first thing I'd like to do is looking at the agenda,
22 rearrange a couple of things if it's okay. We have
23 Bill Ruland giving opening remarks after and I'd like
24 to have him open before me. And one other thing the
25 Item No. 7 here where we discuss defense-in-depth I'm

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1 actually going to talk about that throughout my
2 discussion of the rule concept and then just summarize
3 that and then rather that pass the baton back and
4 forth between us if I just kept going such that 5 and
5 7 would be combined in the order of presentations
6 here.

7 CHAIR SHACK: Okay. If I could just turn
8 to Bill?

9 MR. RULAND: Thank you. Good afternoon
10 Mr. Chairman and fellow subcommittee members. My name
11 is Bill Ruland, I'm the director of the division of
12 safety systems in the office of NRR.

13 As Dr. Shack had alluded to, we're here
14 to discuss the alternative to the current EECS
15 performance requirements in 10 CFR 50-46. As you are
16 well aware this rule-making has been around for quite
17 some time and it has been reshaped several times both
18 due to industry studies, subsequent Commission
19 redirection and your comments.

20 I think the staff is prepared to answer
21 the questions that you have alluded to, Dr. Shack, so
22 I'd like to make note of that. The staff has in fact
23 put considerable effort to derive the rule as you see
24 it today and I think we have essentially addressed all
25 your comments.

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1 We are not asking for a letter at this
2 time since the staff's plan is to re-notice this
3 proposed rule for public comment. What we plan to do
4 is come back to the committee after receiving public
5 comment and we draft the final rule. So we don't need
6 a letter as a result of this meeting; we anticipate
7 our schedule would be some time coming back maybe next
8 spring.

9 And we appreciate the time and effort that
10 the committee has devoted to this endeavor and as
11 always we look forward to your feedback during this
12 meeting. Thank you.

13 MR. COLLINS: Okay. Now I want to staff
14 off by giving an overview of the presentations we plan
15 to make today. The first thing I'm going to put up is
16 what I call a commission level vision for the rule, a
17 very high level one slide summary, and then give a bit
18 of background on where we have been, primarily for the
19 sake of any members that haven't been involved in the
20 past.

21 Then I'll go through with an overview of
22 the current version of the rule, the one we want to
23 send out for public comment in a couple of months or
24 next month.

25 We refer to this version as the revised

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1 proposed rule. There's been so many versions that we
2 can get confused as to which one we're talking about.

3 We'll try to be consistent. The version we have
4 before us today we're calling the revised proposed
5 rule. We will also use the term draft final rule,
6 that's the one you commented on in November of 2006.
7 And we may also refer to the original proposed rule
8 which is the one that went out to the public back in
9 2005. Okay? Ideally, we'll be making only reference
10 to two out of those three but you never know and
11 hopefully we'll be consistent.

12 MEMBER BROWN: Which one is the current
13 one?

14 MR. COLLINS: The revised--

15 MEMBER BROWN: --proposed rule.

16 MR. COLLINS: Right. Okay. After I go
17 through the background on how it got through those
18 versions of the rule, we're going to focus on the
19 changes that have been made based on the last
20 Commission SRM. That's the SRM that came out after
21 the Committee's letter. We sent a subsequent paper
22 up to the Commission discussing your comments and the
23 Commission gave us direction. Okay? So we're going
24 to talk mainly about the changes that have been made
25 in response to your letter and the Commission's SRM.

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1 After I go through that then Rob Tregoning
2 is going to discuss topics associated with the
3 applicability studies that really provide the
4 fundamental basis for the rule, the expert elicitation
5 study, and then there was also the seismic study that
6 the staff did. Both of those have been discussed with
7 the Committee at different times but Rob's going to
8 touch on those again.

9 After Rob has finished, well this was the
10 old schedule, after Rob has finished we'll go to Steve
11 Dinsmore and he'll talk about changes to the risk
12 assessment process. Okay?

13 There's also one other thing I want to
14 point out right at the start. In the FRN we have
15 included a question with regard to the use of Large
16 Release Frequency, LRF, versus Large Early Release
17 Frequency. We're not trying to solve that issue in
18 this rule, okay. We'll basically go along with
19 whatever decision is made in those areas.

20 But for legal purposes more than anything
21 we've included this question in the FRN because if we
22 decide to subsequently use LRF as a criteria down the
23 road in this rule and haven't noticed it in a previous
24 Public Notice we may have to re-notice a third time,
25 okay.

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1 So the main issue here is please don't ask
2 us about that because we're not trying to solve that
3 issue in this rule, okay. We don't have the people
4 here to discuss that.

5 The rule concept, this is what I'm
6 referring to as the Commission level vision, okay, the
7 initial intent when the Commission asked us to start
8 this rule making was hopefully to get licensees to
9 focus on more risk significant events. And so we were
10 directed to develop an alternative to the large break
11 LOCA requirements that are currently in 50-46. And
12 the alternative approach was never intended to be
13 mandatory, it would strictly be what I call what would
14 be a business decision for the licensees and they
15 would have the option of maintaining the current 50-46
16 licensing basis of they could adopt this new
17 alternative. Okay?

18 The new alternative would divide the LOCA
19 break spectrum into two regions based on estimates of
20 LOCA frequency. And the Commission suggested a
21 guideline frequency for dividing the spectrum at about
22 ten to the minus fifth per years.

23 Now breaks in the region that have the
24 higher estimates of frequency would still continue to
25 be treated as Design Basis Accidents and there would

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1 basically be no changes to requirements for those
2 breaks. They're estimated to have the lower frequency
3 of occurrence, the Commission said they still must be
4 mitigated but the performance demonstration need not
5 be performed with Design Basis Accident assumptions.
6 Okay? More realistic assumptions could be used.

7 And subsequent to a plant adopting an
8 alternative, the Commission said that changes then to
9 the plant should be reviewed by some sort of a risk-
10 informed process. Okay? That was the starting point
11 for the rule.

12 Now I want to give some background on how
13 we got to where we are today. This originally started
14 back around 2003 was the first SRM. The staffing
15 Commission paper that precipitated the SRM had argued
16 that the technical basis wasn't ready but the
17 Commission decided that they wanted us to go forward
18 anyway. And it took quite a while for us to even get
19 the first draft put together. We then sent it to the
20 Commission two years later, March 2005, and the
21 Commission really didn't like that version either and
22 it took us until November of 2005 to incorporate the
23 changes that the Commission directed. Okay? It was
24 finally published for public comment in November of
25 2005.

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1 The most comments that we got on the
2 original draft were from the nuclear industry, 11 out
3 of 13, and they were pretty consistent. They thought
4 that the licensing change process was too burdensome
5 and they thought that the transition break size was
6 too large.

7 We subsequently had three separate public
8 meetings to work on addressing those comments and
9 after those meetings we went back and tried to modify
10 the rule in such a way that we would maintain our
11 comfort and safety level but try to reduce the
12 implementation burden. And at that point we posted
13 what was called the draft final rule. Okay? That was
14 the one you reviewed in November, and that was the one
15 that precipitated your comments.

16 Next slide. In the ACRS letter on that
17 draft final rule, the Committee recommended that the
18 draft final rule not be issued as presented and the
19 letter identified several significant concerns and
20 included lots of suggestions as to how they might be
21 addressed.

22 And the few things the Committee was
23 satisfied with, they were happy with the relaxation of
24 coincident single failure requirements being relaxed
25 and the fact that loss of off site power need not be

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1 considered coincidentally the Committee didn't object
2 to that either.

3 However, there was concern with the
4 defense-in-depth for breaks larger than a TBS and
5 there was concern that safety margins may be eroded.
6 They expressed concerns with the risk-informed
7 assessment process; it was noted that the process in
8 the draft final rule was different from the precedents
9 and practices that had been established over the years
10 in implementing Reg Guide 1.174 and that we really
11 ought to look into what the implications of those
12 differences were.

13 And the Committee also indicated that the
14 process for licensees self approval of changes needed
15 to be tightened up and that there would probably be
16 more changes that the staff should review before they
17 were approved.

18 Finally, the Committee indicated that the
19 rules should require plan-specific demonstration of
20 the applicability of the underlying studies, the
21 expert opinion elicitation report and the staff's
22 seismic study.

23 MEMBER CORRADINI: Just from a chronology
24 kind of standpoint, at that point it did not go out
25 for comment again? It has not gone out for comment

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1 again?

2 MR. COLLINS: No.

3 MEMBER CORRADINI: Okay.

4 MR. COLLINS: No, the comments from the
5 Committee were significant enough that we felt that we
6 needed to go back to the Commission to get some
7 guidance as to where they wanted us to go.

8 MEMBER CORRADINI: Okay. Thank you.

9 MR. COLLINS: Okay. So in the face of
10 these comments which we thought to some extent were in
11 conflict with what we understood the Commission's
12 guidance to be, we decided that we needed to develop a
13 SECY paper to ask the Commission what they really
14 wanted us to do given all the advice they were
15 getting.

16 And the subsequent SRM told us that we
17 should continue with the rule-making. One of the
18 reactions in the staff paper were to just discontinue
19 the rule altogether. But the Commission said that we
20 should continue the rule-making but its priority ought
21 to be lowered.

22 We have been working on it as a high
23 priority rule primarily because of the perception that
24 this could result in a safety enhancement but the more
25 we looked at it that became unclear that there would

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1 be any such enhancement as a result of implementing
2 the rule. So it became categorized more in accordance
3 with those that may be considered burden reductions.

4 So the Commission said, well, treat it as
5 a lower priority rule but continue working on it.

6 The Commission also agreed with the ACRS
7 that the defense-in-depth ought to be increased for
8 breaks larger than the TBS, and they also agreed that
9 the expert elicitation report ought to be demonstrated
10 applicable on a plant-specific basis. And although
11 they didn't mention the seismic report explicitly, the
12 implication is clear that no reason why people
13 wouldn't have to do that as well.

14 So the Commission left it up to the staff
15 to decide how defense-in-depth might be beefed up.
16 They didn't tell us exactly any specifics as to how to
17 do it.

18 The Commission also threw in another
19 recommendation that we were kind of surprised at. They
20 directed the staff to find ways to improve leak
21 detection in plants for piping larger than a TBS, if a
22 plant adopted this alternative.

23 And then the last thing that the
24 Commission did, which was another surprise to us, they
25 indicated that the total increases in risk should be

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1 limited to very small. In the draft final rule we
2 refer to them as "small" and in the PRA world, that's
3 a factor of ten difference. Okay? So the total
4 reduction then need to be very small.

5 MEMBER CORRADINI: Just for
6 clarification, that doesn't change your initial
7 elicitation analysis of 10 to the minus fifth as the
8 cut point, it more changes the risk information and
9 how you judge it after you've gone down this path?

10 MR. COLLINS: Yes.

11 MEMBER CORRADINI: Okay.

12 MR. COLLINS: Okay. Then after we got
13 that SRM, actually it was quite a lull, it was almost
14 a year where we weren't working on this rule while we
15 were interacting with the Commission. We took that
16 guidance and we drafted the current revised proposed
17 rule and when we sent it by our Office of General
18 Counsel for review they recommended that we should--
19 we noticed at least portions of the rule and when we
20 talked about it more internally we thought that, since
21 there's always been a lack of consensus on this rule
22 and there is no urgency for the rule in that it's a
23 voluntary alternative and parts of the rule seem to be
24 so intertwined, we thought we would just re-propose
25 the entire rule for comment again. Basically give

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1 everybody another bite at the apple.

2 And we advised the Commission that we were
3 going to do that in our Commission memo in December of
4 2008.

5 MEMBER CORRADINI: Again, a little more
6 background. I'm sure you told us this in 2006 but I
7 don't remember, so as Bill called it an enabling rule
8 it's something somebody can voluntarily opt for?

9 MR. COLLINS: Yes.

10 MEMBER CORRADINI: In the current
11 situation if this didn't exist, licensees can
12 currently opt to choose between what I remember as the
13 old Appendix K approach and a full treatment of
14 uncertainties for the complete range. Those are the
15 two ways in which you can address and show a
16 compliance with 50-46, is that right?

17 MR. COLLINS: That's correct.

18 MEMBER CORRADINI: And one last thing.
19 How many of them have chosen path A and how many have
20 chosen path B?

21 MR. COLLINS: I don't know offhand. Do
22 you have an idea Ralph?

23 MR. LANDRY: Ralph Landry from the staff.

24 MEMBER CORRADINI: I was trying to get
25 you up.

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1 MR. LANDRY: I'm trying to hide in the
2 corner, Mike. The exact number I really can't give
3 you because you have to break it down by break
4 spectrum. All small breaks are analyzed by the old
5 Appendix K methods. There are no approved realistic
6 models for small break analysis.

7 Each of the PWR vendors has an approved
8 Appendix K model and an approved realistic model for
9 the large break spectrum. There are a small number of
10 plants, significantly less than half the plants, that
11 I believe today are still analyzed by the Appendix K
12 method; the majority are now using the realistic model
13 because so many--

14 MEMBER CORRADINI: For the large break
15 spectrum?

16 MR. LANDRY: For the large break spectrum
17 because so many have gone through license renewal and
18 power uprate that as part of going through the power
19 uprate many of them are using the realistic models for
20 the margin it gives you. The difference between an
21 Appendix K and a realistic approach for a large break
22 is something typically on the order of 400 degrees on
23 PCT holding everything else the same.

24 MEMBER CORRADINI: Of all the conditions
25 and the requirements in terms of temperature,

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1 oxidation, that tended to be the one that was most--

2 MR. LANDRY: Yes, for the large breaks.

3 MEMBER CORRADINI: Thank you.

4 MR. COLLINS: Okay. Our current plan
5 for this rule-making the version that you're reviewing
6 now was published on the Agency's web site on April
7 16th of this year. We're having our meeting with the
8 subcommittee right now for the ACRS and like Bill said
9 we're not asking for a letter at this time.

10 Our plan is to have the package signed out
11 by the EDO by the end of June and we figure on about a
12 45-day comment period. Following the comment period
13 we expect we'll be into the public meeting mode again
14 unless everybody just loves the rule, which we're not
15 expecting.

16 And then after we take into account those
17 public comments we'll come back to meet with the ACRS
18 again, we expect it will be probably next spring at
19 some time, with the draft final rule version 2. Okay?

20 And at that time we'll be asking for a letter from
21 the Committee. And then if all goes well we'll get
22 the final rule to the Commission by about June of
23 2010.

24 Okay. Now the revised proposed rule
25 itself. Some of the things which we haven't touched at

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1 all in modifying the rule is transition break size and
2 of course since the November 6th meeting we've done
3 absolutely nothing to change the transition break
4 size. For PWRs it's still the largest attached pipe
5 to the reactor coolant system. It typically turns out
6 to be the surge line. And BWR is the largest
7 feedwater or residual heat removal line inside
8 containment.

9 MEMBER BROWN: And these are determined
10 based on your ten to the minus 5th break frequency?

11 MR. COLLINS: That was the starting
12 point.

13 MEMBER BROWN: And this is what fell out
14 of that starting point?

15 MR. COLLINS: That fell out of that when
16 we took into account primarily the actual pipe sizes
17 in the plants.

18 MEMBER BROWN: The NRC determined this?

19 MR. COLLINS: Yes.

20 MEMBER BROWN: It's not up to the
21 licensees to do that for the plant design, this now
22 comes the metric, is that correct?

23 MR. COLLINS: Yes. The way the rule is
24 written it says the large detached pipe.

25 MEMBER BROWN: I read the rule and that's

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1 why I just wanted to make sure. I didn't understand
2 that connection. It was fuzzy to me when I read all
3 the letters.

4 MR. COLLINS: Okay. And mitigation must
5 still be demonstrated for all LOCAs, that hasn't
6 changed either. Okay?

7 Now there's changes from here on out.

8 MEMBER BROWN: I have one more question.
9 I'm one of the new guys that don't know the
10 background. Mitigation must be demonstrated for all
11 LOCAs?

12 MR. COLLINS: Right.

13 MEMBER BROWN: Even the large break?

14 MR. COLLINS: All the way up to the
15 double-ended guillotine.

16 MEMBER BROWN: The double-ended
17 guillotine break. And when you say mitigation?

18 MR. COLLINS: We have some criteria in
19 the rule which have to be met, mitigation criteria,
20 which I'm going to discuss.

21 MEMBER BROWN: All right. I'll wait.

22 MR. COLLINS: It's a few slides down.
23 Okay. Now from here on out there's some things that
24 have stayed the same and some things that have
25 changed. If a licensee wants to adopt the

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1 alternative what do they have to do in the first
2 place? How do they get started? Okay?

3 So first of all they have to submit a
4 License Amendment Request to the staff. Okay? Now
5 that License Amendment Request has to include enough
6 information that will demonstrate the applicability of
7 the elicitation report to their plant, Rob's going to
8 talk about that in a little while, and it also needs
9 to demonstrate the applicability of the staff's
10 seismic study or provide a plant-specific study that
11 gives us results that are favorable as the staff
12 study, and Rob's going to talk about that as well.

13 They need to describe the process that
14 they used for doing a risk-informed evaluation of any
15 plant changes that came in with the initial amendment.

16 They need to add to the tech specs any non-safety
17 equipment that's credited for analysis of breaks
18 greater than the TBS. That's new. Actually, the
19 demonstration of the applicability of the elicitation
20 report is new, the seismic report is new, okay. And
21 then they have to provide the revised ECCS analysis;
22 nothing new there.

23 MEMBER BROWN: The licensees you said in
24 an earlier comment that the initial proposal, the
25 licensees or people you can talk to, public comment,

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1 said that that was burdensome and you worked to reduce
2 the burdensomeness of it.

3 MR. DINSMORE: This is Steve Dinsmore.
4 Much of the burden that they were talking about
5 originally was the PRA-related burden.

6 MEMBER BROWN: Okay. Not this type of
7 stuff? Okay. Because these were added back in so I
8 would have viewed those as new burdens but not of the
9 same issue.

10 MR. COLLINS: Oh yes. Well, this rule is
11 no less burdensome now than--

12 MEMBER BROWN: But this is going to get
13 better for them?

14 MR. COLLINS: No, I'm saying that
15 facetiously. That was tongue in cheek. I'm sorry.

16 MEMBER CORRADINI: But just to clarify
17 one thing just so I understand when you said the
18 Commission kind of surprised you by changing a
19 qualitative descriptor from small to very small, that
20 involves the third bullet, does it not?

21 MR. COLLINS: No, not really. No.

22 MR. DINSMORE: It evolves.

23 MEMBER CORRADINI: The acceptance
24 criteria?

25 MEMBER BROWN: Right. I guess that's

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1 what I'm trying to say. You do the analysis but now
2 the line by which you judge has moved?

3 MR. COLLINS: Yes. But there's process
4 steps involved too that we're making reference to.

5 MEMBER CORRADINI: Okay. Right. That
6 helps.

7 MR. COLLINS: Steve will discuss those.

8 MEMBER CORRADINI: Okay. Thank you very
9 much.

10 MR. COLLINS: Actually, I'll touch on
11 them and Steve will discuss them in more detail. Okay.

12 Now the ECCS analysis requirements. For
13 breaks that are smaller than the TBS everything is the
14 same as it was before we even started this whole
15 thing. There's no changes, any breaks less than a
16 TBS.

17 Now for breaks greater than the TBS we
18 made some changes and there's some things that haven't
19 changed. First of all, we haven't changed, the no-
20 single-failure assumption is still in place now. For
21 breaks larger than the TBS you do not have to assume a
22 single failure. Okay?

23 You do not have to assume a loss of
24 offsite power. Okay? Well one more thing that
25 hasn't changed, we're still going to allow alternative

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1 metrics for coolable geometry, if somebody wants to
2 try to defend them. Okay.

3 Now things that have changed, in the
4 credit for use of non-safety equipment, the previous
5 rule allowed credit for non-safety equipment. This
6 rule still allows it for breaks larger than a TBS but
7 there's a few conditions that we've added. Okay?

8 First of all, the equipment's got to be
9 identified in the tech specs. Now we're not talking
10 about having a typical LCO on the equipment but it
11 simply needs to be identified in the tech specs. In
12 this way a licensee can't remove that without staff
13 review. Okay? And the Commission in their SRM
14 actually directed us to do that. They said that the
15 equipment used for mitigation of breaks larger than
16 the TBS should not be removed without prior staff
17 approval. So we said we'll put it in the tech specs,
18 that way they can't do that.

19 MEMBER BLEY: I'm just confused. I'm not
20 familiar with the tech spec entry that's not
21 associated with the LCO. How's that done?

22 MR. COLLINS: Well we don't know.

23 MEMBER BLEY: So nobody's done one yet?

24 MR. COLLINS: No. Nobody's done one.

25 MEMBER BLEY: This isn't in place yet?

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1 MR. COLLINS: No, this is not in place.
2 We'll have to create a section in the tech specs that
3 identifies this.

4 MEMBER STETKAR: But in the rule there's
5 a de facto LCO of 14 days.

6 MR. COLLINS: Yes, there's a back stop in
7 there. Right.

8 MR. DINSMORE: But that's 14 days without
9 having the equipment available to mitigate that you
10 need. This is the equipment that you should have
11 available. This equipment could--

12 MEMBER STETKAR: Could you say that
13 again?

14 MR. DINSMORE: Let's say you're going to
15 credit some fire pump instead of a LPIC pump, which
16 you can do in this case. The 14 days means you can't
17 have both one LPIC and the fire pump out for more than
18 14 days because you either needed one or the other.
19 However, you could have that fire pump out whenever
20 the LPIC pump is available.

21 MEMBER STETKAR: I understand that.

22 MR. DINSMORE: Yes. So that the 14 days
23 is on--

24 MEMBER STETKAR: This is on the
25 combination?

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1 MR. COLLINS: It's on the combination,
2 right. Right.

3 MEMBER STETKAR: But listed in the tech
4 specs is that superset of--

5 MR. COLLINS: Fire pump.

6 MEMBER STETKAR: And LPIC.

7 MR. COLLINS: Yes, and any other pumps
8 that they might want to add to the plant and take
9 credit for at one point or another.

10 MEMBER STETKAR: Okay.

11 MEMBER CORRADINI: So can I just ask, I'm
12 glad they asked it because I was confused. So just
13 let me say it back to you so I get it right. So in
14 your mind you have this vision that if this were to go
15 forward and a licensee were to opt for this there
16 would be a new section of the tech spec that says
17 between TBS and double guillotine I need these things,
18 or I'm going to need these things to mitigate.

19 MR. COLLINS: I would say I may take
20 credit for any of these things.

21 MEMBER CORRADINI: I may take credit for
22 it. And then the LCO for the 14 days applies to the
23 complete set?

24 MR. COLLINS: The 14 days think of it as
25 they must be in an analyzed condition throughout the--

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1 whenever they're operating they need to be in an
2 analyzed condition. They can use any of this
3 equipment except for up to 14 days. Okay? Up to 14
4 days they could be in a non-analyzed condition.

5 MEMBER CORRADINI: Which some of these
6 things could be unavailable?

7 MR. COLLINS: Yes, all of them in fact.
8 All of the non-safety stuff could be unavailable for
9 up to 14 days.

10 MEMBER CORRADINI: Okay. Got it.

11 MR. COLLINS: That's what the rule says.

12 MEMBER BROWN: So if you took credit for
13 three non-safety pieces of equipment, they could all
14 be out of service for 14 days and you could continue
15 operating? The non-safety?

16 MR. COLLINS: That's correct. That's
17 correct.

18 MR. RULAND: And it's 14 days out of
19 what?

20 MR. COLLINS: Within any 12 month period.

21 MEMBER BROWN: Okay. So you add them up
22 as you go?

23 MR. COLLINS: Yes, add them up as you go.

24 MEMBER BROWN: It could be one year three
25 there and four--

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1 MR. COLLINS: Right. Right. A total of
2 14 days in any 12 month period. Right. That's a
3 backstop that we put in there.

4 MEMBER BROWN: Is that what LCO means?

5 MR. COLLINS: LCO means Limiting
6 Condition of Operation. That's a defined term in the
7 regulations and this is not an LCO.

8 MR. DINSMORE: It's a lot different
9 because LCOs normally don't add up, you just go in and
10 out.

11 MEMBER BROWN: Did the rule say they add
12 up? I didn't--

13 MEMBER CORRADINI: Yes, we missed that.

14 MR. COLLINS: The words were deliberately
15 written as 14 days in any 12 month period. We
16 intended it to be added up, that's why it was written
17 that way.

18 MEMBER CORRADINI: And then I'm sure
19 we'll come back to that. In the most recent past
20 incarnation of this it was seven, was it also added up
21 over 12 days?

22 MR. COLLINS: No, I don't think so.

23 MR. DINSMORE: I believe what happened
24 was the rule which went on the web back then said
25 seven and when we came to make the presentation we'd

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1 already changed it to 14.

2 MEMBER CORRADINI: What? Say that again?

3 Because some of us actually do remember seven
4 somehow so I was trying to figure out how you defined
5 seven back then.

6 MR. DINSMORE: Right. There was a rule
7 which was posed on the web which said seven days.
8 When we came to make the presentation to the ACRS
9 about the rule that was posted on the web, we had
10 already decided to change that seven to 14. I have
11 some backup slides that tell you where those numbers
12 came from.

13 MEMBER CORRADINI: That'll come. I just
14 wanted to understand the difference. Thank you.

15 MR. COLLINS: Okay. Another change that
16 we made that kind of crosses over two bullets, there
17 the credit for offsite power and the credit for non-
18 safety equipment. Operators must be able to readily
19 provide onsite power to any equipment that's credited
20 for mitigation of breaks.

21 Now this is a defense-in-depth measure.
22 Okay? They can still in the performance analysis
23 take credit for offsite power so when they're trying
24 to show that they meet the coolable geometry criterion
25 they can take credit for offsite power for the non-

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1 safety equipment. But they still have to be able to
2 readily attach that equipment to onsite power for the
3 purposes of accident management. That was not in the
4 previous version of the rule. Okay?

5 MEMBER BROWN: Do those go together? If
6 offsite is not available and how can they get it back?

7 MR. COLLINS: They would attach it to
8 onsite power. It could be safety grade onsite power,
9 it could be some other.

10 MEMBER BROWN: All right. You don't care
11 where the power comes from?

12 MR. COLLINS: We don't care. They need
13 to be able to attach it to some onsite power for the
14 purposes of accident management. Okay?

15 Let's see am I still on this slide?
16 There's another change we have made now to the
17 analysis method that deals with ECCS requirements.
18 The previous version of the rule did not require prior
19 staff approval of the methods used for analyses of
20 breaks larger than a TBS. Okay? And this current
21 version of the rule, the revised proposed rule,
22 requires fire staff approval for the methods used for
23 larger than TBS breaks. That was one of the
24 recommendations of the committee in their letter as I
25 recall.

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1 And we've also modified the acceptance
2 criteria for breaks larger than the TBS. We've
3 changed the criteria to a high probability that the
4 acceptance criteria are met, just like the criteria in
5 the best estimate methodology in 50.46 that says you
6 have to meet the criteria with high probability.

7 The previous version of the rule had
8 something like reasonable confidence that we meet the
9 criteria and we just thought you ought to have more
10 confidence in the result. Right? Why have two sets
11 of methods divided by this magic line called the TBS?

12 Your analysis ought to be reliable. So we decided we
13 would make the high probability criteria apply for
14 breaks larger than a TBS.

15 This also gives us more confidence and a
16 better understanding in margins that may be eroded.
17 We'll do a review of the methods and we'll have high
18 confidence in the results. So that's a change from
19 the previous version of the rule as well. Okay?

20 Now once someone has adopted the 50.46(a)
21 option, you know, they're free to make changes to the
22 plant that they might not have been able to make
23 before they adopted the option. So changes that are
24 now made must be evaluated using a risk-informed
25 process if that change is enabled by this new rule.

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1 And what we mean by enabled is that you will meet the
2 criteria of 50.46(a) but you would not meet the
3 criteria of 50.46. That's how we determine what an
4 enabled change is. Okay?

5 Or if you bundle a change with an enabled
6 change it also has to be a risk-informed evaluation.

7 I guess the second one's automatic actually because
8 you already have an enabled change. Okay.

9 And staff review will be required unless
10 there's three conditions that are met. Okay. The
11 licensee has a risk-informed process reviewed by the
12 staff for making changes, that the change doesn't
13 result in an increase in risk that's greater than
14 minimum, which has some value that Steve can attach to
15 it, and 50.59 still has to be satisfied. Okay? So
16 if a licensee can meet all those criteria they can
17 make changes on their own; otherwise it'll have to
18 reviewed by the staff.

19 MEMBER BLEY: Tim, back to your first
20 bullet. The first one, if I'm reading it right if I
21 read the rest right, is if you bundle changes and one
22 of them is enabled by the rule, then you have to risk-
23 inform the whole set of them which is a little more
24 than they would normally have to do?

25 MR. DINSMORE: Yes, that's correct. But

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1 the only reason to bundle them really is if you need
2 them to help you meet the risk acceptance criteria.
3 So there's a link there.

4 CHAIR SHACK: Now, this is a reduction in
5 scope for the process. Now why did you change the
6 reduction in scope from the previous version of the
7 rule which was based on the maintenance rule? That
8 was sort of neither the SRM nor the ACRS told you to
9 do that, that was your own idea.

10 MR. DINSMORE: Well, if we put back in
11 minimum, see the way the draft final rule is written
12 they had to do risk-informed evaluation for every
13 single change at the plant, including stuff that was
14 not previously regulated, which was one of the
15 comments we got.

16 Now if you tack onto that also that
17 there's a minimum change in risk--

18 CHAIR SHACK: Then you restricted that by
19 saying you only had to do that for components that
20 were under the maintenance rule. If the change
21 affected a component that was under the maintenance
22 rule, wasn't that the way the what is it the draft
23 final version was written?

24 MR. DINSMORE: Yes, that was one of the
25 criteria. Also the SRM that came back down when they

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1 changed small to very small they said ensure that all
2 changes are made under this rule.

3 CHAIR SHACK: All changes? So you didn't
4 want to restrict it that way. Got you.

5 MR. DINSMORE: So again it was kind of
6 well we have all these options and we effectively took
7 refuge in 1.174 and just said, well, if we're going to
8 do this at least we know how to do 1.174. And rather
9 than change the whole characteristic of all the
10 analyses, we thought we'll just try to go back to
11 1.174 and do what we know how to do.

12 MEMBER STETKAR: Are you going to go
13 into more detail about this or is this our shot at--

14 MR. DINSMORE: No, it comes up. It'll
15 come back.

16 MEMBER STETKAR: Okay. I was just
17 looking forward to the slides and I wasn't sure where
18 we had the opportunity to discuss this in more detail.

19 MR. DINSMORE: Yes, it comes back in
20 different sets of bullets that actually we'll lay it
21 out in a little more detail yes.

22 MEMBER STETKAR: Let me see if I can,
23 just so I can think ahead a bit and understand. Two
24 things I was struggling with is the second bullet
25 there, or the converse of that, that a staff review is

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1 not required as long as the licensee has submitted an
2 acceptable process and the licensee has made the claim
3 that the risk is indeed minimal and they've satisfied
4 the 50.49 staff. Then the staff doesn't need to
5 review any of the changes?

6 MR. COLLINS: Right.

7 MEMBER STETKAR: The issue I keep hanging
8 up on is seismic risk. Within the context of the rule
9 and the implementation of the rule, is seismic risk
10 determined simply by the seismic-induced pipe failure
11 frequency? In other words, demonstrating that my
12 seismic-induced pipe failure frequency at the TBS or
13 above is less than 10 to the minus five?

14 MR. DINSMORE: That would be an entry
15 point into the rule. You have to do that to even
16 take--

17 MEMBER STETKAR: But for me as a licensee
18 to say that you don't need to review my submittal for
19 some change if I can demonstrate to you that indeed my
20 seismic-induced pipe failure frequency at the TBS is
21 less than ten to the minus five, is that adequate for
22 me to justify the fact that the increase in risk is
23 minimal and I don't need to submit my analysis to you?

24 MR. DINSMORE: No, for each change that
25 you were proposing to make, when you evaluated that

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1 change you'd have to do a risk assessment evaluation
2 of that change. That should also include the effect
3 of seismic on that change.

4 MEMBER STETKAR: Simply limited to
5 seismic break frequency? Or integrated risk?

6 MR. DINSMORE: Well integrated risk if
7 you were making some change that's going to affect the
8 capability of the plant to respond to a seismic event,
9 regardless of whether you were breaking a pipe or not.

10 MEMBER STETKAR: Hard for me to believe
11 then how anybody can pass that criterion. If I have a
12 ten to the minus five seismic event I'm going to, with
13 high confidence, fail most if not all of the
14 mitigation systems for that event. And therefore my
15 core damage frequency is going to be ten to the minus
16 five. Ergo, it is not less than ten to minus six--

17 MR. DINSMORE: Ten to the minus seven.

18 MEMBER STETKAR: Seven, whatever. Very
19 small.

20 MR. DINSMORE: No, that's minimum.
21 There's three numbers.

22 MEMBER STETKAR: I'm sorry. Small, very
23 small. I haven't got the step ladder right in my mind
24 yet.

25 MR. DINSMORE: I guess it's not clear to

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1 me how difficult or not difficult it's going to be but
2 the parameters are that--

3 MEMBER STETKAR: I just wanted to
4 understand how if I was going to make a submittal, it
5 is not acceptable for me to simply show that the
6 seismic-induced pipe break frequency is less than ten
7 to the minus fifth and therefore I can make a
8 determination as a licensee. Now I'm making the
9 determination of whether or not I must submit this
10 change to you for review. Right? I must claim that
11 the increase in risk is minimal. So what criterion do
12 I use? Because everything that I've read about
13 seismic is simply seismic-induced pipe break
14 frequency. It is not seismic--

15 CHAIR SHACK: That was to select the
16 transition break size.

17 MEMBER STETKAR: True.

18 CHAIR SHACK: Now once you've selected
19 the transition break size you still have to go through
20 this risk assessment which is an integrated risk
21 assessment.

22 MR. DINSMORE: I will give you another
23 example perhaps. One of the things that we were
24 talking about a long time ago for self approval is
25 increasing the time for valves to open because now you

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1 have a little more time. So you're going to increase
2 the time for a valve to open.

3 Now once you're in this and you've had
4 this approved process beforehand, there's really no
5 seismic impact, well, they'd have to just determine
6 the potential impact of seismic events on the
7 sequences that they're going to change. I'm not quite
8 sure I'm fully answering your question because I guess
9 the idea was that they need to be bounded by the
10 seismic transition break so they'd have to show that
11 the frequency of seismically induced breaks is not
12 greater than ten to the minus five.

13 MEMBER STETKAR: Okay, that's frequency.

14 That doesn't--

15 MR. DINSMORE: But once they're in there,
16 yes, then everything switches over to evaluating the
17 specific changes that you're looking at. And when you
18 evaluate each specific change you have to deal with
19 seismic as you would normally deal with seismic in a
20 risk informed 1.174 submittal. I mean that varies a
21 lot depending on what's going on but however you deal
22 with that--

23 MEMBER STETKAR: I guess what I'm
24 struggling with is I understand what you're saying
25 about changes but simply by invoking this rule I am

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1 presuming that my seismic-induced core damage
2 frequency is negligible compared to my non-seismic
3 induced core damage frequency.

4 So, for example, I want to change valve
5 stroke times which might not necessarily be directly
6 affected by a seismic event. So I put my blinders on
7 and I look at that very, very narrow issue and I show
8 that the change in risk, on strictly that issue, is
9 very, very small. And simply by invoking this rule
10 I've now increased my core damage frequency by a
11 factor of ten to the minus five because I haven't
12 looked at the true seismic effect of this entire rule.

13 Do you follow what I'm saying?

14 CHAIR SHACK: You lost me a bit at the
15 very end there.

16 MEMBER STETKAR: The fact that the rule
17 requires me to only look at seismic-induced LOCA
18 frequency not seismic-induced risk, I can invoke the
19 rule as long as my seismic-induced pipe break size is
20 less than ten to the minus five per year to get a
21 transition, a LOCA of the transition break size.
22 Right?

23 MR. DINSMORE: Well, your LOCA frequency
24 might be much less than ten to the minus five.

25 MEMBER STETKAR: But if may be ten to the

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1 minus five and maybe it's ten to the minus six.

2 MR. DINSMORE: Let's say your pipe break
3 frequency is ten to the minus six and your CDF from
4 seismic is ten to the minus five. Again, are you
5 going to change that by the change that you make?
6 But that's covered here.

7 MR. DINSMORE: We try to keep them
8 separate. One is just get in and the other is--

9 MEMBER STETKAR: I'll let you keep going.
10 I was trying to get some things straight in my mind a
11 little bit.

12 MR. DINSMORE: It gets complicated.

13 CHAIR SHACK: I mean, in all likelihood
14 your likelihood of busting the pipe is going to be a
15 lot lower than your seismic likelihood of busting a
16 lot of other stuff.

17 MEMBER STETKAR: That's right, but I
18 don't want to make that presumption because we're
19 talking about a rule here.

20 CHAIR SHACK: No, I want to allow the
21 fact that the likelihood of a seismic event, because
22 we're going to apply this to every plant from here on
23 out, so there might be, I might harden my equipment in
24 the future such that there's an equal likelihood of
25 breaking the pipe and breaking the equipment. I

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1 don't want to presume relative likelihoods here.

2 MEMBER STETKAR: If we think about
3 existing nuclear power plants in the United States
4 based on construction and design basis accelerations,
5 you're absolutely right. But if you talk about new
6 plants being built that will operate under this rule
7 that may not necessarily be true.

8 CHAIR SHACK: But even if it isn't I
9 think they're still covered.

10 MEMBER STETKAR: That's what I just want
11 to make sure. The words "risk" and "frequency" are
12 used a little bit sloppily in the rule itself. And I
13 just want to make sure that when we're talking about
14 risk we're talking about risk and when we're talking
15 about frequency we're talking about frequency as part
16 of it.

17 MR. COLLINS: Shall I continue? The last
18 bullet on this slide is a new addition as well. When
19 licensees come in and subsequently make changes to
20 their plant, they have to confirm that those changes
21 don't invalidate the applicability of the elicitation
22 report of the seismic studies that got them in the
23 door in the first place as well.

24 If somebody comes and decides they want to
25 change the seismic support or something, that could be

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1 problematic. Okay.

2 Now risk-informed plant changes, those
3 that basically are enabled or bundled will have to
4 meet criteria in the rule, which are basically mirrors
5 of what's in Reg Guide 1.174. They need to maintain
6 defense-in-depth and safety margins. They have to have
7 monitoring programs in place and the risk increases
8 have to be acceptable, although they have to be very
9 small.

10 And then the licensees are also required
11 to periodically update their PRA and confirm that they
12 haven't exceeded the very small cumulative risk
13 estimate.

14 Referring to these here as other
15 requirements, although I think I've addressed them
16 already in the previous discussion, the analysis
17 methods for LOCAs has got to be approved by the staff
18 now and have to be able to connect any non-safety
19 equipment to onsite power.

20 PRA methods must be of sufficient scope
21 and quality; there's no change there from the previous
22 version of the rule.

23 The leak detection one is brand new.
24 Basically, this is a nudge to have people pick up the
25 practices that were described in Reg. Guide 1.45 which

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1 was developed after the Davis-Besse event. I think
2 that's where the Commission decided that this was not-
3 -

4 CHAIR SHACK: The 1.45 is much older than
5 Davis-Besse but it was revised.

6 MR. COLLINS: It was revised, right.
7 Right. It was called Guidance on Monitoring Response
8 to Reactor Coolant System Leakage and currently the
9 Commission would be happy to have people adopt that as
10 an acceptable means of maintaining leak detection in
11 breaks larger than the TBS.

12 CHAIR SHACK: Good.

13 MEMBER BROWN: I take it for not the big
14 stuff. Is there a leak detection? You mentioned
15 earlier that that was an addition that the Commission
16 added so I was taking it from that that we don't have
17 leak detection methods?

18 MR. COLLINS: No, there's nothing in
19 50.46, which addresses leak detection right now. Okay?
20 There's other regulations.

21 MEMBER BROWN: So this would be an added
22 capability?

23 MR. COLLINS: This would be an
24 enhancement in your leak detection capability.

25 MEMBER BROWN: You have to add capability.

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1 You have to add equipment to do that.

2 MR. TREGONING: You have to demonstrate
3 that you have sufficient capabilities to meet these
4 enhanced detection requirements. You may or may not
5 have to add equipment to do that.

6 MEMBER BROWN: You mean you may have
7 something that's already there that can fulfill that
8 requirement?

9 MR. TREGONING: You may be adequate
10 already.

11 MR. COLLINS: And then the last bullet is
12 the backstop which is not an LCO but it's an LCO-like
13 backstop for assuring that the plants operate in an
14 analyzed condition. The original Commission SRM said
15 that you must maintain your ability to mitigate breaks
16 up to the largest, the double-ended guillotine of the
17 largest pipe. And in interacting with the industry we
18 found out that that could be a killer for the rule.
19 They could really take advantage of the rule because
20 if they had to take a second pump out for service at
21 some point it would be meaningless. And the risk
22 implications of that should be very low. Okay? So we
23 put a backstop for 14 days in there.

24 MEMBER STETKAR: Tim?

25 MR. COLLINS: Yes?

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1 MEMBER STETKAR: Since this whole rule
2 revolves around a kind of risk-informed framework if
3 someone's going to adopt it, why impose a fixed
4 negotiated -- I'll use that word -- 14 day de factor
5 LCO, when indeed each individual licensee could use
6 their risk information to you know we're moving in the
7 direction of risk-informed tech specs and we have a
8 process in place to indeed justify LCOs based on a
9 plant-specific risk assessment, why in this particular
10 case 14.000 days is appropriate for absolutely
11 everyone where certain licensees might be able to
12 justify longer times, other licensees might indeed be
13 restricted to much less durations if they have less
14 redundancy and so forth.

15 MR. DINSMORE: There is another
16 difference between this and normal LCOs. With normal
17 LCOs you could still mitigate the accidents. In other
18 words, you have two LPIC pumps, you need one and you
19 take one out. You still have one left, unless that
20 happens to fail.

21 Well, in this case this 14 days you could
22 not mitigate that large break LOCA.

23 MEMBER STETKAR: I understand that but
24 philosophically we're still talking about a risk
25 metric in terms of determining what that appropriate

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1 number is. We're accepting the risk of core damage
2 in this case, known core damage, for a certain period
3 of time. In the other case we're accepting a risk of
4 reduced margin to core damage.

5 MR. DINSMORE: Yes.

6 MEMBER STETKAR: Philosophically it's no
7 different.

8 MR. COLLINS: I mean that's been debated
9 as long as the world's been going on. What should we
10 do about that? The Commission wants us to put a
11 backstop somewhere; when we talk to the industry we
12 originally had a seven day period in there. The
13 industry said, look, we need more time to get
14 equipment fixed and analysis done, you know, and we
15 can do just about anything we need to do in a 14 day
16 period so let's put a backstop at 14. That's kind of
17 how we got there. Steve's got a more sophisticated
18 way of getting there.

19 MEMBER STETKAR: I read that.

20 MR. COLLINS: But the fact of the matter
21 is the Commission wants us to have mitigation
22 capability and they want to put a backstop which is
23 not overly burdensome so we kind of arrived at a 14
24 day number.

25 MEMBER STETKAR: But does the rule have

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1 to specify a specific number or does the rule have to
2 specify a requirement for a licensee to (a) have a
3 tech spec and (b) have a justification for the tech
4 spec?

5 MR. COLLINS: The rule can be written any
6 way--

7 MEMBER STETKAR: Or a climate for a
8 licensee to provide a tech spec with an LCO and
9 justification for that LCO also satisfies the
10 criterion for a backstop doesn't it? I mean in that--

11 MR. COLLINS: It could be done that way.
12 It probably could be done in a lot of different ways,
13 this is just one way that we've come up with.

14 MR. DINSMORE: We discussed that
15 specifically and it became an extra analysis that had
16 to be done and provided and reviewed.

17 MEMBER STETKAR: Again, but it's a
18 licensee, this is a voluntary acceptance on the part
19 of the licensee. If they don't want to do the
20 analysis they don't have to.

21 MR. DINSMORE: Yes. Right.

22 MR. COLLINS: It's just one way of doing
23 it. Okay.

24 MEMBER RAY: I've been pondering this
25 readily connect onsite power to safety equipment

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1 that's credited. Is there any more guidance or
2 anything specified other than it has to be able to
3 readily connect in terms of what you do to connect it?

4 MR. COLLINS: Not at this point. We'll
5 probably have to develop that as part of the Reg
6 Guide.

7 MEMBER RAY: Okay. John has been asking
8 a lot of questions about seismic. Are there any
9 requirements on this non-safety equipment at this
10 point?

11 MR. COLLINS: Well, it has to be
12 available. And another thing we have to put in the
13 tech specs, that opens the door to us to ask them
14 about it, okay, because we have to review a tech spec
15 change. Now we haven't put any specific requirements
16 on it but you know it's something that we'll look at
17 and if we think it's squirrely we'll deal with it at
18 the time.

19 MEMBER RAY: Well that's not satisfying.

20 MR. DINSMORE: Also, if the non-safety
21 rated equipment is extremely sensitive to seismic
22 events, some big tank on the top of something or
23 other, then when you do your change in risk to make
24 the change that you're going to credit that, then you
25 would need to include the risk of the seismic event--

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1 MR. COLLINS: Disabling.

2 MR. DINSMORE: Yes, disabling, thank you,
3 of that equipment. So it's not completely
4 disappeared. It's treated as part of the process.

5 MR. COLLINS: This is an area we had
6 trouble with all along. I mean supposedly we're
7 dealing with the very low risk contributors already
8 and how much attention do we want to pay to the
9 equipment associated with the low risk events, you
10 know, and it's a constant debate. If we go too far
11 in one direction we're back into the normal 50.46
12 again putting all the requirements on for the
13 equipment that we had low TBS, and if we go the other
14 way it's like well at what point do you stop putting
15 requirements on things and just ignore it all
16 together.

17 MEMBER RAY: Yes, those are points I can
18 recognize. It's the part in-between that I'm
19 thinking kicking the can down the road has maybe got
20 some problems. Maybe that's all we can do at this
21 point but I just think, you know, to say well we'll
22 worry about that when we get to it might not be the
23 best way to handle it. Seems like an afterthought I
24 guess is what I'm saying.

25 MR. COLLINS: Well, it certainly would be

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1 nicer if we had nice clean criteria for all the
2 equipment. I mean I'm in agreement with that, I mean
3 it's just that I think we'll work it out in the reg
4 guide.

5 MEMBER RAY: Okay.

6 MEMBER STETKAR: One thing I'd just like
7 to mention again is that this is a rule that will be
8 in place for not only current existing operating
9 reactors but all future reactors, and it's quite
10 likely (a) most of the equipment in this plants will
11 be non-safety related and (b) it's quite likely that
12 seismic events will be the dominant risk contributor
13 in those plants. I'll just make that statement.

14 The concept that we're dealing with a very
15 low risk contributor as a fraction may indeed apply
16 for existing operating reactors. As a fraction of the
17 total risk, the seismic issue in particular, may not
18 apply as a small fraction of the total risk. Absolute
19 risk may still be very, very low but being careful
20 about the seismic part of the problem may be more
21 important for new reactors than it is perhaps for
22 existing reactors, just because of the nature of the
23 way that they designate their systems, most of which
24 are non-safety related.

25 MEMBER RAY: Well, I mean you're going to

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1 have to do a seismic analysis on this non-safety
2 equipment.

3 MR. COLLINS: Yes.

4 MEMBER RAY: Okay. If that's what you
5 say. Why is it non-safety-- I mean I don't know.
6 We'd better move on I guess. It seems very strange.

7 MR. COLLINS: Okay. Now as far as future
8 reactors go, the rule doesn't say all that much about
9 it other than the 50.46(a) can be used if similarity
10 in design and operation is demonstrated and if an
11 appropriate TBS is specified.

12 Now this is going to be a design-specific
13 review which is really going to require a lot of
14 development in reg guide space but the Commission
15 wanted to leave the door open to future reactors so
16 we've included it in the rule.

17 These next two slides are simply a summary
18 of what we think the changes have been relative to
19 defense-in-depth since the draft final rule that you
20 reviewed in the past. Nothing changed with regard to
21 single failures. Loss of offsite power, this is why
22 we require now that they provide onsite power for any
23 non-safety equipment, that gets credited in the
24 analysis. Non-safety equipment now has to be
25 identified in the tech specs and it's got to be

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1 maintained available if they want to take credit for
2 it because of the 14 day backstop. As far as the
3 ECCS analysis methods go before we had no prior
4 approval of ECCS methods, now prior approval is
5 required. And instead of just giving us a reasonable
6 representation of the system response we want a
7 demonstration of high probability that the criteria
8 will not be exceeded.

9 With regard to the criteria though there's
10 something I didn't mention. We added a question in
11 the FRN as well with regard to the coolable geometry
12 criteria for breaks larger than the TBS. The question
13 we put in there was whether we thought it was
14 practical to try to develop implementation criteria
15 for coolable geometry for breaks larger than the TBS,
16 as opposed to just using the same criteria we used
17 below the TBS.

18 And the reason we added that question is
19 just because of our history in trying to modify
20 50.46(b) right now with the oxidation criteria we've
21 been trying to do that for years and years and years,
22 and is it really practical to try to slice the bologna
23 further now and define coolable geometry differently
24 for beyond TBS. So we added a question to the FRN to
25 say that we think this is, you know, are we wasting

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1 our time doing that?

2 MEMBER POWERS: My response to it now you
3 put it up was that we've been trying so hard to get
4 50.46(b) done that why are you inviting this headache
5 on yourself here?

6 MR. COLLINS: Exactly.

7 MEMBER POWERS: I mean my personal
8 feeling is we've got it pretty please. But it's not a
9 radical change in the definition of the coolable
10 geometry. Now maybe somebody wants to come in with a
11 more realistic analysis. I mean 50.46 is a fairly
12 conservative approach to the world just because nobody
13 can figure out how to do it any other way. I mean it
14 follows the logic that you've got to maintain geometry
15 and the way to do that is don't break anything, don't
16 break anything, it's got to be ductile as though as it
17 has to survive. I mean that's a pretty conservative
18 approach.

19 MR. COLLINS: Okay. Well that's the end
20 of my presentation unless there's more questions.
21 And I'll hand it over to Rob.

22 MR. TREGONING: Thanks, Tim. I'm Rob
23 Tregoning from the Office of Research and I'm just
24 going to present a brief overview of efforts that our
25 office have undertaken to initiate the development of

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1 a regulatory guide so that applicants coming in under
2 this rule, provide some guidance so that they could
3 use or demonstrate that the transition break size
4 that's been developed under this rule is applicable to
5 their plant.

6 So just a brief description of what I'm
7 going to be covering in the next few slides. For those
8 of you that haven't followed every twist and turn of
9 the TBS development I'm going to provide a brief
10 summary, a very brief summary of the research that was
11 conducted to support the development of the TBS,
12 discuss the motivation and objectives for developing
13 the regulatory guidance and then in just a very few
14 slides present a high level overview of the scope,
15 philosophy and the general framework that is currently
16 envision for this regulatory guidance.

17 And then, finally, I'll touch on the
18 status and schedule for the development and then also
19 discuss interaction with the ACRS as part of the
20 schedule that we've drafted for the guidance
21 development.

22 So a little bit of a background. I think
23 we've already touched on these NUREGs during this
24 meeting, at least conceptually. There were two NUREGs
25 that were developed, NUREG-1829, which covered the

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1 expert elicitation which developed LOCA break
2 frequencies for what was called normal operational
3 loading, so that was normal loading and transients
4 that would be expected over a 60-year life of a plant.

5 And then once the TBS was picked,
6 primarily from that work as well as other
7 considerations, there was an additional study done
8 summarized in NUREG-1903 which looked at estimating
9 the seismic LOCA frequencies associated with breaks
10 greater than TBS. So we didn't consider seismic
11 explicitly when we picked the TBS, but what we did is
12 after we picked it we went back and did some work to
13 make sure that the seismic LOCA frequencies were still
14 below our ten to the minus fifth per year metric that
15 we were given by the Commission as guidance for basing
16 the TBS.

17 And this work really started, this
18 technical basis work started in an SRM in 2002 where
19 the Commission directed us to provide a comprehensive
20 LOCA failure analysis and they further indicated that
21 we should use expert elicitation to convert service
22 data and PFM results.

23 MEMBER BROWN: Let me-- I want to try to
24 make sure that I understand. You talked about the ten
25 to the minus fifth seismic break; now is break due to

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1 seismic? I'm just trying to get the wordsmithing.

2 MR. TREGONING: Yes, again there were two
3 NUREGs. The first, NUREG-1829 did not consider
4 seismic initiating events. Okay. And essentially a
5 risk metric of ten to the minus fifth associated with
6 those breaks was used as the starting point for
7 choosing the TBS.

8 Now once the TBS was selected then we did
9 the subsequent study, 1903, to ensure or to
10 demonstrate or to understand if the seismic risk
11 would invalidate the TBS selection that we had made.

12 MEMBER BROWN: And the numbers would come
13 out too large?

14 MR. TREGONING: We wanted to demonstrate
15 that the seismic frequency and therefore risk for
16 breaks greater than the TBS was acceptably small.

17 MEMBER BROWN: You use the word seismic
18 frequency, you mean seismic induced?

19 MR. TREGONING: Seismic-induced LOCAs.

20 MEMBER BROWN: Okay. All right.

21 MEMBER STETKAR: Rob, to be clear again
22 because I get hung up on the words "risk" and
23 "frequency" because they're different things; 1903 was
24 a demonstration that the seismic induced pipe break
25 frequency was less than ten to the minus fifth per

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1 year. It made no assertion whatsoever on risk from
2 those events, is that correct?

3 MR. TREGONING: That is largely correct.

4 The one aspect that would look at risk was it did
5 look at indirect failures of piping, right, so you
6 would look at the frequencies associated with other
7 events such as support failures and what the
8 implication was.

9 MEMBER STETKAR: But that was still, it
10 wasn't a great frequency.

11 MR. TREGONING: Yes, it wasn't a CDF
12 risk per se. It was related to--

13 MEMBER STETKAR: --the pipe break
14 frequency.

15 MR. TREGONING: Right. But the
16 difference with the indirect is it wasn't an
17 initiating event within the pipe break. The pipe
18 break itself wasn't the initiating event.

19 MEMBER STETKAR: Seismic two over one
20 type?

21 MR. TREGONING: Right.

22 MEMBER STETKAR: But still pipe break
23 frequency not the--

24 MR. TREGONING: Consequences.

25 MEMBER STETKAR: But it says on the side,

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1 verify that the risk associated with seismic induced
2 breaks greater than the TBS are acceptable. NUREG
3 1903 says nothing about that statement.

4 MR. TREGONING: That's true in terms of,
5 risk define in terms of CDF, that's true. Although
6 1903 made very crude assumptions about how frequency
7 would translate to risk.

8 MEMBER STETKAR: Okay, if damage
9 frequency of ten to the minus five is acceptable then
10 indeed one can infer--

11 MR. TREGONING: Right. So there were risk
12 inferences made in 1903 but they were usually made by
13 assuming that a pipe break went directly to CDF, so a
14 consequence of one essentially. So a very crude
15 metric was used.

16 MEMBER STETKAR: Thanks.

17 MR. TREGONING: Briefly, I wanted to
18 summarize 1829, the elicitation was used to estimate
19 generic and I've highlighted that because that's
20 really the main reason for developing this regulatory
21 guidance to ensure plant-specific applicability of
22 these generic BWR and PWR passive system LOCA
23 frequencies and again it developed these frequencies
24 associated with material degradation, or aging within
25 passive system components.

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1 We had a number of panelists. We had
2 roughly 12 panelists on the elicitation. They
3 provided quantitative estimates that we then analyzed
4 to develop frequencies associated with each panelist,
5 and they supported those estimates with qualitative
6 rationale. And we did a combination of group
7 meetings to ensure that all the experts had
8 sufficiently equal background in terms of the issues
9 that we were eliciting, but then the elicitation
10 themselves were done individually to address the
11 underlying technical issues.

12 And as people that have followed this are
13 very aware, with the next few statements we had
14 generally good agreement among the experts on the
15 qualitative LOCA contributing factors. But, not
16 surprisingly, there was large individual uncertainty
17 and by that I mean how certain each panelist was
18 associated with their quantitative number.

19 And then also there was substantial
20 variability in estimates between panel members, which
21 we called the panel variability.

22 So that results in a fairly wide total
23 uncertainty associated with these estimates.

24 Another aspect of 1829 which was discussed
25 quite a bit is the results themselves are very

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1 sensitive to the method used to aggregate the
2 individual panelist's estimates. So we developed point
3 estimates of specific frequencies both mean, 95th and
4 then we developed confidence bounds associated with
5 each of those percentiles within 1829. And we
6 published that a little over a year ago.

7 And the way 1903 was done was really a
8 compilation study. The first aspect of the study
9 looked at the experience and all the prior work that
10 had been done, a very large body of prior work that
11 had been done on seismic analysis of piping and other
12 passive systems failures. So it reviewed prior PRA
13 seismic study, component testing and experience as
14 well.

15 It also looked at analyzing direct piping
16 failure associated with rare seismic events, so these
17 are the ten to the minus fifth, ten to the minus sixth
18 per year initiating seismic events. So these are at
19 stresses that are much larger than an SSE or a Safe
20 Shutdown Earthquake type of analysis that would be
21 required under a design using ASME code rules.

22 And the focus again, because we were
23 trying to determine the frequency associated with
24 breaks greater than the TBS, the study was only
25 focused on piping systems with diameters larger than

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1 the TBS, at least the study that was done on 1903
2 although the methods weren't unique, the study itself
3 only examined PWRs and that was really only a function
4 of the fact that we had the most complete information
5 in terms of seismic hazard assessment as well as
6 piping stress information available for the PWRs.

7 So with the P's it ended up that the only
8 systems that needed to be considered based on the TBS
9 were hot legs, cold legs and crossover legs. So
10 essentially the main reactor coolant piping.

11 The other thing that it did look at it was
12 at least one mode of indirect piping failure analysis
13 and that was essentially a failure associated with
14 large component support failure. And the results that
15 were summarized in 1903 with respect to unflawed
16 piping, there was a determination, and this is fairly
17 well known and I don't think very controversial at all
18 based on the experience that we've had internationally
19 on earthquake experience, the failure frequency
20 associated with unflawed piping is much lower than ten
21 to the minus fifth per year. In general those pipes
22 are very robust.

23 For flawed piping, the way the study was
24 done it didn't come up with a frequency per se, but
25 what it did do was associate it with these rare

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1 earthquakes so that the flawed size is associated with
2 failure. And primarily what it demonstrated was that
3 you needed to have for long circumferential flaws and
4 θ over π essentially means you've got a flaw
5 that's about almost halfway around the circumference
6 of the pipe and these are all circumferentially
7 oriented flaws.

8 And what it did for flaws that were that
9 long, the study calculated critical flaw depths and
10 what the study demonstrated is that these are
11 generally large flaws even under these very rare large
12 earthquake loads that are required to cause failure in
13 at least the main circulation loop piping.

14 And then it did look at, again this one
15 failure mode for indirect failure in the two cases,
16 and I say two cases, it looked at two specific plants,
17 a Westinghouse and a CE plant that had been previously
18 analyzed in a Lawrence Livermore study and it
19 essentially just updated that prior study using
20 revised piping stress information as well as revised
21 seismic hazard information.

22 And for those two cases the prediction was
23 that the mean piping failure probability was on the
24 order of ten to the minus sixth per year. And NUREG
25 1903 was published, again a little over a year ago in

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1 February 2008.

2 MEMBER CORRADINI: I remember you being
3 here describing all this to us before in much more
4 detail, but just to understand the connection so is it
5 the intent of when you did 1829 that one of the
6 initiating reasons, potential reasons for a flaw or a
7 break in a piping was seismic in 1829 and this
8 subsequent study just verified that it was a small
9 subset? Or was it a view there's two independent ways
10 of looking at how failure would occur in a piping?

11 MR. TREGONING: They're essentially
12 independent. When we started 1829 we didn't
13 necessarily preclude consideration of seismic failure.

14 In fact, we actually had elicitation questions
15 developed that asked the experts about seismic failure
16 frequencies, or frequencies associated with seismic
17 events.

18 What we quickly found though was that we
19 would have needed an entirely different panel of
20 experts to really adequately address that problem.

21 MEMBER CORRADINI: But to say it
22 differently though, so the panel of experts in 1903
23 were different than those for 1829, or the study was
24 done different than 1829?

25 MR. TREGONING: Yes, it was a totally

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1 different approach; 1829 used the elicitation, 1903
2 was more of a standard analysis. More of a standard
3 piping component integrity type of analysis. But it
4 was also informed by prior studies and operating
5 experience that had been done on the seismic question
6 predominantly back in the 80s when a lot of this work
7 was initially done.

8 So hopefully this clarifies your question.

9 They were entirely different approaches that were
10 chosen to look at each of these questions somewhat
11 independently. But the seismic question was a little
12 bit easier because the seismic question we had
13 presumed or assumed the TBS so it really allowed us
14 to limit or refine the scope of that analysis to only
15 these failures within very large pipes. So that made
16 dealing with the seismic question easier in a sense
17 because we had limited the scope of the analysis by
18 that amount.

19 MEMBER CORRADINI: Right. Thanks.

20 MR. TREGONING: Does that-- it doesn't
21 look like it clarified.

22 MEMBER CORRADINI: I don't know if I'm
23 asking the right question.

24 MR. TREGONING: Well you can think about
25 it and then come back at me with me.

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1 CHAIR SHACK: You know, since you don't
2 really compute a frequency out of that, you just get a
3 warm comfortable feeling out of that, that's an
4 awfully big flaw not to be detected. How small would
5 a flaw have to be before you'd worry about it?
6 What's your acceptance criteria for you know a ten to
7 the minus five or a ten to the minus six seismic event
8 flaw?

9 MR. TREGONING: Yes, that's-- we've
10 struggled with that very question in many contexts
11 within the NRC not just this question, in terms of
12 what's an acceptable demonstration related to an ISI
13 reliability and accuracy and how do we credit that?
14 So we've struggled with that question as an agency for
15 years now.

16 And if you look at the regulatory
17 guidance, there is a requirement in there, and this is
18 more detail than maybe I wanted to get into in this
19 meeting, but one of the things that we're essentially
20 thinking is that when a plant looks at the seismic
21 analysis for their plant, they would essentially have
22 to do their own plant specific critical flaw size
23 calculation.

24 And the way that bars are set is that if
25 they demonstrate that their flaws are bigger than

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1 1903, which are pretty big you know 30 to 40 percent
2 through-wall, I think there's a notion in the staff
3 that we have pretty high confidence in those kinds of
4 flaws. So if they can meet that bar they're okay.

5 So the next question is let's say they
6 fall below it. Well the next criteria that's in there
7 is they compare the flaw that they find with their
8 ASME code allowable flaws which do set inspection
9 limits. And the notion there is that if the
10 inspectable flaw is greater than what their
11 requirements are for code inspections, then there
12 should be at least, if we haven't taken any conditions
13 on those code requirements, that that at least
14 implicitly says that there is a comfort level or an
15 agreement that those flaws are reasonable or are going
16 to be found reasonably using an ASME-qualified
17 inspection.

18 So that's the next bar they can meet
19 that's a little bit more rigorous.

20 Now the third bar, let's say they're below
21 that, and that's really the challenge and really what
22 we've said at that point or where we've gone there is
23 to say, okay, if your flaw is smaller than this then
24 you have to demonstrate to us why you can find that
25 flaw reliably in whatever your critical location is.

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1 So then they would have to come in and
2 demonstrate to the NRC that they could reliably and
3 accurately detect those flaws. And I would predict
4 that that's going to be a fairly rigorous argument
5 that would have to be presented.

6 CHAIR SHACK: How about a cast stainless
7 steel pipe?

8 MR. TREGONING: Well, that would make it
9 all the more challenging. So certainly when they do
10 their analysis, whatever the critical location ends up
11 being and if it's associated with a cast stainless
12 steel pipe per se, that's going to make their
13 inspectability demonstration that much harder. So,
14 yes, material will clearly play into that
15 demonstration.

16 CHAIR SHACK: But they can't use an
17 experience thing, there really hasn't been much
18 cracking in cast stainless steel pipes.

19 MR. TREGONING: Well, we don't-- do we
20 know that?

21 MEMBER CORRADINI: I don't think I
22 appreciate-- I just have one other question, you guys
23 went back and forth on this. So if I understood the
24 conversation, the smaller the flaw the more you're
25 going to ask them to prove they can find it?

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1 MR. TREGONING: Exactly.

2 MEMBER CORRADINI: So the absence of
3 finding something makes them guilty before they're--
4 I'm not understanding, that strikes me like you're
5 going down a, it's not provable.

6 MR. TREGONING: No, the flaw that they
7 come in with is a flaw that's developed by analysis
8 only so it's not like they've done an inspection.
9 And you know this flaw says this is the biggest flaw
10 they can live with at that location, right, and that's
11 determined by analysis.

12 MEMBER CORRADINI: Okay.

13 MR. TREGONING: So the inspection bar
14 would be okay how comfortable are we or how certain
15 are we that they can really find that flaw? And the
16 bigger that flaw is, that level of certainty is
17 increased. So the larger that flaw is, the more
18 relaxed the requirements are that they would have to
19 demonstrate for us.

20 MEMBER CORRADINI: Okay. I understand
21 that.

22 MEMBER SIEBER: The big question at least
23 in my mind is it's very hard to find flaws in cast
24 material. So is the detectability and
25 characterization sufficiently good in cast materials

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1 to make this whole exercise practical?

2 MEMBER ARMIJO: Good question.

3 MR. TREGONING: Well, again that's what
4 would have to be demonstrated.

5 MEMBER SIEBER: Well but you ought to
6 have some kind of a guess at it now right?

7 MEMBER CORRADINI: You don't want to
8 have something that's not usable and that's what I
9 think you're asking.

10 MEMBER SIEBER: That we're doing a lot
11 of work--

12 MR. TREGONING: Well, but if you're
13 limiting location as a cast component, right, let's
14 say that is your limiting location to a seismic
15 analysis. Right now that's problematic and we're
16 working on developing better inspection techniques.
17 But the rule itself can't get ahead of that, right, I
18 mean that's a problem that we're going to continue to
19 work.

20 MEMBER SIEBER: You can spend five years
21 writing a rule that doesn't have an application if the
22 technique to show compliance with a fundamental part
23 of the rule isn't there.

24 MR. TREGONING: Right. But again if
25 there was a determination that every plant was going

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1 to be limited by cast that would be a different
2 situation. There may be a subset of plants and I
3 couldn't put a number on it but my guess would be it's
4 not going to be, I would say it's probably less than
5 half, maybe significantly less than half, that are
6 going to be limited by their cast.

7 And still if they did an analysis under
8 this rule and demonstrated that they had a very large
9 flaw even in a cast component they would be okay.
10 It's only flaws that would be smaller than were
11 developed for 1903 that they would have to have
12 sufficient proof that their inspections were
13 sufficiently adequate.

14 MEMBER SIEBER: Is that sufficiently
15 conservative in your view?

16 MR. TREGONING: Yes. Given the size of
17 the flaws in 1903, yes,

18 MEMBER SIEBER: Okay.

19 MR. TREGONING: These are big flaws
20 right? Big flaws.

21 MEMBER SIEBER: Cast is tough stuff to
22 look into.

23 MR. TREGONING: Tough stuff to look into
24 but in general it's got pretty good toughness and we
25 haven't seen much service-induced, in fact we haven't

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1 seen any service-induced degradation associated with
2 cast. And you might argue that's because we can't
3 inspect very well.

4 MEMBER SIEBER: That's because you can't
5 inspect it.

6 MR. TREGONING: But at least visually
7 it's inspected and there's been no visual
8 documentation and you know even research-wise there
9 hasn't been degradation modes or mechanisms that have
10 been really identified as being of potential concern
11 at this point. But it's something that we're always
12 looking at.

13 MEMBER SIEBER: I'll quit asking
14 questions. Hopefully you'll not identify the peak of
15 my intelligence.

16 MR. TREGONING: Okay. So a little bit of
17 background. Shall I move on?

18 MR. SHUKLA: Yes, this is Girija Shukla
19 from staff. We have looked at these NUREGs and we
20 have written a letter about end of 2007 on these.

21 MR. TREGONING: Yes, and thank you for
22 clarifying that.

23 Okay. So the regulatory guidance itself
24 and, as Tim had mentioned, this was a recommendation
25 that was also made at the ACRS and when we had prior

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1 meetings with the ACRS I think this was always the
2 staff intent that this was something that we generally
3 agreed on was a good idea. And the Commission agreed
4 with everyone on that and essentially said yes, staff,
5 go forth and develop some guidance.

6 And, as Tim had mentioned, in the SRM they
7 specifically only mention guidance for 1829 but we've
8 interpreted their direction as saying we need to
9 develop guidance associated with all of the tech basis
10 that used to develop the transition break size. So
11 that would include both 1829 and 1903. So we
12 proceeded with developing guidance on that basis and
13 based on that interpretation.

14 Okay. So again, like I said, a very brief
15 overview. This is a teaser in that I'm going to be
16 back with a lot more detail at a date to be
17 determined. But I at least wanted to give you a sense
18 of what some initial thoughts are on the plant-
19 specific applicability and how we've gone about
20 developing what at this point is I'll call a pre-
21 draft reg guide.

22 So when we tackled this thing the first
23 thing we did is we really looked deeply into 1829 and
24 1903 and tried to identify all the generic aspects
25 associated with those studies. And we looked at the

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1 assumptions itself, what generic assumptions we had in
2 both of these studies, the approach that we used, what
3 were generic aspects associated with the approach and
4 the analysis. So we tried to look at all aspects of
5 each of those studies and identify issues that we
6 thought were important or critical that plants would
7 need come to in and demonstrate applicability.

8 So we identified as part of this initial
9 evaluation several areas where the LOCA frequencies
10 could be affected by plant-specific factors. And with
11 respect to NUREG 1829 applicability, there were issues
12 associated with safety culture. Of course, we know
13 that individual safety culture can potentially have a
14 large effect on LOCA frequencies and I think Davis-
15 Besse is the most cited example of that.

16 We looked at applicability related to
17 continued operation and then we also looked at
18 applicability related to changes in plant operation
19 that may affect LOCA frequencies. And while we were
20 specifically thinking about changes that would be
21 enacted by the 50.46(a), we really wanted to encompass
22 all changes. So if a plant does a power uprate, even
23 if it's not associated with 50.46(a), we want to
24 ensure that that power uprate if they're going to come
25 in and apply for 50.46(a) is not having an impact on

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1 their LOCA frequencies. So that's what we mean when
2 we talk about changes in plant operation.

3 With respect to NUREG 1903 applicability,
4 and I use the word risk, I'll strike that and use
5 frequency to make sure that we're not confusing piping
6 failure risk with CDF risk, so the frequencies
7 associated with direct piping failures caused by
8 seismic loadings, so these are direct failure
9 frequencies, and then the frequencies associated with
10 indirect piping failures. So we looked at developing
11 guides in all of these areas.

12 What we settled on in the draft guide, the
13 areas that are italicized, continued operation,
14 changes in plant operation and direct piping failure
15 risks or frequencies, those are the areas that are
16 specifically addressed or that will be specifically
17 addressed within the regulatory guide itself.

18 We've developed a white paper that will be
19 used essentially as the basis for this draft
20 regulatory guide and that white paper describes how we
21 are handling safety culture and indirect piping
22 failure frequencies outside of at least the explicit
23 regulatory guides.

24 MEMBER BROWN: What's an indirect piping
25 failure?

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1 MR. TREGONING: Something else failing
2 that turns around.

3 MEMBER BROWN: Okay. All right.

4 MR. TREGONING: Either a support which
5 then cause the pipes to fail or a--

6 MEMBER BROWN: I guessed that. I just
7 wanted to make sure I had it.

8 MR. TREGONING: That was the right guess.

9 MEMBER POWERS: I'm wondering a little
10 bit about how a licensee, what you expect a licensee
11 to do when you ask him to go look at the applicability
12 of 1903. And the reason is I look at what we're
13 requiring people to do with respect to seismic hazard
14 on things like Early Site Permits and things like
15 that. And because the USGS has changed the return
16 frequencies of earthquakes, of significant earthquakes
17 substantially relative to what was in vogue when the
18 plants were licensed, we typically require the
19 licensee to do quite a lot, or an applicant do quite a
20 lot for those Early Site Permits for a plant on a
21 site where there are existing reactors.

22 Do you have that magnitude of effort in
23 mind when you're talking about the applicability of
24 1903 or are you saying, okay, this plant was licensed
25 under this seismic hazard, go ahead and use that

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1 seismic hazard?

2 MR. TREGONING: I would say it's between
3 those two bounds that you've talked about, not the
4 same bar as possibly new reactors they're looking at
5 now for Early Site Permits. But NUREG 1903 really
6 laid out a very explicit approach and method for
7 analyzing direct piping failure. And it made various
8 assumptions using the best available data in terms of
9 the seismic hazard information that was used, for
10 instance, all the soil-structure interaction and plant
11 response factors that were applied in those results.
12 Right?

13 And actually 1903 evaluated a fairly large
14 number of plants, I think on the order of 24, 25
15 plants were actually evaluated, using the information
16 that we had at the time.

17 MEMBER POWERS: These were the plants
18 that had done seismic PRAs?

19 MR. TREGONING: Not necessarily. These
20 were plants that we had seismic hazard information and
21 that was drawn from the Lawrence Livermore study in
22 1995, so not the most up to date but it was the most
23 recent publicly available seismic hazard information.

24 And we coupled that with information that
25 we had for plants on LBB where they had done SSE

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1 evaluations as well as we had information related to
2 design stresses associated with the piping. So those
3 were the plants that we went and we analyzed because
4 we had sufficient information. Because at the end of
5 the day all you need with respect to the seismic event
6 is an understanding of the stresses that are applied
7 at your limiting location.

8 So the way the regulatory guidance is
9 going to be set up because so many different plants
10 were evaluated, what we would ask a plant to do is
11 look at each of those pieces and if you can
12 demonstrate that what was used in the reg guide is
13 still applicable, or conservative for your plant in
14 each of those pieces, you don't have to do a new
15 analysis.

16 But if they're areas that have been
17 updated and we tell them specifically that the most
18 recent or updated seismic hazard information should be
19 used and we give them two approaches. We give them
20 multiple approaches for determining component
21 stresses, they can either use like an SSI factor type
22 approach, as was done in 1903, or if they so choose
23 they can do direct plant modeling, right, using
24 computational methods to predict what the component
25 stresses are.

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1 MEMBER POWERS: It is the most updated
2 seismic hazard information that causes pause because
3 the hoop we force them to jump through in connection
4 with site applications, requires not only to look at
5 what's published on the USGS because that's getting, I
6 mean it's not as old as I am certainly, but there has
7 since that was published been an intervening period of
8 quite a lot of academic theses and whatnot. A license
9 is called upon to go survey that literature and in
10 some cases do their own geo-technical work and things
11 like that.

12 And I mean if they have to do that, that's
13 a reasonably difficult undertaking.

14 MR. TREGONING: Yes, and I would agree.
15 And I think at this point there's some room for
16 discussion here but the way the draft reg guide is set
17 up now it essentially says use your most recent up to
18 date, what you consider your most accurate seismic
19 assessment data.

20 Now what would happen essentially if they
21 came in for review and approval under 50.46(a) and
22 they said this is our most recent and this is how we
23 developed it, if there were concerns that that data
24 was essentially conservative or representative then
25 there may need to be some iteration involved at that

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1 point.

2 So we haven't provided, there was no
3 intent to provide specific requirements or guidance to
4 say this is how you have to develop that data. We
5 could. We could have chosen to do that but we haven't
6 yet.

7 MEMBER POWERS: But your expectation is
8 what I would characterize as reasonably high for that
9 input and that chore of saying that 1903 is indeed
10 applicable to me.

11 MR. TREGONING: Yes. And one of the
12 reasons we haven't been as explicit because we're
13 aware of the continual churning that's going on in
14 early site licensing space. So we don't want to get
15 ahead of that either, so we'd like to see where that
16 shakes out and, hopefully, some of that information or
17 the procedures that are developed there may be
18 applicable at that point.

19 MEMBER POWERS I mean you're quite
20 correct that it's as dynamic as that particular field
21 ever gets right now. I mean it's geological and it
22 takes a while to churn and things like that. But it
23 certainly is, I mean the USGS they've certainly
24 changed the perceived hazard relative to when most of
25 these plants were originally licensed.

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1 MR. TREGONING: Sure. And certainly
2 that's an issue that needs to be addressed and it's
3 been identified which is why again the guidance itself
4 is very vague but there's a notion that there would
5 have to at least be some demonstration that these are
6 applicable seismic hazards.

7 MEMBER POWERS: I would suspect that your
8 indirect failure is also affected by the American
9 Society of Civil Engineers' new approach to seismic
10 damage.

11 MR. TREGONING: Yes. Now that's the one
12 area at least we're not-- indirect failures, because
13 we didn't have a basis because we only looked at a
14 limited number of failure modes in a couple of plants
15 so we felt like we didn't have enough of a technical
16 basis to allow any generic changes in I'll say
17 seismic qualification or testing requirements
18 associated with things that are seismically qualified
19 that could fail and then lead to a direct piping
20 failure. The reg guide itself is pretty definitive,
21 it says you know that you're not allowed to make
22 changes in those areas under this rule unless you want
23 to do a full-scope PRA to demonstrate the
24 acceptability of any change that you would like to
25 make in that area.

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1 So I think for those very reasons, some of
2 which you've just discussed, we decided to stay away
3 from that. And I don't think that was ever the intent
4 of 50.46(a) to begin with so it just seemed like a
5 reasonable limitation to put on, it's not a limitation
6 because a plant could still come and justify it but it
7 would be a fairly high bar to meet if they wanted to
8 make those sorts of changes.

9 MEMBER BLEY: Rob, I would like to go
10 back to not to seismic but to 1829, back a couple of
11 years ago when you brought a draft of that to us. We
12 had urged that when it comes to regulatory decisions
13 that they be based on the totality of the results from
14 the sensitivity studies rather than the arithmetic
15 manipulations. Does that show up in like your second
16 bullet there on how to use that information in
17 specific cases or did you do anything along those
18 lines?

19 MR. TREGONING: Well that showed up
20 explicitly in how the TBS was selected. There's no
21 notion that you know plants are going to be developing
22 quantitative frequencies under this program. All that
23 have to do is demonstrate that within the confines of
24 what was considered in 1829 they're a typical plant.

25 MEMBER BLEY: Okay.

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1 MR. TREGONING: There's nothing unique
2 about that plant that would cause them to stand out in
3 terms of their LOCA frequencies. So it's really just a
4 relative assessment, it's not an absolute assessment
5 in any way.

6 MEMBER BLEY: But they'd have to be
7 within the ranges of things that were evaluated?

8 MR. TREGONING: That were considered in
9 1829, that's exactly right. And if they fell outside
10 those ranges then they potentially, well they would
11 have to justify why being outside that range was not
12 significant if they still wanted to use 50.46(a).

13 Okay. So again just one slide if I can
14 move on, on the philosophy and the framework
15 associated with the applicability guidance. Again,
16 this only addresses breaks larger than the proposed
17 TBS and again that's largely the primary loop typing
18 and the pressure boundary structural components
19 themselves so the big structures, the vessel, the
20 pressurizer, steam generator manway, RCS pump--

21 MEMBER ARMIJO: Could you refresh my
22 memory on the actual dimensions of the TBSs for the
23 BWRs and PWRs that came out of these studies?

24 MR. TREGONING: Yes. The BWR ends up and
25 again it's plant specific because they're all tied to

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1 the system but the nominal pipe dimensions end up
2 being about 18 to 24 inch range for the Bs and about
3 12 to 14 inches for the Ps. And, as we mentioned
4 earlier, the Ps are typically, in fact I think in
5 almost every case associated with the surge line.

6 MEMBER ARMIJO: Okay. What are the
7 largest PWR pipes?

8 MR. TREGONING: They're about 30 inches.

9 MEMBER ARMIJO: So those things are
10 clearly up?

11 MR. TREGONING: Yes, they're well above,
12 right. And then there's a big jump from them down to
13 the surge line size so there's a pretty big gap in
14 pipe sizes there.

15 MEMBER ARMIJO: Thank you.

16 MR. TREGONING: Okay. The other
17 philosophies that we've tried to as much as we can
18 leverage what a licensee would have to submit to
19 information that's already been developed for other
20 applications they may have come in with wherever
21 possible. And specifically the three things that we
22 looked at that we thought were most applicable were
23 any power uprate applications, certainly license
24 renewal, and then prior LBB submittals. So we
25 really wanted to develop this guidance to build off of

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1 the philosophies that are inherent in these other
2 processes that are ongoing at the NRC.

3 The evaluation to address 1829
4 applicability I think I touched on this, it's intended
5 to be largely a qualitative analysis and primarily
6 they're looking at considering plant-specific effects
7 on the variables that affect LOCA frequencies, and
8 ideally demonstrate that there's nothing unique about
9 their plant that would cause an elevation in their
10 LOCA frequencies.

11 The other thing that they need to do is
12 they have to demonstrate the adequacy of existing
13 plant conditions and operations and also, if they
14 propose any plant changes, they have to demonstrate
15 that the plant changes themselves will not cause an
16 elevation in the LOCA frequencies.

17 So if someone wanted to let's say do a
18 power uprate under 50.46(a), they would have to
19 demonstrate that the power uprate would not result in
20 increased LOCA frequencies due to I don't know
21 increased pump speeds that might increase you know a
22 vibrational component of loading within these piping
23 systems. So that would be something that they would
24 need to look at.

25 We talked a little bit in detail, due to

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1 Dana Powers' question about the 1903 applicability,
2 and this is a multi-faceted or it will be a multi-
3 faceted with various options for licensees to
4 potentially use, it can get fairly complicated but
5 what we've tried to do is provide a range of options
6 to allow a more simplistic analysis all the way down
7 to a very complete analysis of piping failures under
8 seismic loading.

9 And the other thing that we're doing,
10 because there's so many options and it can get
11 relatively complex, we have very detailed guidance
12 related to 1903 and then we'll also have some very
13 specific examples about how one would actually do the
14 analysis, if they needed to do the analysis for their
15 particular plant.

16 So where are we in developing this
17 guidance? We have completed the development of a
18 white paper and the white paper will serve essentially
19 as the basis for this proposed regulatory guide. We
20 put the ADAMS number in the white paper for the white
21 paper in the slides

22 if anyone's interested in previewing that white paper.

23 It is available. We made it available in February
24 of this year.

25 We had a public meeting in February also

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1 to get some initial feedback on the white paper
2 itself. We've received at least one round of informal
3 comments from stakeholders which we just got a few
4 weeks ago in April. And we've also used the reg guide
5 development work to also provide some information to
6 feedback and support the rule-making FRN. So some of
7 the language in some of the requirements you see in
8 the rule are directly related to the work that's gone
9 on in developing this applicability guidance.

10 The plan is now that we've got at least
11 some initial stakeholder feedback we're going to use
12 that, along with the white paper, to develop a draft
13 regulatory guide which we've started to work on now
14 and hopefully we'll complete that, maybe not this
15 month but hopefully by next month.

16 And once we are at that stage then you
17 know as part of the normal regulatory guide process I
18 think ACRS has the option of reviewing any regulatory
19 guide that you so choose prior to releasing it for
20 public comment. So that's why I have a tentative date
21 there. I know what typically works is we would send
22 you a letter that would say, this reg guide's been
23 prepared, we're proposing to send it out for public
24 comment, would you like to review it? And you get the
25 chance to review it or not.

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1 And, depending on what we do there, then
2 we'll publish the draft guidance for public comment
3 some time in the late summer. We envision at least a
4 couple of month public comment period. We like to
5 give people a long time to look at this guidance and
6 to give them a chance to comment, so we're thinking on
7 the order of 60 days right now. And then we'll
8 address the public comments toward the end of the year
9 and the plan would be some time in early 2010 we would
10 be, if we're not here talking about the proposed reg
11 guide, we would be back talking about what at that
12 point would be the draft or the proposed final reg
13 guide which would also have considered all the public
14 comments that we got.

15 And in terms of publishing the fina,
16 guidance, the requirements in our schedule is that
17 we're not going to publish this until six months after
18 the final rule has gone to the Commission. And we're
19 not going to publish it because we want to make sure
20 that we've got final Commission direction to go ahead
21 with this rule. There's no sense in having reg guide
22 out in advance of the rule itself. It gets us in
23 enough trouble.

24 So that's it for my prepared remarks. If
25 there are any other questions?

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1 CHAIR SHACK: Is there any plan to
2 develop additional regulatory guidance for the thermal
3 hydraulic piece of this?

4 MR. COLLINS: We will develop some guide
5 but we don't think it's particularly complicated. I
6 mean with the change in requirement for approved
7 methodologies, it's hard to imagine that it's going to
8 be a whole lot different guidance than exists for
9 today's methodologies. So I wouldn't expect there to
10 be much of a reg guide--

11 CHAIR SHACK: I guess it's conceptually
12 possible but not likely.

13 MR. COLLINS: Yes. We'll see what
14 happens at the end of the comment period.

15 CHAIR SHACK: Just the notion, you know,
16 just to sort of if you're willing to accept the size
17 of a flaw as essentially a decision point for you know
18 that it's sufficiently low that you believe it's ten
19 to the minus five, could a BWR come in and show that,
20 you know, it's got a pi over 8 theta flaw that has to
21 be 35 percent through-wall and essentially get a
22 lesser transition break size?

23 MR. TREGONING: You mean get a-- wait a
24 minute let me understand. Would they be able to come
25 in and demonstrate that they could use the rule? Or

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1 would they be able to come in and argue for a smaller
2 TBS?

3 CHAIR SHACK: A smaller TBS in the rule.

4 MR. TREGONING: The TBS has been fixed.

5 MR. COLLINS: I don't think we have any
6 intent in changing the TBS. We've been through this
7 with the BWR owners group a few times in previous
8 comments and I don't think there's any new information
9 that they're going to present to us to make us change
10 the size in TBS.

11 CHAIR SHACK: Any other questions? Well
12 I suggest we take a break then before we go off to
13 Steve and the risk-informed process which is the other
14 major piece of the rule. Be back at 3:35.

15 (A BRIEF RECESS WAS TAKEN)

16 CHAIR SHACK: Come back into session.
17 Our next topic is essentially rule changes related to
18 the risk assessment process, and a number of my
19 members have pointed out to me that I should point out
20 to you that it's not the Advisory Committee on Reactor
21 Safety, it's the Advisory Committee on Reactor
22 Safeguards.

23 MR. DINSMORE: Yes sir, I'd like to
24 apologize to everybody for that and you notice I left
25 the paper off. It does, Mr. Chairman, raise question

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1 raise reliability about the rest of it.

2 However, my name is Steve Dinsmore and I
3 am the senior risk analyst in the Office of Nuclear
4 Reactor Regulation Division of Risk Assessment, and I
5 guess the three of us up here have been working on
6 this rule since its inception. And I think we're the
7 last three that are left.

8 MEMBER POWERS: So we conclude from this
9 the probability of accuracy is .5 percent.

10 CHAIR SHACK: 33.

11 MR. DINSMORE: That just went up. Okay.
12 Well what I'm going to do is--

13 CHAIR SHACK: I'm glad you identified by
14 the way for the industry that it was an SRM that
15 required you to go to a very small increase in risk.
16 We normally get blamed for these sort of things.

17 MR. DINSMORE: Okay. I'm going to give
18 you an overview of the risk informed change control
19 process and during that overview I'm going to also
20 identify the major changes that we made to the process
21 that was described in the draft final rule to get to
22 the one that you have today. Most of those are a
23 direct result of the ACRS and/or Commission
24 direction.

25 In general, what we do is we remove the

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1 deviations from reg guide 1.174 risk informed process
2 that were in the draft rule and so I think the process
3 in the revised proposal rule is much more closely in
4 line with reg guide 1.174, and this first slide is
5 just a quick overview of the risk informed control
6 process as it is in the proposed rule. There's a
7 slide on each one of these bullets as I go through.

8 The first thing is the risk informed
9 evaluation must be performed for all facility changes
10 made under the rule. The second thing is submittals
11 are required for all changes under the rule unless
12 self approval is authorized. If you want self
13 approval you have to come in and request it and once
14 you get self approval you can make changes on your own
15 if they're less than minimal. Or you can simply come
16 in and request changes like a normal risk-informed
17 1.174 process.

18 CHAIR SHACK: Oh I see, this is an
19 additional step that you go through.

20 MR. DINSMORE: Yes. It simplifies life a
21 lot for people who just want to do one or two things.

22
23 MEMBER BROWN: Did I miss that nuance?

24 MR. DINSMORE: Well, the draft final rule
25 said everybody had to be able to make changes on their

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1 own. So everybody who implemented the rule had to
2 come in initially and explain to us and provide us all
3 the processes they were going to use to be able to
4 make self approved changes.

5 If you don't want to do that you don't
6 have to. If you want to just make a couple of changes
7 you just come in like you do normally do for a risk-
8 informed submittal, tell us what the changes are, tell
9 us how you did the change in risk evaluation, and
10 we'll evaluate that submittal as it is.

11 MEMBER BROWN: As you have normally done.

12 MR. DINSMORE: As we have normally done.

13 MEMBER BROWN: Okay.

14 MR. DINSMORE: As we have normally done.

15 There's two different pieces.

16 MEMBER BROWN: That's new in the revised
17 proposed as opposed to the draft, as opposed to the
18 original?

19 MR. DINSMORE: Right. There then also
20 will be the change in risk acceptance criteria and
21 estimates, the PRA updating and reporting
22 requirements, the risk acceptance quality
23 requirements, the defense-in-depth safety margin and
24 performance monitoring requirements.

25 Okay. Next slide. Risk-informed

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1 evaluation for changes made under the rule. The draft
2 final rule set a staff review and endorsed risk-
3 informed evaluation process is required for all
4 facility changes after implementation of the rule.

5 The revised proposed rule says the risk-
6 informed evaluations required for all facility changes
7 made under the rule and that's defined as changes that
8 are enabled by the rule which, as Tim defined earlier,
9 changes that satisfy the revised ECCS analysis in the
10 new rule but not the requirements in the old rule, and
11 other changes that licensees choose to bundle together
12 to get an acceptable risk estimate.

13 MEMBER BROWN: If you don't mix them say
14 you make a set of changes you want to do it under the
15 old rule 50.46 but you can do that still. Correct? I
16 mean if you haven't asked for anything. Are you
17 saying once you do a 50.46(a) every change you make
18 after that has to be a 50.46(a) or if you want to come
19 in with one that's not--

20 MR. COLLINS: That's the way the rule
21 was. The way it is now--

22 MEMBER BROWN: In the draft final rule?

23 MR. COLLINS: That was the draft final
24 rule, yes sir. And the way it is now--

25 MEMBER BROWN: Okay, I think I might not

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1 be asking it-- if you come in with a change and
2 somebody says I want to use 50.46(a) for this set of
3 changes; now he finishes all those, you all are
4 satisfied he does the work. A couple of years later
5 he decides he wants to make another change. Can he
6 come in under the old 50.46? He has to do all
7 subsequent changes under 50.46(a)?

8 MR. COLLINS: That's correct. That's
9 correct.

10 MEMBER BROWN: Okay.

11 MR. COLLINS: Unless he switches his
12 licensing basis back to 50.46.

13 CHAIR SHACK: Undo.

14 MEMBER SIEBER: He has to undo the old
15 changes.

16 MEMBER BROWN: Oh okay. He has to
17 reevaluate the old--

18 MR. DINSMORE: Yes, he would have to
19 reevaluate the old changes.

20 MEMBER BLEY: So he's locked into doing
21 risk-informed changes from then on?

22 MR. DINSMORE: Sure.

23 MEMBER BLEY: I didn't get that out of
24 reading the thing.

25 MEMBER SIEBER: Unless he rolls back the

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1 original change.

2 MR. COLLINS: Well he's likely to do
3 risk-informed changes if they are enabled by 50.46(a).

4 Every change would not necessarily have to be a
5 risk-informed change just because he went to 50.46(a).

6 MR. DINSMORE: I think the answer to your
7 question as I understand it is he could use the old
8 rule if he wanted to.

9 MEMBER BROWN: If he can pass the old
10 rules--

11 MR. DINSMORE: He doesn't need the new
12 one.

13 MEMBER BROWN: Therefore he doesn't need
14 the enabling relaxation?

15 MR. COLLINS: That's correct. That's
16 correct.

17 MEMBER BROWN: So the answer to my
18 question is he can do a 50.46 if he doesn't need the
19 new rule to get him to meet the criteria? He doesn't
20 need the new criteria in order to get--

21 CHAIR SHACK: But if he's gone to
22 50.46(a) and made a change that doesn't satisfy the
23 original 50.46 he would have to undo to get back
24 there.

25 MR. COLLINS: No, it's not. What you're

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1 saying is correct because once you switch to 50.46(a)
2 you will always meet 50.46 the way it was. Okay?

3 MEMBER BROWN: No, that's not right.

4 MR. COLLINS: I'm sorry. I'm going the
5 wrong way, I'm going the wrong way. Once you meet
6 50.46(a), okay, if you want to make a change that
7 would have met 50.46 it will certainly meet 50.46(a).

8 CHAIR SHACK: Yes. But you may not want
9 to go through all the drill for it.

10 MR. COLLINS: And you may not have to if
11 it wasn't enabled by going to 50.46(a).

12 CHAIR SHACK: That's what I said.

13 MR. COLLINS: Any change you want to make
14 you can make without going to 50.46(a). The other
15 changes you made you couldn't have implemented without
16 doing 50.46(a). Once you've made your licensing basis
17 50.46(a) you're going to have to do 50.46(a) forever
18 until you go back.

19 CHAIR SHACK: That's right.

20 MR. COLLINS: But that doesn't mean every
21 change needs to be risk-informed. That's all we're
22 differentiating here. Every change does not need to
23 be risk-informed. It only needs to be risk-informed
24 if it's enabled by 50.46.

25 CHAIR SHACK: Got you. Got you.

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1 MR. COLLINS: You still have to meet
2 50.46(a) forever, but that doesn't mean every change
3 request has to be a risk-informed change request.
4 That's the idea of things being enabled by the term
5 enabled, that's the key to that term enabled.

6 MEMBER BLEY: And that means you couldn't
7 do them without 50.46(a).

8 MR. COLLINS: Correct. But there are
9 changes which after you've done 50.46(a) you could
10 have made under 50.46.

11 MEMBER BLEY: And you can still do that?

12 MR. COLLINS: You can still do that
13 without a risk-informed amendment.

14 MEMBER BLEY: Okay.

15 MR. COLLINS: Okay.

16 MEMBER SIEBER: Okay. Got it.

17 MR. DINSMORE: This actually simplifies,
18 well it simplifies life in the future because the way
19 that the draft proposed rule was is every change in
20 the future was a risk-informed submittal, which was a
21 big change from what they do today.

22 And, as Dr. Shack pointed out, there
23 wasn't anybody who actually came out and said don't to
24 do this. However, it has to kind of hang together
25 with everything else that goes on and one of the

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1 reasons that we were told to make every change in the
2 future a risk-informed change was because it might be
3 difficult to figure out which ones are enabled and
4 which ones are not.

5 But then the new SRM came down and said,
6 well, make sure the changes made under this rule are
7 very small, so we have to figure that out anyway.

8 And then it just was a lot simpler to lay
9 it out according to 1.174. So you're right, there was
10 no direct comment you shouldn't make them do a risk
11 calculation for every change in the future. On the
12 other hand they already so that, they do risk-informed
13 ISI, they're always updating. So they kind of do that
14 anyway.

15 But as far as the rule is concerned we
16 simply brought it back to 1.174, changed the scope of
17 the analysis as described up there.

18 The next step the submittal requirements.
19 The draft final rule there was an initial submittal
20 to implement the rule which included quite a
21 description and everything of your risk assessment
22 process. However, afterwards the submittals were only
23 required for facility changes that must otherwise be
24 submitted for review or changes to the SSCs within the
25 scope of the maintenance rule.

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1 The ACRS comment on that was licensee
2 should submit all changes that cause greater than very
3 small increases, I'm paraphrasing that comment. We
4 certainly understood the comment so we--

5 MEMBER SIEBER: That's a first step.

6 MR. DINSMORE: So we went back and we
7 changed the rule but right now a submittal is required
8 for each change enabled by the rule of course unless
9 you have the self approval authorized. If you want
10 self approval you have to come in and request it. If
11 you have authorized self approval submittal required
12 for each more than minimal risk increase and
13 submittals are always required if you want to bundle
14 unrelated changes into the change and risk estimate.

15
16 So if you have your self approval process
17 approved you can make individual changes that rely on
18 this rule without coming in. There's a reporting
19 requirement but that's--

20 Now you guys said greater than very small,
21 in our terminology that's ten to the minus six for
22 CDF. We changed it to more than minimal in part
23 because having a guidance for self approval that's
24 less than what we would normally have to review means
25 that we can be a little more confident that when that

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1 calculating number is that small they probably really
2 are small so we don't really have to review them.

3 And then the Commission directed us to use
4 very small as the total increase and so if we'd have
5 simply stuck with very small instead of minimal here,
6 they could do as much risk increase as they could do
7 under the rule without ever coming in.

8 MEMBER BROWN: Where's the word minimal?

9 MR. DINSMORE: It's on the second from
10 bottom bullet. More than minimal risk increase. I
11 hope that's right. Yes.

12 MEMBER BROWN: My eyes are obviously not
13 working well. So more than--

14 MEMBER ARMIJO: It means different.

15 MEMBER BROWN: What does the word seven--

16 MR. DINSMORE: Ten to the minus seven for
17 CDF. Increase is less than ten to the minus seven for
18 CDF and ten to the minus eight for LRF. In practice
19 that's--

20 MEMBER BROWN: Of less than ten to the
21 minus seven?

22 MR. DINSMORE: An increase less than ten
23 to the minus seven would normally be considered
24 minimal.

25 MEMBER BROWN: Minimal.

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1 MR. DINSMORE: We need the numbers. I
2 mean you can argue about the numbers but we need the
3 numbers to keep this moving through.

4 MEMBER STETKAR: Does the industry--
5 Since I just learned what very small and minimal mean
6 and I've written that down so I'd remember it, does
7 the industry understand what minimal means?

8 MR. DINSMORE: Yes.

9 MEMBER STETKAR: Okay. So they know that
10 you're really talking about ten to the minus seven
11 frequency?

12 MR. DINSMORE: Yes. It's actually the
13 same number that we're proposing to use for the self
14 approval for the new fire protection rule. Industry
15 doesn't like the number obviously.

16 MEMBER STETKAR: No, no, I just wanted to
17 make sure that you know--

18 MR. DINSMORE: They understand it.

19 MEMBER STETKAR: That's it not very vague
20 and qualitative, that indeed there's been enough
21 communications in the meetings and things that they
22 understand what that number is.

23 MEMBER SIEBER: Why didn't you put the
24 numbers in the rule?

25 CHAIR SHACK: It's in the FRN.

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1 MR. DINSMORE: It's in the FRN yes. We
2 don't put them in the rule because then in order to
3 change them then we have to change the rule, whereas
4 if we put minimal then we can change guidance later on
5 that says now we call minimal.

6 MEMBER SIEBER: I understand.

7 MR. DINSMORE: I think we do it a lot.

8 MEMBER BROWN: Where in the rule is the
9 minimal stated?

10 MR. DINSMORE: It should be (f)(1)(ii).

11 MEMBER BROWN: Okay. Go on and I'll do my
12 searching while you're talking.

13 CHAIR SHACK: I think it's just under
14 (f)--

15 MR. DINSMORE: (f)(1)(ii).

16 MEMBER BROWN: Oh okay. I even had it red-
17 lined. Still couldn't find it.

18 MEMBER BLEY: You need a new color.

19 MEMBER BROWN: No, I need new eyes.

20 CHAIR SHACK: That's why you do PDS and
21 just put minimal into the search box.

22 MR. DINSMORE: Okay, that's the second
23 attribute and now we've changed it.

24 This one I guess I you could argue might
25 have increased the burden, depends on how big the

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1 changes they're making, but the burden wasn't really
2 on our mind. We were just trying to make things fit
3 together here.

4 CHAIR SHACK: Well it's also consistent
5 with 1.174.

6 MR. DINSMORE: Well, 1.174 doesn't have
7 self approval.

8 CHAIR SHACK: No, but I mean you would be
9 in for very small changes you would have to come in to
10 the staff.

11 MR. DINSMORE: Well 1.174 I always have
12 to come in.

13 CHAIR SHACK: Yes. I mean so why do you
14 get a one times ten to the minus six free anywhere
15 else if you have to come in under 1.174 for a one
16 times ten minus six. I mean if you're going to have
17 self approval it ought to be less than--

18 MR. DINSMORE: Right. It's not
19 inconsistent, yes. That was our working goal.

20 MEMBER SIEBER: Sounds like 50.59.

21 MR. DINSMORE: Yes. The words come out
22 of 50.59. They have a very nice definition of minimal
23 in 50.59.

24 Change in risk-acceptance criteria, this
25 is another hot topic on the draft final rule. It said

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1 the total increases in CDF and LRF from all facility
2 changes are small and the overall risk remains small.

3 The ACRS comment was this is a significant departure
4 from current risk informed guidance which should be
5 reviewed for its implications. We reviewed its
6 implications and we changed it again based primarily
7 on this direction from the Commission to say total
8 increases in CDF and LRF for changes made under the
9 rule are very small, and the overall risk remains
10 small.

11 And that very small, that's an
12 interesting, if you read his note sheet it directed
13 any changes under this rule be further restricted to
14 very small increases because its important safety
15 benefit is emphasized over the burden reduction. So
16 the knew what they were doing and some of these
17 sentences you kind of, you have to interpret but they
18 really meant it so we put it in there exactly as they
19 meant it.

20 MEMBER BROWN: You changed from "all
21 facility changes" to "for changes made under the
22 rule."

23 MR. DINSMORE: Right. There's two
24 changes in that sentence, yes sir.

25 CHAIR SHACK: But the very small one is a

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1 biggie.

2 MR. DINSMORE: Yes. So all facility
3 changes originally again when they transitioned to
4 50.46(a) they had to transition their whole process,
5 their whole facility change process to a risk-informed
6 process. And then over time they had to make sure
7 that the total increase in risk from all changes--

8 MEMBER BROWN: Today's tomorrow is next
9 year's five years from any subsequent changes?

10 MR. DINSMORE: Yes.

11 MEMBER ARMIJO: Lifetime limit?

12 MR. DINSMORE: Yes. Which is why there
13 was a significant departure from current risk-informed
14 guidance.

15 MEMBER ARMIJO: So the lifetime limit
16 increase is a factor of ten from where they are?

17 MR. DINSMORE: Well it's ten to the minus
18 five.

19 MEMBER BROWN: And now it's ten to the
20 minus six.

21 MR. DINSMORE: Now it's indeterminate.
22 The lifetime limit for changes made under this rule is
23 now ten to the minus six, but other changes they make
24 to the plant that have nothing to do with this rule
25 they're still in that current licensing regime.

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1 There's no risk--

2 MEMBER BROWN: The 50.46?

3 MR. DINSMORE: Well, they could make
4 changes because of other reasons.

5 CHAIR SHACK: No, he could come in for
6 1.174 changes and make up the ten to the minus five
7 presumably?

8 MR. DINSMORE: But probably not using the
9 new acceptance criteria for the ECCS because then he'd
10 have to rely on this rule.

11 CHAIR SHACK: Suppose he goes to 50.46(a)
12 in this and now he makes another risk informed change
13 that has nothing to do with 50.46, he would then get
14 the ten to the minus five presumably?

15 MR. DINSMORE: Yes. He'd be in a
16 different world, right. They'd be disassociated.

17 MEMBER BROWN: Would you repeat that? Or
18 can you repeat that?

19 CHAIR SHACK: If the change is related
20 to the 50.46(a) it is limited to be very small, ten to
21 the minus six, but if he had another risk-informed
22 change that had nothing to do with 50.46, it would
23 then be subject to the typical staff limit of small,
24 which is ten to the minus five.

25 MEMBER BROWN: A risk-informed change

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1 under 50.46--

2 CHAIR SHACK: No, no.

3 MEMBER CORRADINI: It's under something
4 else.

5 CHAIR SHACK: Completely divorced from
6 50.46.

7 MEMBER BROWN: All right. All right.
8 That's beyond my knowledge level at this point. Go
9 ahead.

10 MEMBER SIEBER: Well that fits the box in
11 1.174.

12 MR. DINSMORE: Yes.

13 MEMBER SIEBER: Okay. That's where that
14 one comes from.

15 CHAIR SHACK: Well, the original comment
16 there was this was the first time at least some of the
17 members recognize that the staff was imposing a total
18 limit on delta CDF in 1.174.

19 MEMBER SIEBER: Right.

20 CHAIR SHACK: And that still may be a
21 matter of some internal debate.

22 MEMBER SIEBER: Well, the box is sort of
23 fuzzy as I recall it.

24 CHAIR SHACK: Yes, but the question is
25 whether you consider that as a box for a change or a

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1 cumulative change.

2 MEMBER SIEBER: I always thought of it as
3 cumulative.

4 CHAIR SHACK: What it says is that the
5 cumulative differences will be considered in approval.
6 I don't believe that it actually has a strict limit.
7 When you get to ten to the minus five let's say the
8 regulatory attention increases exponentially.

9 MEMBER SIEBER: I think that's right.

10 MEMBER POWERS: Certainly that was my
11 understanding was it's just that as the cumulative
12 effect becomes bigger and bigger you're going to get a
13 little more scrutiny.

14 CHAIR SHACK: Right. In fact the
15 scrutiny will become so high--

16 MEMBER BROWN: We'll have two different
17 acceptance criteria for accomplishing changes of delta
18 CDF, ten to the minus 5. Ten to the minus 6.

19 CHAIR SHACK: It comes down to the vote
20 sheet that he was reading from. Some of the
21 Commissioners, this rule change was originally
22 proposed as being a safety beneficial rule change and
23 so the notion is that if it's a safety beneficial rule
24 change you don't need much increase in risk under it,
25 so it becomes very small.

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1 MR. COLLINS: In fact, we met with the
2 Office of Research yesterday and they had not yet
3 concurred on the FRN package. And they are
4 contemplating adding a question to the FRN which says
5 should we require that implementation of this rule
6 result in no net increase in risk. That's a question
7 to put out with the FRN. Just because, you know,
8 thinking back to the original intent of the Commission
9 was isn't this going to be a safety benefit? Then why
10 should there be any net decrease in risk. So that may
11 appear as a question in the FRN.

12 It's not in the copy that you have because
13 just as of yesterday they were thinking of adding that
14 as a question.

15 CHAIR SHACK: We know the answer.

16 MR. COLLINS: They don't know whether
17 they're going to ask it?

18 CHAIR SHACK: No, what the response will
19 be.

20 MEMBER SIEBER: We can make it a
21 recommendation to be considered.

22 CHAIR SHACK: We still can write a
23 letter, yes that's true. Write a letter.

24 MR. DINSMORE: Well, when we went back to
25 1.174, we went back to some of the unclarities, the

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1 unclarity in 1.74 including this cumulative. So
2 the change in risk estimate it used to say the total
3 cumulative risk increase estimate was required, which
4 was actually pretty easy to do. You just take your
5 current CDF and you subtract your original CDF and LRF
6 and you get the estimate.

7 It's a little more complicated when you
8 talk about the cumulative effect of changes over time
9 for a specific subset of changes. The ACRS comment
10 again was this was a significant departure. Now the
11 revised proposed rule, the cumulative effect of
12 previous changes made under the rule that have
13 increased risk but have met the acceptance criteria
14 shall be evaluated.

15 We took that from the 50.48^(c)) from NFPA
16 805. They also ran across this problem, and we're
17 trying to use the same language because we're hoping,
18 naturally, to use whatever, we want the two wheels to
19 run the same. So we simply took as much of that
20 language as we could and stuck it in here.

21 We're not entirely sure how to do it yet,
22 we're still working on figuring it out for the other
23 rules but however we end up doing it we want to do it
24 the same.

25 And actually those were the major changes,

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1 PRA update and reporting, there was no substantive
2 changes, they have to do their update no less than
3 every two refueling outages. After the update they
4 need to take appropriate action to ensure the
5 acceptance criteria are met and the reporting is just
6 if you exceed the acceptance criteria you have to tell
7 us on how you're going to fix it.

8 And then every 24 months if you have a
9 self approval process approved you just have to tell
10 us which changes you made.

11 Risk assessment quality requirements, here
12 also no substantive changes although we made couple
13 of small ones. The PRA must address all initiating
14 events and all operating modes, that's a pre-standing
15 thing. And the PRA must, and the draft final rule
16 said calculate CDF and LRF because that was in the
17 50.69 for example. We simply took it out because they
18 all do that anyway and then we had this question about
19 LRF so we just took it out. And I don't think it
20 really makes any difference.

21 And then the last one, the risk assessment
22 other than PRA must be developed using an integrated
23 systematic process. The draft final rule said non-
24 PRA risk assessments shall produce realistic results,
25 and we had a big internal discussion about what would

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1 we do if somebody came in with a conservative
2 analysis? If the rule says it's realistic and they
3 come in with conservative. So we changed it to be
4 consistent again with 50.69 to an integrated
5 systematic process that quickly deflects the plan from
6 all that stuff. But nobody commented on that but Tim.

7 Maintain defense-in-depth. There's some
8 things going on. We included the specific defense-in-
9 depth attributes from 1.174 to make them criteria. We
10 did that on purpose. And the revised proposed rule
11 it still includes them plus there's additional
12 criteria which Tim talked a lot about earlier and I
13 won't go into again. However, again research has
14 indicated to us that they might be redefining a good
15 defense-in-depth attributes and they express some
16 reservations that if we put these in the rule now
17 we'll be fixing these and then installing them and so
18 we're considering taking them out. I think we're
19 moving down the path, we would just say defense-in-
20 depth must be maintained.

21 And then the last two maintain adequate
22 safety margins. No substantive risk assessment
23 changes although some of the other changes might have
24 affected both of these.

25 And then implement adequate performance

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1 measurement programs. The ACRS did comment that they
2 thought that we should increase the special treatment
3 requirements and the availability of the non-safety
4 related equipment relied on to mitigate. Other than
5 what Tim was talking about we didn't put anything in
6 the rule to directly say that. We kind of, well if
7 you put it in tech specs it's going to be at least
8 listed in there.

9 And we do have this monitoring performance
10 measurement program criteria that the program should
11 be designed to detect degradation before plant safety
12 is compromised, and we would interpret that to be if
13 they're relying on this non-safety related equipment
14 and its reliability started to degrade to such a
15 point that when they do their update they're going to
16 not meet the acceptance criteria, if there was a
17 really badly degrading situation we'd catch it, and if
18 it's not really badly degrading then maybe it's not
19 really risk significant.

20 So in that way we kind of tried to
21 encompass that comment without actually putting
22 something in the rule to deal with it.

23 MEMBER SIEBER: When you say put it in
24 tech specs that means there's going to be surveillance
25 requirements?

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1 MR. COLLINS: No.

2 CHAIR SHACK: SIEBER: No?

3 MR. COLLINS: No.

4 MEMBER SIEBER: What does it mean?

5 MR. COLLINS: It just means it's going to
6 be identified there. It's going to be like a list,
7 this is equipment which we may credit in our analysis
8 of breaks larger than TBS. That's all it's going to
9 say.

10 CHAIR SHACK: And if they remove it
11 they'll have to come back and talk to--

12 MR. COLLINS: If they want to remove it
13 they have to come back.

14 MEMBER SIEBER: What good does that do?

15 MR. COLLINS: Well, all it really does it
16 alerts us when they want to say we'd like to take
17 credit for this equipment. And it gives us a shot at
18 reviewing that when they make their initial submittal
19 and we can, you know, attach conditions on that if
20 we're worried about it at the time of their submittal.

21 MEMBER SIEBER: But they have no
22 obligation to maintain a certain degree of reliability
23 or to surveille or to do anything?

24 MR. COLLINS: Well, I believe their
25 maintenance rule still apply.

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1 MEMBER SIEBER: Yes, but--

2 MR. COLLINS: Aside from the maintenance
3 rule I don't think there's any other specific
4 requirements.

5 MEMBER SIEBER: If it's non-safety and
6 the maintenance rule--

7 MR. DINSMORE: Well, there is always this
8 thing that they have to do a change in risk evaluation
9 and they have to do an update periodically. And if
10 the stuff that they're crediting really gets
11 unreliable--

12 MEMBER SIEBER: So it's not really good?

13 MR. DINSMORE: It's really not, well if
14 it becomes not good enough such that it's endangering
15 their meeting the acceptance criteria.

16 MEMBER SIEBER: So you're looking back to
17 the reliability assumptions that went back into the
18 risk evaluation?

19 MR. DINSMORE: Well, I would assume when
20 they did the initial study obviously the reliability
21 was sufficient. But if over time it degrades for
22 some reason--

23 MEMBER RAY: Yes, but the inspectors will
24 never know how to interpret that, neither will the
25 people in the plant.

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1 MEMBER SIEBER: Well, you aren't going to
2 know when you're violating it.

3 MEMBER RAY: Exactly. That's what I'm
4 saying.

5 MEMBER STETKAR: This criteria is just
6 deterministic though. If I have a certain minimal
7 complement of equipment I maintain core cooling. It
8 doesn't have anything to do with reliability.

9 MR. DINSMORE: No, this would be the
10 change in risk acceptance criteria.

11 MEMBER STETKAR: The change in risk?

12 MEMBER SIEBER: Without action statements
13 there's no penalty if it doesn't work.

14 MEMBER RAY: Everybody's going to think
15 this is not going to work. To just say well it's a
16 list but nobody knows how to interpret the list unless
17 you notice that the availability of the equipment is
18 inconsistent with the assumptions in the risk analysis
19 that you submitted. I mean you're talking about
20 different worlds.

21 MEMBER SIEBER: Well that means you've
22 got to reach really far to figure out what your goals
23 are.

24 MEMBER RAY: Yes, I mean the people in
25 the plant are clueless about what that says.

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1 MEMBER SIEBER: Some will worry about it,
2 some will ignore it.

3 MEMBER RAY: Hopefully that's true.
4 Everybody will ignore it I think.

5 MEMBER SIEBER: Well there's got to be
6 some conscientious guy out there somewhere.

7 MEMBER RAY: Well no, you've got to have
8 something that is both capable of demonstrating
9 compliance or consistency, I won't call it compliance
10 if you don't like that. And I don't know how the heck
11 you would do that. We are getting way out of bounds
12 of what's reasonable.

13 MEMBER SIEBER: I can see waiving special
14 treatment but I can't see waiving surveillance and
15 performance indicators.

16 MEMBER RAY: Yes, and you've got to
17 translate the assumptions in the risk analysis into
18 something that people in the plant can actually do.

19 MR. DINSMORE: Well, but the assumptions
20 in the risk analysis is mainly the unreliability or
21 the unavailability, and they can check that. They do
22 check that for the maintenance rule.

23 MEMBER SIEBER: But they aren't required
24 to.

25 MEMBER RAY: Yes, but you don't match it

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1 up with the analysis you're talking about. That's
2 what I'm talking about.

3 MR. DINSMORE: When they do their
4 periodic update they're supposed to take the plant-
5 specific data, update the failure rate and the
6 unavailability data that they're using in their PRA,
7 re-do the calculations to see what the change in risk
8 is for the changes that they've already--

9 MEMBER SIEBER: You don't tell them to do
10 that though any place.

11 MR. DINSMORE: It does. It tells them in
12 here. The PRA has to be updated every two refueling
13 cycles to adequately--

14 MEMBER RAY: No, no, no, no, no. I mean
15 we're just in different worlds here I think.

16 MEMBER CORRADINI: I think what Harold's
17 asking for is something on a practical level that the
18 operating staff can look at monthly, quarterly,
19 something, so they know whether it's something that's
20 up or down.

21 MEMBER RAY: You can't come out of the
22 plant and say you know I've just updated my analysis.

23 The two years has gone by and you know what? You've
24 violated the assumptions in the prior analysis because
25 you had this damn thing out of service and they

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1 couldn't get the parts for six months and it wasn't
2 even there. Nobody cared.

3 MR. COLLINS: Well the availability is
4 covered by the 14 day backstop. It's the reliability
5 that is at issue I think.

6 MEMBER STETKAR: Not necessarily if your
7 analysis takes credit for one low pressure injection
8 pump and a fire pump and you've had two low pressure
9 injection pumps the whole time and you've never had a
10 fire pump. You still meet your 14, you don't fall
11 under your 14 day because you either need two low
12 pressure injection pumps or one low pressure and a
13 fire pump to meet your deterministic success criteria.

14 MEMBER SIEBER: If you don't do a
15 surveillance you don't know if it works or not.

16 MEMBER STETKAR: And you've always had
17 two low pressure injection pumps but for the last two
18 years your fire pump, forget fire protection, your
19 special LOCA pump you know. Your alternative LOCA
20 pump. That hasn't been there for the last two years.

21 MR. COLLINS: Well let's say it's been in
22 pieces on the floor

23 MEMBER STETKAR: It's been in pieces on
24 the floor.

25 MR. COLLINS: But if you've had two LPICs

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1 available then you're okay.

2 MEMBER CORRADINI: Then you don't need to
3 credit it.

4 MR. COLLINS: You don't need to credit
5 that other one. You're all right. There's a whole
6 bunch of configurations that could meet the
7 deterministic criteria.

8 MEMBER STETKAR: Right.

9 MR. COLLINS: And you can't be out of any
10 one of them for more than 14 days but he can analyze--
11 He's got to always have at least one available.

12 MEMBER BLEY: You must be out of all of
13 them before the 14 days.

14 CHAIR SHACK: You have to be outside of
15 the analyzed.

16 MR. COLLINS: Right. You have to be out
17 of the analyzed condition for more than 14 days.

18 CHAIR SHACK: That's when the clock comes
19 on.

20 MR. COLLINS: Right.

21 MEMBER STETKAR: But your special LOCA
22 pump could have ben in part and pieces on the floor
23 for the last two years?

24 MR. COLLINS: Right. As long as both
25 LPIC pumps were working.

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1 MEMBER SIEBER: Or you could have taken
2 credit for it and it could have been together but not
3 perform because you didn't test it.

4 MEMBER CORRADINI: I think what Harold,
5 not knowing as detailed as they in operation I think
6 what they're reflecting on is you could have a big
7 disconnect because one group is not necessarily
8 talking to the other group with the frequency and you
9 could just be off separately, total disconnect.

10 MEMBER RAY: Well, yes, I mean it was
11 sort of glib when he said well it'll just be a list in
12 the tech specs but there's nothing other than
13 identifying it as a list and making it part of the
14 maintenance rule that's a consequence of that.

15 And I'm saying, you know, no, if this
16 stuff is being credited, somebody somewhere needs to
17 do the job of surveillance, or demonstrate that it is
18 available for the time periods that are assumed in the
19 analysis. And nobody in the plant knows anything
20 about what's assumed in the analysis. Now you may be
21 assuming that they will be told as sort of an extra
22 tech spec piece of information, by the way these are
23 the assumptions in the analysis for this non-safety
24 related equipment that's listed in the tech specs.
25 Maybe that's what you're thinking.

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1 But you can't ask them to come back and
2 tell you that they violated their assumptions in the
3 analysis after it's happened.

4 MEMBER SIEBER: You'll find out during
5 the aftermath.

6 MEMBER RAY: That's a sure fire trip to
7 the Region. He's damn right.

8 MR. DINSMORE: We were helping the
9 maintenance. The maintenance process somehow runs and
10 we were kind of under the impression--

11 MR. COLLINS: This is a funny situation
12 because with plants the way they operate today and with
13 the current requirements for below the TBS, you're
14 already covered by two trains of safety grade
15 equipment. This part of the rule would come into play
16 if somebody went to a power uprate for example and
17 needed two pumps. That's the only time this would
18 really come into play right?

19 MR. DINSMORE: No, that's the 14 days.
20 We're not talking about the 14 days.

21 MR. COLLINS: Always have two trains
22 available because of the requirements below TBS.

23 MEMBER RAY: I thought you were talking
24 about listing the non-safety equipment.

25 MR. COLLINS: Yes. Yes.

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1 MEMBER RAY: Okay. And Jack asked you
2 well does that mean they'd have surveillance
3 requirements, and you said oh no.

4 MR. COLLINS: No, and that's correct.

5 MEMBER RAY: But buried in some analysis
6 somewhere there are assumptions about that non-safety
7 equipment. And we'll find out if we violate them
8 every two years.

9 MR. COLLINS: That's what I said it's a
10 risk-informed--

11 MEMBER BLEY: You get your fine.

12 MR. DINSMORE: No, well then you just
13 have to come in and tell us we found it we're fixing
14 it. It's the reporting requirement.

15 MEMBER RAY: Okay, I'm sorry. But mean
16 you can't violate some important assumption at least
17 without knowing about it.

18 MR. DINSMORE: But this equipment is for
19 a very unlikely, I mean unlikely event, and so there
20 is some flexibility that we were willing to take on
21 for mitigating this.

22 MEMBER RAY: The real question is how do
23 you translate from what's in the analysis and what's
24 written somehow in the tech specs to what some poor
25 guy in the plant's going to be able to check and say

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1 yeah I'm meeting the criteria. And that's something
2 new.

3 MR. COLLINS: And how do you inspect
4 against that.

5 MR. FLACK: This is John Flack with the
6 ACRS. I just want to point out that I started reading
7 the white paper that was just discussed earlier and
8 talks about safety culture. And there's a lot of
9 assumption in there about how the staff will react to
10 certain things with respect to the safety culture
11 that's going on in the plant.

12 Now I don't know if this is the answer but
13 certainly it seems to put more of a burden on the
14 inspector and how he goes about assessing the safety
15 culture at a plant based on that discussion and the
16 assumptions that are going into that, recognize that
17 it's not going to get you into something that's locked
18 in but there is going to have to be something going on
19 there that's going to probably be more important at
20 this point if they go down that road.

21 MEMBER RAY: Well, I'll tell you right
22 now as somebody who ran a plant for a long time, like
23 Jack or Otto, I would say okay we're going to add to
24 the tech specs something that'll keep us out of
25 trouble. I don't want to find out I got in trouble

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1 later after I take the data and somebody way over in
2 engineering grinds it through some analysis some day.

3 I want to stay out of trouble.

4 MR. COLLINS: But you are not alone in
5 that. I mean we debated this exact issue internally,
6 right and we got beat down. We had originally
7 proposed it would be included in the tech specs, the
8 non-safety equipment with testing and availability
9 requirements.

10 MEMBER RAY: That's what the ACRS is for.

11 MR. COLLINS: And we got beat down. Yes.

12 MEMBER STETKAR: Tim, let me ask you a
13 question because I'm not as familiar with all the
14 integrated thinking. For new reactors, you know, we
15 look at the new designs coming in and typically
16 they've identified classes of non-safety related
17 equipment called RTNSS, Regulatory Treatment of Non-
18 Safety Equipment. And this is the area that I'm not
19 familiar with, how will that equipment be treated in
20 the technical specifications for those new reactors?
21 And is this conceptually parallel to that?

22 MR. COLLINS: I don't know the answer to
23 that.

24 MEMBER STETKAR: And it seems to me that
25 whatever decisions are being made regarding the

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1 treatment of that equipment for all new reactors in
2 the tech specs for those reactors, the treatment of
3 this equipment should be equivalent. I mean it's
4 essentially the same thing. We're talking about non-
5 safety related equipment being inserted in the tech
6 specs and it's not clear. There will be reliability
7 requirements and it's my understanding that there will
8 be for that RTNSS equipment somehow imposed either in
9 the tech specs or through formal maintenance
10 requirements or formal performance indicator
11 monitoring or whatever, it would seem that this is in
12 the same area.

13 MEMBER CORRADINI: It seems actually very
14 similar. If anything, you'd want to make the
15 requirements consistent.

16 MEMBER STETKAR: Right. It would be, for
17 example, the active low pressure injection systems
18 that the passive plants are taking credit for to keep
19 the risk below a certain line.

20 MEMBER CORRADINI: Yes. Exactly. That's
21 the best example.

22 MEMBER STETKAR: And it's my alternate
23 LOCA pump here.

24 MEMBER SIEBER: It's an economic thing
25 too you know because the way to make all the gravity

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1 stuff work is to make a big LOCA.

2 MEMBER STETKAR: Well, yes, but I mean in
3 terms of regulatory consistency if we're writing a
4 rule today for this particular little area it seems
5 that--

6 MR. COLLINS: My recollection is the
7 written stuff is not going to actually be in the tech
8 specs.

9 MEMBER CORRADINI: I don't know, I mean
10 that's what I was asking.

11 MR. COLLINS: I think it has to be
12 identified and there has to be some sort of
13 surveillance of it in the tech specs.

14 MEMBER BLEY: There are requirements.

15 MEMBER CORRADINI: I will go back myself
16 but I think so.

17 MR. COLLINS: I understand the
18 consistency but I didn't think that that stuff was
19 going to be in the tech specs.

20 MEMBER SIEBER: You take credit for in
21 risk base then you have to have some kind of
22 surveillance to show that you meet the conditions you
23 assumed in the risk analysis. And if you don't do
24 that, don't take credit.

25 MR. DINSMORE: Well, that's what's

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1 written in this rule that you have to monitor it to
2 make sure that--

3 MEMBER CORRADINI: But I think the spirit
4 of what Harold is saying is as a good operator you
5 just don't monitor it, you determine some
6 deterministic set of checks so that you don't get in
7 trouble post fact.

8 CHAIR SHACK: The operator is certainly
9 free to do that. The question is what do we require
10 them to do?

11 MR. COLLINS: This goes back to the whole
12 problem of supposedly we're dealing with equipment
13 which is very low risk significance, right. And we're
14 trying to relax requirements on stuff that is of low
15 risk significance and how far do you go in relaxing it
16 you know.

17 MEMBER SIEBER: You're trading that risk
18 significance against a margin that you want to--

19 MR. COLLINS: Exactly. Yes.

20 MEMBER SIEBER: So that risk significance
21 becomes more important as you go on.

22 MR. COLLINS: I mean you've got single
23 failure and you got rid of loss of offsite so that
24 means you've got to in-post some sort of requirement
25 on these pieces of equipment that have to be there in

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1 this list.

2 MEMBER SIEBER: Otherwise, the risk
3 evaluation is no good.

4 MR. COLLINS: We're on your side.

5 MEMBER SIEBER: We just don't know it
6 yet. So we're all for you.

7 MR. COLLINS: That's fine. I've got no
8 problems with any of this. I'm just telling you this
9 is the debate we're in constantly.

10 MR. FLACK: Well, the question I'm
11 rolling around in my own mind is that if you didn't
12 give any credit for any of the non-safety related
13 equipment in the PRA, what would your CDF look like?

14 And that goes without saying, I mean you do give
15 credit for this equipment to begin with. The question
16 is you know what is it really? Because there's a lot
17 of credit taken in the PRA for equipment that's not
18 safety related. I mean nobody knows, I mean I haven't
19 seen any calculations to say don't give credit for any
20 non-safety related equipment and then look at the CDF.

21 I mean I have never seen that happen.

22 It could be pretty high I would think
23 because there's a lot of recovery actions stuff that
24 they put in there, at least I'm going back to the IBE
25 days when they put in a lot of, there was over 500

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1 enhancements and none of that was safety related
2 equipment.

3 So I mean that raises a bigger question
4 about how much of this is out there, you know, that's
5 not controlled basically by tech spec. So I don't
6 know, you know, I think it comes down to safety
7 culture at the plant myself. I think it's having to
8 stay on top of these things know when you have stuff
9 there on the corrective active for a long time that it
10 begins to raise questions by the inspectors. Are
11 they given enough time to do that?

12 We've got to I guess talk about that in a
13 future subcommittee.

14 MR. DINSMORE: Well, I've completed my
15 presentation. I'll turn it back over to Tim. Do you
16 have a closing--

17 MR. COLLINS: No, we have no further
18 presentation.

19 CHAIR SHACK: Questions or comments?

20 MEMBER RAY: I don't know how to
21 articulate it Bill, I don't want to repeat it. It's
22 been pretty well summarized by the people on the other
23 side of the table I think. If you're going to take
24 credit for it you've got to have some way of avoiding
25 non-compliance in retrospect.

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1 MEMBER SIEBER: You're right.

2 MEMBER RAY: Period.

3 MEMBER SIEBER: You have to continuously
4 validate your analysis or periodically do it.

5 CHAIR SHACK: And like the bullet three
6 adequate performance measuring programs are
7 implemented to ensure the risk-informed evaluation
8 continues to reflect the actual plant design and
9 operation? These programs shall be to detect
10 degradation of systems, structure of component before
11 plant safety, provide feedback timely and monitor
12 systems structures. I mean it's there.

13 MR. DINSMORE: It does permit you to come
14 in, I'm not sure it's a violation until you found it
15 and didn't tell us.

16 MEMBER RAY: It is. Trust me.

17 (Laughter)

18 MR. COLLINS: I do have, well you look
19 like you're ready to say something.

20 CHAIR SHACK: I'm trying to think, you're
21 going to have to give a shortened version of this for
22 the forthcoming--

23 MR. COLLINS: That was my question,
24 right.

25 MEMBER SIEBER: Don't skip this last

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1 part.

2 MEMBER POWERS: I thought it was just
3 perfectly adequate.

4 CHAIR SHACK: Actually I think most of it
5 probably comes out of Rob's hide on the white paper
6 because that's really not part of the rule.

7 MEMBER CORRADINI: You mean ways to cut
8 it down?

9 CHAIR SHACK: Yes, and obviously to have
10 less time. And I think you know we have the notion
11 that we have the white paper and we're planning
12 regulatory guidance but we probably can shorten that.

13 MEMBER POWERS: Again, your introductory
14 comments seemed to cover everything that the full
15 Committee needs to know about it. I mean Steve and
16 Rob's stuff goes into the gory subcommittee kind of
17 details that the full committee doesn't really need to
18 know.

19 CHAIR SHACK: Well, I'd be less inclined
20 to throw away Steve's stuff.

21 MEMBER POWERS: Why, you just like to see
22 him tormented by Apostolakis?

23 MR. TREGONING: Well a lot of Steve's
24 stuff really elaborates on points that are made in
25 the overview presentation.

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1 MEMBER CORRADINI: Yes, but if anything
2 you can insert those.

3 CHAIR SHACK: Since this is a risk-
4 informed piece though that risk-informed process is
5 important.

6 MEMBER POWERS: They're asking for a
7 letter here.

8 CHAIR SHACK: Yes, that's true. Well
9 they're not asking for a letter, the question is
10 whether we want to write one. It's a totally
11 different question.

12 MEMBER POWERS: That is a different
13 question.

14 CHAIR SHACK: I don't see now pillorying
15 Steve is going to contribute to the decision.

16 MR. DINSMORE: I'm actually kind of used
17 to it. If you start with it didn't happen. If you'd
18 like we could cut two or three of these big changes
19 out and replace--

20 CHAIR SHACK: Yes, that's what I think
21 would be good.

22 MR. DINSMORE: You could combine I think
23 expand a little bit on Tim's but I think Dana's got it
24 about right, that that probably is pretty much the
25 level. And the same with Rob's you know what we need

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1 is the idea that we're going to have a program or a
2 way to essentially ensure their compliance.

3 MR. TREGONING: I think that's going down
4 to a bullet or two essentially because I agree it's
5 detail that's not required.

6 MEMBER SIEBER: Nobody argued with you
7 much.

8 MEMBER BLEY: That was here. I suspect
9 we'll get back into what we did two years ago and
10 start asking about the two NUREGs in some detail.

11 CHAIR SHACK: I hope not. We've
12 revisited it so many times. Well as long as we stay
13 within the allotted time. I guess my bigger question
14 to the subcommittee is does anybody feel that we have
15 issues that we probably do need to write a letter on?

16 MEMBER BROWN: I don't know that it's an
17 issue to write a letter on except just as the new guy
18 reviewing and reading all this stuff and at the end as
19 I walk through and knowing that this is trying to get
20 a handle on how much defense-in-depth you have and how
21 far you can push it, it just looked to me back under
22 the general design criteria we've literally ripped
23 away every layer of defense-in-depth, because there's
24 no single failure either for electric plants, ECCSs,
25 emergency core, I mean containment heat removal,

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1 containment atmospheric clean up, cooling water and
2 then the containment design basis is done on a
3 realistic basis. It's not a design basis for any
4 change made or expected.

5 And that seems to me that every layer has
6 been stripped out and the final barrier, the
7 containment integrity, has been stripped back also
8 from a design basis to a realistic analysis basis.

9 And so all I did was stack all of those
10 six items up in my mind and say how far do you go? I
11 mean if that's the consensus of the Committee that we
12 want to agree with something like that, I'm a defense-
13 in-depth guy, okay, and I don't mind risk informing
14 evaluations. I'm not saying you shouldn't do that.
15 The point is how far is too far.

16 And it's relative to the discussions we
17 had on a number of the points as we went through here.

18 And I just kind of choked at the last one. I mean I
19 kind of bought off saying okay I can understand that,
20 but then when the integrity, containment integrity
21 went down the tubes, I kind of stepped back and said
22 why would we do that? That just seems to be a step
23 too far. That's just my observation.

24 MEMBER BLEY: I guess, you know, just for
25 a comment on that, Charlie. There's no way you get

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1 through the risk analysis side of this and the
2 liability calculations if you you've got many single
3 failures lying about. You just won't make it.

4 MEMBER BROWN: I understand that, that's
5 why you want to get rid of them.

6 MEMBER BLEY: Well, yes, but there are
7 double failures that might be more-- so you're really
8 taking failures by their likelihood rather than just
9 by the count. And so I think when events have
10 recovered.

11 Now on the containment side I haven't
12 thought a whole lot about that but we're going to
13 realistic analysis which is as far as I know including
14 uncertainties. It should cover some here.

15 CHAIR SHACK: And, again you know there's
16 the defense-in-depth, we're talking about challenging
17 the containment on its design basis, there's also the
18 ultimate strength of the containment. So I mean we're
19 looking at this in multiple kinds of levels. I don't
20 think that we have stripped the defense-in-depth to
21 the extent that you think we have. We're just
22 treating it more like other beyond design basis
23 events.

24 MEMBER BROWN: We have removed, before
25 the design basis events were covered, I mean not

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1 design, no, the large break was covered based on the
2 past licensing--

3 CHAIR SHACK: That large break with a
4 single failure and a loss of offsite power.

5 MEMBER BROWN: A loss of offsite power.
6 That was covered before. Now we thrown that out
7 because of the low risk or low probability of its
8 occurrence. You don't want to devote more resources,
9 you'd rather take care of those that are more likely.

10 I understand, I read all the letters, but I don't say
11 I understand them all. But I did get the track as you
12 went forward.

13 So there was some rationale to do in that.
14 It just seems to me how far do you walk that puppy
15 back down the path? That's all.

16 CHAIR SHACK: Well, I think the
17 Commission has tried to address that by saying that
18 this really is not intended to be so much a burden-
19 reduction rule as increase in safety. You know it
20 gives, I mean we know that the intent of the design
21 basis wasn't completely successful although you could
22 mitigate the single failure large double-ended break
23 loss, you core damage frequency was a lot more likely
24 than that event was.

25 And so this actually gives you the

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1 flexibility, hopefully, to address events that are
2 more likely and more risky while giving up an
3 extremely unlikely event. And that's not a bad
4 tradeoff and they've sort of pushed that into the rule
5 by capping the amount of risk increase they're willing
6 to accept from this rule to a very small amount.

7 MEMBER BROWN: It does emphasize it as a
8 safety change rather than a burden reduction.

9 CHAIR SHACK: Yes, but how do we see this
10 as an increase in safety?

11 MEMBER SIEBER: It could be small.

12 CHAIR SHACK: We don't know what changes
13 are going to be made. It could be that those changes
14 will result, you know, that you'll be able to make
15 changes in the way that will in fact result in a
16 reduction in risk.

17 MEMBER BROWN: Yes, but normally those
18 aren't going to be made unless you do, I mean let me
19 step back. You have a power operate, somebody can go
20 do the power operate in accordance with this rule.
21 Without the rule, the old way, they would have to
22 update the systems potentially. Similar to the top
23 routine.

24 MEMBER CORRADINI: But let me--

25 MEMBER BROWN: Let me finish. Okay.

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1 With this rule now it would enable them to pass
2 through those with no changes, and making assumptions
3 that single failures don't-- In other words, you have
4 to have both, if you've got two trains you've got to
5 have both of them. If you've got three you may have
6 to have all three, whatever that combination is. And
7 you've walked that through every one of the systems
8 that you've got in there.

9 So I have a hard time envisioning that as
10 quote "an increase in safety," because you've actually
11 increased the power uprate where you've got more
12 energy that you're taking out of the plant. Higher
13 temperatures more than likely, I mean it's hard to do
14 it without higher delta Ts and more fuel loadings in
15 order to achieve your refueling outages.

16 So that's why I was asking the question:
17 how do we envision this? I mean it's a nice thought
18 that you're getting increased safety, it's not
19 apparent when you walk through it to neophyte walking
20 through these, but you cannot, somebody or anybody be
21 able to say write down why this is an increase in
22 safety if you apply these rules as you take some of
23 these potential changes into consideration.

24 MEMBER CORRADINI: But I don't know if I
25 would necessarily support the rule because of increase

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1 safety. I guess I'd support the rule based on reduced
2 burden.

3 MEMBER SIEBER: Safety impact should be
4 minimal.

5 MEMBER CORRADINI: But I mean I don't
6 think you can argue, I think Charlie has a very good
7 point that I don't think you can argue that this
8 increases safety. I think it shifts where you worry
9 about safety.

10 MEMBER SIEBER: Well--

11 CHAIR SHACK: It could increase safety.

12 MEMBER CORRADINI: It could but I think
13 within the uncertainty of the calculation, I guess the
14 only thing Charlie I would disagree with is right now
15 the applicants can come in under the realistic LOCA
16 under 50.46, not the Appendix K version but the
17 realistic, and if they wanted to submit and spend the
18 money to do so, to do a risk calculation for a small
19 break, they probably would then find margin they could
20 uprate. No change in the rule.

21 And so this is just simply identified in a
22 different way to analyze the system and--

23 CHAIR SHACK: And they will not evaluate
24 the changes they make to see what they do to the risk.

25 If they make any change they will cap it at one times

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1 ten to the minus six.

2 MEMBER CORRADINI: Right. But to repeat
3 what you're saying, that the current rule if this
4 didn't exist at all, they can take option B and use a
5 realistic calculation with uncertainties and never
6 investigate how that affected risk. Here they're
7 required to.

8 MEMBER ARMIJO: What if they voluntarily-
9 -

10 MEMBER CORRADINI: Yes of course.

11 MEMBER ARMIJO: What's their incentive to
12 voluntarily use this rule? What's their benefit?

13 MEMBER CORRADINI: Economic.

14 MEMBER ARMIJO: There is no economic.

15 MEMBER BLEY: To get a change they
16 couldn't get the other way.

17 MEMBER SIEBER: Well let's go back to
18 the question that Bill asked which is, is there
19 something we ought to write about? And one of the
20 things we ought to write about is--

21 MEMBER CORRADINI: The last point--

22 MEMBER SIEBER: --the last point on use of
23 non-safety equipment in systems and how reliable is it
24 and should you keep track of that? And if you want to
25 look for a safety benefit right now you get no credit

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1 for those who have no requirements to keep them
2 operable. If you impose the rule--

3 CHAIR SHACK: And you take credit for
4 them as John says in the PRA.

5 MEMBER SIEBER: Yes, on the other hand,
6 what good is the PRA if it doesn't reflect what's in
7 the point.

8 CHAIR SHACK: Well that's why you have
9 the measurements rule.

10 MEMBER SIEBER: My point is with these
11 non-safety systems if you have some surveillance
12 requirement and can demonstrate that it actually does
13 impact and perhaps reduce the probability of an
14 accident, there is the safety benefit. But without
15 imposing some kind of surveillance then you can't show
16 that. And so to me if you're going to give credit in
17 risk base for non-safety equipment, not only do you
18 have to list it in tech specs but you have to set
19 performance goals and you have to surveille it to make
20 sure it meets it.

21 And if you do that you may end up with a
22 safety benefit.

23 MEMBER ARMIJO: That's a new category or
24 reclassifying old equipment into an existing safety
25 grade category.

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1 MEMBER SIEBER: That's right. You know
2 without all the paper work.

3 MR. BESSETTE: The transition break size
4 it still pretty big; for PWRs it's what, 10 or 20
5 percent break. You've still got to have a blowdown
6 that takes about 100 seconds or less, you still need
7 the accumulators, you still need low pressure
8 injection. You have to inject borated water, if you
9 have one source as a borated water source tank, you
10 only have four pumps that connect to that, two high
11 pressure injection, two low pressure injection. So
12 it's not as if you can take a fire pump and help out
13 the situation because the fire is connected to an
14 unborated water so practically speaking a lot of these
15 considerations are just you know exercises in
16 futility.

17 CHAIR SHACK: I mean if the break were
18 six inches it would be a different story.

19 MR. BESSETE: Yes. Yes.

20 And containment, all the energy from the
21 primary system is still going to end up in
22 containment. You have your peak containment pressure
23 is going to be the same with the 10 percent break as
24 it was before. Yes.

25 MEMBER SIEBER: Take forever to get

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1 there, a few seconds. Anyway, that will be my
2 suggestion about what to write about and there's two
3 aspects to it. It depends on how everybody feels, of
4 course, but that's where I--

5 MR. BESSETTE: The most significant
6 difference that I see is you're not going to fail any
7 fuel most likely for design basis accident.

8 MEMBER SIEBER: Probably not.

9 MR. BESSETTE: And you don't have to
10 deal with the gap at least on the--

11 MEMBER RAY: Well, to make one comment on
12 Charlie's point. I believe that this kind of analysis
13 should result in a greater safety because you
14 eliminate arbitrary constraints on what conditions can
15 exist. You go beyond what was a previously truncated
16 set of things. Multiple failures for example. And
17 worst case conditions than are in the design basis.

18 So in principle it can do that, and it
19 should do that. Unfortunately, I think too many
20 people look at it as a burden reduction vehicle and so
21 they get wrapped up in these things like we were
22 talking about which is well gee whiz, this is really a
23 low probability thing. If I had taken credit for some
24 non-safety thing I shouldn't have to pay attention to
25 its reliability as well, other than what I already do

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1 under the maintenance rule.

2 It seems to me that if it's the right
3 thing to do it's the right thing to do, and that ought
4 to be the reason why we do it.

5 Now in a practical world that, of course,
6 isn't what governs. And I understand that. But
7 nevertheless safety should be enhanced by a more
8 comprehensive look at what might happen and what
9 responses to what might happen we can rely on. And
10 the deterministic design basis that we've used up
11 until now eliminates some things that ought to be
12 considered it seems to me.

13 MEMBER BROWN: Then we ought to be able
14 to write it down. Somebody ought to be able to write
15 that down as to why this is a benefit instead of just
16 chatting about it.

17 MEMBER RAY: Well you just said you'd
18 read a lot of letters.

19 MEMBER BROWN: I just read them all and I
20 mean none of them answered that question. None of
21 them stated why are you doing it. And what you have
22 the potential to talk about the reduction in this and
23 the reduction in that. And flexibility for various
24 things.

25 But it didn't say anything about you get a

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1 better overall evaluation of the risk associated with
2 operating plant for the following reasons: bang,
3 bang, bang. It's not written down. It's ad hoc, you
4 have to make it up as you go and if you don't want to
5 do that that's a big change. If somebody implements
6 this it's a big change.

7 The only thing people know today about
8 nuclear power plants is TMI and Chernobyl where stuff
9 broke. In one case a lot of people got hurt, in
10 another one--

11 MEMBER SEIBER: A lot of the stockholders
12 got hurt.

13 MEMBER BROWN: Exactly.

14 CHAIR SHACK: Well, with Chernobyl not a
15 lot of stockholders, only one. And neither one of
16 them was a double guillotine break.

17 MEMBER BROWN: No, I understand that. I
18 understand that. It's just they were both stupid.

19 MEMBER CORRADINI: So I guess I want to ask
20 the staff question because I guess I would agree with
21 Jack's final comments that if we were to write
22 something down, the last discussion about connecting
23 the practical aspects of surveillance of this
24 additional equipment with the why it should be
25 surveilled or why it should be worried about doesn't

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1 appear to be in there enough and I sense the staff
2 has--

3 CHAIR SHACK: Well, if you're going to
4 pick this non-safety equipment why not go back to the
5 maintenance rule and look for the most risk
6 significant non-safety equipment. Do a full 50.69.
7 Why do we pick this particular piece of non-safety
8 equipment over what may well be more risk significant
9 non-safety equipment.

10 MEMBER SIEBER: You can do that if you
11 want.

12 CHAIR SHACK: Well you know that's always
13 the trouble with risk informed regulation when you
14 bite off a piece of something and you don't take the
15 whole thing.

16 MEMBER SEIBER: All in one string.

17 MEMBER CORRADINI: But just to finish my
18 thought, if there was something to write down in an
19 interim letter that would be the only thing I think
20 rises up to a thing. But I guess I'd ask the staff if
21 they get the warm feeling that I think uniformly this
22 troubles at least a lot of us, is that enough for them
23 to reconsider some of what they're thinking about? Or
24 do they need something from us in that regard? Tim
25 made a point that he was, he used the term "beaten

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1 down."

2 I mean if we have a letter from you sure
3 it's a lot more weight--

4 CHAIR SHACK: If we want a hammer we put
5 the hammer down. We don't depend on them getting the
6 message back.

7 MEMBER CORRADINI: But I guess let's put
8 it differently, if the rule reappeared whenever their
9 schedule is and it's exactly the same in this one
10 frame, then I think a lot of us would have a problem.

11 MR. COLLINS: I recognize now that's
12 important information.

13 We'll put this out for public comment so
14 we're going to get written comments to the contrary of
15 what you're arguing here I'm sure. Okay? And we'll
16 be modifying the based on the comments we receive.

17 MEMBER RAY: Okay. I bet you something,
18 okay, I bet you you will not get a comment from the
19 industry in any way saying yes I want you to list this
20 in the tech specs, but I don't want to have any
21 requirements placed on it I just want to find out
22 later if I violated my analysis assumption. That's
23 not going to happen.

24 MR. COLLINS: They're going to say
25 there's no need for this to be in the tech specs at

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1 all.

2 MEMBER RAY: That's right. That's not
3 the same thing we say.

4 MR. COLLINS: No, agreed. I understand.
5 Oh I understand.

6 MR. DINSMORE: But to clarify this I
7 wouldn't expect that we're going to change the rule
8 that we're proposing to issue for public comment to
9 include this unless you effectively tell us. I mean I
10 don't know if the schedule, the schedule right now is
11 we've had all offices concur with different comments
12 and that we're going to go and put those comments in.
13 And this particular comment is not one.

14 MEMBER CORRADINI: I understand that. I'm just
15 trying to sense the level of need to write something
16 down versus communicate it verbally.

17 CHAIR SHACK: No, I mean we could send
18 out a letter sort of like the one we sent last time,
19 don't send this thing out for public comment. We
20 could write a letter that says send it out for public
21 comment but we still think--

22 MEMBER SIEBER: We have reservations.

23 CHAIR SHACK: And do this, this and this.

24 Or consider this as part of the comments. Consider
25 this as you know our part of the public comments on

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1 it. There's a whole variety of ways that we could
2 comment on it. But that is a Committee decision.

3 MEMBER SIEBER: Actually there's been a lot
4 of progress I think by the staff.

5 CHAIR SHACK: In fairness to the staff
6 we threw out ping pong balls to tell you the truth.

7 MEMBER SIEBER: Trust us we'll get to
8 cloture.

9 MEMBER POWERS: That's good, there's ping
10 pong balls. And they bounce back. It's when you feel
11 like you're throwing like a raw egg that you get to
12 worry.

13 MR. DINSMORE: I wonder if we can take it
14 back and talk to management as we go through the
15 process and make sure that they're they're aware of
16 it. But I personally would suspect that it's kind of
17 ahrd to change these things at later dates. And it
18 will not work its way in there unless--

19 CHAIR SHACK: No, I would not rely on you
20 to carry on a message back. If we want to send a
21 message we send a wire. It works very well.

22 Any further comments or questions?

23 MEMBER SIEBER: Good meeting.

24 CHAIR SHACK: Thank you very much, it was
25 a very helpful presentation. Thank you.

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1 MR. COLLINS: Tomorrow then I'm just
2 going to present my stuff. Is that what we decided?

3 CHAIR SHACK: Yes and maybe you know grab
4 a couple of points from Steve and maybe a point or two
5 from Rob. Go back through it again just to check but
6 I think you've got most of the important stuff.

7 (Whereupon, the meeting of the
8 Subcommittee on Regulatory Policies and Practices,
9 having been concluded, went off the record at 4:46
10 p.m.)
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§50.46a Rule to Risk-Inform ECCS Requirements (Redefinition of Large-break LOCA)

ACRS Meeting
May 7, 2009

Tim Collins, Senior Level Advisor
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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



Overview of Revised Proposed Rule

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



Overview of Revised Proposed Rule

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



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 \leq “minimal”, and
 - 50.59 satisfied
- Must not invalidate applicability of elicitation report or seismic studies



Overview of Revised Proposed Rule

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



Overview of Revised Proposed Rule

Other Requirements

- Analysis Methods for all LOCAs must be approved by staff
- Ability to readily connect onsite power must be provided if nonsafety equipment credited in analysis



Overview of Revised Proposed Rule

Other Requirements (con't)

- PRA methods must be of sufficient scope and quality
- 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



Overview of Revised Proposed Rule

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



Defense in Depth Considerations 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



Defense in Depth Considerations 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



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 ($\theta/\pi = 0.8$) 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



Technical Areas where Explicit Guidance is Not Warranted

- Safety culture
 - NUREG-1829 identified that plant-to-plant variability can be significant; deficient safety culture may greatly increase LOCA frequencies.
 - Significant enhancements have been made to reactor oversight process (ROP) since NUREG-1829 elicitation was completed.
 - Current ROP is expected to identify deficiencies before plant safety or LOCA frequencies are affected.

- Indirect piping failures due to seismic events
 - NUREG-1903 only considered one failure mode.
 - NUREG-1903 only evaluated two plants and piping configurations.
 - Generic changes to seismic design, testing, analysis, qualification, and maintenance requirements will not be allowed under 10 CFR 50.46a.
 - Plant-specific analysis required to justify any proposed changes.



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



Backup slide

10 CFR 50.46a Rulemaking

Comments

- Issue: Operating restriction when in a configuration not demonstrated to meet the ECCS acceptance criteria for breaks>TBS
 - Proposed rule: prohibited operation in this configuration.

 - Public Comment: Restriction not commensurate with safety significance of configuration and could increase risk by reducing permitted on-line maintenance.

 - Re-proposed rule: Operation in this configuration not to exceed 14 days per year.



Backup slide

10 CFR 50.46a Rulemaking

Comments Issue:

Issue: Operational Restrictions (Cont.)

- Guidance directly addressing issue does not exist but related guidance exists

- RG 1.177, “An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications “
 - Acceptance guideline integral conditional core damage probability $\leq 5E-7$
 - $1E-5$ /year frequency with no mitigation yields allowed AOT of 18 day

- SRP Chapter 2.2.1 and 2.2.2 identifying design basis events (that need to be mitigated) as those with a frequency $>1E-7$ /year
 - $1E-5$ /year frequency could exist for 3.6 days before exceeding annual frequency of $1E-7$