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Assessment & Plant Operations
Subcommittees

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

+ + + + +

MEETING OF THE

RELIABILITY AND PROBABILISTIC RISK ASSESSMENT

AND PLANT OPERATIONS SUBCOMMITTEES

RISK MANAGEMENT TECHNICAL SPECIFICATIONS (RMTS)

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THURSDAY,

MARCH 25, 2004

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ROCKVILLE, MARYLAND

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The Subcommittee met at the Nuclear
Regulatory Commission, Two White Flint North, Room
T2B3, 11545 Rockville Pike, at 8:30 a.m., Dr. George
E. Apostolakis, Chairman, presiding.

COMMITTEE MEMBERS PRESENT:

GEORGE E. APOSTOLAKIS, Chairman

MARIO V. BONACA, Member

F. PETER FORD, Member

THOMAS S. KRESS, Member

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COMMITTEE MEMBERS PRESENT (Continued):

- WILLIAM J. SHACK, Member
- JOHN D. SIEBER, Member
- MAGGALEAN W. WESTON, Staff Engineer

NRC STAFF PRESENT:

- WILLIAM BECKNER
- TOM BOYCE
- MARK CARUSO
- JIN CHUNG
- NAOTO ICHII
- STU MAGRUDER
- GARETH PARRY
- MARK REINHART
- NICK SALTOS
- BOB TJADER
- MIKE TSCHILTZ

C O N T E N T S

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Bob Tjader 9

Industry Presentation:

Biff Bradley 75

Rich Grantom 114

P R O C E E D I N G S

(8:31 a.m.)

CHAIRMAN APOSTOLAKIS: The meeting will now come to order.

This is a meeting of the ACRS Subcommittees on Reliability and PRAA and Plant Operations.

I am George Apostolakis, Chairman of the Reliability and PRA Subcommittee. Mr. Jack Sieber is the Chairman of the Plant Operations Subcommittee.

Other ACRS members in attendance are Mario Bonaca, Peter Ford, Thomas Kress and Steve Rosen.

The purpose of this meeting is to discuss the risk management technical specifications Initiative 4(b), risk informed completion times.

Maggalean Weston is the -- No? I obviously mispronounced.

It's the same person Maggalean Weston is the cognizant ACRS staff engineer for this meeting, now to us as Mag.

The rules for participation in today's meeting have been announced as part of the notice of this meeting published in the Federal Register on March 8, 2004.

A transcript of the meeting is being kept

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1 and will be made available as stated in the Federal
2 Register notice.

3 It is requested that speakers use one of
4 the microphones available, identify themselves and
5 speak with sufficient clarity and volume so that they
6 can be readily heard.

7 We have received no written comments from
8 members of the public regarding today's meeting.

9 Initiative 4(b) is the most complex of
10 these initiatives primarily because of its reliance
11 upon the licensee's PRAs. The staff is currently
12 evaluating pilot proposals for approving the
13 initiative 4(b) process.

14 The overall objective of this initiative
15 is to modify the technical specifications to control
16 operation of the plant in a manner more consistent
17 with plant risk in a given configuration.

18 Current technical specifications address
19 systems independently and do not generally account for
20 the combined impact of multiple equipment on the risk
21 metrics.

22 The maintenance rule configuration risk
23 assessment requirement in 10 CFR 50.65(a)(4) was added
24 to address this consideration, but does not obviate
25 compliance with current technical specification

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1 requirements.

2 The current technical specification
3 requirements may present inconsistencies with a
4 configuration risk management approach and may require
5 plant shutdown or other actions that may not be the
6 most risk effective actions given the specific plant
7 configuration.

8 The staff would like us to comment on
9 Initiative 4(b), particularly the scope and quality of
10 PRA needed to support the licensing process and on the
11 coherence of the various regulatory efforts. That is
12 the maintenance rule, Initiative 4(b), and Regulatory
13 Guide 1.200.

14 They are scheduled to make a presentation
15 to the full committee in April.

16 Jack, do you have any comments?

17 DR. SIEBER: No, sir.

18 CHAIRMAN APOSTOLAKIS: Mr. Rosen will not
19 participate in today's proceedings due to a conflict
20 of interest, and we will now proceed with the meeting.
21 Mr. Boyce of NRR will begin.

22 MR. BOYCE: Good morning. I'm Tom Boyce.
23 I'm a section chief for the tech spec section in NRR.
24 We're here to talk about an initiative to risk inform
25 plant technical specifications. This effort is called

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1 risk management tech specs.

2 With me is the senior staffer for risk
3 management tech specs, Bob Tjader, in the tech spec
4 section; Mark Reinhart, section chief in the PRA
5 Branch of NRR; Michael Tschiltz in the audience,
6 branch chief for PRA Branch, NRR; Bill Beckner, branch
7 chief for the Reactor Operations Branch and my boss in
8 NRR; Nick Saltos, the lead reviewer in the PRA Branch
9 of NRR.

10 We also have the benefit of a couple of
11 industry speakers. Biff Bradley of NEI and Rick
12 Grantom of South Texas Project will be on the agenda
13 after us.

14 We last presented to the ACRS in November
15 2002. This is the next in a series of periodic briefs
16 to the ACRS on risk management tech specs.

17 The last time we talked to you, we gave
18 you an overview of the eight initiatives that comprise
19 the risk management tech specs. Today we wanted to
20 talk about one of them, Initiative 4(b). As George
21 said in the introduction, we think it is the most
22 ambitious of the eight initiatives because it has got
23 the most heavy reliance on PRA.

24 Right now we think it requires a full
25 scope and very high quality PRA in order to be

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1 successfully implemented, and what it does is allows
2 for real time setting of allowed outage times for
3 equipment, and this is a significant change from the
4 way industry and NRC has traditionally approached
5 plant technical specifications.

6 Typically they say up front a piece of
7 equipment is allowed to be out of service for a period
8 of time, say, six hours. At that point, you normally
9 take action, such as shutting down the plant. This
10 would allow a more real time establishment of those
11 allowed outage times based on use of licensee's PRAs.

12 We are still early in the review process
13 so we won't have all of the answers for you today, but
14 we are developing both issues and answers, we hope, as
15 we go along, and this is part of several risk informed
16 initiatives you are going to be hearing about over the
17 next several months. You are going to be hearing
18 about the staff's plans for responding to the recent
19 SRM on PRA quality this afternoon, and we are going to
20 come back to talk to the ACRS in May, along with,
21 I believe, 5046 in Reg. Guide 1.200 in May.

22 So at this juncture we are looking for
23 comments and feedback, but not necessarily a letter,
24 unless you are going to write a letter on the larger
25 context of where we're going with risk informed

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1 initiatives.

2 Any initial questions?

3 (No response.)

4 MR. BOYCE: Okay. With that I will turn
5 it over to Bob Tjader.

6 MR. TJADER: Thank you, Tom.

7 I will be giving an overview of Initiative
8 4(b), but prior to getting into that, let me just
9 discuss a little bit what we provided you already.

10 About a month ago I provided you a three-
11 ring binder which had in it an overview of and status
12 of each of the initiatives and also included in that
13 were the three Initiative 4(b) submittals received to
14 date from industry, that is, the risk management
15 guidance document, the process by which Initiative
16 4(b) is going to be implemented, and then we received
17 the South Texas full plant pilot, and we received the
18 CE generic single system HPCY pilot.

19 I'll be providing an overview of -- also
20 you received some slides of our presentation today,
21 including some backup and support slides, and in
22 addition to that some background information. The
23 background information are our initial review
24 comments, initial acceptance review comments of the
25 three submittals and the industry responses. So you

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1 can see from that that we are early in the process and
2 we ourselves have a lot of questions, some of which
3 the responses have already satisfied, but that is what
4 you have received to date.

5 I will be providing an overview of
6 Initiative 4(b). Biff Bradley of NEI will provide a
7 discussion of the risk management guidance document,
8 the process that Initiative 4(b) will be implemented
9 by, and Rick Grantom will provide a discussion of the
10 South Texas pilot proposal.

11 We invited Fort Calhoun Station here to
12 discuss the CE proposal, and unfortunately they were
13 not able to attend. If you have any questions on the
14 CE proposal, maybe collectively we can respond to
15 those questions and attempt to do that.

16 I think in Tom's introduction, I think he
17 covered everything. So I'll go right to the
18 conclusions.

19 Some of the thoughts that maybe you can
20 help go away from this meeting or this discussion are
21 that the risk management tech spec Initiative 4(b) is
22 linked to the PRA's quality. Initiative 4(b) requires
23 a qualitative risk assessment to determine the
24 appropriate risk informed completion time and requires
25 a high quality PRA.

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1 Communication and training of the
2 headquarters staff and regions are essentially for the
3 successful implementation of Initiative 4(b). That is
4 something that we know we must do and will have to
5 work on in the future.

6 Initiative 4(b) also happens to be the
7 pilot for the NRC internal risk informed environment
8 initiative related to the communication, education,
9 and acceptance of the staff of risk type initiatives.

10 And as Tom said, we are early in the
11 Initiative 4(b) process. The pilots are going to be
12 proof of concept of it, and we are going to learn as
13 we go.

14 Some principles for the risk management
15 tech spec development. In addition to following
16 Commission guidance in the development of the risk
17 management tech spec initiatives, we seek to achieve
18 coherence with other risk informed regulatory
19 developments, such as the maintenance rule, PRA
20 quality Reg. Guide 1.200, Initiative 5069, among
21 others.

22 We will take four and build upon the
23 existing 5065(a)(4) maintenance rule risk management
24 or risk assessment and risk management programs, and
25 we must insure that licensees risk submittals meet the

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1 standards for quality, such as with Reg. Guide 1.200,
2 the ASME standard and others. That's just to mention
3 two, and others, including some of those that are to
4 be developed.

5 Plus we must, as already said,
6 communicate. We must involve the NRC staff with a
7 cognizant and various disciplines, such as those
8 listed here, so that we receive a good quality end
9 product and so that we also receive support in the end
10 product.

11 A general overview of 4(b) and where they
12 are in the initiatives, the status initiatives. There
13 are four general categories of the initiatives. There
14 are the first initiatives that would be approved.
15 They are the ones that rely extensively on the risk
16 management 8.4, risk assessment and risk management
17 programs in place.

18 There is a second set that require a prior
19 analysis of plan configurations, prior to
20 implementation, before they can then apply a four
21 configuration risk management type programs.

22 And then there is the third group in which
23 Initiative 4 falls into, which require a quantitative
24 risk assessment and a high quality PRA for
25 implementation.

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1 And then the final category involves
2 rulemaking, which is in the future, down the road,
3 which could potentially relocate non-risk significant
4 systems from tech specs, superseding the four criteria
5 that are currently in 5036.

6 A little bit of information on Initiative
7 4, the risk informed completion times. The effect of
8 this is to extend completion times from a nominal or
9 current completion time up to a predetermined
10 backstop, which is a maximum using configuration risk
11 management programs.

12 The Initiative 4(b) would utilize a
13 process which is currently proposed as the risk
14 management guidance document for determining the risk
15 informed completion time, and it will require real
16 time capability and cumulative and configuration risk
17 matrix.

18 And the status, the industry has submitted
19 proposals which you have. I have just given you today
20 the feedback that was provided on that and their
21 responses, and as mentioned South Texas and Fort
22 Calhoun were the pilots.

23 DR. SIEBER: So this extension was done in
24 real time?

25 MR. TJADER: Relatively speaking, yes,

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1 sir. Right now I think the programs, configuration
2 risk management programs are on computers in the
3 plants. I have seen them work in a matter of minutes,
4 changing configurations and coming up with real time
5 solutions. So I think it can be relative real time.
6 Probably some of the delays might be due to
7 involvement of plant approval by senior staff and
8 things like that if they're not on site, if it's the
9 middle of the night. That's why perhaps what we
10 perceived excessive time for making these
11 determinations.

12 But these times are to be determined, too.
13 They're going to be worked out in the pilot and other
14 things.

15 DR. KRESS: How does NRC have assurance
16 that these real time PRAs at the plant meet the
17 quality that they think is needed for this?

18 MR. TJADER: Well, Initiative 4(b) is a
19 triple pilot. It's a pilot for Reg. Guide 1.200,
20 which should hopefully establish some level of
21 quality. Now, it may not provide a sufficient level
22 of quality for the application that we want, and that
23 may be in Phase 3 of the SRM or something like that.
24 However, we are, for the pilots in particular, are
25 going to do an extensive review if not an audit of the

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1 applicable portions of the PRA, and we are going to
2 through the pilot exercise the configuration risk
3 management program to hopefully insure that there is
4 reliability in the process and repeatability such that
5 similar configurations produce similar results
6 consistently and that sort of thing.

7 So the pilot will prove hopefully some of
8 that. IF it doesn't, then we'll have to work from
9 there.

10 MR. BOYCE: I think you have asked the key
11 question for the whole project, you know. How do we
12 have that assurance? And you know, saying the same
13 thing as a combination of up front reviews of
14 licensees, PRAs, licensee commitments to documents,
15 and then follow-on oversight by our inspectors and our
16 headquarters teams as appropriate.

17 DR. KRESS: That sounds good. Would this
18 be viewed as similar to the way you review some of the
19 computer codes for meeting the design basis accidents,
20 like the thermal hydraulics code?

21 You know, you will review and approve
22 those and say this now is a blessed code by NRC for
23 use in meeting the Appendix K requirements or
24 something. Would that be the sort of thing that you
25 would do with these PRAs?

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1 MR. REINHART: What we're call this is a
2 proof of concept type approach, and we are going to
3 have to look at the PRA, a review. Some places will
4 have a standard in place or looking at a standard in
5 a reg. guide. Other pieces we don't yet have a
6 standard, but we will have to go in and do a review
7 that is adequate, and we are going to have to as we
8 get into it determine exactly what constitutes an
9 acceptable review.

10 It is going to be thorough.

11 DR. KRESS: That is yet to be really.

12 MR. REINHART: Yes, yes.

13 CHAIRMAN APOSTOLAKIS: Now, when the
14 reassessment of the completion time takes place, the
15 NRC staff will not be involved, right?

16 MR. TJADER: No.

17 CHAIRMAN APOSTOLAKIS: You will review it
18 afterwards?

19 MR. TJADER: All of these determinations
20 under Initiative 4(b) are to be documented so that we
21 can review them post track.

22 There is a backstop, a proposed 30-day
23 backstop at this point in time. If a system in the
24 plant configuration allows extension of the completion
25 time up to the 30-day backstop, and if the system or

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1 plant is not restored to operable status, the 30 days
2 either gives the plant enough time to restore it or if
3 it isn't restored, it gives them time to assess the
4 situation and come into the NRC and discuss it and
5 then perhaps propose if the risk assessment warrants
6 it an extension beyond the 30 days.

7 MR. BOYCE: Just like any other part of
8 the plant operations, licensee has primary
9 responsibility to operate their plant safely. So the
10 answer is, yes, they would be doing this real time.
11 They don't need to consult with NRC as they are doing
12 it. We always have the ability to go in and review
13 what they have done, and we will have increased
14 documentation requirements.

15 MR. REINHART: the licensee would have an
16 implementation program that would get reviewed and
17 reviewed up front, and so they would have to maintain
18 that program and make their determinations in
19 accordance with that program.

20 So the resident or whoever was going in to
21 inspect would see that what was done was done in
22 accordance with the program and established criteria
23 that we all agreed on up front.

24 MS. WESTON: Bob, this 30-day backstop is
25 proposed regardless to what the current completion

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1 time is?

2 MR. TJADER: That goes right into the
3 example right here.

4 MR. BOYCE: Yeah, let's segue.

5 MR. TJADER: That goes right into the
6 example. then perhaps that will answer you question.
7 Otherwise --

8 CHAIRMAN APOSTOLAKIS: It also applies
9 even if the plant configuration changes.

10 MR. TJADER: Any time the plant
11 configuration changes in a way that would affect the
12 risk, as in A(4), the risk has to be reassessed.

13 CHAIRMAN APOSTOLAKIS: Let's say it
14 changes now.

15 MR. TJADER: If it changes now, you have
16 to reassess.

17 CHAIRMAN APOSTOLAKIS: So you start the
18 30-day period?

19 MR. TJADER: No.

20 CHAIRMAN APOSTOLAKIS: No?

21 MR. TJADER: No, no, no. What it is is
22 that there is a front stop, and that is the existing
23 completion time. The plant has to follow the required
24 actions, restore the plant to operability within the
25 existing completion time if within -- sorry. I have

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1 something that I didn't get on PowerPoint here, and --

2 CHAIRMAN APOSTOLAKIS: So if they do it
3 within the front stop there is nothing else. That's
4 it.

5 MR. TJADER: No, no.

6 MR. BOYCE: Maybe we should work through
7 the example and then come back.

8 MR. TJADER: Yes, I'm getting out another
9 slide. Here it is, here it is. My apologies.

10 DR. KRESS: We like these multimedia
11 presentations.

12 MR. TJADER: Okay. Thank you very much.

13 There's a front stop. That is, as I said
14 already, the existing. Now, this is a proposed
15 revised standard tech spec condition with required
16 action and completion times, and this is an example
17 that is provided in the proposed risk management
18 guidance document, Table 3.1.

19 DR. KRESS: Before you go on, I wanted to
20 ask about the front stop. It's supposedly what's in
21 the existing tech specs or at least the revised. Will
22 there be a look to see if they actually conform to
23 your risk informed rules of just the front stop part?

24 You know, I could conceive that some front
25 stops might exceed your risk criteria.

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1 MR. TJADER: Well, the front stops were
2 systems, as they are now, were created using
3 engineering judgment.

4 DR. KRESS: Yes, I know that.

5 MR. TJADER: And they were created very
6 conservatively.

7 DR. KRESS: Oh, you think they're
8 automatically going to meet that risk.

9 MR. TJADER: Well, they were created very
10 conservatively, and existing tech specs were created
11 with blinders on. They were created assuming only
12 that system is experiencing inoperability. Okay?

13 And if that is the case and you enter that
14 tech spec, the front stop or existing completion time
15 will be conservative. I don't think there are any
16 that are non-conservative. If there are, then they
17 need to be changed. They should be non-conservative.

18 Now, the proof is sort of in the pudding
19 once you have multiple interoperabilities and then you
20 find out that through risk assessments, that with
21 multiple interoperabilities you can have --

22 DR. KRESS: That is almost --

23 MR. TJADER: That sort of proves it, and
24 so that's sort of a given that these existing ones are
25 very conservative. When they may not be conservative

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1 is when suddenly you have multiple system
2 interoperabilities, and then when you enter the tech
3 spec and you want to go beyond the front stop, you
4 will perform the risk assessment.

5 DR. KRESS: You see, what is bothering me
6 about this you may be suddenly in multiple things out
7 of the --

8 MR. TJADER: But you should be --

9 DR. KRESS: -- and the front stops might
10 not be conservative then.

11 MR. TJADER: Well, once you're in the
12 first, there should be corrective maintenance going
13 on, and even if there isn't, we're going to stipulate
14 within the program that the risk assessment need to be
15 formed once the second inoperability is entered.
16 That's our intent. That needs to be negotiated.

17 So anyway, you will be under the risk
18 assessment program in the second inoperability and the
19 risk informed completion time will take effect. Okay?
20 Once you have multiple interoperabilities. Okay?

21 But anyway, this is an example of -- some
22 of this has to be negotiated, and I'm sure industry in
23 some cases may have different perceptions, but I'm
24 telling you what our perception of the staff is at the
25 moment.

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1 Okay. This is an example that's given in
2 the risk management guidance document. Required
3 action B(1) --

4 CHAIRMAN APOSTOLAKIS: Wait, wait, wait.
5 Stop with the condition.

6 MR. TJADER: Okay. The condition is that
7 the subsystems -- forget about what subsystem -- when
8 the subsystem is inoperative. Okay?

9 CHAIRMAN APOSTOLAKIS: But not the whole
10 HBSI, right?

11 MR. TJADER: Just one train, just one
12 train.

13 CHAIRMAN APOSTOLAKIS: One train. Okay.

14 MR. TJADER: One subsystem, one train is
15 inoperable. Okay? The way it currently is is that
16 B(1) is all that would be generally -- speaking is all
17 that you'd see in the specs, 4(a) subsystem generally
18 speaking, and you have 72 hours to restore it.

19 The way it is rewritten is by adding
20 B(2.1), B(2.2) and B(2.3). B(2.1) says if they
21 determine they cannot restore the single train to
22 operability within 72 hours, within that 72 hours they
23 must perform a risk assessment, a quantitative risk
24 assessment, to determine the appropriate completion
25 time, and then that must be performed within that

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1 initial completion time.

2 DR. KRESS: Well, let me ask you about
3 that. The extended time enters into the risk
4 assessment. Does it start after the 72 hours or does
5 it start at the time that you do the risk assessment?

6 MR. TJADER: The way you use standard tech
7 specs and the way improved standard tech specs, times
8 zero for all actions is when you enter the specs.

9 DR. KRESS: When you enter the spec is
10 time zero.

11 MR. TJADER: Right.

12 DR. KRESS: Okay.

13 MR. TJADER: So like I said, there are
14 different views on how to accumulate the metrics to
15 determine what the completion time should be. It is
16 presented a little differently, I think, in one or the
17 other of the proposals where they start counting after
18 the 72 hours.

19 We have raised the question, as you can
20 see by the background information, about that. We
21 perceive that it should be when you enter it. Okay?
22 But that has to be worked out, and regardless of what
23 it is, you need to take into account the time from
24 which it was determined to be inoperable.

25 B(2.2) says basically what we just said,

1 is that any time there is a configuration change of
2 significance, you must reestablish that risk informed
3 completion time. It says verify that what you
4 determine, but basically it is reestablish what it is.

5 DR. KRESS: Do you go back to time zero
6 with that after you've had a configuration change?
7 That doesn't make much sense to me.

8 MR. REINHART: Time zero started at time
9 zero.

10 MR. TJADER: Basically, I mean, you are
11 accumulating the risk.

12 DR. KRESS: It starts at the time you
13 enter the tech spec.

14 MR. TJADER: Yeah, but you are
15 accumulating the risk from the time it is inoperable,
16 right? The revised circumstance, obviously I think --
17 I'm sorry. I'm sorry.

18 DR. KRESS: But I'm going to enter the
19 tech specs. I've got one subsystem inoperable. Now,
20 that gives me a certain level of risk that I can stand
21 for a certain amount of time to meet some acceptance
22 criteria.

23 And then halfway through there something
24 happens and I get some other systems inoperable. Now
25 I have a new set of risks, but that risk wasn't

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1 accumulated during that first part. It is only
2 started at that point, and I don't know how to do that
3 in terms of when the time for the extension starts.

4 MR. REINHART: Okay. The time when you
5 enter the LCO, the first LCO is time zero, and if you
6 go in and out of X, Y or Z LCOs until you're back to
7 full compliance, that clock is starting. The risk is
8 accumulating. The 30 days ends from --

9 DR. KRESS: That would certainly be
10 conservative.

11 MR. REINHART: -- the original time zero.

12 CHAIRMAN APOSTOLAKIS: But if you enter
13 state Y on the way, then you recalculate the
14 completion time?

15 MR. REINHART: Yes.

16 MR. TJADER: And actually the --

17 MR. REINHART: From time zero.

18 MR. TJADER: -- time would be addressed
19 from that point.

20 DR. KRESS: Well, that would certainly be
21 conservative.

22 PARTICIPANTS: Right.

23 MR. TJADER: Actually I think Rick Grantom
24 is going to have some graphs and examples.

25 MR. REINHART: Now, we are going to have

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1 some examples of this if you want to go through those.

2 CHAIRMAN APOSTOLAKIS: Okay.

3 DR. BONACA: But you recalculated the
4 completion time not to exceed 30 days.

5 MR. TJADER: Yeah, the backstop is from
6 time zero.

7 CHAIRMAN APOSTOLAKIS: And the criterion
8 is some criterion on ILERP and ICDP. So there is
9 always a criterion there.

10 MR. REINHART: Yes.

11 CHAIRMAN APOSTOLAKIS: And you always can
12 meet that.

13 MR. TJADER: And I think Rick and Biff are
14 going to discuss some of these things.

15 CHAIRMAN APOSTOLAKIS: Okay, yeah.

16 MR. TJADER: Sure.

17 DR. BONACA: Now, is this the same thing
18 that you use for both voluntary and involuntary entry
19 into the tech spec?

20 MR. TJADER: Yes.

21 DR. BONACA: Because I think you are
22 making a distinction at that time.

23 MR. TJADER: Now, there are constraints on
24 voluntary entry that we perceive being put into place.

25 DR. BONACA: Okay. So this is not

1 reflected here right now.

2 MR. TJADER: The constraints on voluntary
3 entry?

4 DR. BONACA: Yeah.

5 MR. TJADER: Some of it has to do with
6 loss of function and voluntary entry into that, and
7 again, some of that has to be worked out and
8 negotiated with respect to that. It also has some
9 relation to some of the other initiatives, such as
10 Initiative 6, which is entry into --

11 DR. BONACA: Yeah, that's an area where
12 I'm sure you'll talk about that, you know, loss of
13 function, I mean, and you know, how far do you go with
14 the tech spec.

15 MR. TJADER: I think that has to be
16 determined. There's different proposals. I think the
17 staff needs to think about that.

18 CHAIRMAN APOSTOLAKIS: And the 72 hours,
19 the second 72 hours says that the utility foresees
20 that they cannot complete the repair in 72 hours. So
21 within the same 72 hours, they have to do this
22 calculation to determine the new time.

23 MR. TJADER: That's right.

24 CHAIRMAN APOSTOLAKIS: And this always
25 starts from time zero.

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1 MR. REINHART: Correct.

2 CHAIRMAN APOSTOLAKIS: So if they enter
3 now a new configuration 71 hours from time zero and
4 they need to do a new calculation, they don't do it?

5 MR. TJADER: they have to, B(2.2), verify
6 completion time. They may do --

7 CHAIRMAN APOSTOLAKIS: Well, then they may
8 not have time to do it. Then they shut down?

9 MR. TJADER: I think like a --

10 CHAIRMAN APOSTOLAKIS: The shut down.
11 Okay. In other words, within 72 hours either you have
12 repaired it or you have done analysis that justifies
13 going beyond. If you haven't had time to do the
14 analysis, tough.

15 MR. TJADER: Well, keep in mind that the
16 actions -- basically what you're saying is true, but
17 keep in mind that the actions to shut down take time,
18 and you can enter those shutdown actions and still be
19 performing your risk assessment, and once that risk
20 assessment determines it's okay, you can back out of
21 your shutdown actions. Okay?

22 CHAIRMAN APOSTOLAKIS: How long does it
23 take to shut down?

24 MR. TJADER: Oh, six hours to hot standby.

25 CHAIRMAN APOSTOLAKIS: But when is it

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1 irreversible

2 MR. TJADER: Well, essentially --

3 DR. KRESS: In hot standby.

4 MR. TJADER: Yeah, hot standby.

5 CHAIRMAN APOSTOLAKIS: You mean within six
6 hours I can stop it?

7 PARTICIPANTS: Yes.

8 CHAIRMAN APOSTOLAKIS: So essentially they
9 have 78 hours.

10 MR. TJADER: Yes, in effect.

11 MR. HEAD: We envision precalculating many
12 of these other situations we can be in so that the
13 answer is readily available --

14 CHAIRMAN APOSTOLAKIS: Microphone please.

15 MS. WESTON: And your name, please.

16 MR. HEAD: I'm sorry. Yeah, Scott Hayes,
17 South Texas.

18 We envision precalculating many of these
19 situations that we think we could be in and the
20 answers would be readily available in the control room
21 within a short period of time. If there is some
22 exotic configuration we've never seen before, then we
23 would muster the staff to make that calculation.

24 Then that would have been precalculated,
25 and we would learn from that and calculate them again.

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1 So that's pretty much --

2 CHAIRMAN APOSTOLAKIS: Well, that was the
3 question I had. A lot of these have been
4 precalculated, right?

5 DR. BONACA: Just for the record, it's not
6 78 hours. It's 72 hours. I mean, my experience was
7 you wrote in an actual statement it was 72 hours, you
8 would certainly make sure that if six hours before the
9 72 hours is over you had not fixed the plant, you just
10 go down.

11 CHAIRMAN APOSTOLAKIS: So you start six
12 hours earlier.

13 DR. BONACA: Yeah, sure enough.

14 CHAIRMAN APOSTOLAKIS: So it's not 78
15 hours.

16 DR. BONACA: You want to be within the
17 tech spec because that's the way we run it.

18 CHAIRMAN APOSTOLAKIS: Okay.

19 MR. BECKNER: This is Bill Becker.

20 The tech spec requirement is to reach hot
21 steam shutdown within six hours in a controlled
22 manner. Many licenses if they believe that they can
23 have a high probability of fixing things and if they
24 can't fix it can shut down in a controlled and safe
25 manner will make use of a portion of that six hours.

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1 Again, the key that the staff looks to is,
2 number one, what the requirement is and can they meet
3 that requirement in a controlled and safe manner?

4 And, again, I think Scott was back there.
5 I think he would agree with that. In fact, I think
6 I've dealt with South Texas where we've discussed the
7 likelihood that certain equipment would be safely
8 fixed within the AOT plus some portion of that six
9 hours.

10 CHAIRMAN APOSTOLAKIS: Okay. Have we seen
11 enough of this?

12 MR. TJADER: I think so. Do you think so?
13 Now, how do I get this one going again?

14 MS. WESTON: Fold it on down, Bob.

15 MR. TJADER: Okay. Just some thoughts on
16 this management Initiative 4(b) and PRA quality.
17 Initiative 4(b) relies on a pool and a process that
18 will provide configuration specific PRA results in a
19 timely manner to determine completion times, and this
20 is a significant change in technical specifications
21 from the inflexible current completion times and tech
22 specs to flexible risk informed completion times.

23 The PRA model and the configuration risk
24 management process, both must be of high quality, and
25 the risk management tech spec Initiative 4(b) will be

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1 a tech spec significant change, not only two tech
2 specs, but the way we have review and have oversight
3 over technical specifications.

4 CHAIRMAN APOSTOLAKIS: Is that a
5 definition of a high quality PRA anywhere? The ASME
6 standard talks about three categories. I believe, the
7 NEI review has grades. So what is a high quality PRA

8 MR. TJADER: Oh, high quality in
9 accordance with the Reg. Guide 1.200 has three
10 elements. There's scope. Let's see. I'll get a
11 slide, slide 8 here. There it is.

12 And Reg. Guide 1.200, this is the Reg.
13 Guide 1.200 definition of the scope, level of detail,
14 acceptability. The scope doesn't cover --

15 CHAIRMAN APOSTOLAKIS: Yeah, let me
16 understand that. If I pick any PRA, it certainly has
17 a scope. It certainly goes down to some level of
18 detail.

19 MR. TJADER: It has to be adequate for the
20 application.

21 CHAIRMAN APOSTOLAKIS: And who determines
22 that? You do.

23 MR. TJADER: We do collectively.

24 CHAIRMAN APOSTOLAKIS: And you have
25 guidance how to do that?

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1 MR. TJADER: Reg. Guide 1.200 would
2 provide guidance.

3 MR. BOYCE: Well, I think most accurately
4 stated for this application we're developing --

5 CHAIRMAN APOSTOLAKIS: You're developing
6 it.

7 MR. BOYCE: Yeah, and Bob hasn't made it
8 to that part of his presentation, but it's essentially
9 the current Reg. Guide 1.200, plus we think in terms
10 of scope it needs to include external events, low
11 power and shutdown and internal events, and transition
12 risk, mode transition risk.

13 But we haven't reached final agreement on
14 that, and that's our initial thought because of the
15 heavy reliance on the PRA in a real time situation, we
16 think you do need that full scope or you might be
17 missing something until proven otherwise.

18 And we haven't made it to the point where
19 we have been able to do I'll call it scoping analyses
20 that would prove that we could live without those
21 elements.

22 MR. TJADER: Yeah, plus Reg. Guide 200
23 currently addresses full power internal events
24 excluding fire and it will progress and achieve
25 further capabilities as time goes on as you're

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1 probably well aware.

2 And so with regard to Initiative 4(b)
3 we've got to do a Reg. Guide 1.200 review and plus the
4 other application, and it will be a specific review in
5 addition to the Reg. Guide 1.200

6 CHAIRMAN APOSTOLAKIS: Now, you will be
7 reviewing the PRA, right? The PRA as it is in several
8 volumes.

9 MR. TJADER: Yes.

10 CHAIRMAN APOSTOLAKIS: Does South Texas or
11 the plant, any plant have this moniker?

12 MR. HEAD: At South Texas, yes, we do.

13 CHAIRMAN APOSTOLAKIS: Now, my
14 understanding is that in order to put the PRA into a
15 risk monitor, you have to change certain things, like
16 do you go to a huge default tree instead of having the
17 event trees and all of that?

18 MR. HEAD: We don't do that approach. The
19 approach we have is we have basically a graphical
20 user interface for control room operators in a
21 software program, which is software QA, and behind
22 that --

23 MR. TJADER: Well, behind that is a
24 database of configurations, and we've precalculated
25 over 14,000 individual configurations of the statio.

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1 So when the operator goes in and uses his mouse to
2 click this is out of service, this is out of service,
3 this is out of service, the program merely goes to the
4 database, finds that configuration and returns him a
5 result, and that's backed up by a fully quantified PRA
6 model, not an aggravated other type of model there.
7 The full PRA level --

8 CHAIRMAN APOSTOLAKIS: Now, is the staff
9 going to review those predetermined states?

10 MR. TJADER: Not all of them, but we are
11 definitely going to review some of them, and we have
12 to inform them which ones that we -- that's one of the
13 things that we have to do that you'll see in the
14 responses to the questions that we need to see the PRA
15 basis for many of these.

16 CHAIRMAN APOSTOLAKIS: Shouldn't you do it
17 randomly?

18 MR. REINHART: I think a lot of the review
19 has to be determined. Currently we're considering
20 having the licensee submit information, whether it's
21 the whole PRA, or whatever we determine appropriate,
22 to the staff. We would do some at headquarters
23 review, and then we would do some on-site review.

24 I think one of the questions we would ask
25 Mr. Grantom is if he has these 14,000 presolved pieces

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1 and he updates his PRA, I mean, obviously, I think
2 he's going to come back and tell us he's going to
3 upgrade his 14,000 presolved.

4 So we have to work some of that out, and
5 I think that there's going to have to be a sampling.
6 I mean, probably it's not going to be a line by line.

7 CHAIRMAN APOSTOLAKIS: Yeah, but some
8 random sampling of these 14,000 configurations you
9 should review without advanced notice.

10 MR. BOYCE: Mike Tschiltz.

11 MR. TSCHILTZ: Yeah, my name is Mike
12 Tschiltz. I'm the PRA branch chief at NRR.

13 And I think you're honing in on an area
14 where we know we have a lot of work to do and we
15 haven't done a lot yet. I think we need to work
16 closely with the industry, I think, for the industry
17 to develop guidance of how these risk management
18 programs that are used at the different sites, and
19 there are like five different types of programs,
20 accurately reflect the PRA so that we have confidence
21 when they use this tool that they're coming up with
22 the right answer.

23 CHAIRMAN APOSTOLAKIS: Right.

24 MR. TSCHILTZ: Now, is that going to
25 involve us going and doing a review of each one of

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1 these? I hope not because that would be an extremely
2 lengthy review and a lot of resources.

3 I think what we hope to do is to develop
4 some type of guidance that the industry develops and
5 we endorse that would give us confidence that if
6 people follow those guidelines that the PRA is
7 accurately reflective in the model and then we can go
8 and do spot checks of that to verify that it is
9 actually occurring that way.

10 CHAIRMAN APOSTOLAKIS: Yes. I think a
11 random sample of these 14,000 after you develop this
12 guidance, predetermined states, would be a good idea
13 to gain confidence, raise your confidence and the
14 licensee's confidence. They get an independent
15 review. You never know what you're going to find.

16 MR. REINHART: I think while South Texas
17 is proposing the presolved, I'm not 100 percent sure
18 that every licensee -- we're only talking about two
19 right now -- is going to propose that approach. So we
20 kind of have to look at these different approaches and
21 say can we go two different ways or do we all have to
22 go a similar way.

23 And like Mike said, a lot of this is still
24 on the drawing board and we're needing to --

25 CHAIRMAN APOSTOLAKIS: But my point is if

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1 they propose to have a number of predetermined,
2 precalculated plant configurations, then it would be
3 to everyone's benefit for you guys to independently
4 review some of them.

5 MR. REINHART: That certainly makes sense
6 to me.

7 CHAIRMAN APOSTOLAKIS: If they have
8 14,000, you review 13,000, for example, and you're
9 safe.

10 DR. KRESS: Yeah, not all plants use that
11 kind of risk monitor, and I'm wondering what they're
12 going to do. Some of them do what you said. That has
13 to be given treatment in some other way.

14 CHAIRMAN APOSTOLAKIS: Because I do
15 believe that some of the risk monitors rearrange the
16 logic of the plant.

17 MR. REINHART: And we have to look at
18 that.

19 CHAIRMAN APOSTOLAKIS: They go to a huge
20 fault (phonetic) essentially. So I don't know what
21 happens there.

22 MR. REINHART: We will have to understand
23 the process, whether we can approve the process
24 through some sampling and understand what that
25 licensee is doing and then go and verify.

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1 CHAIRMAN APOSTOLAKIS: So this is a good
2 thing to remind the committee that one of these days
3 we should have a subcommittee meeting--

4 DR. KRESS: On risk monitors, yes, sir.

5 CHAIRMAN APOSTOLAKIS: -- on risk
6 monitors. We have avoided that.

7 DR. KRESS: Yeah, we were going to go out
8 to Walnut Creek, I think.

9 CHAIRMAN APOSTOLAKIS: We never did, but
10 this is very important to understand because the logic
11 is manipulated.

12 Jack?

13 DR. SIEBER: Yeah, well, I guess the
14 question that comes to my mind is is a risk monitor
15 ever a Reg. Guide 1.200 PRA.

16 CHAIRMAN APOSTOLAKIS: That's also true.

17 DR. SIEBER: They are two different
18 things.

19 CHAIRMAN APOSTOLAKIS: And that's the
20 issue I'm raising, yes.

21 DR. SIEBER: Yeah. And so whether you
22 have a good PRA or not, if you're using a risk
23 monitor, that's what has to be audited.

24 MR. REINHART: Yes.

25 DR. SIEBER: And they are basically

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1 simplified PRAs.

2 MR. BOYCE: And just to complicate that a
3 little bit more, the PRA has to be translated into
4 software that can be used for the monitor. So you
5 have got software QA issues in addition to PRA QA
6 issues thrown into that mix, and Bob at least has a
7 bullet on that later. So we do recognize that
8 problem.

9 DR. BONACA: I have a question regarding
10 quality. When we ask the question about the quality
11 of the PRA, I mean, you to a description of a full
12 power PRA with enhancements, including low power and
13 shutdown maybe and external events, and that's quite
14 a significant level of quality, in my judgment, I
15 mean, insofar as a list is cooked, it should address
16 it.

17 When we talked about the risk evaluations
18 to support multiple components of a service, not in
19 tech specs necessarily; some of them maybe; one of the
20 positions was of the industry, actually the ASME, was
21 that you could use the lowest level of quality of the
22 three levels. The lowest level would be adequate
23 support, taking components of the service and doing
24 the kind of evaluation.

25 Are you expecting something different for

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1 the two evaluations?

2 MR. REINHART: I think that the quality of
3 the PRA we are looking for has to be a high level, not
4 just adequate, and it is going to apply throughout
5 this process.

6 Once a licensee has the ability to use
7 this system to generate their AOTs, they're looking at
8 the configuration, tech spec, non-tech spec, and I
9 cannot imagine having a certain quality for this piece
10 of equipment versus a certain quality for that piece
11 of equipment.

12 DR. BONACA: Yeah, but you could still not
13 take advantage of the tech specs, risk informed tech
14 specs, and still do on-line maintenance of certain
15 components as long as they're not in tech specs.

16 MR. REINHART: Of course.

17 DR. BONACA: And for that you would expect
18 a lower quality PRA.

19 MR. REINHART: Of course.

20 DR. KRESS: Let me ask you.

21 MR. REINHART: Well, I guess --

22 DR. BONACA: Let me just --

23 MR. REINHART: -- if a licensee had a high
24 quality PRA I would be surprised if they had a
25 separate one.

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1 DR. BONACA: Of course. That goes.

2 MR. TJADER: And what we envision as being
3 ideal for implementation of Initiative 4(b), most of
4 the plant may not be there. In fact, none of them may
5 be because we would like to see shutdown and
6 transition risks included, but if they bound the
7 analysis for that process, then you know, that can be
8 considered.

9 I'm trying to make a point here and it
10 just left my mind.

11 DR. KRESS: That happens a lot.

12 MR. REINHART: I think you were moving to
13 the next slide.

14 DR. BONACA: When we review that area, we
15 did not make a distinction on whether or not a
16 component was in tech specs or not. We did not make
17 a distinction, and yet the issue was if you take
18 multiple components of the service, since you have now
19 a new configuration, you have a new power plant.

20 MR. REINHART: You do.

21 DR. BONACA: You do have to perform an
22 evaluation.

23 MR. REINHART: They have to re-perform the
24 risk assessment.

25 DR. BONACA: And the statement was you

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1 don't need to have a high quality for that kind of
2 activity. All you need to have -- what is the
3 category?

4 DR. KRESS: One.

5 DR. BONACA: One.

6 MR. REINHART: I guess I'm not --

7 DR. BONACA: However, now for this, of
8 course, you're saying I'm interpreting this as a
9 Category 2 or 3.

10 MR. TJADER: Oh, I know what my point was.

11 DR. BONACA: -- can't understand.

12 MR. TJADER: Fort Calhoun Station CE and
13 Fort Calhoun Station R pilot, a single system pilot.
14 Okay?

15 DR. BONACA: Okay.

16 MR. TJADER: And I think perhaps a single
17 system pilot will work through some of these
18 capabilities that we may allow for non-whole plant
19 pilots. In other words, you know, applying it just to
20 a select few systems, and perhaps it doesn't need the
21 scope that a full plant one would require.

22 So the Fort Calhoun Station pilot may
23 address the CE. The single system pilot may
24 address --

25 DR. BONACA: So you're telling me that the

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1 issue of quality really is still somewhat --

2 MR. TJADER: A lot of it has to be
3 determined and worked out, but we are going in with a
4 preconceived notion and inclination that that takes a
5 very high quality.

6 MR. REINHART: I think you are all
7 bringing up questions that have to be looked at and
8 determined, but one of the things at least in my mind
9 is we don't want to go in with the minimum we can do
10 today and hope for better tomorrow if we're going to
11 allow a licensee to go this distance with their plant
12 configuration.

13 We'd like to see an honest effort for a
14 good quality PRA, and we'll move from there.

15 CHAIRMAN APOSTOLAKIS: I have a question
16 for South Texas. Why did you choose not to have a
17 monitor and you prefer to have 14,000 pre-calculated
18 states?

19 MR. HEAD: Well, it's basically for the
20 very reasons you brought up. I didn't want to have to
21 answer questions about what was in and what was not in
22 the model, and I also wanted to have an instantaneous
23 response to the operators. And that was really the
24 primary drivers.

25 CHAIRMAN APOSTOLAKIS: The monitor is

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1 supposed to do that.

2 MR. HEAD: Well, there's some calculation
3 time that is involved in there.

4 The other part of it is though that when
5 we pulled the thread on the configuration of the
6 calculation, I wanted to be able to pull that thread
7 back to a calc., a full Level 1 PRA calculation with
8 external events, and I felt that that was the best way
9 to provide a quality level that would be outside of
10 the operators.

11 I didn't have to rely on an operator
12 knowing anything about a PRA. All he had to know
13 about is what's in service and what's out of service,
14 what's operable and inoperable, and it kept them in,
15 in a sense, the same world that they're used to being
16 in.

17 All of the PRA stuff is done separate from
18 them, and we would stand by that separately, and we
19 could stand by that because it's a full level 1 PRA
20 calculation that is archived that that person
21 accessed.

22 And in a sense, the new plant, the new
23 configuration was analyzed.

24 CHAIRMAN APOSTOLAKIS: And how much effort
25 did it take to develop those 14,000 calc. states?

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1 MR. HEAD: Well, the big effort primarily
2 for us, and we're the risk man shop and we have the
3 large event tree and I guess now we can say we have
4 the large fault tree and the extremely large event
5 trees, and we have what we call a maintenance pre-tree
6 that we developed, and we basically built a
7 maintenance pre-tree that gave us a system of, for
8 lack of better terms, toggle switches to be able to
9 turn trains of systems on and off and propagate it
10 throughout the entire model.

11 And we also developed a way to run these
12 things in batches so --

13 CHAIRMAN APOSTOLAKIS: How extensive was
14 this effort?

15 MR. HEAD: It was a pretty extensive
16 effort to develop the PME pre-tree. Bill Stillwell
17 here could actually give you all of the painful blood,
18 sweat, and tears associated with that, and there's a
19 microphone there, and you know, Bill is the primary
20 developer of that.

21 MR. STILLWELL: Bill Stillwell, supervisor
22 of PRA at South Texas Project.

23 The effort was probably four man-years or
24 four years with three or four people working on it
25 with contract time at times. The model is fairly

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1 detailed.

2 Those of you --

3 CHAIRMAN APOSTOLAKIS: Well, this is
4 effort after you had the PRA, right?

5 MR. STILLWELL: After we had the PRA.

6 CHAIRMAN APOSTOLAKIS: Okay.

7 MR. HEAD: This is to build the PME pre-
8 tree to do this application.

9 MR. HEAD: So we took the PRA, modified it
10 to support on-line applications. Those of you that
11 are familiar with South Texas or with risk man. plants
12 realized we use top of instance split fractions. A
13 split fraction is a system under a boundary condition.

14 So if you imagine a three train system
15 like a diesel generator, we would have something like
16 25 different split fractions for that system,
17 combinations of diesels up and down fail because of
18 support system or out of service for maintenance.

19 Carry that through for all of the systems
20 in the plant, and we have on the order of 2,200
21 different split fractions that are used in the model.

22 The model is defined so that any one of
23 those split fractions can be out of service for
24 maintenance. So we basically toggle it off. The
25 model quantifies. Come back and toggle another one

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1 off, and the model requantifies.

2 DR. BONACA: Well, therefore, this is to
3 re-update all of these configurations once you --

4 MR. STILLWELL: When we roll out a new
5 model, it is about three weeks worth of continuous
6 batch runs to repopulate the database. At the same
7 time we're doing spot checks to make sure that the
8 changes that we thought we made make sense when get
9 the maintenance configurations requantified.

10 DR. BONACA: Yeah, the wonderful thing
11 about this is that, you know, this population is
12 verifiable. I mean, you can go in and you can check
13 it. I mean if you do have on-line monitor, and now,
14 I mean, on-line monitors have very large, full PRAs
15 behind it, and they're fast, too, but you don't have
16 pre-calculated results. So you have to verify and
17 validate.

18 CHAIRMAN APOSTOLAKIS: Thank you, Bill.

19 I think we are running behind. So you
20 have already shown us your conclusions.

21 MR. TJADER: I think they've given half of
22 the presentation already.

23 CHAIRMAN APOSTOLAKIS: What?

24 MR. HEAD: You've given half of ours.

25 MR. TJADER: I'm almost done.

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1 DR. KRESS: I have one more question about
2 a scope. I've been envisioning you running along at
3 power and you want to take something out of service
4 for a certain amount of time and you're going to do a
5 PRA calculation, change in risk or the amount of time
6 you can get.

7 Where does shutdown and low power enter
8 into that picture?

9 MR. TJADER: It wouldn't for preplanned
10 maintenance. You would assume -- for preplanned
11 maintenance you'd do the risk assessment in advance of
12 taking the equipment out of service to confirm that
13 you have adequate time to perform that maintenance,
14 and it would only be due to an emergent condition that
15 would you be confronted as to whether or not you would
16 come up against a deadline, a completion time that
17 expires and make that determination of whether or not
18 you should shut down.

19 DR. KRESS: All right. Now, if you have
20 made a determination that you should shut down, where
21 does the shutdown risk enter into the calculation
22 then?

23 MR. REINHART: Well, it could come in a
24 couple ways, and again, it would depend on the
25 ultimate approach we take, but one approach is to

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1 compare continuing at power versus doing something at
2 shutdown.

3 DR. KRESS: Or you may end up saying
4 better to continue at power for that given
5 configuration.

6 MR. REINHART: Exactly. And another
7 piece, thinking a little in the future, if we have to
8 evaluate like our outages, I mean, collectively, to
9 what level do we have to do that and where does this
10 PRA support that?

11 CHAIRMAN APOSTOLAKIS: Is STP the only
12 pilot?

13 MR. TJADER: No. Right now we have two.
14 Well, let's talk about the pilots right now.

15 CHAIRMAN APOSTOLAKIS: Yes.

16 MR. TJADER: Okay. There are pilots for
17 PRA quality and pilots for Initiative 4(b).
18 Initiative 4(b) and PRA quality are underpinning for
19 Initiative 4(b).

20 CHAIRMAN APOSTOLAKIS: Right.

21 MR. TJADER: Reg. Guide 1.200 pilot plants
22 are San Onofre, Columbia Generating Station, South
23 Texas Pilot and Limerick.

24 Now, South Texas Pilot is the Initiative
25 4(b) pilot being tested under Reg. Guide 1.200, and

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1 Fort Calhoun Station is another Initiative 4(b) single
2 system pilot for that.

3 CHAIRMAN APOSTOLAKIS: So Forth Calhoun
4 will be the second one.

5 MR. REINHART: Correct.

6 MR. TJADER: For Initiative 4(b).

7 CHAIRMAN APOSTOLAKIS: For 4(b).

8 MS. WESTON: Only for a single system
9 though.

10 MR. TJADER: And then reg. guide --

11 CHAIRMAN APOSTOLAKIS: But the point is I
12 can't imagine that anyone else is a PRA with the
13 sophistication of South Texas. So maybe you need more
14 than one additional pilot because --

15 MR. REINHART: We would very much like to
16 have --

17 CHAIRMAN APOSTOLAKIS: If I drive a Rolls
18 Royce, I can't extrapolate and say that all cars drive
19 like a Rolls Royce.

20 MR. TJADER: That's the next slide.

21 CHAIRMAN APOSTOLAKIS: Excuse me for
22 calling you a Rolls Royce.

23 MR. REINHART: We agree with you, George.
24 We agree with you.

25 MR. TJADER: We agree, and that's the next

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1 slide. We would like additional pilots. We would
2 like to see a --

3 CHAIRMAN APOSTOLAKIS: So right now it's
4 Fort Calhoun.

5 MR. TJADER: Yes. We would like to see a
6 standard tech spec plan pilot. We also have another
7 plant that has volunteered, but we have yet to see a
8 proposal. Whether that would be acceptable or not we
9 don't know, but Hope Creek has potentially
10 volunteered. They've done that in the past. We need
11 to see --

12 CHAIRMAN APOSTOLAKIS: So anyhow, this
13 will help you.

14 MR. TJADER: So we would like to see
15 additional pilots.

16 MR. BOYCE: We might want to get through
17 the slides and then maybe we can get ahead of these
18 guys on some of the questions.

19 MR. REINHART: Could I just say one thing
20 here? I think if a licensee doesn't have the high
21 quality PRA that we're looking for, they're not going
22 to play in this game.

23 MR. TJADER: For follow-on plants, it may
24 be a long-term goal.

25 CHAIRMAN APOSTOLAKIS: I don't know, guys.

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1 I've done this so many times, and then others are
2 allowed to participate, too, because this is risk
3 informed. It doesn't really matter how good your risk
4 information is.

5 So I'm --

6 MR. TJADER: I appreciate that. I do, I
7 do.

8 CHAIRMAN APOSTOLAKIS: You know, we go
9 through an extensive review, and then we say, "Well,
10 what's risk informed, you know?"

11 They mention CDF someplace. So that's
12 risk information. Well, let's go on.

13 Okay. Please. Continue and finish it.
14 Finish it and continue.

15 MR. TJADER: Okay. Actually just a point
16 of interest. Four of the five pilot applications for
17 Reg. Guide 1.200 are tech spec related.

18 CHAIRMAN APOSTOLAKIS: And that will be
19 reviewed to the same degree as you would review --

20 MR. TJADER: To the degree of the
21 application. These other pilots, San Onofre, Columbia
22 Generating Station and Limerick are not Initiative
23 4(b). SONGS, San Onofre is a diesel outage AOT
24 extension for a specific circumstance.

25 MR. BOYCE: They're Level 1, full power.

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1 CHAIRMAN APOSTOLAKIS: They would not be
2 the 4(b).

3 MR. BOYCE: Correct. They're just Level
4 1, full power.

5 MR. TJADER: -- Calhoun that are
6 Initiative 4(b). South Texas right now is a dual
7 pilot for 1.200.

8 CHAIRMAN APOSTOLAKIS: Okay.

9 MR. TJADER: That's what this is
10 attempting to say. Maybe it isn't as clear as it
11 ought to be.

12 MR. TSCHILTZ: Let me just offer a
13 clarification on that because the Reg. Guide 1.200
14 pilot may finish before the 4(b) pilot for South Texas
15 and Fort Calhoun. I don't see them being as
16 inextricably linked because what we're trying to get
17 out of the 1.200 pilot is what that compliance with
18 that reg. guide actually means, and is there anything
19 that needs to be changed in it before it's
20 characterized other than trial use, before it's
21 finally issued.

22 So that's what we're trying to get out of
23 the pilot. We're not looking for an extended pilot.
24 We're trying to do this in a year or maybe a little
25 bit more than a year for some of the initiatives like

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1 the South Texas and the Surry and the others, the
2 fifth pilot with the 5069 for two systems.

3 But so I just wanted to make the point
4 they're not -- like we may finish the pilot for 1.200
5 while the other 4(b) pilot continues.

6 MR. TJADER: Exactly. Actually Reg. Guide
7 1.200 pilot has to finish before that, and plus we
8 know now that in all probability Reg. Guide 1.200
9 pilot will not be adequate to firm quality for -- the
10 necessary level of quality.

11 CHAIRMAN APOSTOLAKIS: When the time comes
12 to approve 4(b), we will have sufficient information
13 to feel confident.

14 MR. TJADER: Until we get --

15 CHAIRMAN APOSTOLAKIS: Okay. Let's move
16 on. Let's move on.

17 MR. TJADER: We talked about the PRA. The
18 one on -- we talked about some of these.

19 CHAIRMAN APOSTOLAKIS: Exportability.

20 MR. TJADER: Exportability, that is the
21 ability to apply the pilot, what we just talked about.
22 South Texas to subsequent plants, we need reliability.
23 Is the information acceptable? Is it appropriate? Is
24 it repeatable? Will similar circumstances give you
25 similar results?

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1 A continuation. You know, it needs to
2 have enforceable, and you must have adequate oversight
3 in talking about the PRA quality.

4 CHAIRMAN APOSTOLAKIS: Very good.

5 MR. TJADER: Potential implementation
6 structure. On the STAIC (phonetic), our perceived
7 structure of things is that the program requirements
8 of Initiative 4(b) will be stipulated in the
9 administrative control section of the tech specs. It
10 will call out the PRA quality requirements, Reg. Guide
11 1.200, for instance, and the appropriate guidance
12 document, for instance, Reg. Guide 1.177 and enhanced
13 1.177 if that's it, and the risk management guidance
14 document.

15 And also, there will be licensee -- yes?

16 CHAIRMAN APOSTOLAKIS: Can you tell me in
17 a couple of sentences why Regulatory Guide 1.177 is
18 not sufficient and we have to do this? It's not
19 clear. One, one, seven, seven --

20 MR. TJADER: One, one, seven, seven, I
21 think, takes a single AOT and a static type of
22 environment.

23 CHAIRMAN APOSTOLAKIS: Does it say single?

24 MR. REINHART: If you look at the whole
25 structure, the three tier approach, yes. You're

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1 looking at a single AOT, and like Bob says, to get
2 into a dynamic ongoing situation, we need to put
3 guidance somewhere. One of the options is 177 and
4 appendix. It might be a different reg. guide, but we
5 need to put some sort of regulatory guidance to
6 endorse whatever standards, guidelines and approach
7 that the community collectively develops.

8 CHAIRMAN APOSTOLAKIS: I didn't realize
9 that 1.177 was for a single thing. That's how you
10 stop here, too.

11 PARTICIPANT: So what's Fort Calhoun?
12 South Texas was multiple.

13 MR. TJADER: Well, what he's asking though
14 is 177 as a licensee makes a request to extend an OAT,
15 say, and generally they've done it on one AOT.

16 CHAIRMAN APOSTOLAKIS: And that's a
17 permanent change.

18 MR. TJADER: Yes, and it's a front stop.

19 CHAIRMAN APOSTOLAKIS: Here these are
20 temporary.

21 MR. HEAD: Well, flexible.

22 MR. TJADER: Basically 177 changes the
23 current completion time, the front stop completion
24 time, and it says that --

25 CHAIRMAN APOSTOLAKIS: Oh, so a licensee

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1 then can use 1.177 to change the front stop. That's
2 a permanent change.

3 MR. TJADER: Right.

4 CHAIRMAN APOSTOLAKIS: Using this new
5 initiative now they can go beyond, and given a
6 particular configuration that can actually extend even
7 that.

8 MR. REINHART: Correct.

9 MR. BOYCE: Yes. In the real time without
10 prior NRC approval.

11 CHAIRMAN APOSTOLAKIS: With here though
12 the South Texas experience has been that in the cases
13 where you have extended the AOTs, you have never
14 actually reached it. You always complete restoration
15 well before. Is that true?

16 MR. HEAD: In general, yes, that's true.

17 CHAIRMAN APOSTOLAKIS: Why do you need the
18 4(b)?

19 MR. HEAD: Well, actually, we have had
20 some enforcement discretions that needed to extent the
21 front stop, for example, essential cooling water for
22 a couple of years ago, that if this had been approved
23 at that point in time, our risk analysis would have
24 said we could have taken that additional time without
25 applying for enforcement discretion.

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1 CHAIRMAN APOSTOLAKIS: I see.

2 MR. HEAD: And there was probably at least
3 two of those situations I can think of off the top of
4 my head.

5 And so now we have encountered situations
6 like that.

7 CHAIRMAN APOSTOLAKIS: So the whole idea
8 of 4(b) is to give you extra flexibility

9 MR. TJADER: Correct.

10 MR. REINHART: Yes. It may be well to go
11 back and --

12 MR. HEAD: That's not the whole point.

13 MR. REINHART: That's not the whole point.

14 MR. HEAD: Part of it is the improved
15 safety. Part of it is by looking at configurations
16 and looking at the integrated impacts on risk of the
17 establishment.

18 MR. TJADER: It's the risk intelligent
19 thing to do, and shutting down isn't always the risk
20 intelligent thing to do, and it's to provide you the
21 appropriate complete time to restore systems to
22 operability, you know, taking in mind the overall
23 configuration of the plant, the dynamic manner.

24 MR. REINHART: It may be well to go back
25 to the question that Tom Kress asked earlier, the

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1 other side of the coin, and I think this is still up
2 in the air as to what to do before you get to the
3 front stop.

4 And a question comes up. As originally
5 envisioned would be if a licensee had a configuration
6 that didn't allow getting to the front stop, they
7 would take action before they got to the front stop,
8 and there's some discussion that has to go on, whether
9 it's through the maintenance rule evaluation or
10 whether this evaluation, whether it's the same
11 evaluation. At some point there has to be a
12 determination of what happens in front of that front
13 stop.

14 CHAIRMAN APOSTOLAKIS: Okay.

15 MR. BECKNER: This is Bill Beckner.

16 George, you have a good question. It
17 really is. If a licensee were to make full use of
18 1.177 and risk inform every AOT, you might ask what's
19 the incentive then to develop this extensive program,
20 and we've looked at that dichotomy, and so, yes,
21 that's a valid question.

22 MS. WESTON: Well, Bill, it allows them to
23 cherry pick if they use 1.177 as opposed to needing a
24 quality PRA for the 4(b) initiative.

25 MR. BECKNER: That's the difference.

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1 Again, the real difference is 1.177 is a prescriptive
2 requirement where we have preapproved limits versus
3 4(b) is a risk based requirement where we preapprove
4 and review the criteria that the licensee is going to
5 use for those limits, and that's the major difference,
6 and therefore, 4(b) is much harder. It should be
7 harder.

8 CHAIRMAN APOSTOLAKIS: Yeah, because in
9 1.177 I can focus (a) on diesels.

10 MR. BECKNER: Yes.

11 CHAIRMAN APOSTOLAKIS: And then I have to
12 make sure that the box of the PRA that involved
13 diesels are of sufficient quality to justify the
14 change.

15 Now you are asking for a much broader
16 authority. So your whole PRA now comes into scrutiny.
17 So it's only a tradeoff.

18 Okay. You have shown us your conclusions
19 already.

20 MR. TJADER: Right.

21 CHAIRMAN APOSTOLAKIS: Very good. This
22 was very innovative, by the way to start with the
23 closing comments.

24 DR. BONACA: I have just a question I
25 could ask. Are you looking at some of the let me use

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1 the word "synergies" between this effort and Option 2?
2 Are you looking at all of that?

3 For example, you may have a train with
4 three systems and you decide that each one of the
5 systems or train is individually not risk significant
6 because you have three of those, but now you may end
7 up with one for a month. Okay? Because tech specs
8 may allow you to do that.

9 I haven't reflected enough about that, but
10 I'm saying there are two things coming together.

11 CHAIRMAN APOSTOLAKIS: The risk importance
12 measures maybe different now.

13 DR. BONACA: Well, no, I'm just wondering.

14 MR. TJADER: I mean, South Texas can
15 address this. they have the annual risk metrics to
16 evaluate the cumulative risk over a year, and in fact,
17 it was to the extent as I understand it that it
18 affects their bonuses and things like that. So the
19 incentive is to be in the risk intelligent mode and
20 configuration that --

21 DR. BONACA: Yes. I guess my question is
22 more like, you know, would now the fact that you go to
23 this type of tech spec influence the way that you
24 would look at -- you know, in your evaluation of risk
25 significant system.

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1 MR. REINHART: I think the answer is yes
2 and no, and the no part is 4(b) is really looking at
3 tech specs per se and how you operate the
4 configuration of the plant.

5 But the yes part is given the
6 configuration based on the high quality integrated
7 PRA, when they come to look at their importance
8 measures, they're going to get the benefit of that PRA
9 to give them the importance measures.

10 DR. BONACA: No, I understand that. I'm
11 only wondering if when they do, in fact, the Option 2,
12 that would make a difference, would it not?

13 MR. HEAD: No, because we're still doing
14 the business. Our maintenance programs are still the
15 same. I mean what we're actually able to see now is
16 a reflection in terms of risk of the impact of our
17 maintenance philosophies and approaches here, and so
18 far I haven't seen any type of a change along that
19 line.

20 It does provide a focus on the risk
21 significant components and combinations of those
22 things that can have synergisms in terms of risk, and
23 we have lessons learned.

24 DR. BONACA: -- the question is that when
25 you do the evaluation, okay, the likelihood that you

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1 have two trains down on a system or three, and you're
2 left with only one because it happens, okay, because
3 something fails is very low.

4 So I can understand how you say, okay,
5 each individual train is not risk significant. Okay?
6 But when you intentionally take them out and then for
7 the remaining system you say that you are going to run
8 for a month, I wonder if that made a difference in
9 your mind maybe for perspectives of a deterministic
10 evaluation like defense in depth rather than just risk
11 per se.

12 DR. KRESS: I'm glad you brought this up
13 because you put your finger on the problem I've had
14 with shutdown risk assessments all along, and that's
15 this. There are two types of shutdown risk. There's
16 this thing when you know what configuration you're in.
17 You want to know what the instantaneous risk is and
18 how long it can stay there and how to manage it during
19 shutdown and during maintenance at power. That's one
20 thing.

21 Then you want to know what are your risk
22 significant components that you might want to have
23 importance measures for. That requires a PRA that's
24 extrapolated through the whole life of the plant
25 through shutdowns that may exist many times with many

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1 different configurations.

2 CHAIRMAN APOSTOLAKIS: Fourteen thousand.

3 DR. KRESS: Many things out of service,
4 and how to make an importance measure calculation with
5 a shutdown risk there, I don't think anybody knows how
6 to do that. It just cannot -- you can bound it
7 possibly by looking at the worst possible conditions,
8 but then you've got a real problem because that bound
9 is too big.

10 But that's my whole problem with shutdown
11 risk, and somebody needs to work on that, how to do a
12 real shutdown risk that's extrapolated and made
13 throughout the full life of the plant.

14 CHAIRMAN APOSTOLAKIS: It would be nice to
15 see from South Texas since they have 14,000 different
16 configurations --

17 DR. KRESS: We might want to look at that.

18 CHAIRMAN APOSTOLAKIS: -- look at some of
19 the worst of those and calculate the importance
20 measures.

21 MR. HEAD: Yes, that's been an ongoing and
22 I won't call it a dream, but a project if I can ever
23 get some time to do that, is to go see the
24 configuration specific variation in importance
25 measures for that.

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1 I do have a supporting slide that we can
2 show you where we can show you some stuff along that
3 line, but --

4 CHAIRMAN APOSTOLAKIS: One last question.
5 We have a utility that takes regulatory Guide 1.177
6 and applies it to all of its risk significant
7 components. How likely would it be for that utility
8 to invoke 4(b) if it is approved?

9 They have extended the front stops to a
10 maximum. Will they ever need the Initiative 4(b)?

11 MR. REINHART: That's a good question. If
12 they went through all of that work, they're going to
13 be looking at them one at a time.

14 CHAIRMAN APOSTOLAKIS: But they still get
15 approvals.

16 MR. REINHART: They still do it. Okay.
17 That's their option.

18 CHAIRMAN APOSTOLAKIS: But do you think
19 they will ever need 4(b)?

20 MR. TJADER: Well, there are always
21 circumstances where equipment is inoperable and it's
22 difficult to restore to operable status, and it will
23 probably happen invariably, but it will happen that it
24 will come up to that front stop.

25 Now, the margin, I mean, the risk informed

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1 completion time, configuration based risk informed
2 completion time, wouldn't vary depending upon, you
3 know, if the front stop varies, but I don't think that
4 that determines --

5 CHAIRMAN APOSTOLAKIS: No, no. If it is
6 difficult to restore something, that will be taken
7 into account in the application for 1.177. So it will
8 already have been extended appropriately.

9 They are not doing anything new, in other
10 words, with 4(b).

11 MR. REINHART: Well, the thing they're
12 doing with 4(b) is looking at multiple configurations,
13 and I think if I would coin what Rick said, if he's
14 looking at overall plant safety in an integrated
15 fashion, he wants to know what multiple configurations
16 are.

17 CHAIRMAN APOSTOLAKIS: Wait a minute, wait
18 a minute.

19 MR. REINHART: And --

20 CHAIRMAN APOSTOLAKIS: That's what I'm
21 missing something. If this component is down, you
22 know, I'm following 1.177 now. I'm calculating the
23 incremental conditional --

24 MR. REINHART: Core damage probability.

25 CHAIRMAN APOSTOLAKIS: Yeah. That

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1 calculation takes into account all other components
2 and systems.

3 MR. REINHART: No.

4 MR. TJADER: It assumes they're all in
5 service.

6 MR. REINHART: It assumes they're all in
7 service and it's looking at them one AOT at a time,
8 one component at a time. It's not looking at the
9 synergism of multiple components being out.

10 CHAIRMAN APOSTOLAKIS: Well, it does
11 include an availability due to maintenance.

12 Wait, wait, wait, wait. One by one. Who
13 wants to come to the microphone?

14 MR. REINHART: Nick Saltos was going to
15 make a comment.

16 MR. SALTOS: Yes, this is Nick Saltos.

17 If I can answer that, what Regulatory
18 Guide 1.177 does, considers is an average risk does
19 not consume the configuration risk.

20 CHAIRMAN APOSTOLAKIS: At the time.

21 MR. SALTOS: At any time. We use average
22 risks given a certain component is out to extend the
23 completion time. We don't consider at all the
24 configuration risk. What the use of 4(b) is going to
25 do is going to look at the whole integrating fashion,

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1 the risk of the configuration.

2 The licensees have the option to decrease
3 the completion time, the outage time for some
4 components and take compensatory measures, do other
5 things so that the risk decreases, and the completion
6 for some components can go beyond what they have
7 calculated using average risk.

8 CHAIRMAN APOSTOLAKIS: Well, okay. The
9 only thing that is positive for the licensees here is
10 that they may take these extra measures because they
11 are not in the standard PRA. If other components are
12 actually down, the situation becomes worse for them
13 because in the actual PRA, there is a probability
14 they're down.

15 So if they don't take any compensatory
16 measures implementing 4(b) finds them in a worse
17 situation because now this component is actually down,
18 whereas the baseline PRA says there was operability
19 that would be down.

20 So the thing that really benefits you is
21 the possible compensatory measures.

22 MR. HEAD: That's true. The compensatory
23 measures help, but also it's taking into account the
24 actual configuration at the time and using a risk
25 threshold to determine what should be the proper

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1 allowed outage time because in many cases these could
2 be very punitive action statements that will force a
3 plant to shut down now because of these conditions,
4 whereas from a risk perspective we clearly could have
5 compensatory measures or clearly have a lower risk
6 significance of the combination that would allow us to
7 continue to operate.

8 MR. BRADLEY: I just wanted to mention
9 there is also a difference in the risk guidelines, the
10 criteria for ICDP, because we're basing this off of
11 A(4), the maintenance rule, which already does address
12 controlling the risk of the entire plant
13 configuration, and the risk metrics in there provide
14 a little more room than the ICDP of 1.177, which was
15 based on one system in isolation.

16 Because you're looking at the whole plant,
17 you have to have a little more room in the ICDP
18 threshold there, and we'll get into this a little more
19 when we talk about our -- yes?

20 CHAIRMAN APOSTOLAKIS: I think saying that
21 you're looking at the four plant in this new case is
22 really not quite accurate. When you are implementing
23 the regulatory guides, you aren't looking at the whole
24 plant. You might say this component is out, but the
25 calculation is the whole problem.

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1 MR. BRADLEY: Well, A(4) requires, is a
2 regulatory requirement right now for all plants to
3 look at the configuration risk of the entire plant
4 whenever they are taking systems out of service,
5 whether they are in tech specs or not. We already
6 have regulations to do that.

7 All we're trying to do here is put more
8 rigor into that approach and allow that to give you
9 more flexibility in the tech specs.

10 CHAIRMAN APOSTOLAKIS: But I think as a
11 general statement, if I apply 1.177 and I extend all
12 of my AOTs to the maximum allowed, the chances that I
13 will ever need to invoke 4(b) go down.

14 MR. BRADLEY: I think so. I agree,
15 George.

16 CHAIRMAN APOSTOLAKIS: As a general
17 statement.

18 MR. BRADLEY: I agree, George.

19 CHAIRMAN APOSTOLAKIS: Because I can
20 complete my --

21 MR. BRADLEY: I agree.

22 MR. REINHART: I think to do that, let's
23 say a licensee is going to systematically do that.
24 What's going to happen is they're going to bring up
25 unique questions to the staff every time they're going

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1 to --

2 CHAIRMAN APOSTOLAKIS: I appreciate that.
3 I appreciate that.

4 MR. REINHART: It would be a horrendous
5 effort.

6 CHAIRMAN APOSTOLAKIS: Yes, but --

7 MR. HEAD: It's not a licensing strategy
8 we had contemplated doing.

9 CHAIRMAN APOSTOLAKIS: Okay. It may be
10 infeasible to do it that way or it may be very
11 expensive and so on, but in principle that would be
12 the thing.

13 MR. SALTOS: Yes, this is Nick Saltos
14 again. Actually, I think if they do that, it seems to
15 me the risk will increase because they will have more
16 space that they are going to use in Area 4 instead of
17 4(b), and 4(b) is supposed to have better PRA and a
18 better process and documentation.

19 If you extend the front stop for all, they
20 will use the maintenance rule trying to define the
21 situations where the risk is increased to the point
22 that they will have to shut the plant down or take --

23 MR. HEAD: Yes, Dr. Apostolakis, Nick
24 makes a good point in that sense. If you were to go
25 and extend all of the AOTs out, and you go and

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1 incorporate that into the frequency or in the duration
2 that you could have, you would ultimately start
3 raising the average --

4 CHAIRMAN APOSTOLAKIS: The baseline risk.

5 MR. HEAD: Yes, and you may reach a point
6 very quickly that you can't support anymore.

7 MR. BRADLEY: A(4) will not let you do
8 that. Right now you cannot. If you went in and did
9 that to all of your AOTs, you would get outside the
10 boundary conditions of the A(4) guidance, which
11 requires you to over time maintain your baseline risk
12 within a window.

13 So there is a regulation right now.
14 That's why we have A(4), for the very reasons that
15 we're discussing here.

16 MR. BOYCE: And, George, just to add one
17 more fact to your thought on using Reg. Guide 1.177
18 and the motivation. Right now we are reviewing risk
19 informed amendments, and so while we are working on
20 Initiative 4(b) and trying to work through one or two
21 plants, the rest of the 103 units are, in fact, coming
22 in and getting individual system-by-system extensions.

23 So if we take long enough on this, they
24 may well have solved the problem for us, as you point
25 out.

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1 That's just a statement of what I'm
2 currently seeing.

3 DR. KRESS: Now, let me ask you guys one
4 more question. I'm still hung up on the zero start
5 time. Suppose I enter into the tech spec area my
6 wanting to take something out of service. I go along
7 and a configuration changes for some reason, an
8 unexpected change. I get some other things out of
9 configuration.

10 Now, I've got a new configuration to
11 calculate the risk, and I've entered the tech specs
12 and been in there for some time. Now, if I go back to
13 zero time and calculate the new risk, I may have
14 already exceeded my risk criteria.

15 MR. BOYCE: I think South Texas in their
16 presentation is going to address that situation.

17 DR. KRESS: Okay. If you had that
18 situation, you'd shut down immediately or what would
19 you do?

20 MR. HEAD: No. We have some examples when
21 we get to our presentation that we can go through.

22 DR. KRESS: Okay.

23 CHAIRMAN APOSTOLAKIS: I think it's time
24 to take a break.

25 DR. BONACA: Oh, finally.

1 CHAIRMAN APOSTOLAKIS: Mr. Chairman, Mr.
2 Chairman. Until five past ten.

3 (Whereupon, the foregoing matter went off
4 the record at 9:51 a.m. and went back on
5 the record at 10:10 a.m.)

6 CHAIRMAN APOSTOLAKIS: We are back in
7 session.

8 The next presentation is by the industry,
9 starting with Mr. Bradley of NEI. Maybe you want to
10 move a little to -- yes, that's right.

11 MR. BRADLEY: Thank you.

12 Good morning. I appreciate the
13 presentation by NRC staff on Tech Spec Initiative
14 4(b). We now have a couple of presentations to
15 discuss: the industry perspective on this initiative,
16 and I'm going to give just sort of a generic overview
17 from the NEI perspective of 4(b) and why we're doing
18 it and talk a little bit about the risk management
19 guidance document that has been developed by EPRI,
20 which is pretty much the linchpin of 4(b) and which
21 would be used by all plants implementing it, and then
22 Rick will talk in more detail. Rick and his
23 compatriots from STP will talk more about one of the
24 pilot applications we have underway.

25 When I developed this presentation I

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1 didn't know I'd be giving my conclusions first. So
2 these may seem a little out of sequence, but let we
3 just say how I was going to conclude.

4 This is a challenging risk application.
5 This isn't a lowest common denominator application.

6 CHAIRMAN APOSTOLAKIS: Maybe you don't
7 know it, but now we have new rules.

8 MR. BRADLEY: Yeah, that's what I found
9 out.

10 CHAIRMAN APOSTOLAKIS: The speaker has
11 five minutes, right? And interrupted?

12 MS. WESTON: Ten. Ten, George.

13 CHAIRMAN APOSTOLAKIS: I said five.

14 MR. BRADLEY: You just broke your own
15 rule.

16 CHAIRMAN APOSTOLAKIS: We will do a
17 calculation as we go to extend the five to ten.

18 MR. BRADLEY: Does my clock start now?

19 CHAIRMAN APOSTOLAKIS: Okay, Mr. Bradley.

20 MR. BRADLEY: T equals zero.

21 CHAIRMAN APOSTOLAKIS: T equals zero, now.

22 (Laughter.)

23 MR. BRADLEY: This is a challenging risk
24 application. This is an application that demands a
25 high technical capability and scope of a PRA, and it

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1 is probably not an application that that every plant
2 will desire to get.

3 As I go through my presentation, I'll talk
4 about some of the specific challenges we were facing
5 in developing the guidance document.

6 It is a work in progress. I'm not going
7 to tell you we have all of the solutions to these
8 things worked out yet. We do believe we have got the
9 guidance document to a point where we need to take it
10 out in the field and let the pilot plants use it and
11 get NRC out there to observe how it would be used and
12 in the process of doing that, start determining the
13 level -- I think the real issue on this is the level
14 of detail.

15 NRC used the term "exportability" in their
16 slides. Basically this is the vehicle for NRC
17 endorsement, and this is what plants would have to do
18 for risk assessment and management to implement 4(b).
19 So the critical question is getting the appropriate
20 level of detail in that document that will enable it
21 to be exportable.

22 And that has to be done in concert with
23 the pilots. As we have done in some other
24 applications, such as IS, you really need a live in
25 conjunction with development of the document here. So.

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1 that said, let me go on to my slides.

2 The foundation for 4(b). There was a lot
3 of discussion this morning about needing some
4 assessment of the configuration risk assessment for
5 the whole plant versus the Reg. Guide 1.177 approach.
6 Just to remind you that there is a rule that was
7 promulgated in 1999, that's the new Section A(4) of
8 the maintenance rule that is a regulatory requirement
9 to assess and manage the risk of plant maintenance
10 activities.

11 And NEI developed a guideline that was
12 ultimately endorsed by NRC that provides metrics for
13 risk assessment, approaches for risk assessment of
14 power operation and shutdown, and also risk management
15 techniques that build off the results of that risk
16 assessment.

17 And our intent with 4(b) is to take that
18 existing document for A(4) and provide additional
19 detail and rigor as necessary to support this
20 approach.

21 Because A(4) was implemented several years
22 ago, we basically now have two regulatory requirements
23 on configuration control of the plant. We have tech
24 specs, which is purely based off your deterministic
25 licensing basis, and then you have A(4), which is a

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1 risk basis.

2 And you can't have conflicts between
3 these, and you will basically have a dual regulation
4 set-up and it can be made more optimal. And that's
5 really what we're trying to do with 4(b).

6 When A(4) was developed, there was some
7 degree of flexibility provided in the guidance for
8 assessment and management. That was with recognition
9 that you had tech specs as a backstop, as a pretty
10 hard backstop that would preclude you being able to
11 take long equipment outages, et cetera.

12 At the time, however, NRC recognized we
13 were getting in a double regulation situation and
14 acknowledged that now that A(4) was in place, it could
15 provide the foundation for some additional reform of
16 tech specs, which is what we're trying to do with
17 4(b).

18 In recognition that we needed to provide
19 some level of understanding for the NRC staff of how
20 4(b) works, we did provide a workshop back in February
21 28th of 2001, where we had a number of plants come in
22 and describe how they do configuration risk assessment
23 and management under A(4). We had over 100 NRC staff
24 attend that. It was held at the auditorium here at
25 Two White Flint.

1 So our overall objective is to better
2 align deterministic tech specs with a risk management
3 approach required by the maintenance rule. One of our
4 goals is to make changes within the existing tech spec
5 framework and practice.

6 This is a document the operators use
7 directly. We don't want to make radical, drastic
8 changes to tech specs, you know. There has been
9 discussion in the past of having a one page tech spec,
10 that kind of thing. We're not doing that.

11 We're maintaining the current format and
12 content of tech specs for the purpose of not providing
13 a culture shock for operators and others in the plants
14 that would have to use Initiative 4(b), maintaining
15 the operator safety focus.

16 Also, this is an application that provides
17 an incentive for improve PRAs and configuration risk
18 assessment tools. As I said, I don't believe all
19 plants will implement this, but certainly for those
20 plants that want to go on up and have a high quality,
21 full scope PRA, this is an incentive to move in that
22 direction.

23 I don't see initiative 4(b) as enabling
24 large changes in plant capacity factors or having huge
25 economic incentives for the plants. It does provide

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1 the opportunity to avoid certain forced outages that
2 crop up with the existing tech specs. It provides an
3 opportunity to get out of the NOED type situation
4 where you may need enforcement discretion.

5 CHAIRMAN APOSTOLAKIS: NOD?

6 MR. BRADLEY: Notice of enforcement
7 discretion. That's when you get outside your tech
8 specs, but you realize it's a risk insignificant
9 condition and you have to go to the staff and get
10 discretionary enforcement. That's how it's currently
11 handled.

12 It is basically just providing a better
13 decision making tool and a more refined approach to
14 plant configuration decision making.

15 The NRC has pretty much discussed the
16 overall framework for 4(b). I just mention a couple
17 of things. It would only apply to equipment, LCOs and
18 tech specs. There are other parts of tech specs, such
19 as safety limits, limiting safety system settings,
20 various parameters. You may have fuel limits, time,
21 temperature limits, things of that nature. Those
22 would not apply to 4(b).

23 Four (b) would only apply to equipment,
24 LCOs because those other things can't really be
25 modeled in a PRA.

1 There was some discussion of the front
2 stop. The question sometimes comes up why do we
3 maintain the front stop, the existing AOT. One of the
4 reasons is for operator familiarity. The way the
5 plants are run now, there's tremendous recognition of
6 those existing front stops, and we want to maintain
7 that just to enable the better decision making in
8 terms of do you stay within that or do you go to the
9 extended AOT.

10 As you approach that front stop for the
11 limiting front stop if you're in multiple conditions,
12 you're going to trigger the more extensive risk
13 evaluation and actions required by 4(b).

14 Even before the front stop, even now, for
15 all plants, whether you implement 4(b) or not, you're
16 still governed by A(4) in advance of any completion
17 time you have in tech specs right now. It's
18 conceivable right now, today, a plant could get in a
19 situation with multiple completion times where they
20 would have to take actions before they hit the
21 limiting tech spec front stop, and that would not
22 change with 4(b).

23 There's also a deterministic backstop.
24 That's 30 days. Basically that means even if you have
25 a situation where you could leave the equipment out of

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1 service for a long, long time without accruing any
2 real delta risk, you still have to restore that in 30
3 days. It's really a deterministic backstop. It's to
4 get you back into your licensed plant condition and
5 for your deterministic accident basis.

6 DR. KRESS: Where did the 30 days come
7 from? Did somebody just pull that down out of the
8 air?

9 DR. SIEBER: Yeah.

10 DR. KRESS: It's a structuralistic --
11 you're right.

12 MR. BOYCE: In addition to that, I think
13 historically when the original front stops were
14 established for current plant tech specs, it is based
15 on engineering judgment, but there was also a
16 recognition of the time it would actually take to fix
17 some of this equipment, and so for this particular
18 backstop 30 days was intended to capture any
19 foreseeable time it would take to actually fix the
20 equipment.

21 So it's an operational consideration, in
22 addition to engineering judgment. So it's not
23 completely arbitrary.

24 MR. STILLWELL: Yeah, the current maximum
25 completion time in tech specs right now is 30.

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1 MR. BOYCE: Thirty days, and what you'll
2 find is some of the PRAs would extend well beyond 30
3 days, and so we had to pick something, and so we used
4 operational considerations to do that.

5 MR. STILLWELL: It's also remotely related
6 to 5059 because at some point in time if you left
7 something out long enough you could be viewed as
8 changing the plan.

9 MR. BRADLEY: That's 90 days. That's sort
10 of the same thing. It was sort of an arbitrary
11 criteria, but we picked 90 days where you would have
12 to do a 5095 evaluation for a temporary alteration to
13 support maintenance.

14 MR. REINHART: This is Mark Reinhart of
15 the Risk Assessment Branch at NRR.

16 There was a thought. I think it was said
17 that there is a conceivable ability to calculate an
18 AOT that would go beyond 30 days, and we wanted some
19 way that we thought, as Tom brought out, we could
20 probably get most equipment done, but if there was a
21 reason that we needed to go beyond 30 days, at least
22 the staff would have a touchstone, would have to have
23 some interaction between staff and licensee. Either
24 the 30 days would be a shutdown limit or then they
25 would come in and say, "Okay. Here's the extenuating

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1 circumstances."

2 CHAIRMAN APOSTOLAKIS: So it is not a
3 rigid backstop.

4 MR. REINHART: Well, it is a rigid
5 backstop. There would be a shut down, but if there
6 was an engagement, just like today in a NOED, I think
7 it would be extremely rare, but if for some reason
8 there was a need to go beyond like, I think, one of
9 the examples Rick will bring up on South Texas, there
10 would be an interaction with the staff. It wouldn't
11 just be a calculation from a tool.

12 MR. BRADLEY: The actual final bullet, the
13 actual completion times would be based on the risk
14 assessment and management guidance that I'm going to
15 talk about here. And one thing I want to clear up.
16 This is not a de facto 30 day AOT for everything in
17 tech specs, which somehow some people misconstrue
18 this, but that's a backstop, and the actual AOT you
19 calculate is generally going to be well in advance of
20 that based on the specific configuration.

21 MS. WESTON: Biff, let me ask you. You
22 said the actual completion times would be based on the
23 risk assessment. Does that mean that the AOTs that
24 are in the tech specs now would possibly change based
25 on risk?

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1 MR. BRADLEY: The way this would work
2 structurally is right now you have like a hard seven-
3 day AOT, for instance. That would be replaced. The
4 seven days would be a front stop. That wouldn't
5 change, but you would have the capability to
6 optionally expand that AOT out to as long as 30 days
7 based on the results of your risk assessment.

8 MR. GRANTOM: We'll go through that in our
9 presentation. We'll actually show you the mechanism
10 in the tech specs that does that.

11 DR. BONACA: One other thing that all of
12 us learned, we recall a piece of equipment that wasn't
13 an AOT was urgency. I mean, you just did it. And now
14 that you have an amount of time, is there going to be
15 a concept where you can plan it during the month or is
16 there the same level of urgency covering the
17 equipment?

18 MR. BRADLEY: That's a good question. I
19 think the level of urgency is really a risk management
20 action, you know. You know, do I need to work around
21 the clock? Do I need to bring on extra crews or
22 whatever to restore this?

23 And that would be a function of the risk
24 significance of the condition. That's a classic risk
25 management action that in our guidance we'll have to

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1 tie that action to certain risk criteria.

2 DR. BONACA: But in general the indication
3 is not that you would say, "Okay. I have a month. I
4 can leave it down for ten days."

5 MR. BRADLEY: Right. That would be --

6 DR. BONACA: And do something else because
7 I had to --

8 MR. BRADLEY: Right. No, that would not
9 be our intent.

10 DR. BONACA: You would still have some
11 degree of commitment to restore it as soon as
12 feasible.

13 MR. BRADLEY: Right, right.

14 MR. BOYCE: Just to add to that, I mean,
15 we also share that concern on the staff, and we were
16 looking for ways to incentivize licensees to restore
17 the equipment to operation, and, Rick, I thought you
18 were going to talk about your monitoring of cumulative
19 risk over time as one way to do that.

20 MR. GRANTOM: Right.

21 MR. BRADLEY: We're going to get to that.

22 MR. GRANTOM: We are going to get there.

23 MR. BOYCE: And that monitoring of
24 cumulative risk may end up being part of our program
25 guidelines that we'd ask licensees to sign up for.

1 MR. BRADLEY: As a matter of fact, there
2 are a few other incentives. One is the other elements
3 of the maintenance rule that require you to have, you
4 know, track and balance, reliability, and
5 unavailability. There are also elements of the plan
6 oversight process that could come into play if you're
7 getting into, you know, mitigating systems and taking
8 long outages.

9 You're going to impact the ROP.

10 CHAIRMAN APOSTOLAKIS: Now, just remind
11 me. The maintenance rule, Paragraph A(4), says assess
12 and manage risk.

13 MR. BRADLEY: Correct.

14 CHAIRMAN APOSTOLAKIS: It doesn't give any
15 numerical criteria.

16 MR. BRADLEY: A(4), the rule itself does
17 not. The implementation guidance we developed,
18 Section 11 of 9301, of NUMARK 9301, does provide
19 metrics. They're guidelines. They're not hard
20 criteria on that.

21 CHAIRMAN APOSTOLAKIS: CDF.

22 MR. BRADLEY: Right. I'll talk about that
23 in just a minute.

24 Actually, as was discussed, we have
25 several pilot plants. South Texas, which is

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1 presenting today.

2 Also, it may not have wormed its way
3 through the bureaucracy of NRC yet, but Hope Creek has
4 actually formally sent a letter to NRC requesting to
5 be a 4(b) pilot. That's a BWR. That's a whole plant
6 pilot. I think that's good because we need both our
7 B and PWR whole plant pilots.

8 And also Fort Calhoun. That's actually a
9 lead plant for what was originally a CE owners group
10 joint application report. It's a system specific
11 pilot. It's really just implementing 4(b) on a single
12 system. That's the high pressure safety injection
13 system.

14 The intent of that was really to take
15 advantage of some work SIOG (phonetic) had done that
16 broke the HPCY system down into its subparts and
17 generated AOTs for various injection valves or pumps
18 out of service that were a subset of the overall HPCY
19 AOT, and this is really a vehicle to try to move that
20 into their tech specs.

21 It's a little different type of 4(b)
22 approach than the South Texas and Hope Creek plants.
23 Unfortunately they couldn't be here today to talk
24 about that. So most of what I talk about today is
25 going to be more relevant to the South Texas and Hope

1 Creek pilots.

2 All three of these plants would
3 incorporate and use the EPRI risk management guidance,
4 which I'm going to talk about in just a minute. This
5 will be incorporated through a reference in their tech
6 specs. That would be a hard regulatory requirement
7 that they have to use the guidance that's in the EPRI
8 document.

9 So EPRI has taken the initiative for the
10 industry to develop this, and as I mentioned, the
11 starting point was our existing A(4) guidance. We
12 have about 25 pages of guidance already that's already
13 used by all plants to implement A(4).

14 However, we realize that to implement 4(b)
15 and to remove some of the backstop that tech spec
16 currently provides you have to put more rigor in that
17 process. That would be more rigor in the risk
18 analysis, the expectation for more quantitative
19 methods, as well as risk management actions.

20 Right now the A(4) guidance pretty much
21 just has a laundry list of risk management actions,
22 and there's discretion on which ones you pick for
23 which situations. We anticipate there would be a
24 little more rigor here in terms of tying specific
25 actions to specific risk levels.

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1 Finally, the existing A(4) guidance
2 doesn't really get into plant shutdown decision
3 making, which is what tech specs are all about, what
4 conditions drive you to shut down. So that will have
5 to be enhanced as well in terms of that shutdown is
6 really like the ultimate risk management action, and
7 so we need a little more rigorous process in terms of
8 what specific conditions, risk metrics, or what have
9 you are going to drive you to a plant shutdown.

10 CHAIRMAN APOSTOLAKIS: Now, in the package
11 we received, there was an EPRI report published in the
12 first half of 2003. Is that the one you're referring
13 to?

14 MR. BRADLEY: It is, yes, although that's
15 a draft, and you know, we're still working on it, and
16 as you see on my last bullet here, we received a
17 number of NRC questions, and we're in an iterative
18 process with NRC staff right now of responding to RAIs
19 and improving that document. But that is the draft
20 document.

21 CHAIRMAN APOSTOLAKIS: Okay.

22 MR. BRADLEY: Finally, the document would
23 need to provide PRA scope and technical capability
24 requirements. There was some discussion this morning
25 of the A(4) and the fact that you could use what was,

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1 quote, low quality PRA to implement A(4).

2 A(4) was developed in advance. It was
3 developed in the late '90s. It was developed in
4 advance of any PRA standards even existing, and at the
5 time, it was an additional requirement that was
6 layered on top of the deterministic design on that
7 licensing basis.

8 So there were not a bunch of rigid PRA
9 requirements put in there for practical reasons, and
10 as a matter of fact, A(4) actually allows you to use
11 qualitative methods as well as quantitative methods.

12 But 4(b) would move you more in the
13 direction of quantification.

14 PRA and tool (phonetic) requirements we've
15 proposed, and this is a little bit different from what
16 NRC provided this morning; this is one of the areas
17 we'll still have to close the gap on. We do believe
18 you'd need an internal events and LERF at power,
19 basically meeting capability Level 2 for all of the
20 supporting requirements of the ASME standard as
21 endorsed by Reg. Guide 1.200.

22 In addition, because what tech specs is
23 really about is knowing what your at power risk is and
24 making a determination of when that at power risk
25 needs to be brought down by shutting down, you need to

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1 have an understanding of your whole at power risk
2 picture.

3 And because we're dealing with a
4 quantitative determination of AOTs, it's pretty
5 difficult to do this with a qualitative method. So
6 you really need to be able to quantify all of the
7 significant risk contributors in the at power
8 condition. So that would include obviously internal
9 events and fire for all plants.

10 For many plants that would also include
11 seismic and other external events. So we do recognize
12 that this is moving in the direction of a full scope
13 PRA.

14 We don't believe you necessarily need to
15 have an LPSD or shutdown PRA to implement 4(b). The
16 reason is that tech specs are always driving you from
17 an at power condition to a shutdown condition.

18 If you have knowledge of your shutdown
19 risk, that's great, but that's really an offset, and
20 if you don't have that and if you assume shutdown risk
21 is zero, that's conservative from the standpoint of
22 tech specs because that's going to make all of your
23 risk deltas that much larger.

24 So we believe it's conservative to
25 implement this without a low power shutdown PRA.

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1 However, if you have one, it could be used, and it's
2 going to help offset and demonstrate that the risk of
3 shutting down may be some finite level that you can
4 compare to the at power risk.

5 DR. SIEBER: In fact, it could be as great
6 as or greater than the risk of continuing operation.

7 MR. BRADLEY: So you have one that's going
8 to give you more flexibility here.

9 DR. SIEBER: Yeah.

10 CHAIRMAN APOSTOLAKIS: Is the internal
11 events PRA at power going to include uncertainty
12 analysis?

13 MR. BRADLEY: Yes. Because Reg. Guide
14 1.200 has a fairly substantial treatment of
15 uncertainty, it requires that the base PRA, that the
16 key sources of uncertainty be identified, that they be
17 peer reviewed, and that the key assumptions that flow
18 out of those key sources of uncertainty also have to
19 be peer reviewed and addressed.

20 So the Reg. Guide 1.200 takes the whole
21 issue of uncertainty in the base model up to a much
22 more rigorous level than what we've had in the past.
23 So the answer would be, yes, it would require that.

24 CHAIRMAN APOSTOLAKIS: Including model
25 uncertainty?

1 MR. BRADLEY: Yes. The key sources of
2 model uncertainty have to be determined and peer
3 reviewed and addressed. As a matter of fact, we're
4 working through exactly how that will happen right now
5 in the Reg. Guide 1.200 pilot program as was mentioned
6 earlier, we have four or five of those pilots are tech
7 spec applications.

8 But, yes, it's a pretty substantial
9 treatment, as well as parameter uncertainty.

10 CHAIRMAN APOSTOLAKIS: In the context of
11 model uncertainty, there were two papers that we
12 handed out last time when we were discussing NEI-00-
13 04. Maybe you must have them then.

14 MR. BRADLEY: Yeah.

15 CHAIRMAN APOSTOLAKIS: One had to do with
16 human reliability, and the other had to do with some
17 risk assessments that the former PRG did showing how
18 different assumptions changed the CDF.

19 So I think it would be a good idea for you
20 to have a look at this.

21 MR. BRADLEY: Yes. We have those papers
22 from the previous briefing on 00-04.

23 One thing I would mention is this is a
24 little different from 00-04 in that in 00-04 we're
25 using sensitivity studies to a great extent to deal

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1 with uncertainties, and 4(b), that's really not as
2 feasible. You can't run a whole series of sensitivity
3 studies when you get in a configuration.

4 So in terms of being able to use
5 sensitivity studies, we're a little more limited here.

6 CHAIRMAN APOSTOLAKIS: And, in fact, these
7 two are good examples of what we mean by the statement
8 that the PRA should be appropriate to the issue at
9 hand. In a special treatment requirement when we
10 categorize components, SSEs, it's a fairly
11 conservative categorization. So sensitivity analysis
12 probably are good enough.

13 Here, judging from what I have read in the
14 draft EPRI report, precision or accuracy requirements
15 are much higher because now you say if I'm between ten
16 to the minus five and ten to the minus six, I do this.
17 So I have to have high confidence that these numbers
18 make sense.

19 MR. BRADLEY: That's correct.

20 CHAIRMAN APOSTOLAKIS: So I agree with
21 you, and this is actually a very good example.

22 MR. BRADLEY: In addition to the base PRA,
23 as I mentioned in my first slide on conclusions, there
24 are some challenges in this. One of the challenges is
25 that there are not yet standards or endorsed standards

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1 by NRC for non-internal events. So the plants that
2 are implementing this, the pilot plants will be in
3 what NRC calls Phase 1 of their PRA implementation
4 plan with respect to their fire and external events
5 models. That will require, for instance, Rick, who
6 has fire and seismic initiators built into his model;
7 that will have to be reviewed by NRC directly because
8 they are currently and at the time we'll be doing this
9 they will not be an endorsed standard yet out for
10 that. So that's one of the challenges.

11 And also you have the tool itself. There
12 was quite a bit of discussion of that this morning.
13 In addition to the base PRA, you have to have the tool
14 that translates your configuration and determines your
15 configuration risk, and there are a number of ways to
16 do that.

17 We talked about pre-assessment this
18 morning. There are also other, you know, safety
19 monitor and other ways to do this, and I think it
20 would be safe to say not all plants would intend to do
21 this the way South Texas does by preassessing all of
22 the configurations.

23 They would also like to explore the
24 capability to use the safety monitor type approach to
25 do this as well, and obviously there will be the need

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1 to address the quality of that tool.

2 Another important factor is the ability to
3 determine and track aggregate risk. Basically the
4 bottom line on this application is at the end of a
5 cycle or at the end of some finite period of time
6 you're not supposed to increase the baseline risk of
7 the plant.

8 You can't go into taking large
9 unavailabilities on equipment over time and have your
10 baseline CDF or LERF creeping up over time. So you
11 have to have the ability to track where you've been,
12 determine how much risk you've accrued and at the end
13 of some period, say, a cycle, a fuel cycle, you would
14 assess that and make sure you're still within some
15 window with respect to your base CDF and LERF. That's
16 an important aspect of this.

17 DR. SIEBER: But the fact is it does creep
18 up regardless of what you do. You're just trying to
19 limit the increments, right?

20 MR. BRADLEY: Well, I'm not sure it would
21 necessarily creep up because plants are already doing
22 on line maintenance. They already are accounting for
23 those unavailabilities in their existing models, and
24 again, our intent with this initiative isn't to
25 enable, you know, a quantum leap in the amount of on-

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1 line maintenance we're doing. I wouldn't expect that
2 to change.

3 I mean, we're basically, the way our
4 guidance works, we're basically imposing the Reg.
5 Guide 1.174 permanent change guideline. Say, you
6 know, at the end of the cycle you need to make sure
7 you're within some delta, you know, and we'll have to
8 determine what that is, but I wouldn't expect this to
9 cause long term creep upwards of CDF. That's not our
10 intent, and I don't think the NRC would want that
11 either.

12 DR. SIEBER: I'll have to think about that
13 for a little bit.

14 CHAIRMAN APOSTOLAKIS: On the issue of the
15 monitor, I think it's time for the ACRS to really look
16 more carefully into what goes into these monitors. So
17 I'd like to have a subcommittee meeting some time
18 soon, but would NEI pick one or two of the licensees
19 who have good monitors to come and educate us?

20 MR. BRADLEY: Yes, we would, and also John
21 Gaertner from EPRI is in the audience, and I think
22 EPRI has a large program with regard to various types
23 of configuration risk assessment tools. They have
24 forums and tremendous technical knowledge of those.
25 So I would invite EPRI to also participate in this.

1 CHAIRMAN APOSTOLAKIS: Now, these tools
2 are different from a monitor?

3 MR. BRADLEY: There are a number of --
4 John, if you want to speak to it -- there are several
5 different types of tools.

6 MR. GAERTNER: I'm John Gaertner from
7 EPRI.

8 Yes, in addition to some that we've
9 developed, tools such as EOS and ORAM Sentinel at
10 EPRI, there are commercially available tools, such as
11 the safety monitor and some independently developed
12 tools.

13 We have developed, as Biff said, the
14 configuration risk management forum, which is an EPRI
15 program, but we invite all of our participants, which
16 is every U.S. nuclear plant, to participate in this.
17 We have annual meetings, and we have technical
18 activities throughout the year to investigate, improve
19 these methodologies no matter what tool is used, and
20 we address generic issues that the industry has to
21 make these better, and we give them a forum to
22 communicate.

23 So we're addressing consistency issues.
24 We're addressing the other improvements that we can
25 make. So we're very proud of that, and we'd be

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1 pleased to participate and provide some input to you.

2 CHAIRMAN APOSTOLAKIS: I think that would
3 be great, but one issue in particular that I would
4 like us to address is what exactly is it that people
5 do. What changes do they make to the PRA as we
6 understand it in order to convert it to a monitor?

7 And that can be a fairly technical
8 discussion, but I think it's time that we really
9 understood that issue.

10 MR. GAERTNER: Yes.

11 CHAIRMAN APOSTOLAKIS: That's why I am
12 proposing that subcommittee meeting, and there we can
13 also have the more general discussion of configuration
14 management and the various tools you mentioned that
15 EPRI has developed.

16 MR. GAERTNER: Yes, I understand that.

17 CHAIRMAN APOSTOLAKIS: Would one day be
18 sufficient for this?

19 MR. GAERTNER: Yes, I believe it would.

20 CHAIRMAN APOSTOLAKIS: So maybe we can
21 coordinate it with the ACRS staff.

22 MR. BRADLEY: Yes. Please, we would be
23 happy to do that and just let us know and we'll set
24 that up.

25 CHAIRMAN APOSTOLAKIS: Right. Would the

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1 staff have anything to say on the monitors? Have you
2 investigated the monitors and so on? Mark?

3 MR. BOYCE: We're interested from tech
4 specs' standpoint.

5 MR. REINHART: This is Mark Reinhart for
6 the PRA branch.

7 We're definitely interested in the risk
8 monitors. I think we have to understand also how the
9 PRA flows into the monitor and flows into the decision
10 making process and the controls that go on to the
11 monitor and the criteria that gets fed into that.

12 So I think we would definitely be
13 interested in participating.

14 CHAIRMAN APOSTOLAKIS: No, I understand
15 that some foreign utilities, especially in Taiwan,
16 have also developed the monitors. Does anyone know
17 whether these are drastically different from what
18 we're doing here? Should we hear from them as well?

19 MR. CHUNG; Mr. Chairman, this is Jim
20 Chung with the PRA branch at NRR.

21 We joined EPRI's reliability in the risk
22 work station membership two years ago. So we have
23 access to EOS (phonetic). In fact, EPRI came to the
24 NRR many times to do research, and they gave us
25 seminars. In fact, we had a seminar twice last year.

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1 So I can arrange since I'm the program
2 manager for interfacing with EPRI. What I can do is
3 I can arrange with EPRI and present it to you.

4 On top of that, we are also members of the
5 Safety Monitor Owners Group. So we have access to the
6 safety monitor, too.

7 CHAIRMAN APOSTOLAKIS: Like San Onofre is
8 advertised as having a good safety monitor.

9 MR. CHUNG: Yes, sir.

10 CHAIRMAN APOSTOLAKIS: I would really like
11 to understand.

12 MR. CHUNG: We can --

13 CHAIRMAN APOSTOLAKIS: Now, remember this
14 is going to go down to the dirty details, not just --

15 MR. CHUNG: Absolutely.

16 CHAIRMAN APOSTOLAKIS: -- here's a great
17 tool.

18 MR. CHUNG: We will discuss the master
19 fault tree.

20 CHAIRMAN APOSTOLAKIS: Yes, exactly.

21 MR. CHUNG: Exactly, and we can discuss
22 that, how to read Grantom's and faults in South Texas
23 project and things like that.

24 CHAIRMAN APOSTOLAKIS: Coming back to the
25 question of foreign utilities, are you familiar?

1 MR. CHUNG: The other member of our work
2 station just like we are. They are using the same
3 tool, slight modifications. For example, in Taiwan,
4 they made their own adjustment or little pedigree has
5 been changed.

6 CHAIRMAN APOSTOLAKIS: So there is no
7 reason to hear from them.

8 MR. CHUNG: No. We can listen directly to
9 the horse's mouth; EPRI.

10 DR. BONACA: One document I would like to
11 say. Maybe, Mr. Reinhart, you're aware of that report
12 that Dr. Shepard of PWG put together. That's quite a
13 remarkable report, very recent, and he really has
14 taken all of the international and then the U.S.
15 experience on this monitor. It's pretty sizable. I
16 don't know.

17 That would be useful to the membership.

18 MR. REINHART: Yes. I think that whole
19 effort would be good to bring in. In fact, I would
20 kind of like modify the statement that I think the
21 international experience is good and has some views
22 that maybe we could learn from as well as they could
23 learn from us.

24 CHAIRMAN APOSTOLAKIS: So what do we do?

25 MR. REINHART: I think that that would be

1 good.

2 CHAIRMAN APOSTOLAKIS: Should we invite
3 somebody?

4 DR. BONACA: Well, the report, I think,
5 has been issued or is in draft, and I think it would
6 be valuable for the members to receive a copy of it.

7 CHAIRMAN APOSTOLAKIS: A copy of the
8 report, for sure. The question is --

9 MR. REINHART: Would somebody from that
10 group be valuable to come present.

11 DR. BONACA: Shepard is very, very --

12 CHAIRMAN APOSTOLAKIS: Who is he?

13 DR. BONACA: He's from U.K., and he's the
14 guy who put together the report, and he is extremely
15 knowledgeable.

16 CHAIRMAN APOSTOLAKIS: Do we pay them when
17 they come?

18 MR. REINHART: I think we would invite
19 them to come, but I doubt that NRC would pay for them.

20 CHAIRMAN APOSTOLAKIS: They will come to
21 educate us but on their own expense?

22 MR. REINHART: I don't know the answer to
23 that. I think probably we --

24 CHAIRMAN APOSTOLAKIS: Well, let's explore
25 that.

1 MR. REINHART: -- need to explore that.

2 CHAIRMAN APOSTOLAKIS: Let's explore that.
3 Well, some of them, you know, are very proud of what
4 they've done. Maybe they would be happy to come
5 anyway.

6 MR. REINHART: Yes, I think there's a lot
7 of work that's going on, and what Mario Bonaca was --

8 CHAIRMAN APOSTOLAKIS: I don't want a
9 presentation that will say, "Gee, these are great
10 tools. Look what they do." I want to understand the
11 technical details behind the monitor. Okay?

12 MR. REINHART: I understand.

13 CHAIRMAN APOSTOLAKIS: Yeah, and now, a
14 question to the members. Should this be a
15 subcommittee meeting with the full ACRS?

16 DR. KRESS: I think so.

17 MS. WESTON: Yes.

18 DR. SIEBER: Yes.

19 DR. KRESS: It's one of those things where
20 we need to educate the full committee.

21 CHAIRMAN APOSTOLAKIS: The full committee
22 needs to be educated, in my view, because you're going
23 to be hearing about monitors a lot in the future.

24 DR. SIEBER: That's true.

25 CHAIRMAN APOSTOLAKIS: So maybe we can

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1 schedule it like a Monday and Tuesday before the full
2 committee meeting, Mr. Chairman.

3 DR. BONACA: We'll have to look at the PMP
4 and just let's bring it up, Mag. Okay?

5 CHAIRMAN APOSTOLAKIS: No, but I think
6 that would be the most appropriate time if you want
7 the full membership present.

8 MS. WESTON: We may tack a day on.

9 CHAIRMAN APOSTOLAKIS: Yeah, two days.

10 DR. SIEBER: I would comment that I think
11 that there's a lot for us to learn here and to put it
12 into a four-day ACRS committee meeting will limit the
13 amount of time that --

14 CHAIRMAN APOSTOLAKIS: No, no, no. The
15 full committee will come to the subcommittee meeting.

16 DR. BONACA: We will just have the
17 subcommittee the day before.

18 CHAIRMAN APOSTOLAKIS: It's like we do
19 with security.

20 DR. SIEBER: It's a whole day's work.

21 CHAIRMAN APOSTOLAKIS: yeah.

22 MS. WESTON: It will just be a committee
23 of the whole.

24 CHAIRMAN APOSTOLAKIS: It's a subcommittee
25 meeting, but all of the members are present; the way

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1 we handled 1.174 and now we are handling security
2 issues.

3 DR. SIEBER: Right.

4 MR. REINHART: Mr. Chairman.

5 CHAIRMAN APOSTOLAKIS: Yes, sir.

6 MR. REINHART: Another thought that might
7 be well to consider. We're sort of throwing out risk
8 monitoring in a broad sense, and like you say, you
9 want to know the details. As I'm getting more into
10 this, I'm sensing there's a significant difference
11 between the EOS approach --

12 CHAIRMAN APOSTOLAKIS: Yes.

13 MR. REINHART: -- and what South Texas is
14 doing, and we probably want to understand both of
15 those.

16 CHAIRMAN APOSTOLAKIS: Absolutely. I want
17 to understand what does it take to take a PRA and
18 develop a monitor like San Onofre's, this master fault
19 tree and all of that. What happens? Do we lose that
20 information? Do we have that information?

21 MR. BRADLEY: We can definitely support
22 that. Through EPRI I think we have --

23 CHAIRMAN APOSTOLAKIS: The models and so
24 on.

25 MR. BRADLEY: Yeah, we can do that.

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1 CHAIRMAN APOSTOLAKIS: I think that would
2 be extremely valuable to us because we keep talking
3 about the PRA, and maybe we don't realize sometimes
4 that the way it is used is through a different venue,
5 so to speak.

6 MR. REINHART: I appreciate that.

7 CHAIRMAN APOSTOLAKIS: Okay. Great. so
8 one day will be sufficient; everybody agrees?

9 So we will do this in one of the ACRS
10 meetings over the next few months. Thank you very
11 much. Okay. Great.

12 What else of importance do you have to
13 say?

14 (Laughter.)

15 MR. BRADLEY: What kind of a loaded
16 question is that?

17 I take that as a subtle hint to move
18 quickly. Okay. Let me do that.

19 The metrics. Basically, again, you have
20 to deal with planned evolutions as well as emergent
21 conditions. This was discussed this morning.
22 Obviously you're going to plan maintenance outages on
23 line or at shutdown, but there is also the thing that
24 can break that you weren't aware of, and that triggers
25 additional issues like how much time do you have to

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1 reassess the configuration. The guidance will address
2 all of that.

3 There are also three different types of
4 risk metrics that are historically used for this
5 approach. There's the ICDP. That's a temporary risk
6 increase, which has used like a 1.177 type approach.

7 There's the CDF limit. That's basically
8 what we call the risk speed limit, and then there's
9 also the cumulative risk, the delta CDF that you
10 accrue over time. Obviously LERF would also fall into
11 the same approach. The next three slides, and these
12 are things you're already very familiar with. This
13 just shows how a typical ICDP is calculated. For this
14 particular calculation the ICDP is just the green, the
15 area in green, and here you're using R0, which is the
16 zero maintenance condition. So you're not using the
17 time averaged unavailabilities for the other
18 components that aren't out of service. You're
19 assuming the rest of the plant is in service, which
20 actually gives you a higher ICDP than if you had used
21 what we see here as RIPE, which is basically the
22 baseline risk with a time averaged unavailabilities.

23 But you're familiar with this, and the
24 EPRI guidance will have criteria on ICDP as a function
25 of what risk management actions or types of risk

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1 management actions would take place at differing
2 levels of ICDP.

3 One of the challenges that you get into
4 here is this is a simple configuration with one thing
5 out of service, but where you have overlapping
6 configurations or multiple components out of service
7 the issue of how you define a configuration becomes
8 important, and we need to have some rules on what is
9 a configuration where it's more complicated than this,
10 and that's one of the challenges we have.

11 We'll also, in addition to having ICDP
12 type limits, there is also what we call the risk speed
13 limit, and that's basically just a CDF limit that you
14 shouldn't exceed regardless of the duration of the
15 condition.

16 DR. SIEBER: Is that plant specific?

17 MR. BRADLEY: It would have to be plant
18 specific because there is significant variation in
19 plant baseline CDFs. In the A(4) guidance we
20 designated ten to the minus three as the CDF speed
21 limit that shouldn't be exceeded, but that's subject
22 to reconsideration as we move into 4(b).

23 And, again, you're right. It can be done
24 as a ratio of your baseline CDF or there is a plant
25 specific element to it.

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1 Finally there is the cumulative risk, and
2 the EPRI guidance would require that all plants have
3 to measure and maintain the cumulative risk below some
4 limit, as I talked about earlier on probably a fuel
5 cycle limit.

6 In addition, a lot of plants, like STP,
7 actually use cumulative risk on a smaller time frame
8 such as a work week as opposed to using a
9 configuration specific definition of an ICDP. They
10 will just define an ICDP limit for a work week and do
11 it that way, which does have some advantages, but this
12 just illustrates how --

13 DR. BONACA: Just on the speed limit, you
14 know, shouldn't it be a function of how often you get
15 into this?

16 MR. BRADLEY: Yes. That's why we have
17 to --

18 DR. BONACA: Because if you set it at ten
19 to the minus three, I mean, hypothetically if you
20 always gain, you know, you could change significantly.
21 I understand you have a cumulative --

22 MR. BRADLEY: Right.

23 DR. BONACA: -- and that -- okay, and that
24 may be provided.

25 MR. BRADLEY: It's a combination. It's

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1 not any of these in isolation. You have to use the
2 combination to do that.

3 DR. BONACA: And that provides the stuff.
4 Okay.

5 DR. SIEBER: So that means that if you do
6 some really risky thing that only takes you 15
7 minutes, if you accumulate risk over a week, you could
8 probably do it?

9 DR. BONACA: As long as that thing isn't
10 violating this, your speed limit. That's the intent
11 of having the speed limit, is to keep you from doing
12 just that, the very risky, very short duration type
13 thing.

14 Of course, after you've assessed the risk
15 and have some determination of what it is, you have to
16 take actions based on those results. Those are the
17 risk management actions, and there are a whole number
18 of risk management actions, such as protecting the
19 opposite train, making sure you're not doing any
20 maintenance on other parts of the plant that could
21 cause a large risk spike, given the condition you're
22 in. There are other things, such as working around
23 the clock. There's a whole laundry list of actions
24 that you can take to try to minimize the risk of these
25 configurations you get into.

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1 Those are specific to the configuration
2 you're in and the risk level that you're at. So this
3 guidance has to address those actions and what
4 triggers them. They may be different. The classic
5 tech spec action has shut down the plant. Well, as
6 has been discussed today, there may be other actions
7 that are more risk effective and make more sense than
8 just shutting down the plant when you get into this
9 situation.

10 And there will be more specificity than
11 what we have in the existing A(4) guidance here.

12 And that gets me back to my conclusions
13 where I started. So I'm done unless there are any
14 questions.

15 CHAIRMAN APOSTOLAKIS: Thank you, Biff.

16 Who's next? Rick?

17 MR. GRANTOM: I wanted to briefly let you
18 know the participants here: myself, Rick Grantom, for
19 South Texas project; Bill Stillwell, who is the
20 supervisor.

21 CHAIRMAN APOSTOLAKIS: It is customary
22 when the staff makes presentations like this to put
23 their E-mail and telephone number next to their names.
24 So please next time, can you do that?

25 MR. GRANTOM: I will do that.

1 CHAIRMAN APOSTOLAKIS: And there is
2 another question that I'm dying to ask you. What
3 makes you qualified to address this august committee?

4 I got my answer. Go ahead.

5 MR. GRANTOM: The manager of risk
6 management at South Texas project, and I've been
7 doing risk management applications since the early
8 '82s and have actually ushered through, with the help
9 of the team at South Texas, several applications
10 before.

11 CHAIRMAN APOSTOLAKIS: Very good.

12 MR. GRANTOM: Notably of which is the --

13 CHAIRMAN APOSTOLAKIS: Sieber wants to say
14 something?

15 DR. SIEBER: I was just about to observe
16 that that's a risky question to ask.

17 (Laughter.)

18 CHAIRMAN APOSTOLAKIS: Okay.

19 MR. GRANTOM: I feel quite good with the
20 team here and the experience that we have at South
21 Texas project that we are ready to now once again
22 incorporate a new era in risk management.

23 Following on here with our conclusions, we
24 kept these very simple. We are prepared to support
25 the industry 4(b) pilot. We are serious about this,

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1 and we are doing this. We feel that the application
2 of flexible AOTs is a natural progression in the use
3 of risk insights, and it's an appropriate PRA quality
4 pilot for a Reg. Guide 1.200, simple conclusions.

5 Now, a lot of the things that I was going
6 to discuss have already been discussed. So I'm
7 probably going to try to move through. This is
8 basically the agenda that we had here, and I'll try to
9 hit through these things. I think we have covered
10 most of this.

11 This is the 4(b) pilot, Reg. Guide 1.200
12 for PRA quality. Tech spec structure and format are
13 going to be the same, but we're going to look a little
14 bit different because we're not approved tech spec
15 plant, and so we have a different set of tech specs
16 here. And so our current tech spec AOTs will be a
17 front stop and the back stop that we talked about are
18 also preserved in here.

19 The EPRI implementation guideline we'll be
20 referencing. One thing that is interesting here, we
21 would apply our approach here for conditions where
22 Tech Spec 303 currently applies, and this is where we
23 have the cross-train failures and this is the very
24 putative (phonetic) shutdown action statement, and so
25 we would subsume that into this.

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1 Of course, this would not be done on a
2 planned basis. This would be an involuntary entry
3 into this.

4 We have a new tech spec. Our real
5 mechanism here in our tech specs is a new tech spec
6 section called 3.13, and the flexible AOTs are
7 associated with all of the components within the scope
8 of the configuration risk management program. It's
9 only those components.

10 And here is the scope of those components
11 here. I won't go through all of these, but the intent
12 of this slide is to show you that this is a
13 comprehensive whole plant treatment in the sense that
14 these are the components within the scope of the
15 current configuration risk management program.

16 CHAIRMAN APOSTOLAKIS: Now, if I could
17 mess up your presentation, --

18 MR. GRANTOM: I passed my limit.

19 CHAIRMAN APOSTOLAKIS: Huh?

20 MR. GRANTOM: I passed my five minute
21 limit.

22 CHAIRMAN APOSTOLAKIS: There is a Table 3-
23 2 in the EPRI interim report that gives criteria in
24 terms of ICDP and ILERF, which I don't see in your
25 presentation. At which point would it be appropriate

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1 for us to discuss those?

2 MR. GRANTOM: The implementation slide
3 when get to that point. Plus I have some supporting
4 slides also.

5 CHAIRMAN APOSTOLAKIS: I'd like to spend
6 five minutes discussing those, but you tell me when
7 it's appropriate.

8 MR. GRANTOM: Okay. I would be glad to
9 bring that up.

10 CHAIRMAN APOSTOLAKIS: Okay.

11 MR. GRANTOM: Here is the --

12 CHAIRMAN APOSTOLAKIS: By the way, the
13 five minute starts from time zero when Biff started.

14 (Laughter.)

15 MR. GRANTOM: Biff took my five minutes.

16 CHAIRMAN APOSTOLAKIS: Took your five
17 minutes. You are a new configuration.

18 (Laughter.)

19 MR. GRANTOM: I understand. Here is
20 actually the tech spec 3.13, the risk management
21 technical specification that was actually proposed,
22 and I might spend just a quick moment here to
23 highlight this.

24 The intent of this is that the system
25 technical specifications that are currently within our

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1 current tech spec, if they are applicable to
2 configuration risk management would reference this
3 section, this 3.13, and 3.13 then has action
4 statements that says determine that the configuration
5 is acceptable beyond the front stop.

6 And if you can't meet that, then you
7 determine that the configuration is acceptable beyond
8 the front stop whenever configuration changes occur
9 that may affect plant risk.

10 And then if you reach ultimately the point
11 that you have to restore the equipment within the 30
12 days, which is the backstop, and if you can't restore
13 it within the 30 days and you go back to the
14 referencing technical specification and implement the
15 required actions.

16 So what it actually looks like in a sample
17 system level specification, here's one for essential
18 cooling water. You can see we have highlighted the
19 new parts of this. The seven days is our current
20 front stop that we have. That's the current allowed
21 outage time as it sits right now, but it says that
22 restore to operable within seven days or apply the
23 requirements of Specification 3.13.

24 So this gives an operator an opportunity.
25 It says he either knows up front that it's going to be

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1 going on past the seven days or he finds out through
2 some other emergent condition that it's going to
3 happen. Now he has the opportunity to go and invoke
4 3.13 to enter into configuration risk management.

5 And then he calculates the AOT under a
6 configuration risk management space, accounting for
7 all equipment within the scope of the CRMP being out
8 of service at the same time and calculating the
9 flexible AOTs.

10 We also had to apply a new tech spec down
11 here for two or more essential cooling water pumps
12 being out of service, and then we can also calculate
13 that with the same type of configuration here with us.

14 And all of the other systems that are
15 associated with this will have a similar set and so
16 this represents in a sense a very simple change to the
17 tech specs, the same sets of words, the same reference
18 back to 3.13, something very simple to go forward here
19 with this.

20 MR. STILLWELL: This is something of a
21 dated slide. We would note that the 12 hours or two
22 or more will probably not be the time frame that we
23 would be talking about to make that calculation. It's
24 probably more like one hour or something that's closer
25 to the equivalent of 3.03, and that's why we're

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1 talking about at our statement. We probably have that
2 already precalculated or we would have that already
3 precalculated.

4 CHAIRMAN APOSTOLAKIS: How many loops does
5 the essential cooling water system have?

6 MR. GRANTOM: Three trains per unit.

7 CHAIRMAN APOSTOLAKIS: So when you say
8 with two or more inoperable, that is at least two?

9 DR. SIEBER: Then you're down to one.

10 MR. GRANTOM: That means you're down to
11 one or none.

12 CHAIRMAN APOSTOLAKIS: Why at least two?
13 That's the maximum you can restore.

14 MR. GRANTOM: Well, we have three trains.
15 so we have -- with two operable, that means one of
16 them is not. With two or more inoperable, that means
17 either one or none is not.

18 MR. STILLWELL: If you get back to one
19 operable, then you're back in A.

20 DR. BONACA: Yeah, restore here includes
21 also the one that is still operable.

22 CHAIRMAN APOSTOLAKIS: So the whole system
23 may be inoperable because with two or more essential.
24 So all three may be inoperable.

25 DR. SIEBER: Right.

1 MR. GRANTOM: It's in the realm of
2 possibility.

3 CHAIRMAN APOSTOLAKIS: In that case, even
4 in that case, you can continue to operate as long as
5 you restore at least two within 12 hours or you go to
6 3.13.

7 MR. STILLWELL: That 12 hours is going to
8 disappear.

9 CHAIRMAN APOSTOLAKIS: Yeah, yeah.

10 MR. STILLWELL: Three trains of ECW for us
11 is a very short time now.

12 CHAIRMAN APOSTOLAKIS: So we are not just
13 talking about always having one train of the system
14 operating. You can actually have the whole system
15 disabled.

16 MR. GRANTOM: Yes, and that would be the
17 situation even in current tech specs now unless it
18 induces a trip. So it's within the same aspects we
19 have of the risk associated, very putative to be able
20 to do those kinds of things, and this would be
21 strictly obviously from an involuntary condition.

22 MR. STILLWELL: B is the current
23 equivalent of tech spec 3.03.

24 DR. SIEBER: Well, if you had everything
25 inoperable, that would be an abnormal operating

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1 occurrence, which would put you in the AOT, which
2 gives you maybe a minute or two to do something.

3 MR. STILLWELL: Depending on the system,
4 yeah.

5 CHAIRMAN APOSTOLAKIS: Let me understand
6 that. If all three are inoperable, what happens?

7 MR. GRANTOM: Well, we're in this
8 technical specification 3.0.3.

9 CHAIRMAN APOSTOLAKIS: Which says?

10 MR. GRANTOM: Which says you have to be in
11 hot standby.

12 MR. STILLWELL: Within one hour. Start
13 making preparations and within one hour start shutting
14 the plant down.

15 CHAIRMAN APOSTOLAKIS: Okay, but during
16 that time you may go to 3.13?

17 MR. STILLWELL: Yes, sir.

18 MR. GRANTOM: Yes, we can go to 3.13.

19 CHAIRMAN APOSTOLAKIS: And argue that even
20 with all three inoperable, I can still operate for
21 more than an hour.

22 MR. STILLWELL: Yes, sir. Not argue.

23 MR. GRANTOM: We'd have to have the
24 analysis.

25 MR. STILLWELL: The analysis would be

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1 available to you. The reason that this is interesting
2 is that there are some systems, like containment
3 spray, where that is a very lengthy period of time.
4 For ECW it is not. It look like 3.03.

5 DR. SIEBER: Well, you don't need
6 containment spray for normal operation.

7 MR. GRANTOM: Well, that's true, and so it
8 becomes in a sense --

9 DR. SIEBER: That's a true risk.

10 MR. GRANTOM: -- a reflection of its risk
11 significance. ECW here would be highly risk
12 significant, whereas containment spray would not be.
13 So it does look at configuration risk from one, two,
14 and three trains of being inoperable.

15 CHAIRMAN APOSTOLAKIS: Even though we
16 demanded for AP-600, right?

17 PARTICIPANT: Correct.

18 DR. SIEBER: In this scheme, since they
19 have three trains and most everybody else has two,
20 the GDCs require two. This is just recognizing that
21 extra flexibility.

22 MR. GRANTOM: We do have extra
23 flexibility.

24 DR. SIEBER: Right.

25 MR. GRANTOM: For literally almost every

1 initiating event, one train out of three --

2 DR. SIEBER: So that is why you have to
3 have two out of service before you get to the LCO.

4 MR. STILLWELL: Let me just say that that
5 extra flexibility is something that really only
6 manifests itself in the time that we might be allowed
7 to be in that configuration. This still could apply
8 to the two train plan.

9 DR. SIEBER: Well, it certainly does, but
10 you can have a failure of a single train and not care.

11 MR. STILLWELL: And our risk numbers
12 reflect that. A two train plant with both containment
13 sprays inoperable would still have probably
14 significant amount, much more time than they have
15 right now with the current 3.03 to bring those back to
16 service.

17 So some of this is a three train artifact,
18 but a two train plant can apply this also.

19 DR. SIEBER: Oh, absolutely, and in fact,
20 there it becomes more critical because you have the
21 flexibility to deal with single failures.

22 MR. GRANTOM: Exactly right.

23 DR. SIEBER: Without getting into LCOs.
24 So I just wanted to mention that to make sure it's
25 clear to everybody.

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1 MR. STILLWELL: I want to correct that.
2 From a design basis standpoint, we need all three
3 trains. To mitigate the large break LOCA, South Texas
4 needs all three trains.

5 DR. SIEBER: Oh, yeah?

6 MR. STILLWELL: Yes, sir. But it's only
7 really for the large break LOCA. For the more risk
8 significant scenarios, one train will typically do it,
9 and that's where we accrue the risk benefits. That's
10 why we're here, is that we have lived this way since
11 we licensed the plant, is that we got this extra train
12 that has risk benefits.

13 DR. SIEBER: What's short, the high head
14 flow or --

15 MR. STILLWELL: No, sir. Just real quick,
16 we have -- do you want it deterministically or do you
17 want it --

18 DR. SIEBER: Give it me deterministically.

19 MR. HEAD: Design basis space for a large
20 break LOCA, our safety injection systems are not
21 cross-typed. So we have and A train going to A loop,
22 B going to B, C going to C.

23 DR. SIEBER: I've got it.

24 MR. HEAD: Single failure, broken loop,
25 one train left.

1 DR. SIEBER: Right. Got it.

2 MR. STILLWELL: The critical thing is the
3 broken loop. One train fails and goes out the floor.
4 So deterministically, we need all three.

5 DR. SIEBER: Yeah. On the other hand, if
6 you had the cross-ties, you wouldn't

7 MR. GRANTOM: That's right, but that's in
8 a sense why we're in to see -- that's why tech specs
9 look like two train tech specs when we're really three
10 trains. We didn't get credit for that. However, two
11 train tech specs could apply this very well and have
12 some latitudes with this.

13 DR. SIEBER: Okay. That clarifies it for
14 me. Thank you.

15 DR. BONACA: The word "operable" you're
16 using here is still the traditional approach?

17 MR. GRANTOM: Yes, sir, absolutely, still
18 operable.

19 DR. BONACA: But I understand from option
20 two you are changing some of the definition of
21 operability for the systems, for certain systems. Are
22 you?

23 MR. STILLWELL: It doesn't change the
24 definition. We don't affect operability.

25 DR. BONACA: No, no. I'm talking about

1 you know, operability implies also the degraded and all
2 of the --

3 MR. GRANTOM: No, sir. The option --

4 DR. BONACA: Okay? So a system may be
5 functional, but not operable.

6 MR. GRANTOM: Well, but in option two we
7 would still say whatever that component is that has
8 fallen under the Option 2 our out exemption space is
9 till operable.

10 DR. BONACA: Okay, but you seem to be
11 changing, however, the pedigree that you're required
12 to have.

13 MR. GRANTOM: Right. We're allowed to
14 change that pedigree, but in so doing within the
15 requirements we have, that system would be operable.

16 DR. BONACA: Yeah, okay, all right.
17 Because you changed the definition.

18 MR. GRANTOM: Right. Because we changed
19 the requirement.

20 DR. BONACA: Okay.

21 MR. STILLWELL: I just want to be real
22 clear. We haven't in Option 2, to my knowledge,
23 altered the definition of operable.

24 DR. BONACA: No, I understand that. You
25 just simply have reduced the requirement.

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1 MR. STILLWELL: Right. Now, the beauty of
2 this is that the degree of operability can be assessed
3 differently depending on why the system is inoperable.
4 If it's because it has pulled the lock or it is torn
5 apart on the floor, the risk impact from that pump is
6 different than if the shift supervisor has told it may
7 not be seismic or qualified.

8 DR. BONACA: Well, that's why I was trying
9 to pursue that. At times you have a system which is
10 clearly functional, and the NRC will agree with that,
11 would provide still the flow, whatever, but it
12 doesn't meet some specific requirement that is more of
13 a pedigree nature.

14 So that's still -- and still you have
15 under the Part B. So, therefore, you could have, for
16 example, still this train is functionable, but --

17 MR. GRANTOM: That's actually part of this
18 whole thing, is what's good about this. If you do end
19 up with some lesser degree of operability -- and this
20 is what really happens to stations --

21 MR. STILLWELL: That's right.

22 MR. GRANTOM: -- some lesser degree of
23 operability, all of a sudden you're determined that
24 you have two trains inoperable. Now you're in this
25 3.03 and both Scott and Bill and I know very painfully

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1 from several times of what we have to do to mobilize
2 to address these needs. This allows that time to be
3 able to go and address that kind of stuff, some things
4 that clearly are not risk significant in that regard.

5 And I think in a sense this is a safety
6 benefit because it's a true mobilization of the
7 stations when these events occur, and Scott has been
8 through a lot more of it than I have.

9 The next slide here talks a little bit
10 about the PRA quality item here. We have already kind
11 of talked about it in a sense, but my only point here
12 is that it's Reg. Guide 1.200, but we ar also looking
13 at the PRA quality need for the 4(b) application
14 itself. So there is the PRA quality aspect of the
15 base PRA. There's the quality of what kind of quality
16 do I have to do this type of application here that
17 we're including in both of these.

18 In the implementation area here, we are
19 applying our configuration risk management program,
20 and it is basically the same program that we use
21 current for A(4) of the maintenance rule. The
22 configuration risk management program is during a
23 proceduralized process. It establishes risk
24 thresholds, non-risk significant threshold of 1E minus
25 six, and a potentially risk significant threshold of

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1 1E minus five.

2 One E minus six is the threshold basically
3 where we do most of our routine maintenance work
4 activity. We live and breathe underneath that
5 threshold as we go forward, and then the potentially
6 risk significant threshold is the next order of
7 magnitude up where more compensatory measures are
8 taken and the procedure requires that.

9 CHAIRMAN APOSTOLAKIS: So what is this ten
10 to the minus five?

11 MR. GRANTOM: What we call the
12 potentially --

13 CHAIRMAN APOSTOLAKIS: No, but what is it?

14 MR. GRANTOM: It's ICCDP.

15 CHAIRMAN APOSTOLAKIS: IC?

16 PARTICIPANT: Incremental Conditional Core
17 Damage Probability.

18 CHAIRMAN APOSTOLAKIS: ICCDP.

19 PARTICIPANT: Per week, right?

20 MR. GRANTOM: For a week.

21 Actually it could be cumulative. This is
22 in the configuration. This is the way we do business
23 right now, but with this new tech spec, that would be
24 for that configuration.

25 MR. HEAD: Yeah, actually it applies right

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1 now. If we have a configuration roll over into the
2 next week, we keep accumulating the risk. So the
3 ICCDP is actually on the maintenance configuration
4 perspective of time.

5 MR. GRANTOM: And it is important for you
6 to note, too, that we actually do this right now.
7 This is an ongoing process that we do every day, every
8 week at STP now.

9 CHAIRMAN APOSTOLAKIS: Your PRA includes
10 uncertainty calculations for the parameters.

11 MR. HEAD: For the parameters, yes.

12 CHAIRMAN APOSTOLAKIS: So when you say ten
13 to the minus five, this is a mean value?

14 MR. HEAD: It's a mean value.

15 CHAIRMAN APOSTOLAKIS: Now, one of the
16 questions that comes to my mind, and I'm often asked
17 that question when I talk to non-PRA audiences and I
18 want to give a talk. They say, "Well, gee, you know,
19 everybody keeps saying that the uncertainties are
20 large, and yet you take action when you see something
21 like ten to the minus five."

22 How believable is that number? What's the
23 answer to that?

24 And that was, in fact, the question I had
25 about Table 3-2 of the EPRI report. First of all, I

1 assume this is not a rigid, you know, limit. I mean,
2 if you are at nine, ten to the minus six, what do you
3 do? Do you say, "I'm below the limit so I don't do
4 anything"?

5 MR. HEAD: Exactly. That's the limit.

6 (Laughter.)

7 MR. HEAD: I was being facetious. In
8 truth, between ten to the minus six and ten to the
9 minus five, we're taking compensatory measures to
10 drive the risk back down. Being in extra crews,
11 starting working overtime, deferring maintenance or
12 completing maintenance that we're already in as soon
13 as possible. So between ten to the minus six and ten
14 to the minus five we're already doing things. At ten
15 to the minus five the compensatory actions increase in
16 severity, if that's the right word, up to and
17 including a forced plant shutdown.

18 Is ten to the minute five the limit? Yes
19 and no. Above that we shift to a higher gear. Below
20 that eight times ten to the minus six or five times
21 ten to the minus six, we're already making
22 preparations to do what we can to reduce the risk.

23 MR. GRANTOM: And I guess part of the good
24 part of this application is if, in fact, we know we
25 are accruing risk at this level or a certain level and

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1 we're going to cross that threshold, we're not going
2 to return the equipment back to service; we know that
3 we're not going to be able to do that, then we go
4 ahead and evoke the actions that we need to do at that
5 point in time.

6 I mean that's generally how we work, but
7 the E minus five threshold is a threshold that we're
8 monitoring to, as is the 1E minus six threshold. So
9 it depends in a sense. If it looks like they're
10 fixing to get it back, well, yeah, we keep marching
11 along to do this, and then as maybe you'll see in some
12 of the supporting slides when we get to that, you'll
13 see that these risk levels are archived and maintained
14 and kept, and you can get this running history of what
15 risk has done over the last cycles or over the last
16 six years.

17 MR. HEAD: Actually eight years now.

18 MR. GRANTOM: Eight years. Pardon me.

19 So the other part of this that I wanted to
20 bring up is --

21 MR. STILLWELL: Rick, I can't leave that.
22 I think we sort of beat around the bush on that.
23 That's pretty much in my mind the shutdown moment,
24 that if we reach that point and haven't taken some
25 other action and gotten some other relief or did

1 something else, that that would be the shutdown
2 moment.

3 CHAIRMAN APOSTOLAKIS: If you take some
4 action, some compensatory measure that is very
5 difficult to quantify, then you will not see an impact
6 on the number.

7 MR. HEAD: Probably not.

8 CHAIRMAN APOSTOLAKIS: So how does that
9 affect your decision making process? You're saying,
10 well, the number is nine, ten to the minus six, but
11 look. I have three guys here doing this, which I
12 cannot quantify. So is that a judgment that the
13 number is not really nine, ten to the minus six?

14 MR. HEAD: As a practical example, some of
15 the things we have done recently, we have been in
16 discussion with the NRC about how good are these
17 compensatory measures. How good is a non-safety
18 related diesel generator set out in the yard, not
19 having a qualified diesel?

20 CHAIRMAN APOSTOLAKIS: And?

21 MR. HEAD: And I think what it does is
22 give you a comfort level that we know it's worth
23 something. How much something we don't really need to
24 know.

25 CHAIRMAN APOSTOLAKIS: Why not?

1 MR. HEAD: We're comfortable where we are,
2 but where we are right now with the diesel generator,
3 we're not going to exceed ten to the minus five.
4 We're going to get close to ten to the minus five, but
5 we do have non-safety diesel generators that we know
6 drive risk down.

7 So we approach ten to the minus five. The
8 diesel generators keep us well below ten to the minus
9 five. That's our discussion with the NRC. Are you
10 comfortable with that? Is this good enough or do we
11 say at ten to the minus five we shut down?

12 So I think where you would be at a limit,
13 you would be talking to the NRC. This is what we have
14 done.

15 DR. BONACA: I think simply just to define
16 the compensatory action, to alert the operators to
17 protecting the equipment that is needed for
18 compensation is in and of itself a true improvement
19 itself.

20 CHAIRMAN APOSTOLAKIS: I agree, but the
21 point is are the numbers changed?

22 DR. BONACA: I don't know.

23 MR. HEAD: Well, the number that we
24 present would not change.

25 MR. GRANTOM: The number that we would

1 present would not change, but there could be cases
2 where we could, in fact, take credit for that.
3 Obviously those are things that we would look to be
4 able to do, but you're right, George. There could be
5 situations where I can't quantify fit. I'm not going
6 to be able to change the number.

7 MR. STILLWELL: But, George, there have
8 been things in the past where we have unquantified
9 cross-connect capability that's not in the model right
10 now and that, in fact, we could, depending on the time
11 frames, if something was significantly broken and we
12 were going to encounter the ten to the minus five
13 moment, say, two weeks from now, that we could
14 incorporate those into our station procedures and
15 actually in the model and take credit for them, and
16 this would give us time to do that.

17 MR. GRANTOM: I think that is the
18 important thing. This gives us time to be able to do
19 those kinds of things.

20 MR. STILLWELL: I envision that to be very
21 rare, but certainly something that we and maybe other
22 stations could do, but it would be something that we
23 would have to pass a certain level of pedigree for us
24 to be able to take credit for it.

25 If it's just that we say we have it,

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1 that's not going to do it.

2 DR. SIEBER: No.

3 MR. GRANTOM: Okay. Well, we've kind of
4 talked about that. I think what Bill was talking to
5 is the recent extended diesel generator allowed outage
6 time that we've had, and Bill and him are monitoring
7 that right now.

8 Our letter of intent went in with this
9 amendment request in early 2003. We expect our formal
10 amendment request to be submitted in June 2004. So
11 we're actually pursuing this and moving forward, and
12 here's my conclusions again.

13 But it may be good at this point in time
14 if you'd want to that we can talk about risk profiles
15 and look at the uncertainty and historical aspects of
16 that, and I had some supporting slides for that. I
17 think they're right here.

18 Biff kind of went over these same slides
19 here. So I don't know that I need to go through this
20 and have the risk assessment, but this is, for
21 example, here an actual risk profile that occurred at
22 STP, and I'd like to use an old one back to 2001 just
23 to give you an idea that we had been doing this quite
24 a while.

25 You can see the various maintenance states

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1 that are there, A, B, C, and D, and those are
2 distinct, unique sets of equipment that are out of
3 service at a given time, and this is what we planned
4 to do. It says the planned risk profile at the top,
5 and then you look at that same work week for the
6 actual risk profile, and you can see it's slightly
7 different from, you know, what was planned and what we
8 actually did her.

9 Now, there's also some other supporting
10 information here that defines exactly what, for
11 example, maintenance date G is for this week, and
12 maintenance date G is not the same from one week to
13 the next. It's just how it letters and that type of
14 thing.

15 But what's important to note here is when
16 you're looking at these incremental or instantaneous
17 changes here, as you get to the cumulative risk, and
18 this is another important point here that I think
19 shows one of the true safety benefits of this
20 methodology as it's imposed into the station.

21 At the end of this thing you get a planned
22 risk and then you get an actual risk. You've got what
23 you planned to do. Now, what did you really do?

24 And at the station, these are presented in
25 our teamwork and communication management meetings

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1 every week, what the planned risk profile is for the
2 week, and then on Wednesdays, it's what was the actual
3 risk from the previous week

4 And when they're off, they have reasons
5 and lessons learned as to why they didn't meet the
6 planned risk profile. They had emergent conditions.
7 Some work ended up earlier than it did before. They
8 had some other problem.

9 There's lessons learned that go out of
10 this, and this level of dialogue at a managerial level
11 at a station right now, personally I don't know of
12 other stations that do it. They may do this, but to
13 have this highlighted by what they can see here has an
14 extremely powerful effect on the organization as they
15 try to continually improve.

16 And the name of the game is meet the plan;
17 do your schedule; meet the plan. And when we collect
18 this information week after week after week after week
19 of the actual risks, you start to see a picture.
20 Here's what we have from 1996 through 2000 of a
21 rolling 52-week CDF value. Each data point is the
22 rolling 52-week average going forward, and you can see
23 quite simply that there are synergistic effects that
24 occur.

25 This area right here is South Texas, are

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1 the two EAD HVAC trains being out of service from an
2 involuntary condition at the same time, and you can
3 see these.

4 But part of the message also here is when
5 you're looking at uncertainties in a sense, here's
6 empirical data on what those uncertainties really did
7 relative to the variation of plant configurations over
8 time here.

9 So you can see both units kind of work
10 fairly well together along those lines, but you do see
11 some variation within a window here. So --

12 DR. SIEBER: Does that include the
13 outages?

14 MR. GRANTOM: Yes.

15 MR. HEAD: It does include the outages.
16 In general, the outages will be the lower part of the
17 slide.

18 MR. GRANTOM: The little valleys down
19 there.

20 DR. SIEBER: Okay.

21 MR. GRANTOM: And then you see the impact
22 of what longer allowed outage times do here, and to me
23 when I look at this, I mean, there's a tremendous
24 wealth of information about the operational and
25 maintenance philosophies of the station that one can

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1 see in this, and there's lessons learned to be gained
2 out of these kinds of things.

3 It gives us very good confidence that, you
4 know, merging into this 4(b) will almost in a sense be
5 just a reaffirmation of what we're already currently
6 doing every week. This would represent in a sense
7 something that would maybe go into an annual report
8 back to the staff of saying here has been our 18 month
9 rolling average for both units. Here's the risk
10 levels.

11 To me, I mean, this is an extremely
12 important statement of risk management for a station
13 to be able to do this at this one time.

14 CHAIRMAN APOSTOLAKIS: Can you tell us
15 what economic benefits the utility has from this?

16 MR. GRANTOM: If you can prevent an
17 inadvertent shutdown from the tech spec --

18 CHAIRMAN APOSTOLAKIS: Have you?

19 MR. GRANTOM: In the past from our NOADs,
20 yes, we have.

21 MR. STILLWELL: We've done a couple from
22 an enforcement discretion space that this would
23 subsume and, therefore, an enforcement discretion
24 would not be needed. I think there has been other
25 cases where we have been in situations where, you

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1 know, the maintenance we needed to do was not allowed
2 because of tech spec restrictions that this would
3 allow us to accommodate.

4 I just think from a business perspective,
5 you know, I think the risk that we see the most is if
6 we are in some sort of train outage, and we're working
7 on some piece of equipment and the other train
8 component goes out of service. Right now that's
9 basically an instant shutdown that you would be able
10 to manage that risk.

11 Now, it may still end up because of what
12 it is basically a shutdown, but for some components in
13 tech specs, it would not require an immediate
14 shutdown. So the economic benefits, I think, prove
15 the asset could be substantial.

16 Now, for us as a three train plant maybe
17 it's a little more than a two train plant, but it's
18 still there by the two train plant, we believe.

19 MR. GRANTOM: I think it's quite
20 significant, George, when you look at -- you can go
21 back in history and find administrative shutdowns in
22 other areas where people have had things that weren't
23 really risk significant in which they've shut down.
24 Certainly the case in the South Texas project, we
25 would have seen those examples.

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1 And you know, you thought about cost of
2 replacement power, but the other thing, the other
3 intangible here that's not quantifiable is in a sense
4 a quality of life, quality of work issue where you're
5 immobilized in the station here to go and take care of
6 something that everybody knows that this is not a risk
7 significant thing. Staff mobilized. We got ourselves
8 mobilized, and --

9 DR. SIEBER: And there's a cost to that.

10 MR. GRANTOM: And there is a human cost to
11 that. There's a human performance cost to that.

12 DR. SIEBER: Dollar cost, too.

13 MR. GRANTOM: And there's a real dollar
14 cost there. We're paying people overtime. We're
15 mobilized out there. Of course, we don't get paid
16 overtime, but there are a lot of those issues like
17 that, and to actually shut down, now you're looking at
18 some real money.

19 DR. SIEBER: Let me ask you to do
20 something for me. If you go back two or three slides
21 to the one that showed the risk --

22 MR. GRANTOM: This one?

23 DR. SIEBER: No, the blocks.

24 MR. GRANTOM: Okay.

25 DR. SIEBER: And basically what you're

1 doing is you're accumulating risk over a period of
2 time and comparing it to the plan that you had. You
3 could do the same thing with dollars. You could do
4 the same thing with dose, and I don't know if you've
5 ever done it or not, but I would be curious to know
6 whether you get minimum dollars spent at the same time
7 you get minimum risk, at the same time you get minimum
8 dose, or are they in conflict with one another
9 during --

10 MR. GRANTOM: A good at power safe running
11 plant is the most economical and safest from the human
12 burden. Almost every faction of the organization
13 benefits from that, and we have looked at the dollars
14 along those lines.

15 DR. SIEBER: And dose?

16 MR. GRANTOM: Haven't looked at dose as
17 much, no, but in terms of dollars, you're talking
18 about risk informed asset management now to me --

19 DR. SIEBER: That's right.

20 MR. GRANTOM: -- when you're speaking in
21 terms of those kinds of things, and you'll find out
22 that the value of a component in terms of dollars is
23 huge relative to what happens, but there are some
24 components that you can flat make perfect that return
25 nothing in that regard.

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1 DR. SIEBER: So this allows you then to
2 make decisions on how often you will maintain
3 something and how --

4 MR. GRANTOM: How often you will maintain,
5 how quickly we have to return things to service. It
6 also offers the opportunity in a sense that if you
7 know something is going to be extremely risk
8 significant. Now there's a new argument that could be
9 made in terms of dollars, in terms of these other
10 things that says it's worth more to make this a more
11 robust component. It's worth more to invest money to
12 incorporate predictive tools in there of, you know,
13 vibration monitoring.

14 It's worth more to develop a more robust
15 maintenance strategy for this component than this
16 other component, and the thing works very well as far
17 as being able to focus management resources and
18 station resources on the things that really matter at
19 that point in time, and it forces itself to do that.

20 DR. SIEBER: How do you integrate this
21 risk information and cost information into the
22 management decision process? I mean, who's making the
23 decisions and what are they looking at?

24 MR. GRANTOM: Well, a lot of this is part
25 of our reliability efforts and our reliability

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1 management team that we have at South Texas that looks
2 at a lot of this information. I would say that we're
3 still -- we have, in fact, done this.

4 For example, South Texas is evaluating the
5 vessel, a head replacement, and we're using these
6 economic risk arguments here to be able to, with
7 uncertainties -- you'd be proud of this, George --
8 with uncertainties as to what the various options are,
9 what the right fiscal years are to be able to do these
10 kinds of things, and we can roll into those kinds of
11 analyses to inform management to make better
12 decisions.

13 We are working pretty hard right now at
14 trying to build those same kinds of capabilities in
15 the reliability of a component type of argument. Now,
16 in some cases for modifications, we do a better job at
17 that and more tied into the process. We're working on
18 getting tied in, and Scott is a member of the
19 reliability management team at South Texas, and these
20 are things that we're continuing to work on.

21 DR. SIEBER: Well, that helps my
22 understanding, and I apologize for taking you off your
23 track.

24 MR. STILLWELL: One of the reasons we're
25 here is that the integration has taken place. I mean,

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1 this is the way we do business, and it was not that
2 big a jump at all for us to take this, the way we do
3 business, apply it to tech specs, and it's not going
4 to be that big a jump with the stations.

5 DR. SIEBER: It's like safety culture. If
6 it isn't in your heart, you aren't going to do it.

7 MR. STILLWELL: Well, it's there. This is
8 the way we do business.

9 CHAIRMAN APOSTOLAKIS: Okay. Now, are you
10 gentlemen familiar with the Commission's policy
11 statement and phase approach to quality for the PRA?

12 MR. HEAD: Yes.

13 CHAIRMAN APOSTOLAKIS: You have read it?

14 MR. HEAD: We've read it.

15 CHAIRMAN APOSTOLAKIS: Where would you say
16 you are?

17 MR. STILLWELL: Let me answer that.

18 DR. SIEBER: Three.

19 (Laughter.)

20 MR. STILLWELL: I have to feel compelled
21 to react to your earlier statement. Using your
22 analogy, we don't view ourselves as a Rolls Royce. I
23 would say personally, we're a seven year old Suburban
24 that we change the tires every now and then and try to
25 take it to places where we've never been before.

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1 DR. SIEBER: Be careful now.

2 MR. STILLWELL: Excursion, okay?

3 But what we really have is a really good
4 pit crew. Okay? We have people that use it all the
5 time, and so as I say, I wanted to find a place to
6 react to your Rolls Royce discussion, and I don't
7 think that's --

8 CHAIRMAN APOSTOLAKIS: But where are you
9 now? Are you in Phase 3?

10 PARTICIPANTS: No.

11 MR. GRANTOM: No, we're not.

12 CHAIRMAN APOSTOLAKIS: Why not?

13 MR. GRANTOM: Maybe Gareth.

14 We have no standards on this. We are
15 beyond the standards.

16 MR. PARRY: Yeah, this is Gareth Parry
17 from the staff.

18 We're going to be talking about that this
19 afternoon, but they cannot say what -- well, they
20 cannot be in Phase 3. They cannot even be in Phase 2
21 for many of their applications because we don't have
22 the standards in place for assessing the quality of
23 the PRA, and that's really the definition of the
24 phases, but we're going to talk about that this
25 afternoon.

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1 CHAIRMAN APOSTOLAKIS: That's an
2 administrative thing, I mean.

3 MR. PARRY: Well, then the SRM is an
4 administrative SRM.

5 MR. GRANTOM: Well, if I were giving it
6 strictly from the technical perspective, I don't know
7 how to put it in terms of the phases in a sense, but
8 we're clearly beyond what the standard would require
9 because we're incorporating a capability beyond what
10 the standard does for a baseline PRA because we're
11 able to do alignments, configurations, and those types
12 of things.

13 CHAIRMAN APOSTOLAKIS: Do you feel you
14 have a good baseline PRA that will enable you to
15 address any issue?

16 MR. GRANTOM: I don't know about that.

17 CHAIRMAN APOSTOLAKIS: The current state
18 of the art. Huh?

19 MR. GRANTOM: Yes.

20 MR. HEAD: So far we have been able to
21 address any issue within the current state of the art.

22 CHAIRMAN APOSTOLAKIS: Now, is that Phase
23 3?

24 MR. HEAD: No, it's not.

25 CHAIRMAN APOSTOLAKIS: Phase 2?

1 MR. GRANTOM: No.

2 MR. HEAD: No, it's Phase 1.

3 CHAIRMAN APOSTOLAKIS: Regardless of the
4 standards.

5 PARTICIPANTS: No, you can't separate.

6 MR. GRANTOM: You guys are going to have
7 fun this afternoon.

8 (Laughter.)

9 MR. GRANTOM: George we talked about this
10 yesterday, and it is an issue in a sense because, you
11 know, we build methodologies. We try out the
12 methodologies. We get lessons learned. We get
13 acceptance, and then we build standards.

14 CHAIRMAN APOSTOLAKIS: You have a seismic
15 PRA?

16 MR. GRANTOM: Yes.

17 CHAIRMAN APOSTOLAKIS: You have a fire
18 PRA?

19 MR. GRANTOM: Yes.

20 CHAIRMAN APOSTOLAKIS: Do you expect to be
21 very surprised by any standard that will come out in
22 these?

23 PARTICIPANTS: Yes.

24 PARTICIPANTS: No.

25 MR. GRANTOM: Maybe no.

1 DR. SIEBER: If you are, it will be a
2 surprise.

3 PARTICIPANTS: It will be a surprise.

4 CHAIRMAN APOSTOLAKIS: You are surprised
5 it will be a surprise.

6 MR. GRANTOM: We don't expect to, but I
7 won't discount the possibility that we could be
8 surprised.

9 CHAIRMAN APOSTOLAKIS: By how wrong the
10 standard will be.

11 (Laughter.)

12 CHAIRMAN APOSTOLAKIS: Now let's talk a
13 little bit about this Table 3-2, which unfortunately
14 they took away from me.

15 MR. GRANTOM: We've got it.

16 CHAIRMAN APOSTOLAKIS: And making a
17 transparency which I need. It doesn't have to be
18 blown up. Just bring a transparency.

19 DR. SIEBER: Three, two of?

20 CHAIRMAN APOSTOLAKIS: Three, dash, two.
21 Ah, we've got it. By George, he's got it. Put it up
22 there. Turn off the high tech stuff.

23 Okay. So this is the quantitative
24 (phonetic) risk acceptance guidelines. When I look at
25 this, I ask questions to myself similar to the one --

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1 you must have seen this before.

2 PARTICIPANTS: Yes.

3 CHAIRMAN APOSTOLAKIS: That I asked you
4 about at ten to the minus five. When there is a
5 calculation of the ICCDP and then based on that
6 calculation I look at this left-hand column, and it
7 tells me if I am below ten to the minus five. Now, if
8 it's above ten to the minus five, that's not entered.
9 Between ten to the minus six and ten to the minus
10 five, I have to do some things.

11 That implies that I can calculate these
12 numbers with high confidence., and I was glad to hear
13 Mr. Bradley say earlier that, yes, this imposes
14 requirements on the quality of the PRA that we would
15 need to do a good uncertainty analysis and so on, and
16 I agree with that.

17 Then I happen to look at the slides that
18 Mr. Baranowsky presented at the regulatory information
19 conference this year, and I saw two slides that I
20 found very disturbing.

21 Can we have slide number three? Would you
22 turn off the overhead projector, please? Number
23 three.

24 Okay. Now, when these guys were
25 developing the SPAR models, which are the NRC's PRAS

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1 in consultation with the utilities, they don't do it
2 in isolation. What do we see here? The red dots are
3 SPAR CDFs. The blue dots are licensee CDFs, and the
4 trend is obvious. We're talking about an order of
5 magnitude typically, except for a few plants between
6 the licensee CDF and the SPAR, which is the result of
7 negotiation between the NRC and the licensee.

8 MR. HEAD: I saw the same slide, but there
9 were also two or three other slides associated with
10 this. Is this the one as we were getting the
11 agreement, when we were going out to negotiate with
12 the licensees?

13 CHAIRMAN APOSTOLAKIS: I believe this is
14 the current CDF and the SPAR. No?

15 PARTICIPANT: NO.

16 MR. GRANTOM: I'm not sure.

17 DR. SIEBER: This is for this afternoon.

18 CHAIRMAN APOSTOLAKIS: Yeah, but it's also
19 relevant here.

20 So what is the current one?

21 MR. HEAD: Well, page 5, I think.

22 CHAIRMAN APOSTOLAKIS: Let's go to five.

23 MR. HEAD: Having been an MSPI pilot, the
24 difference is not as large anymore, but that was a lot
25 of work between us, the licensees, and the NRC

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1 contractors to resolve the differences between the
2 spar model and the plant specific PRA.

3 CHAIRMAN APOSTOLAKIS: But this is only
4 what, two, four, six, maybe ten points.

5 MR. HEAD: Ten or 12 plants, yes.

6 CHAIRMAN APOSTOLAKIS: What about the
7 rest?

8 MR. HEAD: One of the conclusions I came
9 to as a result of this process is the SPARS are
10 intentionally conservative, especially in the area of
11 operator actions, and they should be. We're much more
12 realistic in terms of operator --

13 CHAIRMAN APOSTOLAKIS: How can we say that
14 we're conservative in the area of human reliability
15 when we don't have good models for human reliability?

16 MR. HEAD: I would say we have adequate
17 models.

18 CHAIRMAN APOSTOLAKIS: I don't know about
19 that. Look at one paper.

20 MR. HEAD: Well, we have been doing
21 operator reliability for 25 years now or 30 years now,
22 and we have benchmarked somewhat against simulator and
23 things that have actually happened. Personal opinion,
24 I would say our operator action models are not
25 necessarily as weak as everyone seems to think.

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1 CHAIRMAN APOSTOLAKIS: Well, the problem
2 there, Bill is that if I pick a model and then pick
3 another model, I get different results, and I don't
4 know which one to believe.

5 MR. BOYCE: If I see widely disparate
6 results, I would say that's a big problem. If I see,
7 in fact, there are two results, that's PRA, and that's
8 dead on.

9 CHAIRMAN APOSTOLAKIS: And I agree, but I
10 don't know what kind of difference I'm going to see.
11 The only evidence I have is from '89 where the
12 differences are big. Nobody has done anything since
13 then.

14 MR. HEAD: Other than the SPAR model
15 benchmarking.

16 CHAIRMAN APOSTOLAKIS: Well, the SPAR
17 models? No, the SPAR models also have their own human
18 reliability model. So what is the difference between
19 the SPAR Rev. 3R and the SPAR Rev. 3?

20 MR. HEAD: I don't know if I can speak to
21 that.

22 MR. BOYCE: Yeah, I wish Pat Baranowsky
23 was here, and maybe he is best to answer that. I
24 mean, I could guess, but I think Rev. 3 is what is out
25 there right now and we're using for most of like the

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1 STP Phase 3 calculations. I think Rev. 3I is where
2 we've completed the benchmarking efforts where we had
3 contractors, I think, from B&L go out to each of the
4 sites, and then the Rev. 3Is were used for all of the
5 pilot plants, and we did inspections against licensee
6 results and our SPAR 3I results, and we ended up
7 coming up with discrepancies.

8 After working through the discrepancies,
9 I think we ended up with a Rev. 3R.

10 CHAIRMAN APOSTOLAKIS: So Rev. 3R is the
11 current situation for these.

12 MR. BOYCE: For the pilots, and I think
13 that Pat has completed all of the benchmarking of all
14 the utilities, and so I think for the rest of the
15 hundred and -- well, he has only got about 70 SPAR
16 models. So for those 70 SPAR models, I think they are
17 just about all at Rev. 3I right now.

18 CHAIRMAN APOSTOLAKIS: I?

19 MR. BOYCE: Right. So I think the current
20 state of affairs is the slide on the upper left.

21 CHAIRMAN APOSTOLAKIS: Now Mark.

22 MR. REINHART: This is Mark Reinhart from
23 the Probabilistic Safety System Branch.

24 I was going to offer on the benchmark
25 trips, the staff did go to every utility and look at

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1 every PRA, but it was more of a here's a scenario.
2 Looking at it from the significance determination
3 process in parallel, they would run a scenario on the
4 PRA from the licensee. They would run a scenario on
5 the SPAR, and if there were differences, like an order
6 of magnitude, we'd try and figure out why there were
7 differences and then go feed that back.

8 But that was more in the sampling realm
9 rather than a systematic, you know, step by step.
10 Also, I think it was mentioned the SPARs use a lot of
11 standard assumptions across the board, and licensees
12 may or may not use those same standard assumptions.
13 So it will drive some differences.

14 CHAIRMAN APOSTOLAKIS: Let's go to slide
15 six. So here we have a listing of the major factors
16 that influence the differences, the differences in
17 risk results, and what Mr. Baranowsky has done, he has
18 categorized them into large, medium and small.

19 So large support system initiator modeling
20 and frequency, the RCPC failure model, which of course
21 is a major model uncertainty, PWR depressurization,
22 and so on.

23 The question in my mind is: have these
24 PRAs gone through the NEI review process?

25 MR. PARRY: Our models?

1 CHAIRMAN APOSTOLAKIS: No. This is the
2 difference between SPAR and the licensee PRAs.

3 MR. PARRY: The licensee PRAs have, yes.

4 CHAIRMAN APOSTOLAKIS: And yet the NRC
5 staff still finds these things?

6 MR. PARRY: This is the difference between
7 the SPAR model.

8 MR. GRANTOM: And the PRA.

9 MR. PARRY: Right.

10 CHAIRMAN APOSTOLAKIS: The SPAR model
11 cannot be different because the agency would be making
12 decisions using SPAR. Baranowsky comes here and says,
13 "We differ with the licensees on how they model
14 support systems," and then we cannot just dismiss that
15 and say, "Oh, but that's SPAR."

16 I have to understand why, and especially
17 if the licensee's PRA has undergone this review
18 process, which is advertised as very vigorous, and I
19 have no reason to doubt that. Why do I see this? It
20 bothers me.

21 MR. PARRY: George, can I just make a
22 couple of comments?

23 MS. WESTON: Your name please, for the
24 record.

25 MR. PARRY: Oh, sorry. This is Gareth

1 Parry from the staff.

2 There are differences because I think the
3 way that the SPAR models have been developed, they
4 only develop them for those initiating events that I
5 think contribute to 90 percent of the core damage
6 frequency. A lot of the things that they don't model
7 very well are the support systems. That's why you see
8 that as a big difference up here.

9 Other things I can't really speak to, but
10 I know that they're not intended there. They use
11 relatively crude human reliability analysis. They
12 use, I think, to some extent generic data. So there
13 are going to be differences.

14 And I think what the value of this is is
15 it shows where the big differences are. Now, there
16 may be cases where in the SPAR models they have
17 adopted what a lot of people think are very
18 conservative success criteria, and the one I would
19 think of is the PWR PORV success criteria. For
20 example, for feed and bleed, I think of the SPAR
21 models. They require both PRVs to open in the SPAR
22 models uniformly. I think in the licensee's PRAs they
23 don't necessarily because they've done different
24 success criteria calculations.

25 CHAIRMAN APOSTOLAKIS: What I'm getting

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1 now is almost a unanimous blasting of the NRC SPAR,
2 including from the NRC staff.

3 MR. PARRY: No, not necessarily.

4 CHAIRMAN APOSTOLAKIS: Well, that's what
5 you're telling me, that all of these differences
6 really point to the fact that SPAR is, in fact, wrong.

7 MR. PARRY: No, these are different
8 assumptions.

9 CHAIRMAN APOSTOLAKIS: Why should it be
10 conservative? I mean, the SDPs would depend on these
11 things.

12 DR. KRESS: Because they started out.

13 CHAIRMAN APOSTOLAKIS: But this is the
14 current state of affairs, is it not?

15 DR. KRESS: We're trying to work our way
16 down from conservative to be closer --

17 CHAIRMAN APOSTOLAKIS: Well, first of all,
18 the second one for sure nobody does work. The model
19 hopefully RCPC failure, but I find this very
20 disturbing. You guys may be happy with this.

21 MR. PARRY: I really think you need to
22 talk to Pat Baranowsky though because he is obviously
23 the guy that can give you the right perspective on
24 that.

25 CHAIRMAN APOSTOLAKIS: I have, not in

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1 detail, but I have.

2 MR. REINHART: This is Mark Reinhart from
3 PRA branch again.

4 The STP really isn't reliant on the SPAR.
5 What would happen if we got into a Phase 3 STP? We
6 would use SPAR to get some insights. We would also
7 get insights from the licensee, and all of these
8 differences would come out.

9 Why is there a difference between SPAR and
10 the licensee's results? If it were a comparison
11 there, it might be a different comparison, but if it
12 were, some of these pieces would come to mind. For
13 instance, the second one there, RCP seal failure,
14 that's often a difference between what the staff does
15 and what the licensee does.

16 I think the licensee staff in developing
17 their PRAs, they have a lot more resources. They have
18 a lot of folks to develop one PRA per licensee, where
19 staff has a few folks with the lab's help to develop
20 SPARs for everybody, and it is really a level of
21 detail of the model.

22 CHAIRMAN APOSTOLAKIS: Let's go to the
23 next slide. He is not saying we have to improve SPAR.
24 What he is saying is that there is detailed guidance
25 needed for models and parameter estimates for the

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1 factors that result in large and medium variations in
2 risk.

3 As I read this, it tells me that both the
4 industry and the NRC needs this. He is not saying
5 SPAR models are suffering so that we have to do this.
6 He says implement detailed guidance consistent with
7 high level support of the ASME standard.

8 I don't see anywhere in here anything that
9 says we have to improve the SPAR models because the
10 industry's models are better. Now, we can have
11 Baranowsky, of course, confirm or refute what I just
12 said, but when I read this, I think the message is we
13 have a problem, and that problem is -- now, that
14 doesn't mean South Texas has a problem. I'm sorry.
15 I don't want to tie this to your presentation.

16 Probably you are one of the points in the
17 light, but this will come up also in the afternoon
18 perhaps, but I mean, this was presented just -- when
19 was the conference? A month ago?

20 MR. PARRY: No, last week, the week
21 before.

22 CHAIRMAN APOSTOLAKIS: So this month.

23 MR. STILLWELL: I think the regulator,
24 that very first slide that you had that showed all of
25 the red dots on top, the regulator would take solids

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1 that the spar is more conservative for their initial
2 decisions that they have to make when they're
3 assessing something that has happened at a station,
4 and if we get engaged on the issue in detail, we may
5 end up relying on the blue dot for the real answer.

6 MR. PARRY: Or some place in between

7 MR. STILLWELL: Or some place in between,
8 but for the --

9 CHAIRMAN APOSTOLAKIS: So why is he saying
10 then that we need detailed guidance? If that is so
11 simple --

12 MR. STILLWELL: I said for the first cut,
13 going through --

14 MR. GRANTOM: I think it depends on what
15 you intend the SPAR models to be able to ultimately
16 do. If they're there to promote communication and
17 dialogue on what the real issue is for an event that
18 has happened at a station, that may be sufficient the
19 way they are. If they're intended to do analysis to
20 confirm an analysis that the station has done, well,
21 now you're talking maybe about a higher level of
22 quality.

23 And I think that kind of has to depend on
24 what the staff intends the SPAR model to be.

25 CHAIRMAN APOSTOLAKIS: He acknowledges

1 like in the penultimate bullet. Define the role of
2 SPAR.

3 MR. GRANTOM: Yes.

4 CHAIRMAN APOSTOLAKIS: That's fine. But
5 look at the last bullet. Why is there a need for
6 systematic approaches?

7 Anyway, I think --

8 MR. GRANTOM: Well, anyway, in some cases
9 what we're doing, we're looking at deltas, you know,
10 here.

11 CHAIRMAN APOSTOLAKIS: Well, yeah, the
12 first transparency we had up there. I mean, when I
13 see that in the EPRI report, I feel uncomfortable.
14 Now, what you told me earlier about how you handle the
15 ten to the minus five, that you know, it's not a black
16 and white thing and that you're doing certain things
17 even before you get there. That's probably the best
18 way to handle these things.

19 These are numbers that give you an
20 indication of where you are and that you have to be
21 alert and start doing thing one, and I hope these
22 numbers will be treated the same here. But when you
23 see things in the table that say that if you're
24 between ten to the minus six and ten to the minus five
25 and for ILERF ten to the minus seven and ten to the

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1 minus six do certain things, then it seems to me the
2 burden on the PRA analyst to come up with a good
3 quality PRA is very high.

4 MR. GRANTOM: Well, that's true, and if
5 you look at our configuration mismanagement program
6 procedure, you'd see specific, you know, kinds of
7 compensatory measures defined in there as what people
8 do during that particular -- when that occurs.

9 CHAIRMAN APOSTOLAKIS: Okay. I think
10 we've exhausted this subject.

11 MR. REINHART: Mr. Chairman.

12 CHAIRMAN APOSTOLAKIS: Yes.

13 MR. REINHART: Could i Just offer one
14 other perspective on the SPAR?

15 From the staff's point of view, if we're
16 going to do a review, the SPAR is an independent check
17 maybe to stimulate our thinking, give us a
18 perspective. If we get down to the details inevitably
19 we're dealing with a licensee on their PRA to really
20 get to the details.

21 CHAIRMAN APOSTOLAKIS: But my
22 understanding, Mark, is that there is interaction with
23 the licensee, and you have changed the SPAR.

24 MR. REINHART: Yes.

25 CHAIRMAN APOSTOLAKIS: If the SPAR model

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1 is conservative in certain aspects, there is an
2 indication that there is some model uncertainty there,
3 and the NRC chose to go to the conservative way as
4 they should.

5 This is the message I get from all of
6 this. So when, you know, Mr. Bradley comes later and
7 tells me, you know, this is what EPRI developed, that
8 will be an input to my thinking, and I'll try to see
9 how they managed it. Okay?

10 And the second bullet in the previous
11 slide regarding the RCP seal failure is an example
12 that everybody knows.

13 MR. REINHART: Right.

14 CHAIRMAN APOSTOLAKIS: So I think we are
15 going beyond now the standard PRA approach. We're
16 addressing the real issue of uncertainties, and I'm
17 not claim that I know how to handle those, but there's
18 an industry we have to pay attention.

19 In fact, last time when we were discussing
20 the special treatment requirement rule, Mr.
21 Pietrangelo and Mr. True agreed that they would look
22 into the issue of model uncertainty, but in their case
23 of course the categorization is conservative already.
24 So it is not as urgent as it is here.

25 Any other comments or questions from the

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1 members? From the presenters?

2 MR. GRANTOM: Thank you for the time and
3 the opportunity to discuss this.

4 DR. SIEBER: Thank you.

5 CHAIRMAN APOSTOLAKIS: Public? I'm sorry.
6 The NRC staff.

7 MR. BOYCE: Did you see anything that you
8 wanted to explicitly let us know and perhaps a letter?
9 Are you intending to write a letter on risk in
10 general?

11 CHAIRMAN APOSTOLAKIS: I cannot decide on
12 whether we want to write a letter. We will -- maybe
13 I should do that now. Go around the table and get
14 some preliminary feedback.

15 We'll talk about it later I am told.

16 When?

17 Well, they can give me their impressions.
18 Can you give me your reaction to what you've heard
19 today, please? Who wants to go first? Tom?

20 DR. KRESS: Well, I certainly think it's
21 a good idea to risk inform the tech specs, and if
22 you're going to do it, I think the approach being
23 taken is a legitimate one. You have to have
24 acceptance criteria, risk metrics, and figure out how
25 to calculate it, how to assure the quality. What

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1 quality of PRA is needed and how to assure that, it
2 seems to me is as yet a to be determined factor, and
3 I'm interested in seeing how that works out.

4 As far as the details of the risk
5 acceptance matrix and the way you would calculate them
6 and the way you enter into the various parts of it, I
7 think they have thought that out pretty well, and it
8 looks good to me.

9 The one thing that tends to bother me a
10 little bit is how to choose the zero time when risk
11 configurations change. I think their process of
12 saying you enter the tech specs at zero time and no
13 matter what happens, when it happens that's zero time;
14 I think that's conservative. It maybe too
15 conservative, but maybe that's not NRC's problem.
16 Maybe that's the industry's problem.

17 So I think that would be a conservative
18 way to deal with it. So on the whole, I'm pretty
19 pleased with what I see. I think it's a good
20 approach. I think it's headed. I think it will make
21 the tech spec more coherent and give some flexibility
22 to industry to use on line risk monitors.

23 One other issue I have, potential issue I
24 have with it, is -- well, I guess I'll save that one
25 till later.

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1 CHAIRMAN APOSTOLAKIS: Thank you.

2 Mario.

3 DR. BONACA: I am encouraged by what has
4 taken place. I like this initiative, and I like what
5 is being done at South Texas. I think the level of
6 flexibility that the plant can have with significant
7 backing of good risk insights.

8 I'm just thinking that one day when all of
9 this 104 plants will be operating, and they won't be
10 probably under this 4(b), there will be a lot of
11 configurations out there taking place at any given
12 time. So I think it's very important that this risk
13 model be accurate and good.

14 But I think that for this we see, you
15 know, high quality PRA being used.

16 CHAIRMAN APOSTOLAKIS: Very good.

17 DR. BONACA: So I'm very supportive.

18 Insofar as writing a letter, I think it is
19 probably premature and --

20 CHAIRMAN APOSTOLAKIS: They're coming back
21 in May.

22 DR. BONACA: Yeah, it's still a work in
23 progress. My thought would be not to write a letter.

24 CHAIRMAN APOSTOLAKIS: Peter?

25 DR. FORD: Yeah, I find that the

1 development of this tool very, very impressive,
2 indeed. Being a novice in this area, I really am
3 impressed by something I didn't think was possible.

4 The biggest question I have is the
5 treatment of uncertainties. I hear deterministic
6 numbers, given 72 hours, 24 hours, et cetera, et
7 cetera, in the various presentations that will be
8 made, and I keep asking myself as a deterministic sort
9 of guy, well, what's the uncertainty in that value,
10 and is there any danger of not taking that into
11 account?

12 But I think I'm expressing more my newness
13 to this particular subject of what is being
14 undertaken.

15 CHAIRMAN APOSTOLAKIS: Thank you.

16 Jack?

17 DR. KRESS: That was my other issue that
18 I didn't bring up.

19 CHAIRMAN APOSTOLAKIS: The uncertainty
20 aspect.

21 DR. SIEBER: It seems to me that issues of
22 philosophy and policy here are pretty well thought out
23 both by the staff and licensees in the industry, and
24 so I wonder whether it's worth our while to write an
25 expansive letter that would cover these global kinds

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1 of aspects.

2 There may be individual things that we
3 want to talk about. I think Tom's question about when
4 is time zero is an important one, particularly in
5 light of the fact, just as an example, if you have a
6 PC of equipment with a seven-day LCO and you go
7 through five days of that and it is probably not risk
8 significant, and then another piece of equipment that
9 goes out, the combination of which is really risk
10 significant, it doesn't give the advantage to the
11 licensee to say time zero starts when the first piece
12 went out.

13 And so to me I'm struggling with that. If
14 there's a way to do that better and mimic the
15 situation better, then I would encourage people to
16 find that way because to me that's sort of
17 troublesome.

18 The other troublesome thing is --

19 DR. KRESS: And you might be able to do
20 that with some sort of cumulative risk concept.

21 DR. SIEBER: I think you can do it.

22 MR. STILLWELL: We thought really hard
23 about what you're talking about because we've --

24 DR. SIEBER: Okay. I think it can be
25 done, and I think it is worth pursuing.

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1 The other thing that I think is
2 significant is that, you know, this is a two phase
3 exercise. One of them is to apply risk information to
4 modify your tech spec so that you have differing
5 outage times, allowed outage times. It all relies on
6 the quality of the PRA. The quality of the PRA relies
7 on Reg. .200, which relies on industry standards, half
8 of which aren't written.

9 So as we charge forward in the process,
10 we're trying to risk inform the tech specs. I think
11 that there has to be plenty of emphasis on defining
12 what's a suitable PRA, and you know, just getting back
13 a little to the discussion of the SPAR models, I sort
14 of look at the SPAR models as the same kind of
15 assessment tool that the NRC uses in Appendix K.

16 The licensee comes forward with an
17 Appendix K analysis that meets the rules, and NRC
18 relies on the NRC's analysis to determine whether the
19 final acceptance criteria is met or not.

20 On the other hand, they assess the quality
21 of the licensee's work by using TRACE or some similar
22 code that's in there, stable of intellectual property,
23 and SPAR models to me are the same kinds of things.
24 If you want to do a general survey, that's fine, but
25 I wouldn't make specific inclusions about specific

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1 plants from the SPAR models because the licensee has
2 spent more time and effort putting in the right
3 numbers and putting in the right logic than was done
4 with SPAR.

5 I think SPAR has a useful place, but I
6 don't think I can draw any conclusions from that. So
7 I don't know if you can decipher anything out of what
8 I said, but I think that those are my impressions as
9 to where we stand today and what the ACRS ought to do.

10 And I would like to add I would like to
11 thank the staff for a very good presentation and South
12 Texas and NEI and EPRI and everyone else who has
13 worked so hard on this project.

14 Thank you.

15 CHAIRMAN APOSTOLAKIS: I would just make
16 one comment that I don't view the SPAR models that way
17 because they are not developed independently. There
18 is a lot of give and take with the utility, and I
19 don't see why the staff should do something that the
20 utility has done better.

21 The staff say no, no, no, we'll stick with
22 something that's bad, and therefore, the way I see it
23 is that when there are differences, there are
24 legitimate professional differences regarding a few
25 things, and these differences have to be reflected in

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1 the PRAs. That's where I'm coming from.

2 Now, if somebody tells me, yeah, we
3 corrected this and now the point is on the line, well,
4 great. Let's all rejoice.

5 But when I see a list that says, you know,
6 there are differences regarding this and this and
7 that, then I'd like to see some resolution because I
8 don't think that the intent of SPAR is to be
9 capriciously conservative. They will be conservative
10 when there is a reason to be conservative, and that's
11 my starting point, which is related to PRA quality and
12 all of that.

13 I'd like to thank the presenters, both the
14 staff, NEI, and South Texas. They were excellent
15 presentations in my view. We had good discussion, and
16 we really appreciate your taking the time to come
17 here.

18 Mr. Grantom must have the last word.

19 MR. GRANTOM: In responding to the
20 questions about when time zero starts, we didn't
21 actually get to go through some of the examples, but
22 in the supporting slides that we had put together in
23 the presentation, I'd invite you to look at the
24 examples that we provided in there for your own time
25 and your own perusal.

1 CHAIRMAN APOSTOLAKIS: Okay.

2 MR. GRANTOM: I just wanted to let you
3 know those were there.

4 DR. KRESS: George, before you bang the
5 thing, every time we review and look at anything with
6 the words "risk informed" in it, we buck up against
7 the issue of, "Well, what about uncertainties? How
8 are you going to treat those?"

9 And it boils down to, well, we know how to
10 do parameter uncertainties, but we don't know how to
11 do model uncertainties, and so we will just forget
12 about the model uncertainties and do parameter.

13 Somewhere along the line, we have got to
14 face up to this issue, and Pat Baranowsky had one of
15 his slides. I think that's what he was talking about.
16 We need to have guidance on how to deal with model and
17 parameter uncertainty in risk informing anything.

18 And I think the ACRS needs to come up with
19 some sort of position on that.

20 CHAIRMAN APOSTOLAKIS: And if you recall,
21 last time when Mr. True and Mr. Pietrangelo were here,
22 they agreed to duplicate --

23 DR. KRESS: They were going to look into
24 that.

25 CHAIRMAN APOSTOLAKIS: When I suggested

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1 that they look at the three.

2 MR. GAERTNER: Yes, I'd like to tell you
3 what has happened since then, and we were aware of
4 what Tony and Doug, the interaction they had with you.
5 At EPRI we have initiated a project to address the
6 entire uncertainty issue and develop a guidance
7 document that will include parametric uncertainty as
8 well as modeling uncertainty. We are closely
9 integrated with the NEI effort and with the NRC effort
10 to develop the acceptance criteria that will be used
11 in the NUREG or in the Reg. Guide 1.200, as well as in
12 their action plan.

13 So that is underway. We're working and we
14 plan to work with NRC Research and with the entire
15 industry on that, and that will be we hope to have a
16 product this year. So we are moving.

17 DR. KRESS: We'll look forward to looking
18 at that.

19 CHAIRMAN APOSTOLAKIS: Would you find it
20 useful to have us comment on it?

21 MR. GAERTNER: Pardon me?

22 (Laughter.)

23 CHAIRMAN APOSTOLAKIS: Would you find it
24 useful to come here and present it and have us comment
25 on it?

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1 MR. GAERTNER: Absolutely. That would be
2 wonderful.

3 DR. SIEBER: What else can he say?

4 (Laughter.)

5 MR. GAERTNER: George, you're famous for
6 your opinions on uncertainty. So I would certainly
7 want you --

8 CHAIRMAN APOSTOLAKIS: So okay. We'll
9 take that into advisement, Mr. Gaertner.

10 Thank you very much.

11 I'm very pleased to hear that, by the way.
12 This is really about time. Okay?

13 DR. BONACA: These are uncertain times.

14 CHAIRMAN APOSTOLAKIS: These are uncertain
15 times.

16 Carl, do you want to say anything?

17 MR. GRANTOM: No, sir.

18 CHAIRMAN APOSTOLAKIS: Okay. Now I can do
19 it?

20 MS. WESTON: Yes.

21 CHAIRMAN APOSTOLAKIS: We'll reconvene at
22 1:30, I understand, and the subject will be an
23 entirely new subject, PRA quality.

24 (Whereupon, the subcommittee meeting in
25 the above-entitled matter was adjourned.)

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**ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
RELIABILITY AND PRA AND PLANT OPERATIONS SUBCOMMITTEES
RISK MANAGEMENT TECHNICAL SPECIFICATIONS (RMTS)
ROOM T-2B3, 11545 ROCKVILLE PIKE, ROCKVILLE, MARYLAND**

MARCH 25, 2004

- PROPOSED AGENDA -

| <u>SUBJECT</u> | <u>PRESENTER</u> | <u>TIME</u> |
|---|----------------------|------------------|
| I. Introductory Remarks Subcommittee Chair | G. Apostolakis, ACRS | 8:30-8:35 a.m. |
| II. RMTS Introduction | Tom Boyce, NRR | 8:35-8:40 a.m. |
| III. Overview of RMTS Initiatives Scope and Status | Bob Tjader, NRR | 8:40-9:10 a.m. |
| • Initiative 4b, Risk Informed TS Completion Times | | |
| • Current Issues | | |
| IV. Initiative 4b Pilot Program | | |
| • RM Guidance Document | Biff Bradley, NEI | 9:10-9:40 a.m. |
| • STP* Whole Plant Pilot | Rick Grantom, STP | 9:40-10:40 a.m. |
| V. Summary | Bob Tjader | 10:40-10:45 a.m. |
| VI. General Discussion | | 10:45-11:30 a.m. |

* South Texas Project

Note: Presentation time should not exceed 50% of the total time allocated for a specific item.
Number of copies of presentation materials to be provided to the ACRS - 35.

ACRS CONTACT: Maggalean W. Weston, mww@nrc.gov or (301) 415-3151.

Risk Management Technical Specifications

Presentation to the Reliability & PRA, and
Plant Operations Subcommittees of the
Advisory Committee on Reactor Safeguards

March 25, 2004

Principles for RMTS Development

- Achieve coherence with other risk-informed regulation development (MRule, PRA Quality, 50.69)
- Credit for 50.65(a)(4) programs in RMTS Initiatives
- Licensee's risk submittals must meet standards for quality and comprehensiveness
- Involve NRC staff with cognizance for operation, training, inspection, maintenance, regions/STA, and risk assessment

STATUS OF INITIATIVES

- Reliance on existing (a)(4) Program
 - Initiative 2: Missed Surveillances (NRC Approved)
 - Initiative 3: Mode Change Flexibility (NRC Approved)
- Analysis of Specific Plant Configurations
 - Initiative 1: Modified End States (1 yr)
 - Initiative 6: LCO 3.0.3 Action Times (1 yr)
 - Initiative 7: Non-TS Support System Operability (1 yr)
- Quantitative Risk Assessment / Quality PRA
 - Initiative 4: Flexible Completion Times (2 yrs)
 - Initiative 5: Surveillance Frequency Program (2 yrs)
- Rulemaking
 - Initiative 8: Relocate non-risk significant systems from TS (3+yrs)

Initiative 4 – Risk-Informed Completion Times

- Effect: Extend completion time from a nominal value up to a predetermined “backstop” maximum using configuration risk management
- Basis: Under development, to include approved process, requirements for PRA technical adequacy, real-time quantitative capability, configuration and cumulative risk metrics
- Status: Industry submitted draft guidance document & pilot proposals; staff provided feedback. STP & Fort Calhoun are Pilots.

Initiative 4b Example

- See proposed 4b Tech Spec; discuss concepts
- Initiative 4b concepts
 - Front Stop; current CT
 - CRMP-based CT
 - Back Stop
 - Use of Real-Time Risk Assessment Tools and Decision Making Process

**TABLE 3-1
GENERIC RISK-INFORMED CTs WITH A BACK-STOP: EXAMPLE FORMAT**

| Actions Condition | Required Action | Completion Time |
|--|---|---|
| <p>B. One [HPSI] subsystem inoperable.</p> | <p>B.1 Restore SI subsystem to OPERABLE status.</p> | <p>72 hours</p> |
| | <p><u>OR</u></p> | |
| | <p>B.2.1 Determine that the completion time extension beyond 72 hours is acceptable in accordance with established RMTS thresholds.</p> | <p>72 hours</p> |
| | <p><u>AND</u></p> | |
| | <p>B.2.2 Verify completion time extension beyond 72 hours remains acceptable.</p> | <p>In accordance with the RMTS Program (i.e., within 24 hours of a subsequent configuration change)</p> |
| | <p><u>AND</u></p> | |
| | <p>B.2.3 Restore subsystems SI to OPERABLE status.</p> | <p>30 days or acceptable completion time, whichever is less.</p> |

RMTS INITIATIVE 4b and PRA QUALITY

- Reliance on a tool that will provide configuration specific PRA results in a timely manner to determine Completion Times; this is a significant change to Technical Specifications
- PRA model must be of High Quality (scope, elements, and technical attributes)
- Configuration Risk Management process and tool must be of High Quality
- RMTS 4b will be a significant change to NRC review & oversight of licensee's Technical Specifications

Pilots for PRA Quality and Initiative 4b

- PRA Quality (RG 1.200) is the underpinning of RMTS Initiative 4b
- RG 1.200 Pilot Plants: SONGS, CGS, STP, Limerick
- RMTS Initiative 4b Pilot Plants: STP & FCS
- 4 of 5 Pilot Applications of RG-1.200 involve Technical Specification Amendments
- STP is a Pilot for both RG 1.200 and RMTS Initiative 4b
- Pilots to test:
 - Reg Guide (RG-1.200) ability to prove adequate PRA Quality
 - Necessary scope of PRA
 - Internal Fire + External Events + Shutdown & Transition Risk
 - Software for Configuration Risk Management Tool
 - Configuration Risk Management Process

CURRENT REVIEW ISSUES

- Exportability; Pilot Plant General Acceptance Criteria
 - Reliability
 - Repeatability
 - Enforceable/Oversight
- PRA Quality (proof of concept)
 - Scope
 - Level of Detail
 - Acceptability

POTENTIAL, IMPLEMENTATION STRUCTURE

- Program Requirements in Technical Specifications Administrative Controls
 - PRA Quality (RG 1.200)
 - Guidance Documents (RG 1.177+, RMG)
- Licensee Program Guidance
- Oversight

Closing Comments

- RMTS Initiative 4b is linked with PRA Quality
- Communication and Training of HQ Staff & Regions are essential; Initiative 4b is linked with Risk-Informed Environment Initiative
- Early in the Initiative 4b Process; Learn as we go forward



**Risk Management
Technical Specifications
Initiative 4B**

Biff Bradley
March 25, 2004



Foundation

- Maintenance rule (a)(4) provision implemented November 1999
 - Resulted in both deterministic (TS) and risk management (MR) regulatory requirements for plant configuration control – sometimes in conflict
 - MR risk assessment and management guidance developed with recognition that TS provided “backstop”
 - NRC recognized that MR could provide foundation for additional TS reform
- Industry (a)(4) programs presented to NRC in February 2001 workshop
 - Over 100 NRC attendees

Objectives

- Better align deterministic tech specs with risk management approach required by maintenance rule
- Make changes within existing tech spec framework and practice
- Maintain operator safety focus and ease of use
- Provide incentive for improved PRAs and configuration risk assessment tools

Initiative 4B approach

- Would apply to all equipment LCOs
 - Not applicable to parameters, safety limits
- Maintains existing LCO as “front stop”
 - Operator familiarity
 - Approaching front stop would trigger more extensive risk evaluation and actions
- Deterministic backstop would be established
 - 30 days irrespective of risk impact
- Actual completion times would be based on risk assessment and management using NRC-approved risk management guidance

Pilot Plants

- South Texas Project (whole plant)
- Hope Creek (whole plant)
- Ft. Calhoun (system specific)
- All would incorporate EPRI risk management guidance method through reference in Tech Specs

Risk management guidance for 4B

- Intent: Achieve NRC approved method for risk assessment and management to implement 4B – reference in TS to adopt initiative
- Developed by EPRI
 - Builds on existing (a)(4) guidance
 - More rigor in risk analysis, risk management actions, plant shutdown decisions
 - PRA scope and capability requirements
- One round of NRC review/feedback complete
 - 75 NRC questions posed and addressed
 - Iterative process to complete development

PRA requirements – proposed for 4B

- Minimum PRA and tool requirements
 - Internal events and LERF, NRC Reg Guide 1.200 (ASME standard)
 - External events at power (including seismic, internal fires)
 - Ability to quantify configuration risk
 - Ability to determine and track aggregate risk
 - Updating requirements

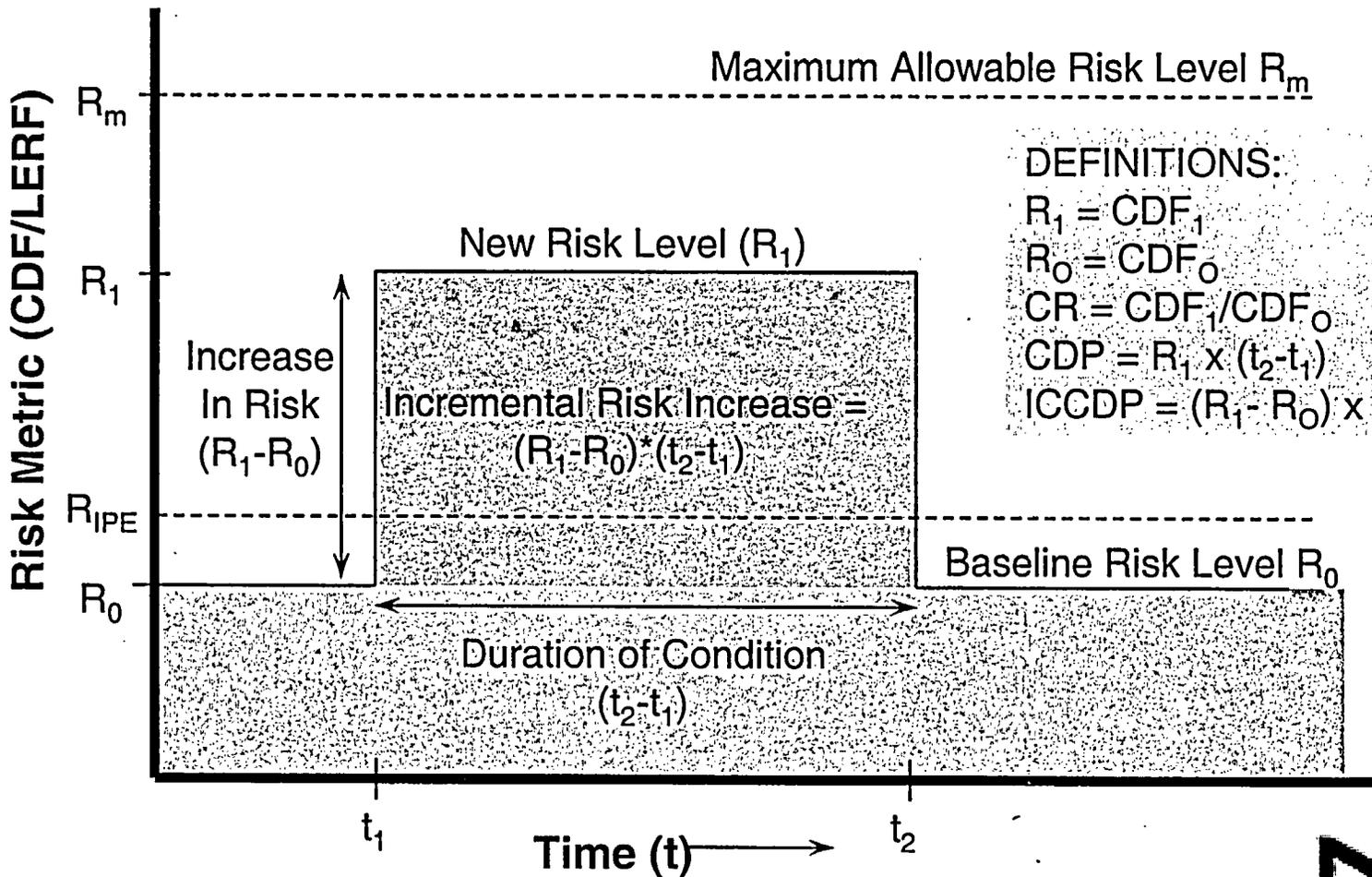
Risk assessment metrics

- Planned evolutions
- Emergent conditions
- Guidance will address use of:
 - Temporary risk increase (ICDP)
 - Risk “speed limit” (CDF limit)
 - Cumulative risk (Δ CDF)



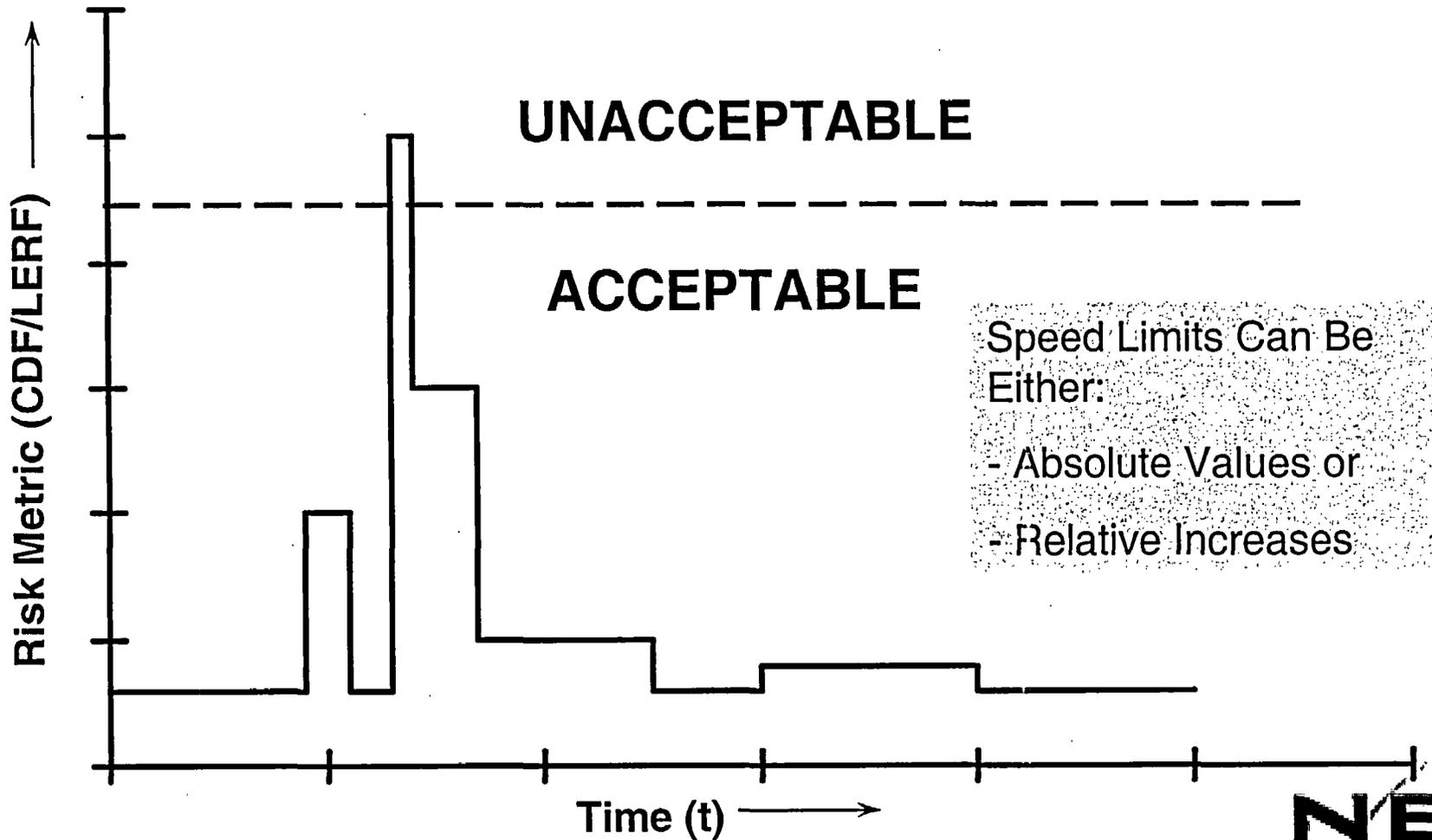
RISK MEASUREMENT APPROACH

TEMPORARY RISK INCREASE



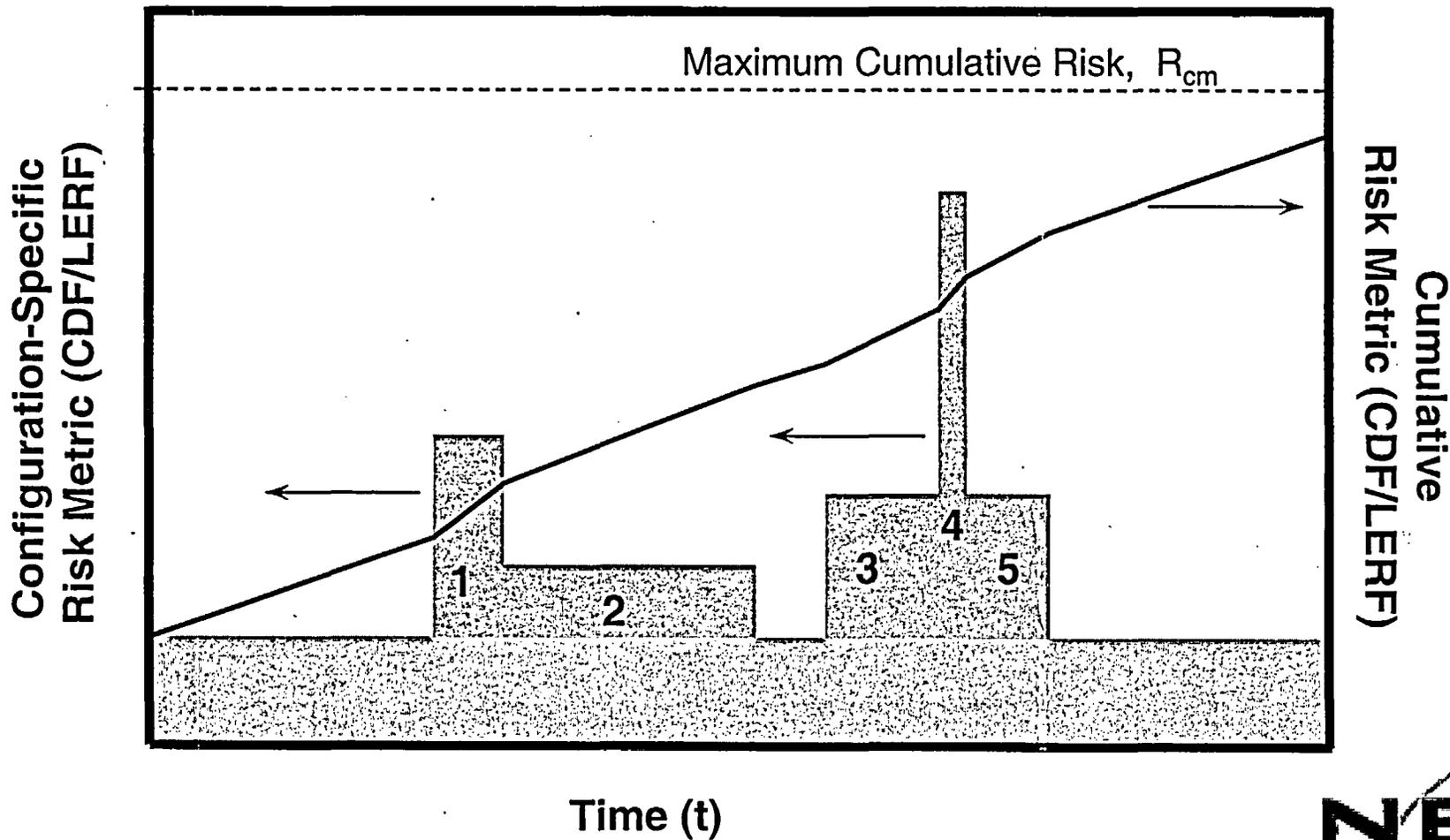
RISK MEASUREMENT APPROACH

RISK "SPEED LIMIT"



RISK MEASUREMENT APPROACH

CUMULATIVE RISK



Risk management

- Actions based on risk metric results
 - Manage risk of configuration
 - Actions may be different from existing Tech Spec LCO requirements
 - Must include plant shutdown decisionmaking approach
- More specificity than existing (a)(4) guidance

Conclusions

- Challenging risk application
- Risk management guidance is work in progress
- Pilot applications will enable further development and detail in guidance
- Goal is NRC endorsement at appropriate level of detail



STP Risk-Informed Technical Specifications Application

ACRS Subcommittee on
Reliability and PRA

March 25, 2004

Introduction

- STP Participants

- Rick Grantom Risk Management Manager
- Bill Stillwell Risk Management
Supervisor
- Scott Head Licensing Manager

Agenda

- Scope and content of the STP whole plant pilot application
- Submittal schedule
- STP PRA Quality (RG 1.200 Pilot)
- Implementation

Scope & Content

- Industry pilot Application for Risk Informed Technical Specifications using Configuration Risk Management (Initiative 4b)
- Comprehensive application of STP's Maintenance Rule (a)(4) approach and STP's Configuration Risk Management Program to produce configuration based allowed outage times (i.e., flexible completion times)
- NRC pilot application for PRA Quality (RG 1.200)

Scope & Content

- Technical Specification structure and format to be retained
- Allows operators to use Risk Management option for determining flexible allowed outage time (AOT) when CTS AOT or “frontstop” has been exceeded
- Imposes a “backstop” for returning equipment to service

Scope & Content

- References the EPRI Implementation Guidelines
- Would apply to conditions where TS 3.0.3 currently applies.
- Establishes a new TS 3.13 to invoke flexible AOT determination
- Flexible AOT based on all CRMP equipment removed from service at a given time

Scope & Content

- Selected instrumentation of TS 3.3
- Code safety valves
- Pressurizer PORVs
- Accumulators
- ECCS
- RHR
- RWST
- RCB Purge
- Containment Isolation Valves
- Containment Spray
- Containment Fan Coolers
- AFW
- MSIVs
- MFIVs
- Atmospheric Steam Relief
- Component Cooling Water
- Essential Cooling Water
- CRE HVAC
- FHB HVAC
- Essential Chilled Water
- SDGs and Off-site circuits
- Batteries
- ESF Buses

Draft TS 3.13

RISK MANAGEMENT

ALLOWED OUTAGE TIME DETERMINATIONS

LIMITING CONDITION FOR OPERATION

3.13.1 When referred to this specification, equipment that has been removed from service or declared inoperable shall be evaluated for its impact on plant risk and allowed outage times determined accordingly.

APPLICABILITY: As required by the referencing specification

ACTION:

Determine that the configuration is acceptable for Completion Time extension beyond the [Front Stop AOT],

AND

Determine that the configuration is acceptable for continued operation beyond the [Front Stop AOT] whenever configuration changes occur that may affect plant risk,

AND

Restore required inoperable [subsystem, component] to OPERABLE status within the Acceptable Allowed Outage Time Extension or 30 days, whichever is shorter.

OR

Take the ACTION required in the referencing specification for required action or completion time not met

SURVEILLANCE REQUIREMENTS

4.13.1: As required by the referencing specification

Sample Specification

PLANT SYSTEMS

3/4.7.4 ESSENTIAL COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4 At least three independent essential cooling water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

- a. With only two essential cooling water loops OPERABLE, within 7 days restore at least three loops to OPERABLE status or apply the requirements of Specification 3.13, OR be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With two or more essential cooling water loops inoperable, within 12 hours restore at least two loops to OPERABLE status or apply the requirements of Specification 3.13, OR be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

STP PRA Quality

- PRA quality issues to be addressed as part of the RG 1.200 pilot
- PRA quality scope to include industry peer review, ASME Standard (ASME RA-S-2002), and RG 1.200
- PRA quality needed for the 4B application itself will also be evaluated

Implementation

- Applies the STPNOC Configuration Risk Management Program (CRMP)
 - Same program used for 10CFR50.65(a)(4)
- CRMP establishes risk thresholds for implementation of compensatory measures
 - Non-risk Significant threshold (1E-06)
 - Potentially Risk Significant Threshold (1E-05)

Implementation

- STP has extensive experience in applying the CRMP
 - Routinely used to manage weekly work
 - Effectively applied to manage the recent extended diesel generator outage

Submittal Schedule

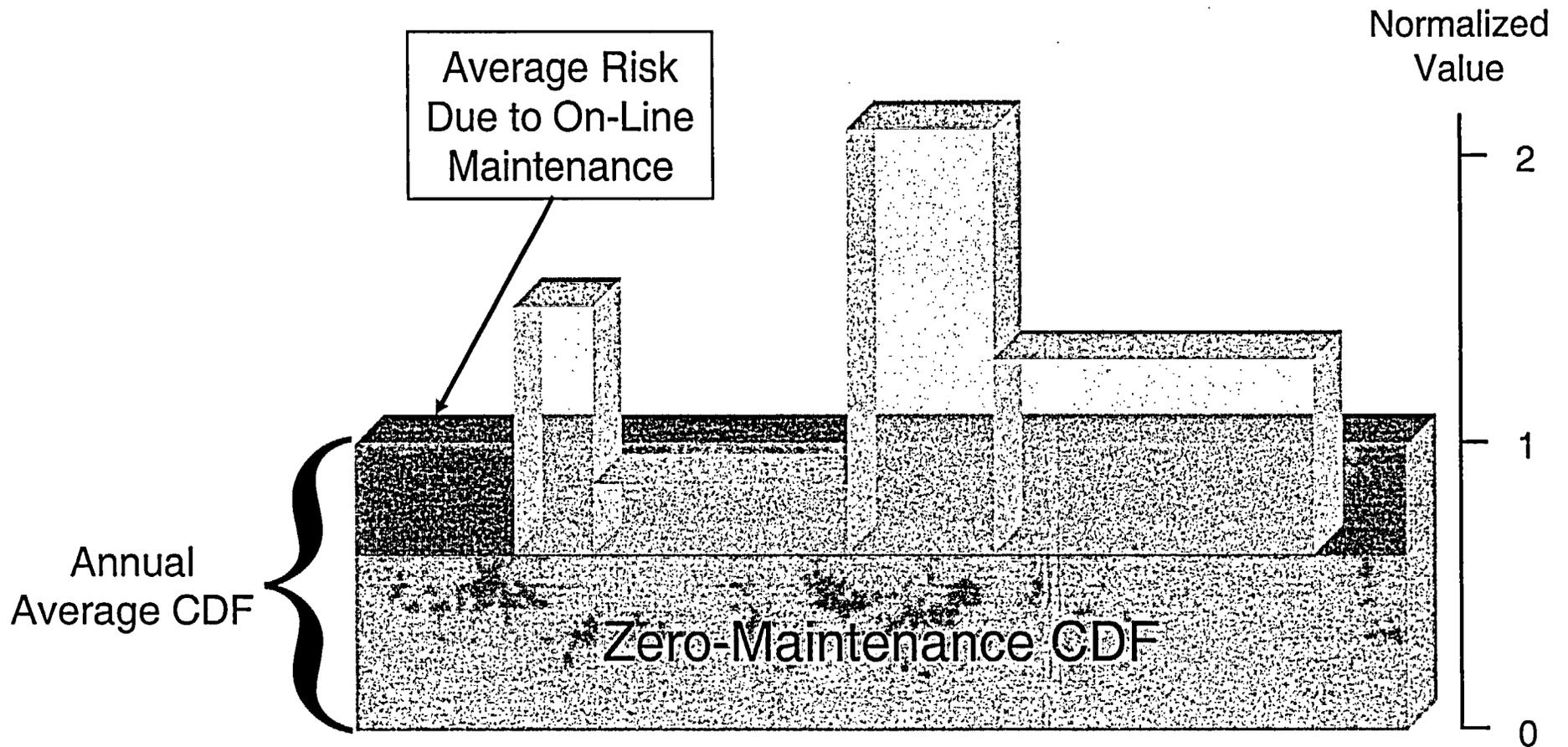
- Submitted “Letter of Intent” with proposed changes in early 2003
- License Amendment Request to be submitted in June 2004

Conclusions

- STP is prepared to support the industry 4b pilot
- The application of flexible AOTs is a natural progression in the use of risk insights
- This is an appropriate PRA quality pilot for RG 1.200

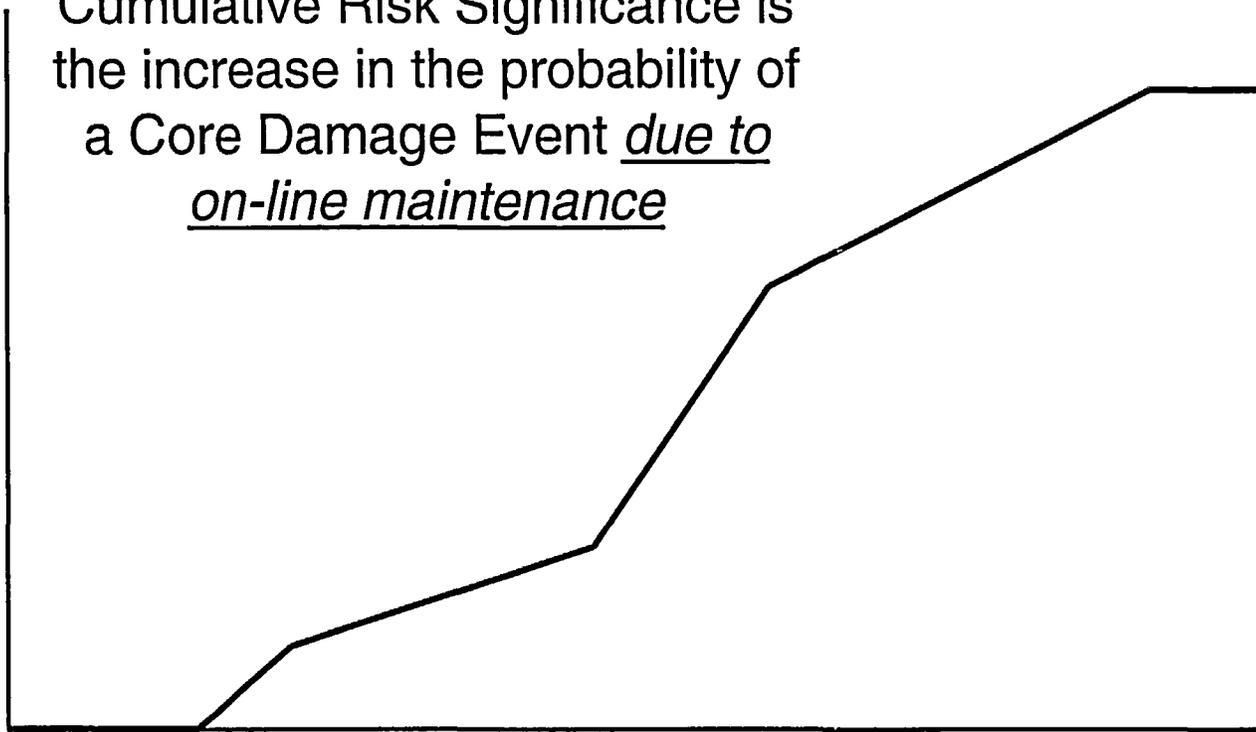
Support Slides

How Risk Values Stack Up

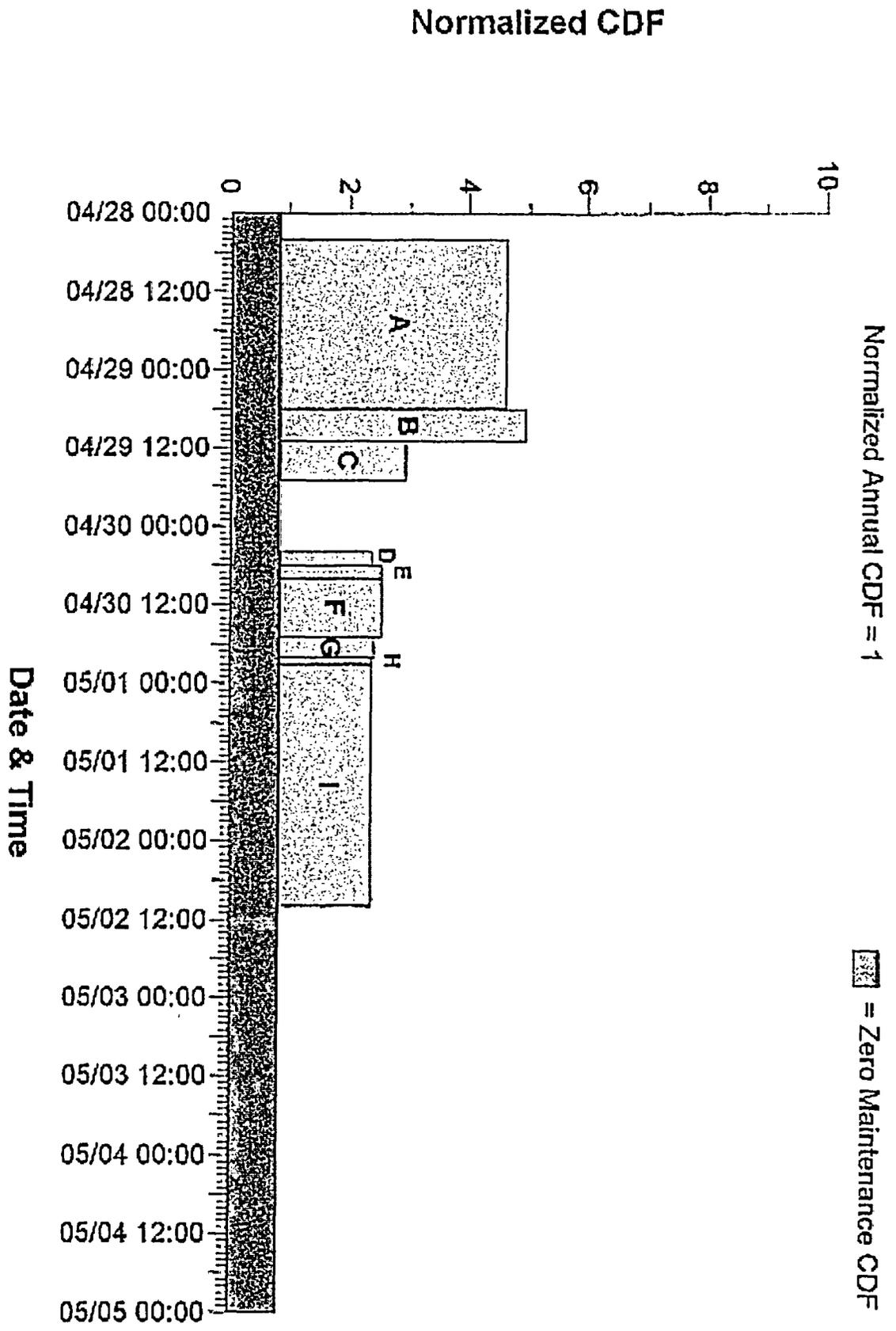


How Risk Values Add Up

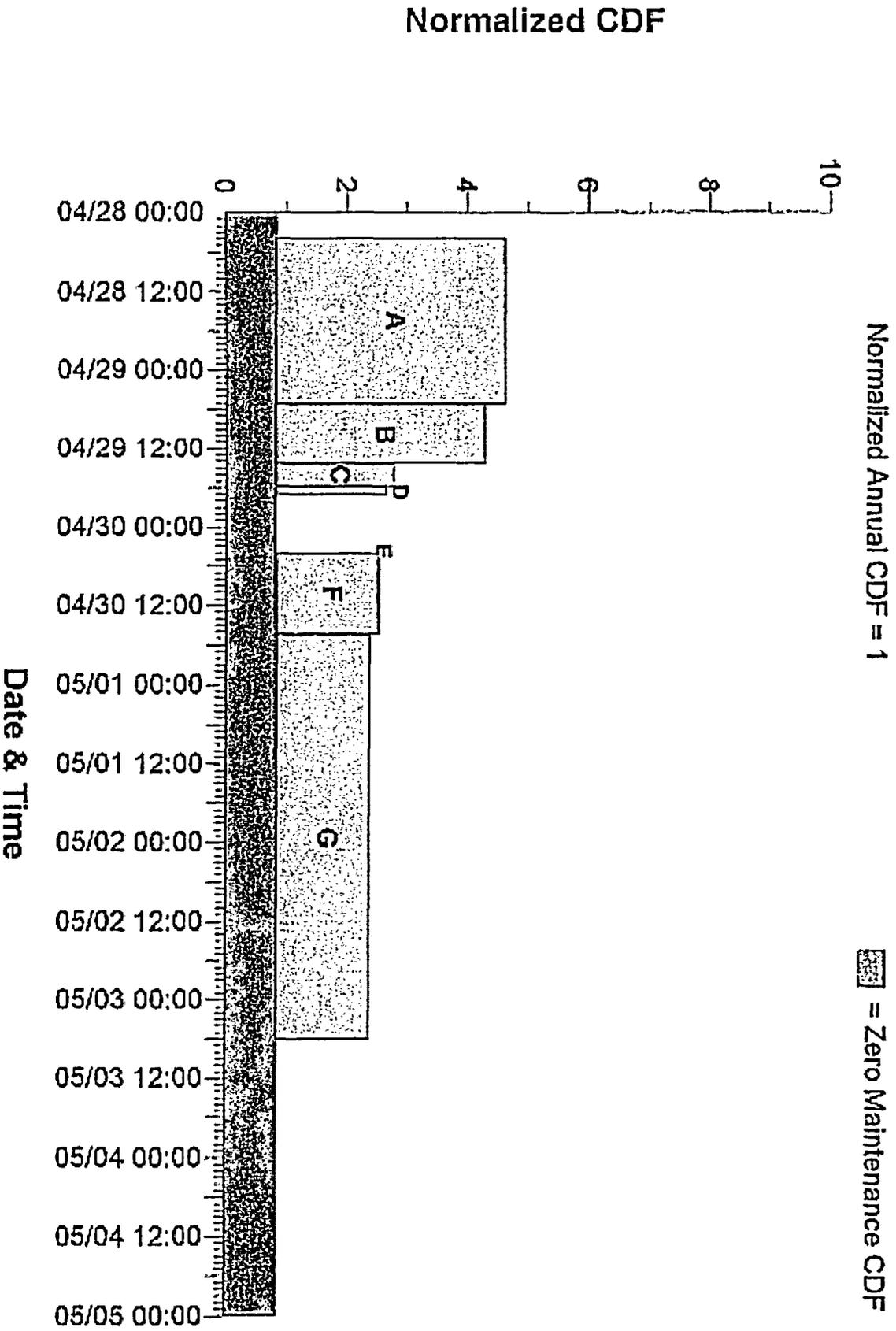
Cumulative Risk Significance is the increase in the probability of a Core Damage Event due to on-line maintenance



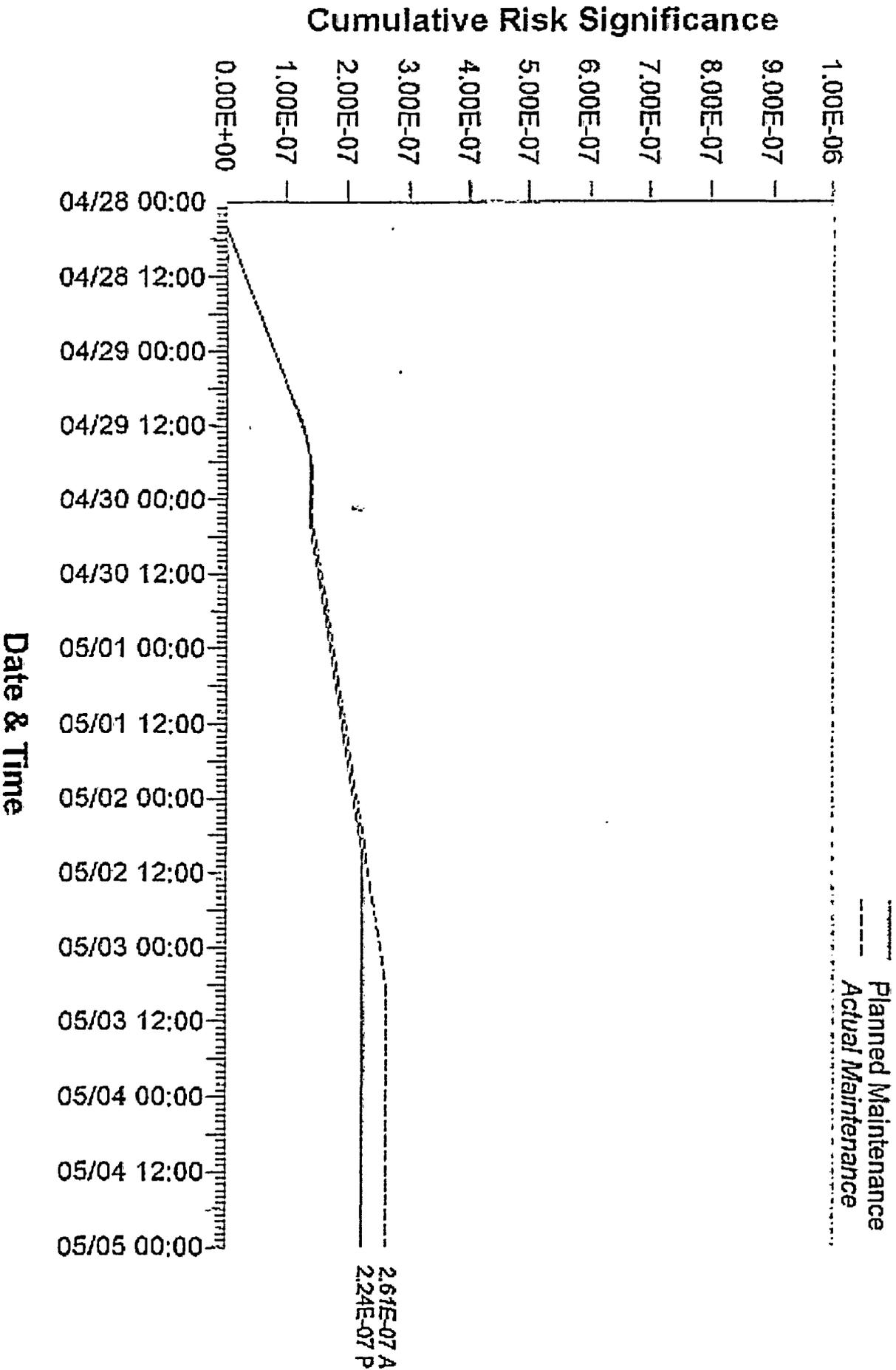
PLANNED RISK PROFILE FOR UNIT 1 WEEK OF 4/27/01



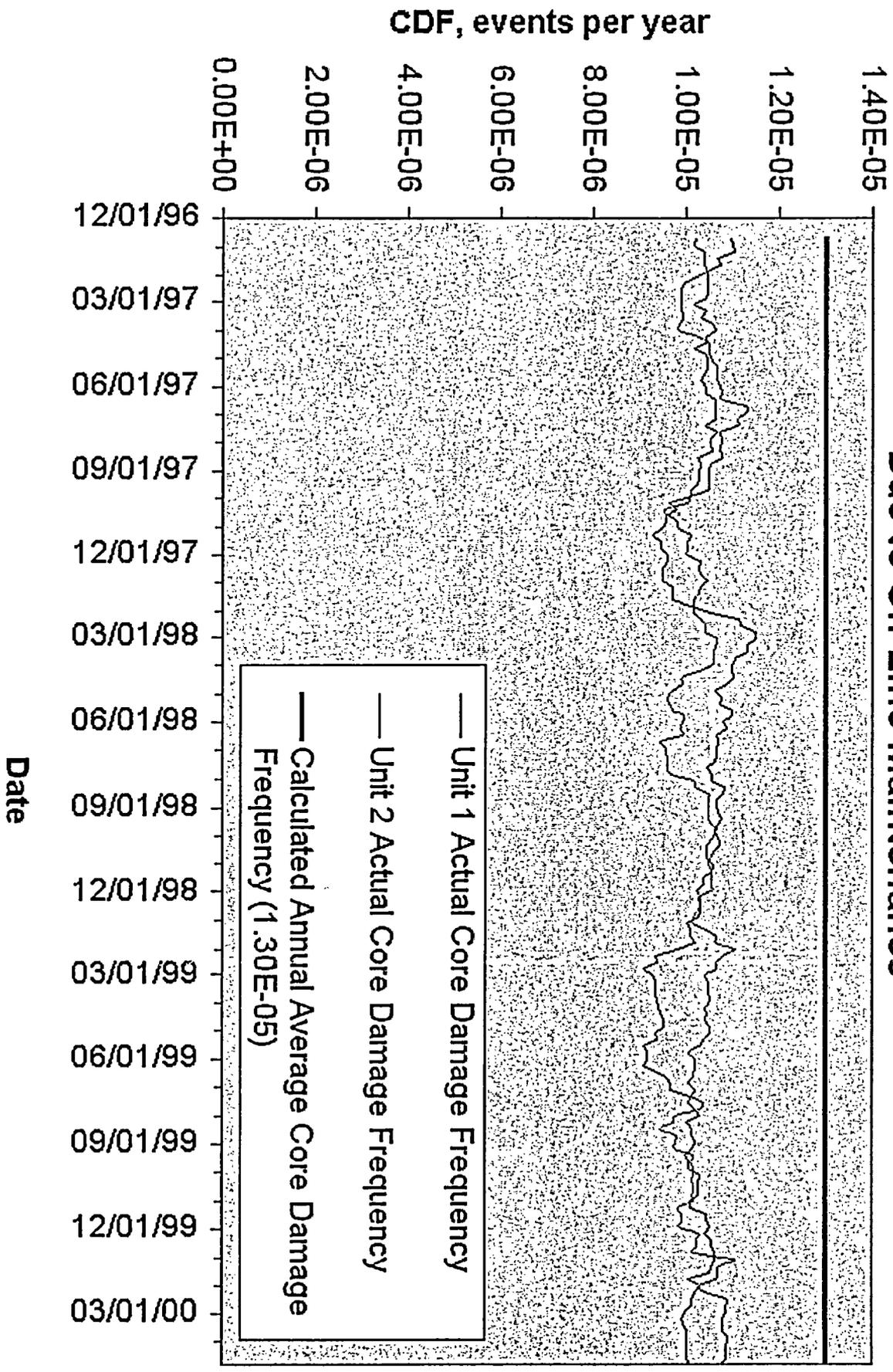
ACTUAL RISK PROFILE FOR UNIT 1 WEEK OF 4/27/01



ACTUAL RISK PROFILES FOR UNIT 1 WEEK OF 4/27/01



South Texas Project Actual Core Damage Frequency Due to On-Line Maintenance



Application of RITS

Example 1: Routine Train A work week with emergent Train B condition

| <u>Time</u> (hh:mm) | Event | Frontstop | Calculated AOT (time to reach 1E-05) | Risk (/hr) | Comment |
|------------------------|---|--|---|---------------|---|
| 00:00 | Begin Train A work week (SDG, ECW, CCW, HHSI) | HHSI (3.5.2.a): 7 days CCW (3.7.3.a): 7 days ECW (3.7.4.a): 7 days SDG (3.8.1.1.b): 14 days | NA, planned to remain within frontstop allowed outage time. | 5.9E-09 | Routine planned maintenance |
| 24:00 | Train B HHSI found to be inoperable | 3.5.2.b: 6 hours to apply TS 3.13 | 24 days | 1.7E-08 | Emergent condition where CTS would require TS 3.0.3 entry. RITS permits the station to address the condition with normal work controls. |
| 36:00 | Train B HHSI restored | Exit TS 3.5.2.b and TS 3.13 applicability. Back on the work week clock with 36 hours elapsed. | NA | 5.9E-09 | |

Application of RITS

Example 2: Emergent condition while in configuration where TS 3.13 is in use

| <u>Time</u> (hh:mm) | <u>Event</u> | <u>Frontstop</u> | <u>Calculated AOT</u> (time to reach 1E-05) | <u>Risk</u> (/hr) | <u>Comment</u> |
|------------------------|--|--|---|----------------------|---|
| 00:00 | ECW pump replacement expected to last 10 days. | TS 3.7.4.a: 7 days (Also makes associated SDG inoperable) | 1 train of ECW could be allowed OOS up to the 30-day backstop | 4.5E-09 | TS 3.13 requirements apply after 7 days. The risk is calculated from the time the ECW is taken out of service. |
| 8 days | Turbine-driven AFW found to be inoperable | TS 3.7.1.2.b: 72 hours TS 3.8.1.1.d: 24 hours | 27 days | 1.5E-08 | Regardless of the frontstop time for the TDAFW pump, TS 3.13 applies because the ECW has gone beyond its frontstop. TS 3.13 requires a determination of the acceptability of the configuration with the additional inoperable TDAFW. Application of the CRMP would determine the configuration is acceptable. |
| 9 days | ECW pump is restored | TS 3.7.1.2.b: 72 hours less the 24 hours that have transpired. | > 30 days (backstop would apply) | 1.5E-09 | The condition that caused TS 3.13 to apply has been exited and there are no TS beyond their frontstop time. The frontstop AOT may be applied to the TDAFW. |

Application of RITS

Example 3: Same as Example 2, except that the emergent condition is restored first

| Time (hh:mm) | Event | Frontstop | Calculated AOT (time to reach 1E-05) | Risk (/hr) | Comment |
|--------------|--|--|---|------------|---|
| 00:00 | ECW pump replacement expected to last 10 days. | TS 3.7.4.a: 7 days | 1 train of ECW could be allowed OOS up to the 30-day backstop | 4.5E-09 | TS 3.13 requirements apply after 7 days. The risk is calculated from the time the ECW is taken out of service |
| 8 days | Turbine-driven AFW found to be inoperable | TS 3.7.1.2.b: 72 hours TS 3.8.1.1.d: 24 hours | 27 days | 1.5E-08 | Regardless of the frontstop time for the TDAFW pump, TS 3.13 applies because the ECW has gone beyond its frontstop. TS 3.13 requires a determination of the acceptability of the configuration with the additional inoperable TDAFW. Application of the CRMP would determine the configuration is acceptable. |
| 9 days | TD AFW restored | NA | > 30 days | 4.5E-09 | TS 3.13 still applies. TDAFW no longer contributes to risk calculation. A new completion time may be calculated. |

SDG 22 113 Day Extended AOT

- One-time emergency TS Change approved on December 30, 2003
- Configuration risk to be managed by application of the STP Configuration Risk Management Program (CRMP).
- Good example of how the CRMP works
 - Duration and risk bound any that would be encountered using proposed RITS

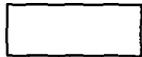
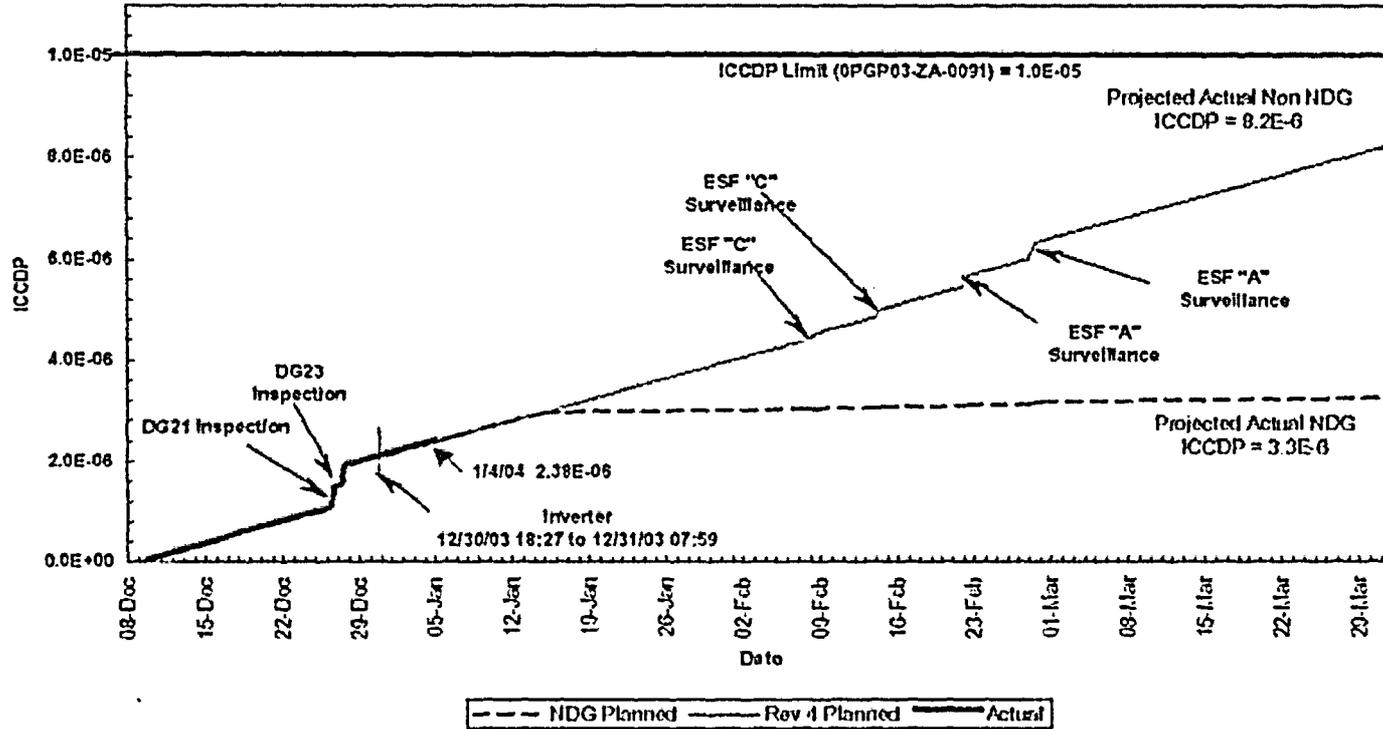
SDG 22 113 Day Extended AOT

- AOT extension met RG 1.174 and RG 1.182 acceptance criteria
- Installed non-safety DGs (NDG) as compensatory action
 - RG criteria met without credit for NDGs
- STPNOC is closely monitoring the risk profile

SDG 22 113 Day Extended AOT

Comparison of Planned and Actual Risk (ICCDP) for Unit 2 During SDG 22 Outage

Data source: NDG Planned - PRA Rev 4 Model Including NDG effect on risk (NDG failure and associated operator data are assumed)
 Rev 4 Planned - PRA Rev 4 Model assuming no NDG effect on risk
 Actuals - RAsCAL data for previous work week and PRA Rev 4



03/24/2004

Backup Slides

Initiative 2 – Missed Surveillance Actions

- Effect: Extension of flexibility granted in Generic Letter 87-09; allow up to one surveillance interval to make up inadvertently missed/incomplete surveillance
- Basis: Infrequent use, likelihood that equipment is operable, entry into corrective action program, assess and manage risk of delay as extension of (a) (4) program (treat as emergent condition)
- Status: Approved, over 90% of plants adopted

Initiative 3 – Mode Flexibility

- Effect: Extension of flexibility granted in Generic Letter 87-09; allow mode transition up in power with inoperable equipment, relying on compliance with TS actions of higher mode
- Basis: Infrequent use, generic risk analysis ruling out some transitions, 50.65(a)(4) assessment and management of configuration risk, oversight of 50.65(a)(4)
- Status: Approved; about 5% of plants adopted

Initiative 1- End States

- Effect: Allow repair in most risk beneficial state (e.g., hot shutdown instead of requiring transition to cold shutdown)
- Basis: CE and BWR generic analysis of preferred mode for repair of inoperable equipment
- Status: Reviewing CE and BWR Tech Spec proposed changes

Initiative 6 – Shutdown Tracks

- Effect: Risk-inform shutdown completion times for not meeting LCO and its actions (LCO 3.0.3 shutdown completion times)
- Basis: CE quantitative bounding risk analysis for specific tech specs
- Status: CE topical under review; SER to be prepared by staff

Initiative 7 – Risk-Informing Support Equipment Impact

- Effect: Allow a TS train to be considered operable up to a prescribed maximum time with degraded non-TS design support features (barriers and snubbers)
- Basis: Generic calculation showing low risk due to low initiator frequency (internal flood, seismic event)
- Status: Staff reviewing proposals

Initiative 5 – Relocation of Surveillance Test Intervals

- Effect: Requirement to perform surveillance remains in TS, frequency adjusted outside TS in TS program using staff-approved methods
- Basis: Review of methods, PRA technical adequacy/quality
- Status: Industry preparing guidance document, methodology, and tech spec changes; Limerick is pilot plant

Initiative 8 – Risk-Informing TS Scope

- Effect: (a) Allow relocation of LCOs not meeting any 50.36 criteria, including criterion on risk significance, (b) Limit scope of TS to risk-significant SSCs
- Basis: Adaptation/adoption of categorization approach from Option 2, generic analysis, PRA technical adequacy
- Status: (a) Industry preparing paper for staff review, (b) 8b requires rulemaking

Feedback from November 2002 ACRS Meeting

- Commission agrees: Graded approach to reliance on PRA capability OK
- Awareness issue: Too much for too little?
- Review/Inspections: Need to guard against abuse – maintain awareness/oversight of patterns
- Integrated effort: Continue to consider how initiatives interact