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NUCLEAR REGULATORY COMMISSION

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Subcommittee on Fire Protection

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

October 27, 2004

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

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
(ACRS)
SUBCOMMITTEE ON FIRE PROTECTION

+ + + + +
MEETING
+ + + + +

WEDNESDAY,
OCTOBER 27, 2004

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ROCKVILLE, MARYLAND

+ + + + +

The subcommittee met at the Nuclear
Regulatory Commission, Two White Flint North,
Room T2B3, 11545 Rockville Pike, at 1:30 p.m.,
Stephen L. Rosen, Chairman, presiding.

COMMITTEE MEMBERS:

STEPHEN L. ROSEN, Chairman
JOHN D. SIEBER, Member
GRAHAM B. WALLIS, Member

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1 ACRS STAFF PRESENT:

2 MARVIN D. SYKES

3

4 ALSO PRESENT:

5 SUZANNE BLACK, NRR

6 DAVID DIEC, NRR

7 FRED EMERSON, Nuclear Energy Institute

8 JEFF ERTMAN, Progress Energy

9 RAY GALLUCCI, NRR

10 PAUL GUNTER, Nuclear Information and

11 Resource Service

12 DENNIS HENNEKE, Duke Power

13 LESLIE KERR, NRR

14 ALEX R. KLEIN, NRR

15 ALAN KOLACZKOWSKI, SAIC

16 DAVID LOCHBAUM, Union of Concerned Scientists

17 ERASMIA LOIS, RES

18 PHILLIP QUALLS, NRR

19 BRIAN THOMAS, NRR

20 SUNIL WEERAKKODY, NRR

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I-N-D-E-X

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<u>AGENDA ITEM</u>	<u>PAGE</u>
Opening Remarks	4
Opening Statement	6
Background Information Related to	9
Rulemaking	
Elements Important to Rule	23
Acceptance Criteria	31
Key Issues	41
Regulatory Analysis	101
Stakeholder Comments	184
Member Comments/Adjourn	195

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

(1:28 p.m.)

CHAIRMAN ROSEN: The meeting will now come to order. This is a meeting of the Fire Protection Subcommittee. I'm Stephen Rosen, Chairman of the Fire Protection Subcommittee.

ACRS members in attendance at this meeting are Jack Sieber and Graham Wallis. Marvin Sykes of the ACRS staff is the Designated Federal Official for this meeting.

The purpose of this meeting is to discuss the current rulemaking activities which would allow for the use of certain manual operator actions to satisfy existing requirements of 10 CFR 50, Appendix R. The staff is currently seeking approval from the Commission to release this draft proposed rule to the public for review and comment.

The subcommittee will gather information, analyze relevant issues and facts, and formulate proposed positions and actions as appropriate, for deliberation by the full committee. The rules for participation in today's meeting have been announced as part of the notice of this meeting previously published in the Federal Register on October 19, 2004.

We have received written comments from the

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1 Union of Concerned Scientists, the Nuclear Information
2 and Resources Service, and the Nuclear Energy
3 Institute, and requests for time on our meeting agenda
4 to make oral statements regarding today's meeting.

5 The agenda shows 10 minutes for
6 stakeholder comments towards the end of the meeting.
7 Because of the interests of the ACRS subcommittee and
8 the full committee on stakeholder comments on this
9 issue, we are going to expand the available time for
10 those stakeholder comments showing 10 minutes to 20
11 minutes per stakeholder, if they choose to use that
12 much time, and to do that I am informing the following
13 members of the -- on the agenda that their times have
14 been subsequently shortened.

15 Mr. Diec on Roman numeral three,
16 Background Information, we'd like you to see if you
17 can do that in 15 minutes. David, is that okay?

18 MR. DIEC: Yes.

19 CHAIRMAN ROSEN: Okay. And Elements
20 Important to the Rule, Mr. Klein, perhaps 10 minutes
21 for you?

22 MR. KLEIN: Yes.

23 CHAIRMAN ROSEN: We know what that is.
24 Brief refresher, please.

25 We're going to take our break down to 10

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1 minutes, and we're going to -- in the principle of
2 giving at home as well. And Regulatory Analysis, Mr.
3 Kerr, we'd like 10 minutes off that. That's on the
4 Cost and Savings perhaps? I think that's Ms. Kerr.
5 Yes, sorry. If you can do that in 20 minutes, we'd
6 appreciate it.

7 The Proposed Rule Text, David, how about
8 doing that in 10 minutes instead of 15?

9 MR. DIEC: That would be nice, if we can
10 do it in five minutes.

11 (Laughter.)

12 CHAIRMAN ROSEN: Okay. Well, then you can
13 think about using your five minutes extra.

14 MEMBER WALLIS: You've got it wrong, Mr.
15 Chairman. What you're going to do is you're going to
16 allow us to ask questions for the same amount of time,
17 and they have to cut those times by half.

18 CHAIRMAN ROSEN: Well, right now, the
19 current plan is as I stated. We really want to hear
20 from stakeholders, and that's why I'm trying to do
21 that, ask for all of your cooperation to do that.

22 And now we'll go forward with the meeting,
23 please. Suzie Black?

24 MS. BLACK: Yes. Thank you. Suzie Black,
25 Director of Division of Systems Safety and Analysis.

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1 I want to thank you for holding this subcommittee. I
2 think it's important to hear all the views of all the
3 stakeholders, because this has been controversial, to
4 say the least.

5 There have been assertions that the NRC is
6 fixing the rule to reward bad behavior, and that we
7 intend to codify -- what we intend to codify is
8 unsafe, uncontrolled, ad hoc, or last-ditch efforts to
9 shut the plant down. And I assure you that's not what
10 this rulemaking is about. Yes, this is supposed to
11 approve what was previously unapproved, but safe
12 manual actions.

13 We are continuing to inspect in this area,
14 and we identify unapproved manual actions or
15 feasibility is subsequently -- and their reliability
16 is evaluated by the inspection staff. And if they are
17 judged on safety significance, there is corrective
18 actions as well as comp measures that are required.
19 It is only those that we believe that are acceptable
20 that will be approved through this rulemaking.

21 Now, the rule language itself has not been
22 that easy to develop, and it may not be able to cover
23 all situations which are safe, but, nonetheless, may
24 not meet the criteria. They'd end up in the final
25 rule, and so there may be some exemptions still

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1 required for some situations that we still believe are
2 safe.

3 But the rule language itself has to be
4 pretty specific, and in order to preclude ones that
5 could potentially be unsafe and unacceptable.

6 Fire protection also relies on defense-in-
7 depth, and we are ensuring through this rule that we
8 aren't undermining the principle of defense-in-depth
9 through this rulemaking.

10 The rule language has been put on the web,
11 and I think -- I believe we e-mailed it to all the
12 stakeholders a couple days ago in preparation for this
13 meeting. There have been some comments that it's not
14 risk-informed. Well, that's true.

15 This part is not risk-informed, but we
16 have 50.48(c), which is the risk-informed fire
17 protection rule. And that fire protection rule could
18 accommodate these manual actions, and a comprehensive
19 risk-informed evaluation of these manual actions.

20 But risk-informing this one piece of
21 Appendix R would be much more difficult, and we
22 support more of a holistic approach through 50.48(c).
23 But let me reiterate that it is not our intention to
24 permit unsafe, unfeasible, non-reliable manual actions
25 in lieu of protection through fire protection features

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1 in this rulemaking.

2 That concludes my opening statement.

3 MEMBER WALLIS: Suzie, can I ask you
4 something here?

5 MS. BLACK: Sure.

6 MEMBER WALLIS: How long have these
7 unapproved actions been going on for?

8 MS. BLACK: It could be as long as I think
9 15 years perhaps.

10 MEMBER WALLIS: So for 15 years, they've
11 been doing unapproved things.

12 MS. BLACK: Yes.

13 MEMBER WALLIS: Okay. Thank you.

14 CHAIRMAN ROSEN: Suzie, I want to
15 compliment you and hold you up as a model for the rest
16 of the staff for completing your talk on time.

17 MS. BLACK: Thank you.

18 (Laughter.)

19 CHAIRMAN ROSEN: David?

20 MR. DIEC: Good afternoon. My name is
21 David Diec, and I'm the Project Manager for this
22 rulemaking effort.

23 With me today, who will make the
24 presentation as we go through the talk today, are
25 Erasmia Lois from the Office of Research; Alex Klein

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1 from the Office of Nuclear Reactor Regulation; Alan
2 Kolaczowski is from SAIC, who is supporting Research
3 in this effort; and Leslie Kerr, who is from the Reg
4 Analysis group of NRR.

5 Before we go into the detailed discussion
6 today, I'd just like to go over the status real quick,
7 that we are in the final preparation for the EDO
8 review and concurrence of the proposed rulemaking
9 package. We are scheduled to go back to brief the
10 full committee next week early, and we are asking for
11 a letter of recommendation on this proposed rule.

12 We are committed to give the Commission
13 the package in early December for consideration, and
14 this is where we are as far as the status of the
15 rulemaking.

16 I will -- the agenda for today's
17 discussion, I will go through background information
18 about the --

19 MEMBER WALLIS: David, are you going to
20 demolish the arguments that we're going to hear after
21 your presentation -- in your presentation? Or how do
22 we get an answer to the public comments, if that's the
23 end of the session today?

24 MR. DIEC: I'm sorry?

25 MEMBER WALLIS: We're going to hear some

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1 public comment at the end of today, right?

2 MR. DIEC: Right.

3 MEMBER WALLIS: How do we get a response,
4 if they are the last people to speak?

5 MS. BLACK: Let me -- can I answer that?
6 I think a lot of the comments that we're going to
7 receive today will be appropriate comments for us to
8 consider during the proposed rulemaking. And I don't
9 think this is our last opportunity to go forward.

10 What we're asking you today is that the
11 rule is good enough to go out for proposed rulemaking.
12 We realize there's going to be a lot of comments on
13 this rule. In fact, the rule itself, when it goes out
14 for comments, will actually ask particular questions
15 on those areas where we think there's a lot of
16 interest from the public.

17 MEMBER WALLIS: So the letter -- you want
18 a letter from us in November.

19 MS. BLACK: Yes.

20 MEMBER WALLIS: All we can say is, "Send
21 out the public -- for public comment the rule."

22 MS. BLACK: Yes. We think -- if you think
23 it's good enough to go out for public comment, then we
24 will --

25 MEMBER WALLIS: Okay. We're not going to

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1 say it's a great rule. We're just going to say --

2 MS. BLACK: Right.

3 MEMBER WALLIS: -- it's good enough to go
4 out and be commented upon.

5 MS. BLACK: Correct.

6 CHAIRMAN ROSEN: Or we could say it's not
7 good enough.

8 MEMBER WALLIS: Or we could say it's not
9 good enough. But we're not --

10 CHAIRMAN ROSEN: But you ought to change
11 this or that.

12 MEMBER WALLIS: But we're not going to
13 give a blessing to the rule.

14 CHAIRMAN ROSEN: I think we have three
15 possibilities -- yes, no, or yes but.

16 MEMBER WALLIS: Yes. Well, we could say
17 we have lots of reservations about the rule, but it
18 should still go out for comment. We could say that.

19 CHAIRMAN ROSEN: And we can list our
20 reservations.

21 MEMBER WALLIS: Yes. Okay, sure. Thank
22 you.

23 MR. DIEC: I will go through the
24 background agenda for the discussion today, and
25 elements of importance to the rule development will be

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1 discussed by Alex. Acceptance criteria also will be
2 discussed by Alex.

3 Key issues will be discussed, and the
4 time-margin concept, from the Office of Research and
5 Detection Suppression -- will be, again, from Alex.

6 And, lastly, we'll follow with the
7 recommendations and results. Lastly, the proposed
8 rule text, which we published recently and made it
9 available to public, I will walk through of how we
10 construct the rule language itself.

11 As Suzie alluded to earlier, that we
12 became aware that operator manual action being
13 utilized by licensees to satisfy 10 CFR Part 50,
14 Appendix R, Section III.G.2. We subsequently revised
15 the IP to focus inspectors on the visibility of such
16 action.

17 The NRC indicated that the current
18 requirement in the Section III.G.2 cannot reasonably
19 be interpreted to allow the use of operator manual
20 action, other than fire barrier distance separation
21 detection to bring the plant down to the hot safe
22 shutdown condition.

23 We also recognize that while operator
24 manual action is judged to be in compliance with the
25 regulation, the use of such action to achieve safe

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1 shutdown as an alternate approach is acceptable
2 through exemption requests.

3 We'd note that the industry
4 representatives, through a number of meetings, stated
5 that many licensees are not in compliance with
6 existing requirements. And we also believe that if
7 those manual actions were to be reviewed and approved
8 by the staff, they more than likely would be found to
9 be acceptable and safe.

10 Because of the apparent misinterpretation
11 of the current rule, in 2003 we forwarded the
12 rulemaking plan in SECY 03-100 to the Commission for
13 consideration, asking for authority to codifying the
14 use of operator manual action in Section III.G.2, and
15 to consider enforcement action or other alternatives
16 to provide regulatory stability as part of the
17 rulemaking plan. Shortly after the Commission issued
18 the SRM in September of 2003, approved the staff
19 rulemaking plan to proceed with such action.

20 We believe that the NRC resource would be
21 better utilized and applied -- when applied to
22 significant safety issues. Fire protection regulation
23 would be more efficient and effective when it includes
24 the use of operator manual action.

25 MEMBER WALLIS: So you're on your next

1 slide now, David?

2 MR. DIEC: Yes. Thank you. And this
3 objective is certainly consistent with one of the
4 NRC's --

5 MEMBER WALLIS: Is that the only
6 objective? I mean, isn't there some safety objective
7 involved here?

8 MR. DIEC: Yes. It is only one of the
9 objectives that we --

10 MEMBER WALLIS: Isn't the safety objective
11 the prime objective? I mean, I don't really care how
12 efficient you are, though you're spending my money.
13 But your main objective is safety. And if you have
14 some measure of that, you could tell us. Maybe that
15 will be more helpful than just this objective here.

16 I mean, this is fine, but presumably the
17 agency is always trying to be efficient. But its
18 mandate is to do something about safety. So I'm
19 surprised you don't have a rule objective which is
20 some -- has some measure of safety in it.

21 MEMBER SIEBER: Well, I presume that you
22 could forego the rulemaking process and just do
23 everything by exemption. Is that correct?

24 MR. DIEC: Certainly, the exemption
25 process is always there.

1 MEMBER SIEBER: And so this is really a
2 move to be more specific in what it is you require,
3 and to be more efficient in the use of your time and
4 the licensee's time, I presume.

5 MR. DIEC: The hope is to reduce the
6 overall burden through a number of reductions in
7 trivial and insignificant administrative exemptions.

8 MEMBER SIEBER: On the other hand, does
9 this rule -- proposed rule break new technical ground,
10 or is it more of a pro forma thing, like a licensee
11 would submit an exemption and the staff would approve
12 it? It seems to me that there's a little bit more to
13 the rule than what licensees now have, which is not
14 consistent with the rule, right?

15 MS. BLACK: Well, I think -- this is Suzie
16 Black. When we first put out the inspection criteria
17 back in March 2003, we used criteria that we had been
18 using through -- to review III.G.3 areas, and other --
19 we have other manual actions that are used in the
20 plant, not just in fire protection. So we used that
21 information to put out the inspection criteria.

22 But through the ACRS meeting and other
23 comments, we have been refining that. So I'd say in
24 some ways we are writing things down that I think that
25 we probably -- when we did an exemption review we

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1 thought about these things, but there was no explicit
2 criteria.

3 And the fact that we needed to have
4 explicit criteria in the rule made it seem like we're
5 breaking new ground. But I think we're just trying to
6 codify what we have always believed we have done as
7 far as reviewing these manual actions.

8 MEMBER SIEBER: Okay. Which --

9 MEMBER WALLIS: Well, if it's just a
10 housekeeping activity, why do you involve the ACRS?
11 If it's just tidying up --

12 MEMBER SIEBER: Well, it's more than that,
13 because there is no way for us to make that judgment,
14 because it hasn't been strictly codified in the past.
15 And so now this is a -- sort of an initial attempt to
16 put in Title X the requirements that otherwise existed
17 in inspection plans and the standard review plan, to
18 some extent, or was otherwise assumed to be implicitly
19 known by everyone.

20 MEMBER WALLIS: Just to make it more
21 formal and understood by everybody.

22 MEMBER SIEBER: Well, that's a laudable
23 goal, and I think that putting aside whether we're
24 more efficient or not, the fact that you write down
25 what your expectation is and can then cite something

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1 official like Title X is the appropriate way to go,
2 provided that the proposed rule is really a good rule.

3 CHAIRMAN ROSEN: Well, I think I want to
4 respond to Graham's question about safety. After all,
5 that is why we're here, and I -- in thumbing, again,
6 through this package, and looking at all of my yellow
7 stickies, I do recall something about -- and maybe it
8 was the reg analysis, where the safety benefits of the
9 rule are discussed. Am I dreaming or --

10 MS. KERR: They're not discussed --

11 MEMBER SIEBER: Come to a microphone. Any
12 one.

13 MS. KERR: They're not discussed
14 extensively, no, in reg analysis.

15 MEMBER SIEBER: And your name?

16 MS. KERR: Leslie Kerr.

17 MEMBER SIEBER: Okay.

18 MEMBER WALLIS: Is somebody going to tell
19 us the safety benefit?

20 MS. BLACK: I don't know that there is so
21 much a safety benefit as it is maintaining safety. We
22 believe that we're going to permit manual actions
23 through this rule that we would have permitted through
24 the exemption process or the approval process for
25 post-1979 plants. But in this way we're putting it in

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1 the rule, and, therefore, when we approve it we don't
2 need to give an exemption,.

3 MEMBER WALLIS: So maybe you're trying to
4 ensure that you don't lose safety?

5 MS. BLACK: Exactly. Yes.

6 MR. KLEIN: This is Alex Klein. The rule
7 right now, as it exists, III.G.2, does not allow
8 operator manual actions under III.G.2. And what we're
9 attempting to do is to codify the implementation of
10 manual actions, and at the same time include what the
11 staff believes to be acceptable feasibility/
12 reliability criteria for implementing those manual
13 actions.

14 So in that respect, I believe that, you
15 know, we're putting down on paper a standard, if you
16 will, that would ensure safety when you -- when a
17 licensee implements an operator manual action under
18 III.G.2.

19 MEMBER WALLIS: Okay.

20 MR. DIEC: We have met with various
21 stakeholders, including the subcommittee a number of
22 times. In September of last year, we briefed you on
23 the rulemaking plan itself, and in October of last
24 year we discussed the interim acceptance criteria with
25 a number of stakeholders, and subsequently we've

1 released that through the Federal Register notice to
2 solicit stakeholder comments on the interim acceptance
3 criteria.

4 And we received a number of comments,
5 which we incorporate that into the package that you
6 have in front of you for review before we came and
7 talked with you today.

8 In April of this year -- let me go back a
9 little bit. During the rulemaking plan back in
10 September 2003 when we briefed you, you raised a
11 question about the reliability of the use of operator
12 manual action. And in April, we addressed that issue
13 by introducing the concept of time margin, which Alex
14 will discuss in detail as we go through the
15 presentation today.

16 The role of detection and suppression was
17 also raised. We discussed about the rationale, which
18 Alex again will go through in detail today why we
19 consider detection and suppression as part of the
20 defense-in-depth. Applicability of manual action to
21 other section of III.G, namely III.G.1 and III.G.3
22 areas, were raised by stakeholders.

23 In the proposed rule package itself, we
24 proposed the Commission to endorse the approach that
25 we would ask a number of questions, to present a

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1 number of questions to the public and ask for a
2 response in these areas, whether or not the -- what
3 will be the appropriate margin for the time margin
4 consideration or whether or not the types of
5 suppression systems being considered, and whether or
6 not there will be advantages or disadvantages by
7 applying operator manual action in other sections
8 beyond what we're considering for Section III.G.2.

9 One point I wanted to -- let me go back to
10 -- to the next slides. In June -- following shortly
11 after that, in June of this year, we held a Category 3
12 public meeting where we invited not only industry
13 representatives but other public interest groups to
14 participate in a meeting. The purpose was to obtain
15 additional information, and help us to gather the
16 information and consider those for the formulation of
17 the proposed rule.

18 The role of detection and suppression was
19 also discussed in detail at this meeting, as well as
20 the applicability of manual action. That's the reason
21 why we want to propose the questions in the rule
22 packing -- package itself, to ask such questions and
23 soliciting the response back as we go through the
24 Commission endorsement for the publication of the
25 proposed rule package.

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1 One thing I want to stress in this meeting
2 is that at the conclusion of the meeting industry
3 representatives acknowledged that the role of manual
4 action has -- is important for defense-in-depth
5 approach. So that is the point that I want to say.

6 MEMBER WALLIS: Now, this public meeting.
7 You have experts from the industry that's affected
8 that's being regulated, and you maybe have a few
9 concerned citizens. Do you have experts in fire
10 protection? Somebody who is sort of outside the
11 politics of this thing who can actually give you a
12 technical evaluation of what's being suggested?

13 MR. DIEC: If I recall correctly, the
14 participants, most of them, you're right, they --

15 MEMBER WALLIS: They all have something at
16 stake, and I'd like there to be some sort of impartial
17 knowledgeable observer there who could give proper
18 advice. I mean, I'm not an expert on fires. But if
19 there were someone who were distinguished and
20 knowledgeable who could say this is okay, that might
21 help me more than people who are just representing
22 their own stake.

23 MR. DIEC: No, I don't recall such
24 individuals that you are alluding to.

25 MEMBER WALLIS: I don't know how we bring

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1 that into the discussion. That would help me.

2 MR. DIEC: Right. We recently engaged
3 with stakeholders again last month at the information
4 -- Fire Protection Information Forum. And as I
5 discussed earlier, that we published the proposed rule
6 text on our website and for information of what the
7 rule text is going to look like and what it's going to
8 say.

9 At this juncture, I'm going to switch over
10 to Alex to discuss about the elements important to the
11 rule development itself.

12 CHAIRMAN ROSEN: We're right on schedule,
13 David. Very good.

14 MR. DIEC: Thank you.

15 CHAIRMAN ROSEN: Actually, one minute
16 ahead.

17 MR. KLEIN: Good afternoon. My name is
18 Alex Klein. I'm a Senior Fire Protection Engineer in
19 the Plant Systems Branch in the Division of Systems
20 and Safety Analysis in the Office of Nuclear
21 Regulatory -- in the Office of Nuclear Reactor
22 Regulations.

23 I've been with the agency almost a year
24 and a half now, and I've been involved with operator
25 manual actions now a little over four months. I've

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1 been given that dubious distinction of providing the
2 technical lead on this project.

3 MEMBER WALLIS: Can I ask you, then, about
4 your expertise --

5 MR. KLEIN: Yes, sir.

6 MEMBER WALLIS: -- on fire protection?

7 MR. KLEIN: Yes, sir. I've got over 25
8 years of fire protection engineering experience. I'm
9 a registered fire protection engineer. I've worked
10 for the industry for 10 years. I worked for the
11 industry as a consultant for over five years.

12 MEMBER WALLIS: That's very good. I mean,
13 I just wondered if you had that sort of background or
14 if you'd been transferred from somewhere else and you
15 were learning.

16 MR. KLEIN: No, sir. I'm a bona fide fire
17 protection engineer.

18 MEMBER WALLIS: Thank you.

19 MR. KLEIN: What I'd like to talk to you
20 about is -- and I'll move through this very quickly,
21 because I believe that we've -- you folks have already
22 heard this before during the April meeting and perhaps
23 some of it during the September meeting.

24 But I want to just give you a little bit
25 of background on why we provided acceptance criteria,

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1 because the acceptance criteria provides the standard
2 to which -- that provides a reasonable level of
3 assurance that the operator manual actions can be
4 satisfactorily, reliably, and feasibly accomplished.

5 Now, this -- these manual actions, the
6 criteria that we're proposing in our rule, address, as
7 we've said before, both the feasibility -- in other
8 words, can it be done, and the reliability, which
9 addresses the repeatability of the manual actions.

10 MEMBER WALLIS: Can you give us a measure
11 of these reasonable levels of assurance?

12 MR. KLEIN: We're going to talk about the
13 criteria, and I will provide to you some details of
14 the criteria that will provide what I believe is a
15 reasonable level of assurance. Did I answer your
16 question?

17 MEMBER WALLIS: Are you going to give us
18 some measure of that?

19 MR. KLEIN: I can't quantify -- I cannot
20 quantify the measure of reasonable assurance. I can't
21 give you a number, if that's what you're looking for.

22 MEMBER WALLIS: Well, I always get a
23 little nervous when I get these vague terms. And I
24 have a reasonable level of assurance that I won't hit
25 my finger when I'm chopping wood, but I did last time

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1 I did it. I mean, so, you know, what's the sort of
2 expectation of probability of success? Are you going
3 to tell us something about that?

4 MR. KLEIN: Not in terms of numbers. I
5 think that -- because this is -- Appendix R is a
6 deterministic rule, what we've proposed are
7 deterministic criteria with defense-in-depth to
8 provide that reasonable level of assurance.

9 MEMBER WALLIS: So it's all in the mind of
10 the beholder somehow? What I think is reasonable may
11 not be what you think is reasonable?

12 MR. KLEIN: What we've tried to do is put
13 down what we believe to be are clear and objective
14 criteria to prevent the --

15 MEMBER WALLIS: In case it has to have
16 some numbers associated with it. Otherwise, it's all
17 just debatable.

18 MR. GALLUCCI: This is Ray Gallucci from
19 NRR Fire Protection. The time margin concept
20 discusses the reliability aspect. It does not get
21 into human -- HRA has not been incorporated into this
22 rule where you're going to have thresholds for human
23 error probability that must be met. The reg analysis
24 -- the reg guide does discuss the criteria in detail
25 and gives you listings of guidance, etcetera, as to

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1 what would be -- how you would meet their
2 acceptability.

3 The reg guide also has taken an initial
4 attempt at quantifying the time margin, which is a
5 surrogate measure for the human reliability/human
6 error probability. So I think as far as any
7 measurable values as far as today's presentation, I
8 think the farthest we're going to get will be Alan's
9 presentation on time margin.

10 MEMBER WALLIS: Can you give me a
11 ballpark? Are you saying that they'll perform the
12 right action 50 percent of the time or 90 percent or
13 99 percent? What kind of ballpark are you talking
14 about when you say "reasonable level of assurance"?

15 MR. KOLACZKOWSKI: Alan Kolaczowski,
16 SAIC. I'll try to give you a general -- at least a
17 rough idea. I think that if all these criteria are
18 met, many of which basically address performance
19 shaping factors as we would consider them in human
20 reliability analyses, etcetera, that if you were to
21 put it through an HRA model and say, "Okay, you have
22 instrumentation, you have the necessary time, you have
23 accessibility, you know the equipment will operate,"
24 etcetera, etcetera. I have a feeling most HRA models
25 would predict numbers down in the 10^{-2} , 10^{-3} failure

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1 probability, if not lower. That's my own personal
2 opinion.

3 MEMBER WALLIS: That would be very helpful
4 to me, rather than these qualitative statements.

5 CHAIRMAN ROSEN: Now, Alan --

6 MEMBER SIEBER: But that's subjective,
7 right?

8 CHAIRMAN ROSEN: -- let me examine that
9 for a moment. 10^{-2} to 10^{-3} , that's with time margin
10 that meets the requirements of the rule, the two times
11 the required time? I just want to be sure I
12 understand what you're saying.

13 MR. KOLACZKOWSKI: Yes. I'm coming at it
14 as if the rule, as it's currently envisioned, were --
15 in other words, all its elements were in there. And,
16 again, I'm just trying to throw out an answer very
17 quickly to a question. But I -- I would think that
18 most HRA models, no matter what you use, whether it's
19 THERP, ATHENA, whatever, with these kinds of
20 performance shaping factors you're going to get some
21 fairly low failure probabilities.

22 CHAIRMAN ROSEN: Well, one of the key
23 performance shaping factors is time.

24 MR. KOLACZKOWSKI: Is enough time to do
25 it.

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1 CHAIRMAN ROSEN: Is the staff is properly
2 recognized.

3 MR. KOLACZKOWSKI: Certainly.

4 CHAIRMAN ROSEN: And put in a time margin
5 of a factor of two on the required time.

6 MR. KOLACZKOWSKI: Yes.

7 CHAIRMAN ROSEN: So that would force --
8 suppress the performance shaping factor for time down
9 to a fairly low value.

10 MR. KOLACZKOWSKI: Yes. That's --

11 CHAIRMAN ROSEN: It suppresses the failure
12 probability for time -- required time to a fairly low
13 value.

14 MR. KOLACZKOWSKI: That is correct.

15 MEMBER SIEBER: But the only quantitative
16 measure is the time it takes to do it, plus the
17 margin, as opposed to, are you going to do it
18 correctly? Are the environmental conditions
19 sufficiently mild so that it's possible for a human
20 being to reliably take the action that you're
21 presupposing, and so forth? So those factors really
22 aren't explicitly in the rules, just the timeline,
23 plus margin. Right?

24 MR. KOLACZKOWSKI: I mean, the only other
25 acceptance criteria are in the rule. And they all

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1 play a role in human performance. I mean, obviously,
2 if a piece of equipment is not accessible, you can't
3 get to it, I don't care if you have a whole lot of
4 time, you can't perform the action.

5 MEMBER SIEBER: But that's --

6 MR. KOLACZKOWSKI: So certainly all of the
7 other criteria also play a role in the human
8 performance being able to actually carry out the
9 action.

10 MEMBER SIEBER: But that's a zero or one,
11 if you can't get to it because the door is locked.

12 MR. KOLACZKOWSKI: Effectively, yes.
13 Effectively, is there a way? It removes a lot of the
14 uncertainty in terms of the reliability, being able to
15 perform the action.

16 MEMBER WALLIS: This is all in there? I
17 mean, if there's a smoke-filled room, presumably the
18 sprinkler goes off because it just measures
19 temperature and sprinkles. But if somebody can't get
20 in there because of the smoke, he doesn't do what the
21 sprinkler would do.

22 MS. BLACK: Excuse me.

23 MEMBER WALLIS: Are we placing the
24 sprinkler with a person? You've got to consider all
25 that sort of --

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1 MS. BLACK: This is Suzie Black. The
2 place where the manual actions are taken is not in the
3 room where the fire is or where the sprinkler is.

4 MEMBER WALLIS: It's all in the control
5 room?

6 MS. BLACK: No. It may be in another fire
7 area. You are assuming that the cable in the area
8 with the fire burns up, and that's why you need the
9 manual actions.

10 MEMBER WALLIS: Lost it. Okay.

11 MS. BLACK: Right.

12 CHAIRMAN ROSEN: Alex?

13 MR. KLEIN: Thank you. The last bullet
14 really is to -- just to indicate that the criteria
15 that we're providing in the rule is to permit both the
16 licensees and the NRC to establish some consistency,
17 so that we're all on the same page basically.

18 The acceptance criteria also provides
19 parameters, again, for both -- both which the
20 licensees and the NRC can use when a licensee conducts
21 its evaluations, whether or not it can implement a
22 manual action, and it also provides the regulator the
23 ability to conduct an inspection in an objective and
24 thorough manner using the same acceptance criteria.

25 And the last bullet speaks to the fact

1 that the criteria that we've developed generally apply
2 to human actions and other applications. In other
3 words, the criteria that we've developed we believe is
4 not anything that's new.

5 It's criteria that we've used in other
6 areas, and I'll give a very quick example -- is under
7 Appendix R, Section III.I, which is fire brigade
8 training area. You'll see that there's some very
9 specific requirements in there for training, for
10 instructions, for practice, and for drills.

11 So the human action type of criteria that
12 we've developed are included -- have been developed in
13 other areas. And I know that -- I believe Alan is
14 going to talk a little bit about the background of the
15 development of the time concept, but the criteria
16 itself is out there today in standards such as the
17 ANSI 58.8 standard, which the staff looked at in
18 detail for adoption here.

19 Now, the criteria was developed because we
20 needed to consider the fact that fires are often a
21 dominant contributor to plant risk. I believe that
22 we're all very well aware of that. The other item I
23 wanted to mention is that fires -- they're a unique
24 hazard, and the efforts to mitigate their effects --
25 and I've used the example of spurious actuation, for

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1 example, of valve closing or something like that.

2 It involves extensive activity outside of
3 the main control room. And when you have fires, or a
4 fire in a nuclear powerplant, it presents a very
5 unique environmental hazard in the plant that you need
6 to address if you are going to send a human -- an
7 operator out into the area.

8 For example, I've got listed here that
9 he's got to consider the -- the licensee has to
10 consider the fact that there is smoke, that there's
11 heat, toxic gases, either along the access or egress
12 routes for the operator. There are suppression
13 activities that take place in the plant that might
14 interfere with the operator manual action, the access
15 and egress routes thereto.

16 For example, there might be fire hoses
17 laid out through the area that that operator would
18 have to deal with in order to access or egress the
19 area that he needs to take the manual action at.

20 So with that, let me just quickly go
21 through the acceptance criteria. You've seen a lot of
22 this in different wording, I believe. What we've done
23 is we've restructured the criteria somewhat. We've
24 got under the proposed rule language under III.P.2(a)
25 a criteria for analysis, which basically determines

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1 the feasibility and reliability of the operator manual
2 action, where the licensee is required to develop a
3 fire timeline and the time margin that we'll talk
4 about.

5 The licensee needs to consider the
6 environmental conditions that I just spoke about,
7 consider the functionality of and the accessibility of
8 the equipment or the cables that he might need to
9 access. He needs to consider the indications,
10 diagnostics, confirmatory, so forth. Certainly,
11 communications are important. Portable support
12 equipment -- you know, is he going to need a ladder?
13 Is he going to need a key? Is he going to need a
14 flashlight? Things like that.

15 And, of course, last -- the life support
16 equipment for that operator. Is that --

17 MEMBER WALLIS: Put that in perspective
18 for me. What are these manual actions replacing? I
19 thought they were replacing requirements on separation
20 of trains and barriers and things like that.

21 MR. KLEIN: That's correct. The --

22 MEMBER WALLIS: So it's a very indistinct
23 connection. I mean, if you want to do something about
24 a fire, that's a completely different question in my
25 mind to: what does the operator do to bring the

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1 system to cold shutdown?

2 MR. KLEIN: Yes.

3 MEMBER WALLIS: They're two different
4 things, aren't they?

5 MR. KLEIN: Well, as Suzie indicated, the
6 fire takes place in the area where you've got
7 potentially unprotected, redundant trains. For
8 example, because you've got the lack of fire barrier.

9 MEMBER WALLIS: So the operator has to
10 know that if the fire is there he's got to be much
11 more careful about what he does, because he might lose
12 two trains rather than one or something, is that what
13 it --

14 MR. KLEIN: Well, that could be one of
15 them. The operator has to be aware of what manual
16 actions he takes place -- that takes place that
17 doesn't inadvertently affect his ability to safely
18 shut down the plant.

19 MEMBER WALLIS: I'm worried about him
20 running around the plant looking for a ladder. That
21 seems to be --

22 MR. KLEIN: No.

23 MEMBER WALLIS: -- totally inappropriate.

24 MR. KLEIN: The reason we put the criteria
25 for portable support equipment in here is because of

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1 the timing issue. We also do not want an operator in
2 a plant looking for a piece of equipment that's vital
3 for him to perform that manual action.

4 MEMBER WALLIS: It's going to be there.

5 MR. KLEIN: That's what we're suggesting.

6 CHAIRMAN ROSEN: It would be pre-staged,
7 I take it, in accordance --

8 MR. KLEIN: Yes.

9 CHAIRMAN ROSEN: -- with the fire pre-
10 plan.

11 MR. KLEIN: That's right. In
12 accordance --

13 CHAIRMAN ROSEN: The operator would simply
14 know there's a fire in Region X. Therefore, I have to
15 go to Region Y and do the things I've been trained for
16 for the fire in Region X. And I expect when I get to
17 Region Y there will be a ladder posted on the wall.
18 I've been there before, and I know there's a ladder
19 there. I hope it will be there today. And then, when
20 I take it down, I'll be able to climb up and close
21 the --

22 MR. WEERAKKODY: That's --

23 CHAIRMAN ROSEN: -- that I have to close.

24 MR. WEERAKKODY: That's correct. There
25 will all be -- I mean, even today that's what the

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1 expectation is. If you are relying on a procedure,
2 the pre-staging and the equipment is there.

3 CHAIRMAN ROSEN: Right. It's all thought
4 out in advance.

5 MR. WEERAKKODY: Yes.

6 MR. KLEIN: That's right.

7 CHAIRMAN ROSEN: In training.

8 MR. WEERAKKODY: Yes.

9 MR. KLEIN: That's right. And if you look
10 at my next slide, we also have procedures in training,
11 which the procedures would talk about what actions the
12 operator is expected to take. And, of course, when
13 they develop the procedures, we would expect the
14 licensee to have developed the support equipment.

15 The equipment that I just spoke about,
16 that you just spoke about, would be available for him
17 to feasibly and reliably perform that manual action.

18 We have another criteria under
19 implementation -- in other words, the staffing. We're
20 requiring that the licensee have qualified personnel.
21 In other words, the operator needs to be qualified to
22 perform that manual action. It can't be just anybody
23 in the plants. And that person or that operator needs
24 to be available to perform that manual action.

25 In other words -- and I'll give you an

1 example. If the fire brigade has on its staff two
2 equipment operators, the licensee, in our viewpoint,
3 could not utilize any of those two fire brigade
4 numbers to go ahead and perform a manual action,
5 because that operator now has a collateral duty, which
6 we believe is not feasible and reliable to perform
7 that manual action.

8 And then, the last criteria that we have
9 is the demonstration.

10 MEMBER WALLIS: I'm trying to visualize
11 this again. There's a fire in Region X. So he's now
12 got to assume that all the trains in that region are
13 not functional, and he goes to somewhere else and
14 shuts a valve or opens a valve to get some alternative
15 way to cool the core.

16 MR. KLEIN: He may do that. He also has
17 to address any spurious actions that might result.

18 MEMBER WALLIS: And there might be a very
19 small fire or some spurious -- spurious actuation of
20 fire detection equipment, which makes him think
21 there's a fire in Region X. So he throws away his
22 very useful equipment he's got there, because he just
23 has to assume it's no longer operable.

24 MR. KOLACZKOWSKI: Alan Kolaczowski,
25 SAIC. I think you'll find that most, if not all,

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1 licensees' procedures, upon suspecting a fire, one of
2 the first things they usually do is first confirm
3 whether there is a fire or not. I believe all the
4 procedures are written that way.

5 MEMBER WALLIS: But, then, suppose you
6 have some very useful equipment in there. It may not
7 be damaged. It might be very useful for cooling the
8 reactor. Do you still have to --

9 MEMBER SIEBER: No.

10 MEMBER WALLIS: -- behave as if it were
11 not there?

12 MEMBER SIEBER: No.

13 MR. KOLACZKOWSKI: That will depend on how
14 the procedures are written. I've seen both types.
15 I've seen procedures where the preemptive actions go
16 quite far, and will actually, if you will, they'll
17 make sure that the good train they're trying to
18 protect is running, and then start shutting down the
19 train that's suspect. So at least they still assure
20 that something is running.

21 Or they may -- I've seen other procedures
22 that are more reactive in nature, basically try to
23 rely on all the equipment that's available and then
24 just respond to changes in the status as it occurs.
25 I've seen procedures of both types.

1 MEMBER WALLIS: So all this is sort of
2 plant-specific, then, is it?

3 MR. KOLACZKOWSKI: To some extent.

4 CHAIRMAN ROSEN: It's plant-specific and
5 region-specific in the plant, depending upon what the
6 fire pre-plan says.

7 MEMBER SIEBER: But there is no rule that
8 requires a licensee to assume that everything in the
9 room now turns to dust.

10 MR. KOLACZKOWSKI: No.

11 CHAIRMAN ROSEN: That's a licensing
12 fiction. In the plants, they deal with reality.

13 MEMBER SIEBER: Yes. You look at your
14 instrumentation to see if it's working or not.

15 MR. KLEIN: Okay. The last bullet I have
16 is on demonstration, and I've put in parentheses the
17 complements to time margin. And the reason I say that
18 is because during the demonstration the licensee
19 performs a walkdown, which can be timed and used as a
20 benchmark for determining how long the licensee feels
21 that it's going to take to perform that particular
22 manual action. And he can use that, then, in the fire
23 timeline and in the development of his time margin
24 that Alan will speak about a little bit later --
25 actually, right now.

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1 The next -- I would like to introduce
2 Erasmia Lois from the Office of Research, who will
3 start the discussion on the time margin concept and
4 development.

5 MS. LOIS: Thank you, Alex. I work for
6 the Probabilistic Risk Assessment of the Office of
7 Research, who is supporting the research supporting
8 NRR in this rulemaking activity. And, specifically,
9 we tried to address the issue of reliability,
10 incorporating the reliability criteria with the
11 feasibility criteria that were developed by NRR
12 primarily.

13 On page 13, why we developed the -- how we
14 came up with the margin concept, in our attempt to
15 address the ACRS recommendations and comments that we
16 have to address reliability as well as feasibility,
17 and desire to incorporate human reliability analysis
18 insights and lessons learned.

19 And we believe that the time margin
20 addresses uncertainties that are associated with the
21 time it takes to diagnose, perform, and verify the
22 actions in a little bit more detail.

23 The ACRS concerns last year were that the
24 feasibility only to some extent addressed the
25 reliability of reactions, the existing qualitative

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1 criteria, and if the -- these criteria were met,
2 uncertainties will still remain that need to be
3 addressed and ensure high reliability of reactions.
4 And here I'm quoting the ACRS from last year.

5 We met and we tried to figure out how we
6 can address the ACRS recommendations for incorporating
7 reliability aspects into the criteria. We wrestled
8 with the idea of developing reliability goals, but we
9 felt that it would be very time- and resource-
10 consuming for both the licensees and the NRC
11 perspectives.

12 It will need to perform risk and
13 reliability analysis, but most importantly we would
14 have to obtain consensus on the approach, model, and
15 data. And, as you know, human reliability has not
16 established a consensus on those aspects.

17 MEMBER WALLIS: I'm rather surprised here
18 that you'd start off by saying fires are the dominant
19 contributor to risk. So you know it's the biggest
20 risk. Then, it would seem that the analysis should be
21 based on risk. You're saying it's too difficult to
22 do?

23 MS. LOIS: Do you want to answer this?

24 MR. WEERAKKODY: Yes. First, fires --

25 CHAIRMAN ROSEN: Sunil, say who you are.

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1 We know, but --

2 MR. WEERAKKODY: I'm Sunil Weerakkody.
3 I'm the Section Chief in Fire Protection, NRR. Fires,
4 for some plants, could be the dominant contributor, for
5 some plants a dominant contributor, not --

6 CHAIRMAN ROSEN: For some plants they are
7 the dominant contributor. For some they are -- for
8 many they are not.

9 MR. WEERAKKODY: Yes. And I think what
10 Erasmia is conveying -- and I agree -- is when we came
11 to you the last time you did have a proposal. I think
12 it came from Dr. Wallis -- that we try to come up with
13 some kind of acceptance criteria that's based on an
14 HRA number.

15 We went back and we secured, you know,
16 Research support, and then looked at why we kept doing
17 that. And I think the last bullet tells you why it's
18 almost an impossible task. It's not -- if it's an
19 easy task to do, then we would have done it.

20 But if you look at the ongoing debate
21 about, you know, the HRA quantification methods, and
22 then given that in a rule you need some consensus on
23 the model and the data and approach, that they used
24 such and such a criteria, we looked at that as an
25 impossible goal.

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1 So rather than trying to quantify and
2 create a numerical threshold, what the Office of
3 Research and, you know, its consultants did was to
4 look at the factors that -- try to capture and address
5 them in the time margin.

6 MS. LOIS: And that's on the next slide.

7 MR. WEERAKKODY: Yes.

8 MS. LOIS: If you --

9 MR. WEERAKKODY: Okay. No, no, no. You
10 go ahead.

11 MEMBER WALLIS: I'm just thinking about
12 this reliability. When we visit regions -- it's good
13 to visit regions and hear about the things that happen
14 at reactors. And I was very struck last time we
15 visited the region. They gave us lists of things that
16 had happened in plants, and there were several things
17 -- the type of team was sent out to close a valve, and
18 they went to the wrong place and closed the wrong
19 valve.

20 And things like that happen at plants.
21 I'm not saying it happens every day, but this is the
22 kind of thing that does sometimes happen. And I would
23 think you would want to somehow factor that into your
24 decisionmaking here.

25 MS. LOIS: And we believe we did. If we

1 -- if we just go to the next slide.

2 MEMBER WALLIS: Are you going to tell us
3 how you did it?

4 MS. LOIS: Yes. That's right.

5 Next slide, please.

6 MEMBER SIEBER: Well, the answer to that
7 question, which I think is a very good question, is
8 you're faced with the decision, do you allow a manual
9 action, or should you modify the plant, so you don't
10 need one? And when you don't quantify the probability
11 of a bad outcome, there is no way to decide whether
12 you ought to modify the plant or not, other than a
13 deterministic way, which this rule provides a -- sort
14 of an escape hatch.

15 MS. LOIS: However, if we look at the
16 bullet which is after -- the third bullet, weapons and
17 it is -- what we recognize -- why we were thinking
18 about how we could develop our reliability goals or
19 thresholds, we recognized that the feasibility
20 criteria address key human performance aspects that
21 we're dealing with in the human reliability.

22 So a lot of the issues that we would build
23 with in the human reliability analysis, and as part of
24 our -- all the uncertainty, if you wish, are now much
25 more deterministically determined -- I mean, set --

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1 because the staffing will be there, the equipment will
2 be there, so these are not uncertainties, are not
3 dealt in the uncertainty area anymore.

4 So we've -- that aspect, the fact that the
5 -- we have deterministic criteria that would ensure
6 staffing availability procedures, equipment,
7 demonstration of the feasibility of the actions,
8 reduced the uncertainty from a human reliability
9 perspective.

10 And we felt that the remaining uncertainty
11 -- uncertainties, which is, well, the day or the time,
12 what would -- would the best group be available, will
13 it be harsh environmental conditions, etcetera, would
14 be accommodated by allowing time to perform the
15 action. So that's the basic answer.

16 MEMBER WALLIS: I have to ask you: what
17 are the units of this equation? Feasibility plus
18 margin equals reliability?

19 MS. LOIS: That's --

20 MEMBER WALLIS: Are they dimensionless or
21 something? Or what is -- what are the units of
22 sequence? Or is it such a conceptual thing we
23 shouldn't --

24 MS. LOIS: It's a concept.

25 MEMBER WALLIS: -- we shouldn't take it

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1 literally?

2 MR. WEERAKKODY: It's a conceptual --

3 MS. LOIS: It's a concept. It's a
4 concept.

5 CHAIRMAN ROSEN: I think an arrow would be
6 more appropriate than an equal sign. We all react
7 differently to equal signs. Some, like Dr. Wallis,
8 react very mathematically.

9 (Laughter.)

10 MEMBER WALLIS: Well, I'm a bit concerned
11 that we might end up with something bigger than one
12 here.

13 (Laughter.)

14 CHAIRMAN ROSEN: All right. Go ahead.

15 MS. LOIS: So Alan was the primary
16 developer, came up with the idea. So if you don't
17 like it, blame it on Alan.

18 MR. KOLACZKOWSKI: Oh, you're going to
19 blame it on me, are you?

20 MS. LOIS: He can explain it a little bit
21 more in detail.

22 MR. KOLACZKOWSKI: First of all, just so
23 that we can all envision -- be envisioning the same
24 thing, this is our concept of what the time margin is
25 and what it's trying to do. This is a timeline going

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1 from left to right, and it's trying to depict, in a
2 general sense, what a fire scenario -- how it might
3 evolve, where the fire begins and may or may not be
4 noticeable right from the beginning.

5 Obviously, if you have a switch gear
6 explosion or something like that, it will be
7 noticeable right from the beginning. On the other
8 hand, if it's a slow-burning relay or something like
9 that, it may actually burn for a while, and then
10 finally something happens, either you get a trip from
11 the relay tripping or you get a smoke alarm or
12 whatever.

13 The point is there could be a time which
14 goes undetected that the licensee still doesn't
15 realize that a fire has actually started. But at some
16 point, which we define T_0 , is the first indication to
17 the plant operators that something is amiss. And
18 based on the indications, they suspect it could be a
19 fire.

20 Between T_0 and T_1 there is what we call a
21 diagnosis time at which the crew is actually
22 determining, is there really a fire? That's when
23 they're going to send down an observer or something
24 and say, "We suspect there might be a fire in Room X.
25 Please go check. Is there flames? Is there smoke?"

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1 Etcetera, etcetera, and so forth.

2 In the meantime, the main control room
3 crew may be --

4 CHAIRMAN ROSEN: A trained observer who
5 doesn't go down and jerk the door open.

6 (Laughter.)

7 MR. KOLACZKOWSKI: There you go.

8 MEMBER SIEBER: Well, if he doesn't
9 respond, you know there is probably a fire there.

10 MR. KOLACZKOWSKI: On the other hand, the
11 observer might be the first person who actually saw
12 the fire. That might be the first indication as well.
13 But, nevertheless, there is a time at which the
14 diagnosing and the discerning is there really a fire,
15 where is it, how extensive is it, so on and so forth,
16 they may be beginning to pull out their fire
17 implementation plan, and consideration of that,
18 etcetera, and so forth.

19 And at some point, once they actually
20 confirm there's a fire, they're going to probably call
21 the fire brigade and begin to determine -- these are
22 the procedures we're actually going to enter. Usually
23 those are fire location-specific. Depending on where
24 the fire is, they'll enter a certain procedure,
25 because that means certain trains are now suspect of

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1 equipment, which means they want to protect certain
2 other equipment.

3 At this point, sort of T_1 ends, and we'll
4 now go between T_1 and T_2 , as the actual implementation
5 phase where local crew members are pulled together,
6 they're given their assignments. "You're going to
7 carry out these procedures, these are the actions
8 we're going to go do." And they go out into their
9 local -- respective local areas, and they actually
10 perform the manual actions that we're trying to
11 credit. So that's the implementation time.

12 So the total time between when they first
13 get the indication of the fire -- T_0 -- through the
14 diagnostic phase and through the implementation phase
15 upon which the manual actions are now completed,
16 they've been verified, they can --

17 MEMBER WALLIS: What determines T_3 ?

18 MR. KOLACZKOWSKI: T_3 is an analytical
19 exercise that's done -- thermal hydraulic codes, and
20 so on and so forth, that says, "This is the time I
21 have to have performed these actions in order to
22 prevent" --

23 MEMBER SIEBER: To get a result.

24 MR. KOLACZKOWSKI: -- "some undesired
25 state, and so that I can maintain -- achieve and

1 maintain safe shutdown." So that's an analytically
2 derived time, a calculational-type thing.

3 MEMBER WALLIS: If we think about TMI, the
4 diagnosis time was probably 10 to 20 minutes,
5 depending on what symptoms you think they ought to
6 have noticed. Implementation time to close the block
7 valve was pretty well zero, just have to close it, and
8 yet they stood around for two hours and didn't do it,
9 because they misdiagnosed what was going on. So the
10 time margin was huge, but it didn't help them at all.

11 MR. KOLACZKOWSKI: That may be true. But,
12 again, I think with all of the improvements we've made
13 since TMI, in terms of a symptom-oriented procedure --

14 MEMBER WALLIS: Some procedures -- if you
15 make the wrong diagnosis at T_1 --

16 MR. KOLACZKOWSKI: Or clearly --

17 MEMBER WALLIS: -- time margin may not
18 help you at all.

19 MR. KOLACZKOWSKI: Except that time margin
20 does still allow you time to recover, to perhaps
21 rediagnose the event.

22 MEMBER WALLIS: If you have the sense to
23 think about --

24 MR. KOLACZKOWSKI: That's true.

25 MEMBER WALLIS: -- did I do the right

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1 thing or not?

2 MR. KOLACZKOWSKI: That's true.

3 MEMBER WALLIS: Yes.

4 MR. KOLACZKOWSKI: And that's the point.

5 We are trying to build in a buffer that basically
6 says, look, things are still -- maybe could go wrong
7 that you don't anticipate, and we want a buffer. I
8 think we would all feel much better than if -- even if
9 we can demonstrate this diagnosis and implementation
10 time, and let's say we have an action that has to be
11 done per the calculations within 30 minutes, and the
12 crew was consistently doing it at 29-1/2 minutes, I
13 don't think we'd feel as comfortable than if the crew
14 was consistently doing it in 15 minutes.

15 MEMBER WALLIS: I guess what I'm saying,
16 though, is if -- if T_2 is half an hour, and you have
17 20 minutes' time margin, that may be good. But if you
18 start to have an hour's time margin, I don't think
19 you'd gain anything from the extra 40 minutes, because
20 if they haven't done it by 40 minutes, they're
21 probably not going to do the right thing anyway. So
22 after a while, the time margin doesn't keep building
23 up.

24 MR. KOLACZKOWSKI: That is true, Dr.
25 Wallis. And at some point, I suppose a lot of extra

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1 time just doesn't matter.

2 MEMBER WALLIS: Doesn't help at all.

3 MR. KOLACZKOWSKI: Just like adding a
4 whole lot of redundant trains, because the common
5 cause eventually doesn't --

6 MEMBER WALLIS: Done the wrong thing
7 already. It doesn't help you.

8 CHAIRMAN ROSEN: But comparing this pre-
9 drilled and pre-demonstrated and pre-trained
10 circumstance to the Three Mile Island accident is
11 simply not an appropriate comparison. We're talking
12 about a completely different state of actions that are
13 required.

14 MEMBER WALLIS: I hope we are.

15 CHAIRMAN ROSEN: Much narrower.

16 MEMBER WALLIS: Those guys were trained,
17 too.

18 MR. KOLACZKOWSKI: Okay. So anyway -- oh,
19 go ahead.

20 CHAIRMAN ROSEN: I was just going to point
21 out --

22 MR. KOLACZKOWSKI: Conceptually, this is
23 what we're trying to -- this is what the time margin
24 is. It's trying to provide a buffer between the total
25 time it will take to diagnose and implement actions,

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1 the time at which those actions have to be
2 implemented.

3 MEMBER WALLIS: At least the time margin
4 shouldn't be negative.

5 MR. KOLACZKOWSKI: Yes. And so the
6 question becomes: how long should the time margin be?
7 And that's getting into the next slide.

8 CHAIRMAN ROSEN: At what point in this
9 discussion, Sunil or Alex, do we talk about the
10 demonstration? It seems to me that there are a couple
11 of questions one can pose. And one of them is: when
12 you demonstrate this, do you demonstrate it with one
13 crew, two crews, three crews, or all crews?

14 Then, there's another question which says,
15 if having demonstrated with the right number of crews
16 and gotten reasonable time margins defined, why do you
17 need to demonstrate it over and over again every year?
18 Is it every year we have to do this, or every couple
19 of years it seems like, according to the rule?

20 MR. KOLACZKOWSKI: In the proposed rule
21 right now, it asks that one crew perform it at a
22 minimum once a year.

23 CHAIRMAN ROSEN: One crew, once a year.

24 MR. GALLUCCI: This is Ray Gallucci. Yes,
25 it's -- right now, the option to have all crews

1 perform -- it was discussed earlier -- considered to
2 be too restrictive. It was reduced to one random crew
3 that would do it once a year, and the following year
4 a different crew would do it. But all crews would be
5 trained, but only one crew would perform the
6 demonstration on a 12-month calendar cycle.

7 CHAIRMAN ROSEN: Does that mean if you
8 have 20 of these that you have to do 20 demonstrations
9 each year?

10 MR. GALLUCCI: Twenty crews or 20
11 scenarios?

12 CHAIRMAN ROSEN: No, no. Nobody has 20
13 crews. I mean, 20 actions, 20 manual actions in a --

14 MR. GALLUCCI: You would have to do a
15 representative number. Hopefully, the -- you would
16 have to prioritize which ones you would do. You might
17 want to do the ones that are most difficult. And if
18 you say that the crew can do the most difficult ones,
19 we'd give them credit for some of the other ones. You
20 may have to take a family and maybe do two or three of
21 them. That would be a judgment.

22 CHAIRMAN ROSEN: Is that clear in the
23 rule?

24 MR. GALLUCCI: That would be something
25 that would go in the Reg Guide but not in the rule

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1 language itself.

2 CHAIRMAN ROSEN: I'll just pose those
3 questions, and then perhaps we can come back.

4 MR. KOLACZKOWSKI: So understanding what
5 the concept of the time margin is, the question
6 becomes, "Well, how much margin should there be?" And
7 we did some literature searches to try to see if there
8 was existing research, existing literature out there,
9 that would offer suggestion on what this time margin
10 should be, and came up with, quite frankly, little
11 help -- a little bit, but not really what we were
12 looking for.

13 And so we decided that we would go through
14 an expert elicitation process to derive the time
15 margin or margins. These expert elicitation meetings,
16 there were two of them. They were each multiple-day
17 meetings that were held earlier in 2004, and basically
18 what the meetings involved was we reviewed, prior to
19 the meetings, actually, procedures -- sample
20 procedures from both PWRs and BWRs of manual actions
21 that they want to perform during fire scenarios.

22 We reviewed a lot of the procedures, and
23 we identified the types of actions that the licensees
24 are implementing or want to implement. We developed
25 some example scenarios, and I'll talk a little bit

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1 about the nature of those in just a moment.

2 We also identified the various aspects of
3 the time -- the things that go into the time
4 estimates, and what uncertainties still exist. Why
5 might this time estimate take longer than what we
6 predict, and so on and so forth.

7 And with that knowledge, and using a
8 direct numerical estimate approach -- in other words,
9 we're actually asking the experts to elicit a time
10 margin number if you will -- and using the guidance
11 that's out there on how to perform expert elicitations
12 and avoid biases, and all that other stuff, we went
13 through this expert elicitation process.

14 Just a little bit about that process. The
15 panel expertise is indicated here on this slide. We
16 used, we think, a wide range of relevant expertise to
17 come up with this time margin. You can see here that
18 the expertise ranged from those with a lot of fire
19 inspection experience to a few people had some
20 operations experience, and one in particular was a
21 former SRO at a nuclear plant.

22 We had analytical experience in the
23 reliability risk PRA, HRA, fire analysis areas, and
24 then we had people also who had backgrounds in either
25 or both engineering psychology and human factors,

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1 which, again, are also going to play important roles
2 in the human performance aspect of this whole manual
3 action issue.

4 We considered, as part of the expert
5 elicitation meetings -- we talked a lot about the
6 margins and, for instance, should there be a single
7 time margin that would always apply? Or should there
8 be multiple? Should we have a lot of different
9 margins? If the action has to be performed in 10
10 minutes, should that have a different margin than if
11 the action has to be performed in three hours?

12 Should it be a variable margin? Should it
13 be a percentage? Should it be some percentage of the
14 demonstrated time? Or should it be an interval that's
15 added on? Should it just be a constant "you must add
16 on 20 minutes" or whatever? We talked about the pros
17 and cons of those various types of time margins, how
18 many there ought to be, and so on.

19 Recognizing, also, that the kinds of
20 actions were going to apply to time margin, too, also
21 varies. Some actions are very simple. We talk about
22 closing the valve -- very simple, although that
23 happens to be an in control room action. But,
24 nevertheless, some actions are --

25 CHAIRMAN ROSEN: It may not be.

1 MR. KOLACZKOWSKI: -- very simple, and
2 some are very complex, multiple steps.

3 CHAIRMAN ROSEN: Closing a valve may be an
4 outside control room action, too..

5 MR. KOLACZKOWSKI: That's right. It could
6 be. It could be. But, and so we have -- we just
7 recognize that the range of actions that we're
8 applying it to also was considerable. And some of the
9 actions, as I've already alluded to before, are
10 preventive in nature, and others are reactive in
11 nature. You look for a symptom, and then you go and
12 respond.

13 Maybe you wait until the valve is actually
14 spuriously closed, and then you've got to go down and
15 reopen another path or whatever, would be a reactive
16 action as opposed to a preventive action where you go
17 down and make sure that an alternate valve is open in
18 the first place.

19 Considering all of that, and considering
20 the experience -- what little experience there was
21 about time taken versus time estimates that were out
22 there, and I believe Dave talked about the fact that
23 we looked an existing ANSI standard that talks about
24 providing sufficient time to perform actions and what
25 that margin ought to be, and so on and so forth.

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1 There are some elements of that in the
2 ANSI standard, although it was too generic for our
3 purpose here, we felt. Also recognizing that
4 inspection findings existed where inspectors would
5 actually have a licensee demonstrate certain manual
6 actions as part of the inspection exercise.

7 And we saw the gamut where licensees were
8 able to perform the actions in less time than they
9 predicted, all the way out to some time taking three
10 times as much of the pre-judged time.

11 We looked at other -- other experience or
12 looked at other criteria that we thought would relate
13 to coming up with this time margin, such as the
14 criteria in SRP 18, and so on.

15 Looking at all of this, and recognizing
16 the following -- that, again, we've already alluded to
17 the fact that a lot of the human performance issues
18 that we're trying to account for are already
19 considered through many of the feasibility criteria.
20 In other words, the other criteria would make sure
21 that the staff is available, that they're trained,
22 that the procedures are adequate, that the equipment
23 availability exists, and so on and so forth.

24 So the time margin wasn't to address --
25 was not to address these things. What it was to

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1 address is the remaining uncertainties, that you can
2 still have random problems. You go to turn the hand
3 wheel by hand to close a valve, and it's stuck, and
4 now you've got to go get a crowbar and now -- so you'd
5 need 30 more seconds to go get a crowbar.

6 Then, what you'd demonstrate during the
7 demonstration in which you just pretend to close the
8 valve, and you pretend that it moves just fine. And
9 you don't build in an extra time that says, "What if
10 the valve doesn't move, and I have to go spend an
11 additional minute to go get the crowbar to be able to
12 move the valve?" An example.

13 Environmental -- we can try to predict
14 what the environmental conditions are. But, you know,
15 smoke has a way of going places that you don't
16 predict, and toxic gases have a way of going places
17 where you don't predict. And the next thing you know
18 you've got to put on an SCBA that you didn't assume
19 you were going to have to go get and put on. Another
20 example why it might take a little longer than what
21 you actually demonstrate, and so on. You can see
22 there's a host of --

23 MEMBER SIEBER: There you go.

24 MEMBER WALLIS: All kinds of things can go
25 wrong on the --

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1 MR. KOLACZKOWSKI: Just like this.

2 CHAIRMAN ROSEN: With computers, for sure.

3 MR. KOLACZKOWSKI: There's a host of
4 uncertainties. I want to drop to the bottom bullet.
5 We felt that a lot of these uncertainties that
6 remained, that weren't being addressed yet by the
7 feasibility criteria, as what the time margin needed
8 to address. And the issue is this: that these
9 uncertainties, the remaining uncertainties, are not
10 likely analyzed, nor are fully perhaps enveloped under
11 the timeline criteria, unless we really get critical
12 as to what -- how T_3 is to be calculated.

13 And as I already indicated, you cannot
14 always recreate in demonstrations under the
15 demonstration criteria the actual conditions. You
16 have to pretend to move the valve, because you can't
17 really move it, because right now the plant is
18 operating and you can't go close that valve. So you
19 just have to pretend that you moved the valve as
20 opposed to really moving it and find out that it's
21 stuck.

22 MEMBER WALLIS: So there's a real question
23 about how people respond under stress. Do they take
24 shorter time or longer time or --

25 MR. KOLACZKOWSKI: That's this variability

1 among humans.

2 MEMBER WALLIS: Are things more likely to
3 go wrong when you're under stress?

4 MR. KOLACZKOWSKI: That's this
5 variability. You know, the crews are going to respond
6 with some uncertainty, and to how much time this crew
7 is going to take versus how much time some other crew
8 is going to take, because we're humans and there's
9 variability in how humans perform, especially under
10 stressful conditions, say, of fires in the very next
11 room compared to the place I have to perform the
12 action.

13 So considering all of that, going through
14 the expert elicitation process, etcetera, what it all
15 boiled down to was that it looked like a single time
16 margin would, in fact, work -- that when you
17 considered the range of the types of actions, that
18 some where going to be preventive, some reactive, and
19 so on and so forth, all the issues that I talked about
20 earlier.

21 And also, keep the rule simple -- so that
22 we didn't end up with five different time margins that
23 applied to five different conditions and now you would
24 have to specify what those conditions were, and so on
25 and so forth. It seemed as though with the range of

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1 time margins that the experts came up with that they
2 were all around the recommended time margin that we're
3 going to propose in a moment. And so we said, "Well,
4 why don't we just stick with one time margin."

5 It is a percentage, which in a way is good
6 because it scales with the number and complexity of
7 the actions. If you only have to perform one action
8 and it's very simple, you know what? It's probably
9 not going to take you that long to perform it. And,
10 therefore, the added time you're going to add per this
11 time margin, because it is a percentage, is going to
12 be still a small amount of total time. So it's not,
13 if you will -- we don't think -- too overly burdensome
14 on the licensee.

15 If, on the other hand, the action is very
16 complex, it's going to take a long time, there's a lot
17 of steps, and so on and so forth, yes, it's going to
18 take a long time, but that's also, therefore, the
19 situation in which you probably need more margin,
20 because more can go wrong. You might do a step out of
21 sequence, you find out you've got to go back and redo
22 something that you did incorrectly the first time,
23 etcetera, and so forth. So we thought the percentage
24 concept works very well, because it scales.

25 MEMBER WALLIS: How about the evolution of

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1 the scenario? I have a fire in Room X, and so I send
2 people to do something in Room Y. And half an hour
3 later I learn that the fire has now spread to Room Z,
4 which changes what I might want to have done in
5 Room Y. And it's an evolving situation. It's not as
6 if you know exactly at some time everything you need
7 to know. The information presumably arrives during
8 this time while you're doing things. Is that --

9 MR. KOLACZKOWSKI: That is true.

10 MEMBER WALLIS: So how can you just sort
11 of say it starts here and ends there?

12 MR. KOLACZKOWSKI: Well, like I said,
13 that's a concept. I mean, we're trying --

14 MEMBER WALLIS: I know it's a concept.
15 But, I mean, there's a reality there somewhere.

16 CHAIRMAN ROSEN: Well, me try the answer
17 to that. If the fire spreads to Room Z in your
18 scenario, Graham, there is a fire pre-plan for Room Z.

19 MR. KOLACZKOWSKI: That's correct.

20 CHAIRMAN ROSEN: And I think that then
21 starts at that time when the operators --

22 MEMBER WALLIS: The clock starts.

23 CHAIRMAN ROSEN: The clock starts on
24 Room Z.

25 MR. KOLACZKOWSKI: And you now diagnose

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1 you've got to do something because the fire has gone
2 to Room Z, and eventually you're going to implement
3 steps for Room Z.

4 MEMBER WALLIS: And it might change what
5 you did in Room Y.

6 MR. KOLACZKOWSKI: It might change. It
7 might change.

8 MEMBER WALLIS: But you're not worried
9 about this, the cascading of things?

10 MR. KOLACZKOWSKI: No. Part of the
11 actions will now be reactive. You have to react to
12 the fact that you already put a valve in a position
13 that now you want to put it back in the prior position
14 or something, and you're just going to have to do
15 that.

16 MR. GALLUCCI: This is Ray Gallucci. If
17 you have a scenario that can become that complicated,
18 you probably don't want to be taking manual actions.
19 You'll probably want to fall back to one of the
20 original protective measures. You've probably gone
21 beyond the realm of manual action feasibility and
22 reliability.

23 CHAIRMAN ROSEN: Well, that's drawing an
24 a priori conclusion. I think to me that would come
25 out of the analysis of Room Z, and now you're doing

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1 Room X -- taking Graham's scenario -- you're
2 performing the actions in Room X, and that takes a
3 certain amount of time and certain number of people
4 and resources.

5 Someplace along that time, say halfway
6 through, the fire spreads to Z, they have a new set of
7 resources and time required, and it just may not be
8 the people and the time anymore. And that would seem
9 to me to come right out of the analysis of Room X or
10 Room Z, which would then overlap or be on top of the
11 earlier analysis at which point you would draw a
12 conclusion.

13 But I wouldn't say a priori that you know
14 the conclusion. I think the right process is
15 envisioning that you just have to go do the analysis.

16 MEMBER WALLIS: But the -- from behind me,
17 it's now being brought into the conversation that as
18 a result of this analysis you might conclude that you
19 should not allow manual actions for this type of
20 event.

21 CHAIRMAN ROSEN: Well, yes. That's
22 precisely the point of the analysis, I think, is to
23 decide whether there were --

24 MEMBER WALLIS: Which is something we
25 haven't really discussed yet.

1 CHAIRMAN ROSEN: -- are feasible and
2 reliable. Just because you're doing the analysis
3 doesn't mean that the manual action will show it's
4 feasible and reliable. It quite likely will show the
5 opposite.

6 MEMBER WALLIS: In that case, you would
7 say you are not allowed to take this manual action.

8 CHAIRMAN ROSEN: Correct.

9 MEMBER WALLIS: You would do something
10 else.

11 CHAIRMAN ROSEN: Exactly.

12 MEMBER WALLIS: Okay.

13 MEMBER SIEBER: On the other hand, it
14 seems to me that the concepts in reacting to emergency
15 situations or casualty situations are not all that
16 complex for the operator. He has a series of things
17 to do and some objectives to accomplish, basically
18 which amount to cooling the core.

19 And so when I think about it, the chance
20 that you would have to undo some manual action because
21 of a further development of the fire casualty, is not
22 very likely.

23 CHAIRMAN ROSEN: That's true. And I would
24 -- before we caution -- I would caution you, before we
25 run off and say that manual actions are not likely to

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1 be credited, that we all fly on airplanes and other --
2 take other credit for manual actions, we wouldn't want
3 to fly on an airplane without crew members who are
4 trained to take manual actions.

5 In fact, the manual actions are -- can be
6 very effective under emergency circumstances, and are
7 relied on at a great deal -- in a great number of
8 circumstances.

9 MEMBER SIEBER: Okay.

10 MR. KOLACZKOWSKI: The final two points I
11 want to make are -- the last bullet on this slide.
12 This is what the expert elicitation eventually
13 recommended -- that 100 percent of the total
14 demonstrated time be the time margin. So effectively
15 what you're doing is taking the demonstrated time for
16 the action or actions, doubling it, and then comparing
17 to the T₃ calculation.

18 MEMBER SIEBER: Even if the time is short,
19 where doubling it represents an additional minuscule
20 period of time.

21 MR. KOLACZKOWSKI: Yes. I mean, a lot of
22 the very early actions usually have to do with things
23 like PORV block valve protection, RCP pump seal
24 protection, and some of those do have to be done in
25 relatively short time. But they also -- the actions

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1 themselves, you know, including the diagnostic and
2 implementation, may only take 10 or 15 minutes.

3 So we are talking about, well, now you've
4 got to add another 10 or 15 minutes, as if it took
5 that long, and still hopefully show that -- that
6 that's less than the time you have to have it done by.

7 MEMBER SIEBER: Well, what I'm thinking
8 about is that an action that takes one minute, so you
9 double that, it's two minutes, and when you do that
10 you say you're okay. But if you fail to do it or run
11 into a difficulty, the chance that that one extra
12 minute of margin will be achieved is small.

13 MR. KOLACZKOWSKI: Okay. Well, just
14 recognize, too, though, there's the diagnostic time in
15 where, which will be added.

16 MEMBER SIEBER: Right.

17 MR. KOLACZKOWSKI: My last --

18 MEMBER SIEBER: Well, there was a concept
19 at one time where you were going to say that you
20 either double it or take some fixed number, whichever
21 is larger.

22 MR. KOLACZKOWSKI: That is correct.

23 Just as an aside -- and it's the last
24 slide here, and then I think Alex and Dave want to
25 make a point about the time margin. And this was just

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1 more coincidence than anything, but -- and also
2 recognize that this was developed for a very different
3 purpose. But I think, still, that the coincidence is
4 kind of striking.

5 In NEI-00-01, the Guidance for Post-Fire
6 Safe Shutdown Analysis -- this is not quite a verbatim
7 quote, but it's close -- there's a point at which
8 you're screening out various actions and various
9 scenarios and saying, "I don't have to analyze that."
10 And as part of the process, there's a point in there
11 where the instructions are to not screen, and during
12 preliminary screening, situations involving operation
13 actions where time available is short. That would be
14 our T_3 , less than one hour. And the estimated time to
15 perform the action is greater than 50 percent of the
16 available time.

17 That implies that a factor of two is at
18 least desirable between the estimated time to act and
19 the available time to act, before deciding whether you
20 can screen out that action or not. And it's just kind
21 of a coincidence, and I think just striking, that in
22 providing this guidance they felt like having a factor
23 of two between the time it actually takes to perform
24 and the available time is a good sort of rule of thumb
25 to use before you decide whether you screen an action

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1 out or not.

2 And the factor of two that we came up with
3 in the time margin I just think is an interesting and
4 striking coincidence.

5 With that, I'll leave it with Dave and/or
6 Alex, who I think wants to make a point, one final
7 point about the time margin.

8 CHAIRMAN ROSEN: Okay. You have four
9 minutes to preserve the gains we've made this morning,
10 or to fritter them away.

11 MR. KLEIN: I will -- I will meet the
12 objective.

13 As indicated by Suzie at the beginning of
14 her introduction, we're going to put a series of
15 questions in the proposed rule for public comment.
16 One of these has to do with time margin.

17 As you see up here -- I'm not going to
18 read this to you -- but what I wanted to leave you
19 with is the fact that the staff put together a time
20 margin and a -- put a recommended value on that time
21 margin -- on the time factor of two.

22 Now, that's a strawman. What we're saying
23 is that that is not our final decision on this.
24 That's why we've put a question out to -- to the
25 stakeholders. We offered that number as our best

1 estimate right now, and we are using that as a basis
2 to obtain additional stakeholder feedback.

3 So we're asking a series of questions, and
4 with the hope that we would be able to eventually come
5 to an agreement with all stakeholders on this issue of
6 the time margin and time factor.

7 That's all I have to say about that.

8 MEMBER WALLIS: It seems surprising to me
9 that you are sort of at square one here, that there
10 isn't any kind of established methodology already for
11 this sort of thing. This must occur all the time.
12 This is the kind of question that arises in many
13 situations where people have to take time to take an
14 action.

15 I'm astonished that there isn't some --
16 something already that's standard in other industries
17 or something about human performance. You should be
18 starting from square one, as if no one knows anything
19 about this. And you're saying two might be good and
20 -- there's nothing you can appeal to which is more
21 substantial?

22 MR. KLEIN: I'll ask Ray to --

23 MR. GALLUCCI: This is Ray Gallucci again.
24 That was a question that -- there was a fairly
25 extensive literature search done at the beginning of

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1 the expert elicitation -- in preparation for the
2 expert elicitations, and people were contacted who,
3 you know, worked in industry as well through the
4 members of the panel here. And except for that ANSI
5 standard, which gave very crude, "Don't do anything
6 outside the control room unless you have at least 30
7 minutes," there was nothing established that we found.

8 MR. KLEIN: I have nothing more at this
9 point.

10 CHAIRMAN ROSEN: Well, very good. Are we
11 done with that subject?

12 MR. KLEIN: Yes.

13 CHAIRMAN ROSEN: Okay. We have -- it's 12
14 minutes to the hour. We actually gained two more
15 minutes on our program, so I'll -- and I said we were
16 going to take 10 minutes? Oh, five minutes off the
17 15-minute break. We have a 10-minute break from 2:48
18 to 2:58.

19 (Whereupon, the proceedings in the
20 foregoing matter went off the record at
21 2:48 p.m. and went back on the record at
22 2:58 p.m.)

23 CHAIRMAN ROSEN: We're back after the
24 break.

25 Alex, please continue.

1 MR. KLEIN: Thank you. What I've put up
2 on the slide here are some words, direct language
3 from the draft text for the proposed rule and that's
4 just to give you an indication of the issue with
5 respect to detection and suppression that I'm going
6 to talk with you about.

7 It provides the key words. You can see
8 that what we're requiring is on the III.G.2(c-1) is
9 the actual implementing words, if you will, for
10 operator manual actions and the requirement,
11 condition if you want to call it that or
12 requirement, for the need of detection and
13 suppression in the fire area.

14 What I want to make clear is, and we had
15 some public comments on this with respect to the
16 November 2003 Federal Register Notice where we had
17 published that requirement. Some of the
18 stakeholders out there were under the impression
19 that the detection and suppression was required in
20 the area where the manual actions take place. The
21 requirement is for detection and suppression to be
22 in the area where the fire takes place. It's in the
23 fire area. I wanted to make that clear.

24 What I want to do is I want to put up a
25 picture for you to explain, I guess, the relationship

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1 between the proposed rule language under III.G.2(c-1)
2 and the existing rule language that we have so that we
3 can understand how manual actions and detection and
4 suppression fits into the overall scheme of the rule
5 itself.

6 So what you've got on the left-hand side
7 of the picture is compliance under III.G.2(a) which is
8 your three-hour fire barrier which is deemed to be
9 robust and acceptable without the need for detection
10 and suppression.

11 Then what we have under III.G.2(b) is the
12 other compliance option of 20 feet of separation with
13 no intervening combustibles with automatic suppression
14 and fire detectors in the fire area. We have the very
15 same thing for III.G.2(c) except that in lieu of 20
16 feet of separation we've got the one-hour fire
17 barrier.

18 Now we're proposing under the rule to put
19 in place an operator manual action with acceptance
20 criteria under III.P which is a new paragraph in
21 Appendix R. You can see that what we've put down is
22 under the use of operator manual actions in the
23 III.G.2(c-1), the requirement for automatic
24 suppression systems and fire detectors. What we are
25 trying to demonstrate in this picture is the

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1 consistency across the requirements under III.G.2.

2 CHAIRMAN ROSEN: Wouldn't it be more
3 consistent to take away the requirements for automatic
4 fire suppression and detection across the board if you
5 think consistency is important? Take it away across
6 the board you are even more consistent. In other
7 words, you don't need automatic fire suppression or
8 detection in any case if you can demonstrate that you
9 can reliably and feasibly control the fire with
10 operator manual actions.

11 MR. KLEIN: I believe that -- I'm trying
12 to understand your question, Dr. Rosen.

13 CHAIRMAN ROSEN: I knew you'd have trouble
14 with it. It's what I call a bounding question.

15 MR. KLEIN: Okay.

16 CHAIRMAN ROSEN: Are you suggesting that
17 to be consistent you need to put operator manual
18 actions in the column where you have fire suppression
19 system and fire detection and I'm saying, no, no. To
20 be consistent you need to take it out entirely across
21 the board and rely only on analysis. In other words,
22 now you don't have to have any fire suppression with
23 detection.

24 You just have to say if you can show me
25 with or without a three-hour fire barrier, with a 20-

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1 foot separation, without intervening combustibles or
2 across the board if you can show me that you can take
3 operator manual actions and meet our acceptance
4 criteria with reliability, then all of it is even.

5 MR. KLEIN: I understand what you're
6 saying. I believe that one factor, and I will talk
7 about this in a moment, is the concept -- not the
8 concept but one of the cornerstones that we have with
9 respect to defense in depth. Let me go to my next
10 slide.

11 What I want to do -- there are a lot of
12 words on here but what I want to do is provide you a
13 little bit of historical background with respect to
14 why did the Commission back in 1980 when Appendix R
15 was formulated put in the requirement for suppression
16 and detection in the rule.

17 You can see I've bolded some of the words
18 here and this is with respect to the one-hour barrier.
19 The rule states -- excuse me, the Federal Register
20 Notice at the time states that, "The automatic
21 suppressions required to ensure prompt and effective
22 application of a suppression to a fire that could
23 endanger shutdown capability." Of course, that also
24 equates to the 20 feet of horizontal separation with
25 no intervening combustibles.

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1 The history of Appendix R back then, if
2 you look at the original proposed Appendix R Federal
3 Register Notice you'll note that there was no
4 discussion of four one-hour fire barriers or three-
5 hour fire barriers. The discussion revolved around
6 fire coatings and discuss automatic suppression and
7 detection as the primary means of protection for
8 redundant trains in the fire area.

9 The staff at the time in the late '70s and
10 before 1980 determined that fire coatings were not an
11 adequate fire separation for redundant trains. They
12 came back in 1980 and came out with the final rule
13 where they issued the one-hour fire barrier with 20
14 feet of separation in lieu of the fire codings.

15 The 1980 Federal Register Notice talks
16 about what is the best fire protection that could be
17 provided for redundant trains. Basically it comes
18 down to that the best type of suppression -- excuse
19 me, the best type of fire protection full redundant
20 trains consisted of fire barriers. Basically if you
21 go back to that diagram that I put up before is the
22 left side of that picture, the three-hour fire
23 barrier.

24 MEMBER WALLIS: Well, I think you would
25 have real difficulty making anything other than very

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1 qualitative arguments that these three things, 20-foot
2 separation, one-hour fire barrier, and operator manual
3 actions were somehow equivalent.

4 MR. KLEIN: That's correct. We're not --

5 MEMBER WALLIS: You'll have great
6 difficulty making any kind of argument on that.

7 MR. KLEIN: Dr. Wallis, we're not
8 suggesting that they're equivalent.

9 MEMBER WALLIS: That's what your diagram
10 is trying to imply, that there is some equivalence.

11 MR. KLEIN: It implies equivalency but
12 we're not suggesting that they are equivalent.

13 MEMBER WALLIS: You're just legislating
14 it.

15 CHAIRMAN ROSEN: Yes, I think it is
16 legislated. If you go back to the prior slide where
17 you talk about -- you quote rather what's in the
18 Federal Register for the technical basis for barriers,
19 that they are inherently reliable. I think those
20 words are well put. They are inherently reliable but
21 they have come to mean something else. Would you go
22 back to it? I want to focus on those words.

23 MR. KLEIN: I'm sorry. Which words --
24 which slide are you on, sir?

25 CHAIRMAN ROSEN: Twenty-eight.

1 MR. KLEIN: Twenty-eight. Okay. This one
2 right here.

3 CHAIRMAN ROSEN: They have come to mean
4 something else other than inherently reliable. The
5 way we use them they have come to mean perfect.
6 Inherently reliable for three-hour fire barrier we
7 basically think it's not going to be pierced.

8 MEMBER WALLIS: For three hours.

9 CHAIRMAN ROSEN: For three hours. In
10 fact, that isn't true. We know that barrier do get
11 pierced. They are not perfect. They have seals in
12 them and so on. We've had experience to know that
13 they are like everything else. They have a percentage
14 reliability. Now, granted it's high but it isn't 100
15 percent and that's just the point I want to leave you
16 with.

17 MR. KLEIN: I understand. Thank you. To
18 clarify your comment with respect to penetration seals
19 and so forth, the requirement is that if a licensee
20 were to penetrate a three-hour fire barrier, the
21 penetration seals that that licensee puts in place has
22 to meet the same fire resistant rating.

23 CHAIRMAN ROSEN: And those seals are also
24 inherently reliable but they are not perfect.

25 MR. KLEIN: Correct. That's true. We

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1 accept that. The rationale for why the staff has
2 proposed to put in fire detectors and automatic
3 suppression systems under III.G.2(c-1), as stated
4 previously a three-hour barrier is considered an
5 acceptable fire protection feature without detection
6 and suppression.

7 If we consider operator manual actions as
8 providing reasonable assurance at a level comparable
9 to three hours where we don't put in suppression and
10 detection, then basically what we are saying is that
11 the operator manual action by itself is a sufficient
12 level -- provides a sufficient level of defense and
13 depth under the no detection and suppression scenario.

14 However, we know that experience indicates
15 that human reliability is not at a level provided by
16 three-hour barrier as providing the sole level of
17 defense and depth. As Dr. Rosen pointed out, the
18 reliability of a three-hour barrier although not 100
19 percent is considered robust enough by both the
20 nuclear industry and the non-nuclear industry to be
21 considered adequate for the protection of --

22 CHAIRMAN ROSEN: But I think you would
23 agree that there's some risk --

24 MR. KLEIN: Yes.

25 CHAIRMAN ROSEN: -- that the three-hour

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1 barrier will be penetrated before three hours. It's
2 low, perhaps even minimal but it is still there. It
3 isn't perfect. We're not dealing with impervious
4 barriers.

5 MR. KLEIN: That is correct.

6 CHAIRMAN ROSEN: I think I would point
7 out --

8 MR. KLEIN: I agree.

9 CHAIRMAN ROSEN: -- because I'm trying to
10 make a point that as you suggest in this material that
11 you sent to us, SECY-03-0100 makes the point that
12 operator manual actions if they are feasible the
13 overall risk increase can be minimal so we are really
14 dealing with the same thing.

15 Whether it's a three-hour barrier or an
16 operator action, there is some -- for a feasible
17 operation some of the operator manual actions that may
18 be considered will have minimal risk increase just as
19 penetration of the three-hour barrier is a minimal
20 risk. It's a low probability event. I'm trying to
21 put this thing on some sort of risk continuum rather
22 than this is sacred and this is not. Therefore, we
23 require this for the sacred things and things that are
24 non-sacred we'll think about.

25 MR. GALLUCCI: This is Ray Gallucci. If

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1 the three-hour barrier has a certain unreliability,
2 the one-hour barrier would have a higher
3 unreliability. If you were to remove detection
4 suppression across the board, you would effectively be
5 saying three-hour barrier equals one-hour barrier
6 equals 20-foot separation.

7 I don't think that because of the relative
8 strengths of the different conditions whether they --
9 although we call it implied equivalencies, I don't
10 think that will be a valid statement. Similarly with
11 the operator manual actions, I don't believe that in
12 the case where you are dealing with the deterministic
13 rule where you are not performing HRA that you would
14 want to go in and try to cover all cases by saying
15 that the reliability based on operator manual actions
16 is going to be comparable to a three-hour barrier
17 without some sort of defense and depth attached to it.

18 CHAIRMAN ROSEN: Well, I can think of
19 circumstances into which you would prefer to have
20 feasible and reliable operator manual actions rather
21 than the three-hour barrier.

22 MR. GALLUCCI: Yes, I agree and those are
23 the types of cases that would be handled in the Reg
24 Guide 1.174 exemption process or the 50.48(c) where
25 you would try to -- where you would be relieved of

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1 having to follow deterministic criteria but you are
2 still faced with within the limits of III.G.2(c) or
3 III.G.2, which is where this rulemaking is focused,
4 you don't have that freedom to just --

5 CHAIRMAN ROSEN: You're talking about
6 compliance and I'm not talking about compliance. At
7 the moment what I'm talking about is a conceptual
8 argument and a discussion in an open forum where we
9 are talking about risk, not about compliance.
10 Compliance is required. That is what compliance is.
11 It's a rule.

12 Just in talking about it in rationale
13 terms one can say we are dealing with a risk
14 continuum. If an operator manual action is feasible
15 and reliable, it may be equivalent to a three-hour
16 fire barrier or better. I think you agreed under
17 certain circumstances.

18 MR. GALLUCCI: Under certain
19 circumstances, yes.

20 CHAIRMAN ROSEN: I'm leaving out the
21 question. Don't be confused that I'm not confused,
22 Ray, about what compliance is and we shouldn't be
23 confused.

24 MEMBER SIEBER: I think the difficulty is
25 we don't have risk information so it's hard to make

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1 these categorical decisions, how much is good enough.
2 In the deterministic world you try to balance what you
3 apply to the given situation by the logic of the rule
4 that you put forward since you don't have risk
5 information.

6 To me the ultimate solution to this kind
7 of problem is to develop the risk information and make
8 the rule risk informed. At this point in the world
9 that's not feasible in a short period of time so we
10 are sort of stuck with this layered approach and
11 assumed equivalency even though you can't show what
12 that equivalency is.

13 I think it's difficult to deny the fact
14 that you do need some kind of defense-in-depth because
15 you can't say for certain that every protection
16 feature whether it's human action or a barrier or
17 separation distance is going to be effective. You
18 don't know how effective it's going to be. It says to
19 me that what the staff is doing is not unreasonable.

20 MR. KLEIN: Okay. Let me continue on. We
21 talked about the defense-in-depth which is my third
22 bullet here. I'll put up a slide here in a moment
23 about defense-in-depth. But the last bullet here,
24 enhances the ability of the operator to achieve and
25 maintain safe shutdown from a unaffected area through

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1 the prompt and effective application of fire
2 suppressant, those are the same types of words that
3 were used -- the prompt and effective application of
4 fire suppressant are the same types of words that the
5 original Appendix R FRN used.

6 Now, the reason why the staff feels that
7 it could enhance the ability of the operator although
8 he might be conducting that manual action outside of
9 the area where the fire takes place is because we
10 believe that the addition of a detection and
11 suppression system would either delay or prevent, for
12 example, spurious actuation caused by a fire inside
13 that room that contains the redundant trains.

14 So it enhances their ability to perform
15 the feasible and reliable manual actions by providing
16 additional time as opposed to assuming that without a
17 suppression system in there it would take -- the time
18 line would take its natural progression as Ellen had
19 talked about before with respect to fire development
20 and so forth. In other words, with a fire detection
21 and automatic suppression system you interrupt that
22 fire time line if you will.

23 CHAIRMAN ROSEN: Now, Alex, is that the
24 best the staff can do in terms of a reference, this
25 reference on slide 28, to the Federal Register Notice

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1 that is now 24 years old? Is that the best reference
2 in the regulatory body for the preference for fire
3 barriers or is there something better? Did you just
4 pull that out of your hat because you happened to be
5 looking at that Federal Register?

6 MR. KLEIN: No. Actually --

7 CHAIRMAN ROSEN: I would recommend there
8 are other things to do besides reading 24-year-old
9 Federal Registers.

10 MR. KLEIN: And I agree with you.

11 MEMBER SIEBER: Don't you say them?

12 MR. KLEIN: The reason why I pulled this
13 one out is because I wanted to maintain consistency
14 with respect to Appendix R. We're talking about
15 making a revision to a deterministic rule III.G.2.
16 What I want to do is go back into the history of
17 III.G.2.

18 CHAIRMAN ROSEN: But hasn't this been
19 updated in any sense and codified in the regulation as
20 to the staff's preference or the Commission's
21 preference for fire barriers after that 24-year-old
22 Federal Register notice? By the way, Federal Register
23 notice, notwithstanding the fact that it's in the
24 Federal Register which is important but it's not a
25 regulation.

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1 MR. KLEIN: That's correct. I understand
2 what you're saying. However --

3 CHAIRMAN ROSEN: It's not even a reg
4 guide.

5 MR. KLEIN: We have not revised any of our
6 regulations with respect to fire protection in three-
7 hour barriers or fire separation.

8 CHAIRMAN ROSEN: You understand my
9 difficulty is that quoting a 24-year-old Federal
10 Register notice to me as gospel leaves me somewhat
11 unimpressed.

12 MEMBER WALLIS: Quote a ACRS letter and it
13 might make more sense.

14 MR. KLEIN: Yes. My attempt here is to
15 provide some historical background. To directly
16 answer your question with respect to has the staff
17 done anything more with respect to regulations, the
18 only change that we've made to our regulations since
19 the original issue of Appendix R in 1980 was change
20 the penetration seal requirement. I think the
21 original wording was that it be noncombustible. That
22 was changed.

23 Of course, the recent rule change under
24 50.48(c) which allowed fire protection to be risk
25 informed. Other than that, I cannot point to any

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1 other regulation that we've done. We've lived with
2 this rule now, as you say, for over 20 years so that
3 is the best that I can do at this point.

4 MR. WEERAKKODY: Chairman Rosen, are you
5 asking us whether we have anything more recent and
6 substantial than a 24-year-old notice as the basis
7 when we grouped or when we said we need detention and
8 suppression with manual actions or are we solely
9 relying on something like this as the basis because
10 based on your earlier questions with respect to some
11 probability of a three-hour fire barrier? I just
12 wanted to make sure that we convey --

13 MEMBER WALLIS: I guess we should move on.
14 We have established that you have nothing else to go
15 on.

16 MR. WEERAKKODY: No, we do.

17 MEMBER WALLIS: Oh, you do?

18 MR. WEERAKKODY: The sole basis of
19 including suppression and detection as condition for
20 manual action is not 24-year-old information even
21 based on the current understanding of HRAs which is
22 well known that the human failure probabilities are in
23 general you have .1s, .2s, you know, that type of
24 numbers unless you have very highly liable ones like
25 Kevin pointed out. In some situations you could have

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1 highly liable ones.

2 CHAIRMAN ROSEN: And the ones I pointed
3 out.

4 MR. WEERAKKODY: So it's possible that
5 there could be a whole spectrum of those things. The
6 challenge is the regulation has to color the whole
7 spectrum and we recognize that some of these numbers
8 could be relatively high. In judging whether to
9 require detection and suppression we had to make a
10 judgment as to whether the manual actions would come
11 closer in the liability to the three-hour passive
12 barrier or the other two. We based on our best
13 judgment grouped with the other two.

14 CHAIRMAN ROSEN: Well, Sunil, I've
15 achieved my objective which was to establish that you
16 have nothing in the regulations newer than 24 years
17 old that was in the Federal Register Notice that
18 basically puts the public and the industry on notice
19 that fire barriers are inherently reliable so that's
20 the -- and implies in that Federal Register Notice, I
21 guess, that they are preferable.

22 Maybe more than implies. It even says
23 that. The best fire protection for redundant train.
24 Well, I'm not so sure that is always true. I made
25 that point a few times so pardon me if I quarrel with

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1 the Federal Register.

2 MR. KLEIN: Okay. Let me go on to the
3 next slide where I talk about defense in depth. As
4 Sunil just mentioned, with respect to the reliability
5 of an operator manual action, despite the fact that
6 there might be some specific situations where the
7 reliability might be .01, as Sunil indicated, there is
8 a whole spectrum out there.

9 What we are attempting to do in addition
10 to what I stated before is in keeping with one of
11 these corner stones and defense-in-depth is to meet
12 that second bullet which is to detect, rapidly control
13 and extinguish promptly those fires that do occur. If
14 you look at the way III.G.2(a), (b), and (c) are
15 structured today, especially (b) and (c), we have
16 suppression and detection in there as an additional
17 layer of defense-in-depth.

18 That would ultimately meet that third
19 bullet for providing protection for structures and
20 systems and so forth where fire is not promptly
21 extinguished will not prevent the safe shutdown of the
22 plant.

23 CHAIRMAN ROSEN: You'll understand that
24 those of us who have been in debates other than fire
25 protection about risk analysis have heard the refrain

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1 often in those debates that the reason one can't use
2 risk information in a given circumstance is that it
3 doesn't preserve defense-in-depth. We are also
4 unimpressed with that argument in general.

5 It needs to be flushed out much more
6 specifically in order to be given the credence that
7 the user of the argument likes to ascribe to it. It's
8 almost uttered as if it were a religious mantra. In
9 fact, it's only a concept so understand that when
10 we're talking about the use of risk, which is risk
11 analysis in this case, it's surrogate risk analysis,
12 time origin approach, the utterance of the word
13 defense-in-depth has less impact on some of us than on
14 others.

15 MR. GALLUCCI: This is Ray Gallucci. I
16 attempted to do something at the fire protection forum
17 along those lines where I attempted to in my mind --
18 I'm a risk analyst. With your deterministic analysis
19 you are dealing with point estimates. When you get
20 into defense-in-depth to me is somewhat of a
21 deterministic way to look at uncertainty.

22 When you talk about defense-in-depth you
23 are essentially trying in the deterministic world to
24 put a pseudo quantitative value on the uncertainty.
25 I think if you do a pure risk analysis when you

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1 quantify the uncertainty and if you are comfortable
2 that you've accounted for it very well, that is a way
3 of accounting for defense-in-depth in a risk
4 calculation.

5 Unfortunately, unless we deal strictly in
6 worse case analyses I think in a deterministic world
7 you look for a surrogate for this type of uncertainty.
8 I think in my mind that is the way I view the defense-
9 in-depth concept as a uncertainty type, as a way to
10 handle uncertainty in a deterministic world.

11 CHAIRMAN ROSEN: I applaud you. I think
12 that is precisely true. What we're talking about here
13 when we talk about uncertainty analysis is using
14 uncertainty analysis to tell you when defense-in-depth
15 is appropriate. If you have a lot of uncertainty,
16 then defense-in-depth is really a very important
17 concept and you can trade off uncertainty in defense-
18 in-depth.

19 If you have no uncertainty, and I can't
20 imagine such a circumstance, but if you have none,
21 then defense-in-depth isn't needed. So in the cases
22 where you have a very easy operator action and highly
23 reliable, one could argue there's not much defense-in-
24 depth needed. I think that's helpful.

25 MEMBER WALLIS: It depends what's in

1 depth. If you say that you first try to put the fire
2 out with the suppression system, if it doesn't work
3 your defense is the operators can fix things up. If
4 the operators are the defense-in-depth, that's one
5 thing but if the operators are the primary response
6 and the automatic suppression system is the defense-
7 in-depth, then you have a different rationale.

8 I think the way he's looking at it is the
9 automatic suppression system is the primary response
10 and the operator action is the defense-in-depth. If
11 it doesn't work, the operators can do something.

12 CHAIRMAN ROSEN: That's one way to look at
13 it.

14 MR. KLEIN: I certainly agree with you,
15 Dr. Rosen, that there are some specific situations
16 where the requirement, if you will, for suppression
17 and detection might be over and above because you've
18 got a highly reliable operator manual action.

19 MEMBER WALLIS: You'd have difficulty
20 explaining to the public why if you have a fire you
21 shouldn't try to suppress it.

22 MR. KLEIN: I'm sorry?

23 MEMBER WALLIS: I think you'd have
24 difficulty explaining to the public why if you have a
25 fire you should not detect and suppress it, or at

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1 least try to.

2 MR. KLEIN: That's correct.

3 MEMBER WALLIS: You should just leave it
4 and wait for the operators to do something doesn't
5 sound like a very rational thing to do.

6 CHAIRMAN ROSEN: That's not what I'm
7 suggesting at all.

8 MEMBER WALLIS: Aren't you? You're saying
9 do away with suppression and detection. Isn't that
10 what you're saying?

11 CHAIRMAN ROSEN: No, no, no.

12 MEMBER WALLIS: Isn't that what you're
13 saying?

14 CHAIRMAN ROSEN: I'm saying credit manual
15 action.

16 MEMBER WALLIS: Well, let's move to the
17 next thing. This one here.

18 MR. KLEIN: This is another picture if --

19 MEMBER WALLIS: I thought you were
20 applying this, that you do away with the suppression.

21 MR. KLEIN: This shows the scenario where
22 there is no automatic suppression in the scenario
23 where you have operator manual actions with acceptance
24 criteria. Again, we understand this is a picture and,
25 again, with implied equivalencies that there is some

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1 sort of implied gap there in terms of protection.

2 One thing I want to point out is that in
3 all of the current sections under III.G.2(a), (b), and
4 (c) we have fire protection features in place. the
5 three-hour fire barrier on the III.G.2(a) is a passive
6 fire protection feature. On the III.G.2(b) we have a
7 combination of passive and active fire protection
8 features. On the III.G.2(c) we have a combination of
9 passive and active fire protection features.

10 Now, if you move to the fourth column on
11 the right on the III.G.2(c) with no suppression, what
12 you're left with basically is no fire protection
13 feature. You are left with an operator manual action.

14 MEMBER WALLIS: That was sort of my point.
15 You would be doing away with any response to the fire
16 at all and just relying on the operator.

17 MEMBER SIEBER: Well, even worse than that
18 if you are relying on the one-hour fire barrier to be
19 detection and suppression, then that one-hour fire
20 barrier is going to fail.

21 MR. KLEIN: That's right.

22 MEMBER WALLIS: So we might go along with
23 your argument. It's a qualitative way.

24 MR. KLEIN: It's a qualitative argument.
25 That's right. Because this issue is somewhat

1 controversial with the stakeholders, what we've
2 attempted to do is to ask a question in the FRN to
3 promote some discussion and feedback from our
4 stakeholders.

5 Because the staff is of the opinion that
6 suppression and detection should be a requirement
7 under operator manual actions, we framed the question
8 in such a way that it asked the question with respect
9 to automatic versus fixed fire suppression because
10 there's a difference. On the III.G.2 the requirement
11 calls for automatic suppression.

12 If you look under III.G.3, which is an
13 alternative to III.G.2 where you can't adequately
14 protect your redundant trains, the licensee then has
15 the option of putting in an alternate shutdown system.
16 That under III.G.3 requires a fixed suppression system
17 with fire detectors. So we've asked the question with
18 respect to --

19 MEMBER WALLIS: What's the difference? A
20 fixed one someone has to open a valve?

21 MR. KLEIN: That's correct. In a fixed
22 suppression system the piping network is in place.
23 The automatic actuation feature is not there. Some
24 human error action is required.

25 CHAIRMAN ROSEN: Why don't you ask the

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1 question more broadly rather than just say because we
2 believe that automatic suppression and detection is
3 required with III.G.2?

4 MEMBER WALLIS: Why would you ever want it
5 to be fixed because they are automatic, aren't they?
6 Are there sprinklers that are not automatic?

7 MR. KLEIN: Yes, there are some.

8 MEMBER SIEBER: There are nozzles in there
9 that don't --

10 MEMBER WALLIS: Why would you ever want it
11 to be fixed and not automatic?

12 MR. KLEIN: There are some systems --
13 well, we don't want it that way. The proposed rule
14 language right now calls for automatic suppression.
15 We are asking for --

16 CHAIRMAN ROSEN: I applaud your
17 willingness to ask the question about III.G.3 but I am
18 suspicious that you don't want to ask it about
19 III.G.2. Why don't you ask the question about III.G.2
20 as well?

21 MR. KLEIN: I suspect, Dr. Rosen, that we
22 are going to get comments regardless of how we ask the
23 question.

24 CHAIRMAN ROSEN: I understand but aren't
25 you trying to fix the game by the questions you ask?

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1 Kind of like these polls they take about who's going
2 to win.

3 MR. KLEIN: Not necessarily. I think that
4 the intent here, the reason why we framed the question
5 the way we did is because the technical staff's belief
6 at this point for the proposed rule --

7 CHAIRMAN ROSEN: I know what the technical
8 staff believes but aren't they willing to test that
9 belief at least by asking the question? Are they that
10 timid?

11 MR. KLEIN: We're not timid.

12 MEMBER SIEBER: We may not be at that
13 stage yet but in the process. You put out your
14 hypothesis. You get comments from everybody and then
15 the analysis to decide where it is you want to be
16 follows those two things. We are not to that point
17 yet as I understand it.

18 MEMBER WALLIS: You're simply asking
19 people to respond. That's all you're doing.

20 CHAIRMAN ROSEN: But you have to ask the
21 broader question in order to get a fair response.

22 MEMBER SIEBER: Well, the strawman is out
23 there no doubt.

24 CHAIRMAN ROSEN: Who knows? You might get
25 a response that people agree with your point of view.

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1 You might even get that from ACRS. Or at least added
2 comments.

3 MR. KLEIN: We're hoping for a positive
4 response from you.

5 At this point that ends my discussion with
6 respect to suppression and detection. What I would
7 like to do is to pass it over to Leslie who will talk
8 about the reg analysis. Are we on time?

9 CHAIRMAN ROSEN: That's really wonderful
10 actually. Twelve minutes more ahead so I appreciate
11 that.

12 MEMBER WALLIS: Let NEI spend the time on
13 a multitude of slides.

14 CHAIRMAN ROSEN: Leslie.

15 MEMBER WALLIS: I'm really interested in
16 what a reactor universe is. This is where the
17 reactors have taken over the universe?

18 MS. KERR: I play a lot of video games.
19 My name is Leslie Kerr and this is my first time in
20 front of the ACRS so thank you for having me. I'm
21 going to present the results, or a summary of the
22 results of operator manual actions regulatory
23 analysis.

24 We'll look at the alternatives that were
25 considered in the reg analysis. We'll also look at

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1 some of the baselines that were compared to the
2 alternatives. We'll look at the reactor universe
3 which is just the universe of reactors that we think
4 could be affected by the alternatives.

5 We'll look at the quantitative cost and
6 savings associated with the alternatives. Finally
7 we'll compare the cost and savings and also bring in
8 the qualitative attributes that could be affected by
9 the proposed rule. Finally, I will present the
10 preferred alternative in the reg analysis.

11 The alternatives are the no action or no
12 rulemaking alternative. Under this alternative manual
13 actions for Part 50, Appendix R III.G.2 would not be
14 permitted without a 50.12 exemption. The no action
15 alternative would require any licensees who are not in
16 compliance to come immediately into compliance with
17 current regulations or submit a 50.12 regulation --
18 exemption, I'm sorry, if they are not in compliance.
19 The regulatory guidance --

20 MEMBER WALLIS: Now, I understand they
21 haven't been doing that for 15 years and now you are
22 going to suddenly require it?

23 MEMBER SIEBER: Some have, some haven't.

24 MS. KERR: We don't believe it's -- we're
25 not sure.

1 MEMBER WALLIS: Does "no action" mean
2 doing business as usual or does it mean enforcing the
3 rule as it stands?

4 MS. KERR: The latter, enforcing the rule
5 as it stands.

6 MEMBER WALLIS: So it's not really no
7 action. It's really believing what you said before
8 and making it happen.

9 MS. KERR: Right. Under our regulatory
10 analysis guidelines we cannot give credit for coming
11 into compliance with an existing rule so no action
12 means they would come into compliance with all
13 existing rules and regulations.

14 The regulatory guidance alternative is
15 similar to the no rulemaking alternative except we
16 would put out a new regulatory guidance which would
17 clarify the current rules as there seems to have been
18 some confusion following the Appendix R III.G.2 rules.

19 MEMBER WALLIS: Was the confusion yours or
20 the licensee?

21 MS. KERR: Perhaps both.

22 MEMBER WALLIS: Conclusion and confusion.

23 CHAIRMAN ROSEN: More likely confusion
24 than collusion.

25 MS. KERR: The proposed rule alternative

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1 is what we've been talking about today for the most
2 part which is to revise the existing regulations to
3 allow III.G.2 manual actions that meet the generic
4 acceptance criteria that have been presented.

5 Documentation of those manual actions would be
6 required. 50.12 exemptions would still be required
7 for III.G.2 manual actions that do not meet these
8 criteria.

9 In accordance with the NRC's regulatory
10 analysis guidelines the baseline -- the main baseline
11 is required and that assumes that there is full
12 compliance with existing regulations. We felt that
13 this may not be the most realistic scenario so we did
14 two industry practices baseline. Actually, this slide
15 is a little off.

16 We did one industry practices baseline
17 with interim enforcement discretion and we did one
18 without interim enforcement discretion. Given that
19 interim enforcement discretion is not in place today,
20 that is the most realistic baseline and that is what
21 I'm presenting as a comparison to the alternatives
22 today.

23 Here is the reactor universe. The total
24 universe that could be affected by our alternatives
25 are the 52 pre-January 1, 1979 power reactors. We

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1 split these reactors into present and future actions
2 that they could possibly take. Of the 52 total
3 reactors we assumed that 14 reactors could take
4 immediate advantage of the proposed generic acceptance
5 criteria and document compliance with those criteria
6 rather than come into compliance with current III.G.2.

7 MEMBER WALLIS: That would mean that the
8 others would not?

9 MS. KERR: Right.

10 MEMBER WALLIS: The 38 or something would
11 not be able to meet the criteria?

12 MS. KERR: We also split it. We assumed
13 some were already in compliance with III.G.2 today as
14 it stands. Some would still have to submit 50.12
15 exemption request.

16 MEMBER SIEBER: And the third category you
17 would somewhat have to modify the plant.

18 MS. KERR: That's correct. We assume some
19 would have to modify their plants.

20 MEMBER SIEBER: Because they can't meet
21 even the new rule.

22 MS. KERR: Correct. The future looking
23 ahead after the immediate affect of the proposed rule
24 we assume that five reactors per year over the next 30
25 years will document manual actions rather than submit

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1 an exemption request or make plant modifications so
2 they can actually build III.G.2 manual actions into
3 their plans in the future.

4 CHAIRMAN ROSEN: Where do we get these 150
5 reactors?

6 MS. KERR: I'm sorry?

7 CHAIRMAN ROSEN: Oh, I see. Five reactors
8 per year over the next 30 years. You multiplied the
9 two and said there must be 150 reactors.

10 MS. KERR: Oh.

11 CHAIRMAN ROSEN: I guess you're saying
12 that some reactors may do it more than once.

13 MS. KERR: Correct.

14 MEMBER WALLIS: I don't understand this.
15 Do they have any option or they are not in compliance?
16 Don't they have to do something?

17 MEMBER SIEBER: They have to do something.

18 MEMBER WALLIS: So how can they wait?

19 MS. KERR: Well, the future includes all
20 the reactors. It includes the total universe reactor
21 as they go forward and make plans for their plants in
22 the future. It could even be some of the 14 reactors
23 that take immediate action could in the future take
24 advantage again of the --

25 MEMBER WALLIS: The purpose of the rule is

1 to make sure they comply with regulations. Isn't it?

2 MS. KERR: Correct.

3 MEMBER WALLIS: So doesn't it go into
4 effect right away? Don't they have to then comply?
5 They can't wait for 30 years to comply.

6 MS. KERR: Right. And this is not waiting
7 for 30 years. These are to deal with new issues that
8 come up in the future.

9 MEMBER WALLIS: If new issues come up,
10 they will take down the fire barriers or something
11 and, therefore, they will have to --

12 MEMBER SIEBER: Or discover that the fire
13 barriers aren't what they thought they were.

14 MEMBER WALLIS: The barriers will decay in
15 some way.

16 MEMBER SIEBER: Or some test will come out
17 and say, "Gee, this isn't as good as we thought."

18 MS. KERR: Or technology could change.

19 MEMBER WALLIS: Fires will get hotter.

20 MEMBER SIEBER: Or they discover a cable
21 in the wrong place.

22 MS. KERR: Correct. Now, we'll talk about
23 the cost and savings associated with the proposed
24 rule.

25 MEMBER WALLIS: I thought the objective

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1 here was to bring everyone into compliance, not to
2 make assumptions about who's going to do something.
3 Aren't you trying to solve the problem of
4 noncompliance? Isn't that what you're trying to do?

5 MS. KERR: I believe we are trying to
6 that, but also account for the fact that this rule has
7 benefits in the future as well.

8 MEMBER WALLIS: Well, I have a lot of
9 trouble with almost everything the staff presents and
10 the staff is presenting sort of alternative solutions
11 without telling us very clearly up front what the
12 problem is and what would be an acceptable solution so
13 we get lost as to what you're proposing is going to
14 solve the problem because we've lost track of what the
15 problem was.

16 Dave, are you going to pull it all
17 together at the end and say, "This is the problem we
18 face today and this is why what we're doing is going
19 to solve it. Here is going to be an acceptable
20 solution and this is when it's going to be achieved."

21 MR. GALLUCCI: This is Ray Gallucci. let
22 me offer that I went through the reg analysis and
23 tried to do a simplification as well for myself. I
24 think a lot of these questions, the nature of the reg
25 analysis requires that the baseline assume compliance

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1 so all the things that you would normally expect to be
2 included in the reg analysis which is coming into
3 compliance has already been subsumed in the definition
4 of the base case and that is an idiosyncrasy of the
5 way these regulatory analyses are done.

6 One would have to -- in order to quantify
7 those, you would have to assume noncompliance and then
8 you would basically have to do a baseline that is not
9 the baseline that is normally in these reg analyses.
10 This is a quote in the reg analyses that you have to
11 -- the NUREG/BR says you have to assume all state and
12 federal regulations are being followed. Leslie,
13 correct me if I'm wrong, but because of the nature of
14 this anything the plants would have done as a result
15 of no rulemaking to come into compliance being either
16 they submitted exemptions or they did plant
17 modifications is not costed when you do the delta
18 calculation. It's an idiosyncrasy of the way these
19 analyses are done.

20 MS. KERR: It's not costed into the mean
21 baseline but that's why we went to an industry
22 practice baseline so that we could assume that some
23 plants are currently out of compliance so we can
24 capture the benefits of coming into compliance, the
25 cost and the benefits, as well as the cost and

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1 benefits going into the future. I believe we are
2 solving the problem.

3 MEMBER WALLIS: Why are you doing cost and
4 benefits if they already are not meeting regulations?

5 MS. KERR: I'm sorry?

6 MEMBER WALLIS: Why are you doing cost
7 benefit analysis if they are not meeting regulations?
8 It's not a compliance issue? It's something else like
9 a back-fit type issue or what is it?

10 MR. THOMAS: Maybe I can take this one.
11 Brian Thomas, Section Chief of the Reg Analysis
12 Section, NRR. The policy is that for any generic
13 action, be it a generic letter, be it a proposed
14 modified regulation, you have to establish some sort
15 of a cost benefit benchmark from which the Commission
16 would make a judgment as to the feasibility of going
17 forward with that action.

18 Yes, technically speak we have determined
19 that licensees are not in compliance with the
20 regulation. That is the fundamental problem and so we
21 are trying to make them fix that problem. That's
22 basically the technical issue.

23 MEMBER WALLIS: It seems to me there are
24 two things. If it's a compliance issue, they are not
25 playing the law, then presume that they have to obey

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1 the law. If it's a question of how should we modify
2 the law in some way, then you can look at cost and
3 benefits but it seems to be very clear if they are not
4 obeying the law, are you going to now modify the law
5 so they can obey it? Is that what you're going to do?

6 MEMBER SIEBER: No.

7 MEMBER WALLIS: Would you mind just
8 talking in layman's terms in some way here?

9 MEMBER SIEBER: I think a way to look at
10 it one of the alternatives is to not have a proposed
11 rule and to send in the inspectors.

12 MEMBER WALLIS: Just make them obey the
13 rule.

14 MEMBER SIEBER: There will be lost of
15 enforcement actions and so forth and that has a cost
16 associated with it.

17 MR. QUALLS: Well, it's not just that,
18 sir. It's the fact that -- my name is Phil Qualls.
19 I'm an ex-inspector out of Region V. I work at NRR
20 these days, fire protection engineer. It's not just
21 the fact they are in noncompliance, yes. There are
22 missing barriers where they are using manual actions.
23 What we are attempting to do is codify the existing
24 practice where we were approving exemption requests
25 for a lot of these manual actions throughout the '80s.

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1 MEMBER SIEBER: To make it more efficient.

2 MR. QUALLS: To make it more efficient and
3 to allow manual actions that can be performed. In
4 many cases barriers will probably still have to be
5 installed. But from what I've heard from some
6 industry personnel in recent months, I queried one
7 recently and he told me it cost at his facility to
8 install a thermal-lag barrier it cost them something
9 like \$5,000 including the engineering work per linear
10 foot.

11 MEMBER SIEBER: That's about right.

12 MR. QUALLS: When you start looking at
13 those kind of numbers, sometimes manual actions if
14 they are feasible, performable, and safe are a very
15 cost effective option and we are just trying to allow
16 licensees the option of an additional option to
17 perform a safe --

18 MEMBER WALLIS: This is like -- I'm trying
19 to sort this out. I've got students drinking on
20 campus. They are not in compliance with the law that
21 says, "Thou shall not drink if you're under --

22 MEMBER SIEBER: Under 21.

23 MEMBER WALLIS: Under 21. And so I say,
24 well, I want to codify the existing practice. I want
25 to somehow twist the law so it lets them drink in the

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1 way they have been drinking.

2 MEMBER SIEBER: You want to issue a new
3 birth certificate.

4 MEMBER WALLIS: Or I want to issue some
5 sort of permission to drink as long as it's in a
6 fraternity or as long as there is somebody there or
7 something like that. Is that what you're doing?

8 MEMBER SIEBER: No.

9 MR. WEERAKKODY: I just want to clarify
10 something. I think inadvertently some of the message
11 we are conveying is not coming out right. What we are
12 trying to do is when we recognize that based on our
13 interpretation of the rule that some licensees are out
14 of compliance and this didn't happen 15 years ago.

15 The manual actions were in place about 15
16 years ago but it was only in about 2002 we confronted
17 the issue and we realized that based on the position
18 we took in 2002 there's a number of III.G.2 manual
19 actions that are out of compliance. I just wanted to
20 clarify that. It's not like we knew there were
21 noncompliances 15 years ago.

22 Now, when we made that decision in 2002
23 that based on the OGC and CID position that there are
24 no compliance out there, we had a couple of choices in
25 front of us. It was like a fork in the road. One

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1 choice was to tell the licensees that, "You guys
2 unless you ask our approval, send us exemption request
3 and get us to reviews and approval those requests, you
4 have a problem."

5 The other option was to convey to the
6 licensees the criteria that we would use in our review
7 process and then give them to the licensee through a
8 rulemaking and get them to make that judgment. In
9 2002 the decision was made that it's more efficient
10 and it's more resource intensive to codify these
11 criteria and convey to the industry so that they could
12 comply. I just wanted to make that clear because the
13 other route we could have taken in 2002 was to tell
14 everybody to send us exemptions. Otherwise --

15 MEMBER WALLIS: So if I bring it into my
16 world, the analogy of a student drinking is really
17 raw. It's to extreme. It's more like the case of
18 what students are allowed to use as references on
19 take-home exams. You're not allowed to use any
20 reference material.

21 They say, "Routinely we use the books that
22 we used in the course." So we start saying, "Oh,
23 well, that's not a bad thing. That will be okay. We
24 really were permitting that by exemption." So you're
25 clarifying these exemptions which are reasonable so

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1 you don't have exemptions all the time --

2 MR. THOMAS: That's correct.

3 MEMBER WALLIS: -- making it clear what
4 the ground rules should be for what you're allowed to
5 do --

6 MR. WEERAKKODY: Exactly.

7 MEMBER WALLIS: -- rather than looking at
8 each case individually and say, "This student used 10
9 books from so and so. That really is too many." It
10 becomes so fuzzy that you are trying to make it clear.
11 Is that what you're doing?

12 MR. THOMAS: If I can take that back to
13 the discussion about safety earlier when we talked
14 about maintaining safety, to some degree this rule is
15 being put in place so that we would -- in a way it's
16 a precautionary measure to preclude any further --
17 well, to maintain safety, if you will, and to preclude
18 any further abuse of the law, if you will.

19 Any future degradation of safety, okay?
20 And maintain safety from a safety standpoint. That's
21 my wording of what we are doing with this rule. But
22 at the same time, too, it's providing -- yes, it is
23 providing a basis from which we will -- we think we'll
24 have a more effective efficient --

25 MEMBER WALLIS: I think because of the

1 nature of this arcane regulatory world, I think you
2 have to put it in terms that the public will
3 understand so that they can realize whether you are
4 dealing with a student drinking problem type thing but
5 they are breaking the law, or whether you are doing
6 something quite different which is clarifying sort of
7 exceptions which are perfectly reasonable and don't
8 affect safety.

9 You have to make it perfectly clear.
10 Otherwise, you may be misunderstood or misrepresented.
11 Take it out of this regulatory framework and frame it
12 in some terms that the average citizen can understand
13 and believe that you're doing the right thing.

14 CHAIRMAN ROSEN: Leslie, you're going to
15 have to wrap it up here in the next five minutes and
16 give David his five minutes.

17 MS. KERR: Okay. We'll try. Okay. So
18 onto cost and savings. The licensee's cost would
19 include -- of the proposed rule now is what the cost
20 and savings I'm referring to. The licensee cost would
21 be to document compliance with the acceptance
22 criteria.

23 We used an industry estimate of \$300 for
24 that. Savings or avoided cost include decrease in
25 50.12 exemption request. Again, an industry estimate

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1 of \$2,500 per request. And also a decrease in plant
2 modifications where we used a conservative estimate of
3 \$250,000 per modification.

4 MEMBER WALLIS: I guess I can read ahead.
5 You're going to claim there's going to be a savings by
6 doing this.

7 MS. KERR: Correct.

8 MEMBER WALLIS: Is there anything here
9 that says you've gained anything in safety?

10 MEMBER SIEBER: No, you don't. But you
11 don't lose anything either.

12 MEMBER WALLIS: The only reason you're
13 doing this is really because of safety. Isn't it?
14 You're doing it --

15 MS. KERR: We're doing it --

16 MEMBER WALLIS: -- for cost here.

17 MR. THOMAS: The reg analysis dovetails
18 the technical basis, the technical issue itself which
19 is, as was previously discussed, being done for
20 efficiency and clarification purposes.

21 MEMBER WALLIS: Is there some benefit in
22 public safety which ultimately ought to have a dollar
23 value?

24 MEMBER SIEBER: No.

25 MR. THOMAS: The reg analysis -- the focus

1 of the reg analysis is just on the rulemaking and
2 you've got to look at the technical issue that's being
3 challenged in the rulemaking itself which is --

4 MEMBER WALLIS: So you're in the
5 regulatory world.

6 MR. THOMAS: We're in the regulatory
7 world.

8 CHAIRMAN ROSEN: And there is no one here
9 from the staff to argue any side of this that this
10 suggestion can improve safety in some respect?

11 MR. WEERAKKODY: The only thing I can say
12 is there could be basically again in safety because we
13 are qualifying the criteria and making our
14 expectations very, very clear. That could be a gain
15 in safety. But if you go back to the purpose of the
16 rule because it's not driven by safety. We have
17 always said that we have enough instruments and
18 processes out there today to maintain plant safety.

19 MS. KERR: And we do discuss the
20 regulatory efficiency or clarifying regulations as a
21 qualitative benefit in the reg analysis rather than a
22 quantitative. These are just the quantitative cost
23 savings.

24 MEMBER WALLIS: I guess I'll believe the
25 numbers you've got there. When you get to slide 42,

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1 maybe someone should spend some time, maybe not now,
2 on the quality perception part, the last bullet.

3 MS. KERR: Yes.

4 MEMBER WALLIS: I think this is hanky
5 panky this dollar bit but if there is some measure in
6 terms of how this is affecting safety, that's really
7 what I think the public is interested in.

8 MS. KERR: Okay. Did you want to go
9 there? Do you want me to continue with the slides?

10 MEMBER SIEBER: I think if you're going to
11 catch up it would be a good place to do it.

12 MS. KERR: Okay. Let me just say that NRC
13 also has some cost and savings. The cost is to
14 prepare the regulatory guidance. Savings includes
15 decreasing the NRC review of 50.12 exemption request.
16 When you compare it with the industry practices
17 without enforcement discretion, baseline, there are
18 net costs and savings associated with each alternative
19 and these are presented at the 7 percent discount
20 rate. No action, no rulemaking alternative net cost
21 is zero. Revising regulatory guidance alternative net
22 cost is \$42,240.

23 MEMBER WALLIS: The implications of all
24 these actions are exactly the same.

25 MS. KERR: They are all neutral. Correct.

1 MEMBER WALLIS: All the same?

2 MS. KERR: Yes. The reg analysis is
3 safety neutral.

4 MEMBER WALLIS: So no action is just the
5 same application -- implication for safety as your
6 rule alternative?

7 MS. KERR: Well, we only considered safety
8 in the sense that if the rules are clarified, that may
9 be --

10 MEMBER WALLIS: It must be a safety
11 benefit.

12 MS. KERR: I guess that's not for me to
13 say as a reg analyst.

14 MR. THOMAS: Again, I think to maintain
15 the current level of safety and to preclude any future
16 depletion of safety. If in effect we were to not
17 revise the rule and leave things as they are, the
18 staff would experience a significant amount of
19 exemption request, if you will. From a safety
20 standpoint we think through that method safety would
21 still be maintained.

22 MR. QUALLS: Yes, this is Phil Qualls
23 again. Just a brief note on safety. We tried to
24 write this rule to make it safety neutral from
25 compliant with manual actions to compliant with the

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1 fire barriers has all provided an adequate level of
2 plant safety. We provided the criteria, though,
3 because what we were finding on inspections two,
4 three, four years ago were lack of procedures in many
5 cases, lack of staffing, lack of training.

6 If you look at it from a net safety
7 standpoint from where we were several years ago, yes,
8 by bringing into some standard for the manual actions
9 there should be a net gain in safety. But if you are
10 comparing safety from one compliance option to
11 another, we attempted to make that safety neutral.

12 MS. KERR: Okay, finally, the proposed
13 rule alternative, again, when compared with the
14 industry practices as they stand today, there was a
15 net savings of roughly \$17,000.

16 MEMBER WALLIS: Once we save this money we
17 can spend it on something else?

18 MS. KERR: That's not for me to say
19 either.

20 MEMBER SIEBER: Give it back to the rate
21 payers.

22 MS. KERR: Again, I presented the same
23 results at the 3 percent discount rate.

24 MEMBER WALLIS: How many years is this
25 spread over?

1 MS. KERR: Thirty years.

2 MEMBER WALLIS: How much of it goes to the
3 Government?

4 MS. KERR: Let me look here. Hold on.

5 MEMBER WALLIS: Saving the Government 10
6 million bucks.

7 MS. KERR: It's a combination of both.

8 MEMBER SIEBER: It's the industry that
9 saves the money.

10 MS. KERR: Right. The majority of the
11 savings is to industry but some of it goes to NRC.
12 Here is the final slide. The proposed rule
13 alternative is the preferred alternative in the
14 regulatory analysis because, as we looked at the cost,
15 the quantitative cost, it reduces both NRC and
16 licensee net cost.

17 As far as the qualitative attributes, it
18 improves regulatory efficiency or clarification of
19 regulation. Again, I think we've discussed that a lot
20 here. I won't go into it further unless you would
21 like to.

22 Public perception. This one I believe has
23 both positive and negative connotations. The positive
24 one, of course, we discussed as the public perceiving
25 the NRC and the licensees as following a much clearer

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1 set of rules.

2 The negative one that we considered is
3 that if there is a perception, not necessarily reality
4 but a perception that manual actions are less safety
5 and automatic type of fire protection, then public
6 perception or confidence could be decreased. In the
7 end we decided that the cost savings and improvements
8 in efficiency outweighed the negatives.

9 CHAIRMAN ROSEN: Okay, Leslie. Thank you
10 very much.

11 David, you've got, I estimate, two minutes
12 now before you are cutting into our games.

13 MEMBER SIEBER: We'd like to reduce that
14 in half.

15 MR. DIEC: How about if I try one minute?

16 MEMBER SIEBER: Very good.

17 MR. DIEC: Most of the text that we put
18 forward for the public information before we came
19 before you was one time or another discussed by Alex
20 so in the interest of public interaction with the
21 committee, I'm not going to go through step by step to
22 talk about each one of them.

23 But mainly going through this fairly
24 quickly, we are introducing the existing III.G.2(c)
25 with the entry into different option for using

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1 operator manual action as III.G.2(c-1). That is the
2 fourth option in the III.G.2 section area.

3 The new section P discuss about what we
4 mean operator manual action and the requirement of
5 using it by satisfying the list of criteria including
6 analysis, procedures and training, implementation, and
7 administration. Basically those are the words that
8 are made available to the public and they are included
9 as part of the discussion for the record. With
10 that --

11 CHAIRMAN ROSEN: Oh, boy. That was very
12 quick. I think I would like you to go back two
13 slides. You stuck a couple of words in here that
14 almost nothing was discussed at all and those words
15 are, "Including security event."

16 MR. DIEC: Right.

17 CHAIRMAN ROSEN: Under Item 1.

18 MR. DIEC: Let me --

19 CHAIRMAN ROSEN: Is that the only guidance
20 we've got here? This is a remarkably complex subject
21 to add to another complex subject with only those
22 words.

23 MR. DIEC: Right.

24 MS. BLACK: I thought Cathy Haney was
25 going to address that but I think I can take care of

1 it since she doesn't seem to be here anymore. When
2 this rule was being written there were questions about
3 how we address the safety and security interface in
4 our regulatory framework and it is still under
5 discussion.

6 This is more or less a placeholder because
7 you can either put these requirements in the security
8 rule so when something is changed in the safety part
9 of the license that the implications for the security
10 plan have to be considered or vice versa. If you put
11 it in Part 50, there are many places like 50.59,
12 50.90.

13 The Division of Regulatory Improvements
14 thought it was best to put a placeholder in this
15 regulation to show that we are thinking about safety
16 security interface but not necessarily have we at this
17 point decided exactly how to take care of it.

18 CHAIRMAN ROSEN: Well, I think that is
19 very clear, Susan. The inclusion here of this matter
20 would complicate fire analysis required substantially.
21 From that review then we would need a whole lot more.
22 We do need a whole lot more guidance in this area of
23 how to do this either here or in some other place.

24 If you don't do that, then it understates
25 the importance of this issue dramatically. Just

1 throwing in that phrase can't capture for anyone,
2 certainly not for a member of the public just how much
3 more complicated this would be.

4 What I think we need to understand as kind
5 of a given for this discussion that there will be
6 further guidance about how the security issues will be
7 used when one tried to do an operator manual actions
8 calculation I guess in something other than the
9 construct we've had in front of us because we can't
10 review it here. It's not here. Right?

11 MS. BLACK: That's correct. And in fact,
12 in putting it into the time margin, it may be
13 something that eventually would need to be included in
14 that, but as I see it, as long as you have the
15 available security force, if you feel you need a
16 security officer to go along with this person, it
17 shouldn't effect the time margin as long as that
18 person is available at the time this is needed.

19 CHAIRMAN ROSEN: Well, now you're getting
20 into the details. All I wanted to do is point out
21 that it's not here.

22 MS. BLACK: Exactly.

23 CHAIRMAN ROSEN: And that if it were here,
24 we would probably have to close the session to
25 properly protect classified information.

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1 MS. BLACK: Exactly, and I certainly don't
2 know enough to talk about it. I've probably already
3 told you more than I know about the subject and it
4 will be a subject that will come before the Committee,
5 I'm sure, in its own right, as opposed to --

6 CHAIRMAN ROSEN: So if the ACRS were to
7 write a letter about this, it probably will need to
8 say that this discussion does not include the impact
9 of security events because there's no guidance off of
10 here and that must be provided separately.

11 MEMBER WALLIS: But it has to be
12 considered. If it's an internal person who sets the
13 fire the same person might well remove the ladder
14 which is needed to go up and --

15 CHAIRMAN ROSEN: Or worse, or do worse
16 than remove the ladder.

17 MEMBER WALLIS: He doesn't need to do
18 worse, just do a few simple things.

19 CHAIRMAN ROSEN: So I think what one needs
20 to understand is that this needs to be accompanied in
21 some way with a careful set of guidance and properly
22 classified venues on how to deal with security issues
23 and so my only comment on this slide. Now, go ahead.

24 MR. DIEC: Okay, I guess I went through
25 this slide as well, talking about procedures and

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1 training.

2 CHAIRMAN ROSEN: I did want to reinforce
3 the comment I made about demonstration. This is Item
4 D on your Slide 47. I hope you take notes about that
5 because it isn't clear to me what a licensee is
6 supposed to do. If he has many manual acts, is he to
7 demonstrate each of them each year or some of them
8 each year? And I heard the answer is well, you ought
9 to take a representative sample, you ought to take the
10 most challenging one, but that's no place in any of
11 this guidance that I could find.

12 MR. DIEC: Certainly, this is the area
13 that we're going to go back and look at it and perhaps
14 discuss this issue a little bit further in the reg
15 analysis environment rather than the textual itself.

16 CHAIRMAN ROSEN: In the reg analysis
17 environment?

18 MR. DIEC: I'm sorry, in the reg guides.

19 MEMBER SIEBER: You anticipate a reg guide
20 that goes along with this.

21 MR. DIEC: Yeah, the reg guides is already
22 a part of the package that we forwarded to you.

23 CHAIRMAN ROSEN: But there's nothing about
24 demonstration in terms of --

25 MR. DIEC: Correct, it talks about

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1 demonstration but not to the extent that you are
2 asking questions.

3 CHAIRMAN ROSEN: Well, of course, and I
4 mean, in the reg guide, you have to answer the
5 questions, certainly; answer the questions that come up
6 while we're formulating it. You may have other
7 questions you'll have to answer later, but that seems
8 an obvious one.

9 MEMBER SIEBER: That's an important point,
10 by the way because the reason why we're here is
11 because Appendix R wasn't clear. And so now you're
12 pointing out that there's parts of this new rule that
13 aren't clear and it's not in the reg guide.

14 CHAIRMAN ROSEN: And we're going to have
15 interpretations of exemptions --

16 MEMBER SIEBER: Before we're done,
17 everything ought to be clear. You know, all these
18 loose ends need to be picked up.

19 CHAIRMAN ROSEN: All right, thank you very
20 much. Mr. Emerson of Nuclear Energy Institute has the
21 floor now and we'll try to accord him the 20 minutes
22 we've promised him.

23 MEMBER SIEBER: Slide show?

24 MR. EMERSON: I'm Fred Emerson from the
25 Nuclear Energy Institute. Joining me here are Dennis

1 Henneke from Duke Energy who is a PRA expert with a
2 lot of experience in fire PSA and on my right is Jeff
3 Ertman from Progress Energy with many years experience
4 in fire protection and safe shutdown at several
5 nuclear plants. We appreciate the opportunity to talk
6 to the ACRS and present at least briefly the industry
7 perspectives on what the staff is proposing. I'll
8 start off with a summary slide. The -- in our view,
9 where we started with this two years ago, we started
10 down the rulemaking path to address this issue.

11 The staff proposed an inspection guidance
12 in I think it was March 2003, a set of feasibility or
13 acceptance criteria to achieve the desired goals for
14 assuring the feasibility and reliability of manual
15 actions. And generally we agreed with that, it
16 appeared like it was a reasonable set of expectations
17 for anyone who was going to rely on manual actions to
18 have to address when he did it.

19 Since that time there have been a number
20 of changes as this rulemaking has progressed among
21 which are the automatic suppression and the time
22 margin factor. We don't feel that these improve
23 safety. They just add an unnecessary layer of
24 conservatism and don't really improve safety at all.
25 The third item has to do with the security events that

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1 Dr. Rosen brought up a minute ago.

2 MEMBER WALLIS: You feel that they don't
3 improve safety. Is this on the basis other than your
4 feelings about why they don't improve safety? Why is
5 it -- surely automatic suppression improves safety.
6 Take it out, it's going to make the fire burn more.

7 MR. EMERSON: I'll address your issue.
8 We're going to -- this is just the summary side.
9 We'll get to that.

10 MEMBER WALLIS: You said it didn't effect
11 safety and I'm just challenging that statement.

12 MR. EMERSON: Okay, I understand the
13 question. The issue the Dr. Rosen just brought up
14 having to do with security events, we feel that
15 there's a different mechanism for dealing with
16 security issues. We should not mix the consideration
17 of security events into the time line analysis that's
18 being proposed by the staff, so it should be handled
19 separately. The -- we had recommended -- in response
20 to a Federal Register notice back in January we
21 recommended a set of improvements in the criteria the
22 staff were proposing. That's just for general
23 reference.

24 And lastly, we think there are better
25 methods for addressing these issues related to

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1 improved reliability in the rulemaking process and
2 we'll --

3 MEMBER WALLIS: The rule is put out for
4 comment. You can make all these comments.

5 MR. EMERSON: That's correct.

6 CHAIRMAN ROSEN: But the purpose of this
7 discussion as to whether or not the ACRS wants to --

8 MEMBER WALLIS: But if the rule is so
9 flawed that it's going to be shot down by comments,
10 maybe we should say don't put it out.

11 CHAIRMAN ROSEN: That's right, as we did
12 in one case, we suggested that another rule which I
13 know you're familiar with.

14 MEMBER WALLIS: But you're not suggesting
15 the rule is so flawed it shouldn't be put out, are
16 you?

17 MR. EMERSON: We're suggesting that the
18 original concept was quite reasonable. We think some
19 of the changes that have taken place over the last
20 couple of years have not added anything to the
21 licensee's ability to have safe and effective manual
22 actions.

23 CHAIRMAN ROSEN: Do you want to take a
24 crack at Graham's point or do you want to take a pass?

25 MEMBER WALLIS: Hold up issuing this rule?

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1 MR. EMERSON: Should we hold up issuing
2 the rule?

3 MEMBER SIEBER: In its present form.

4 MR. EMERSON: Just speaking from my own
5 opinion, I'm not sure the rulemaking was required to
6 do that but the staff has chosen that pathway to
7 address this issue. We think the rulemaking could be
8 useful in achieving a broader degree of consistency
9 among the industry but it's not the only way that
10 could be used to do that.

11 MEMBER SIEBER: There's really three ways,
12 okay. One is rulemaking. Another one was the
13 exemption process and the third one goes straight to
14 enforcement. Maybe this is the better alternative.

15 MEMBER WALLIS: You wouldn't want them to
16 go straight to enforcement, would you?

17 MR. EMERSON: Only to say this --

18 MEMBER WALLIS: Well, should we recommend
19 that? Would you like us to recommend they go straight
20 to enforcement, forget about rulemaking?

21 MR. EMERSON: Could I add a little context
22 before I answer the question?

23 MEMBER SIEBER: Yes or no, how is that?
24 Well, we could move on.

25 MEMBER WALLIS: Now, you can add whatever

1 you want.

2 MR. EMERSON: Sunil Weerakkody addressed
3 a minute ago, and he indicated that the staff's
4 attention was drawn to this only fairly recently, you
5 know. This is not a brand new issue. These manual
6 actions have been in place by licensees for many years
7 through the interpretations that were put on the rules
8 that were put in place that long ago. And these
9 manual actions have been inspected for many years and
10 it was only recently, back in 2002 that -- or maybe a
11 year earlier that the staff decided that this was --
12 that this was an issue involving compliance. So as he
13 indicated, the licensees have not been out of
14 compliance for 15 years. It's just an effort recently
15 noticed to the industry that this was a concern of
16 theirs.

17 So as far as do we want to involve the
18 industry in a lot of new exemption requests? I would
19 say that's certainly quite likely if the rulemaking
20 didn't take place.

21 MEMBER SIEBER: Yeah.

22 MR. EMERSON: Whether that's desirable or
23 not, you know, it seems like an unnecessary waste of
24 resources.

25 CHAIRMAN ROSEN: Okay, I'm just being sure

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1 I understood I heard you now that you think that the
2 rulemaking didn't take place, it would likely be a lot
3 of exemption.

4 MR. EMERSON: Yes.

5 MR. HENNEKE: I'd like to say, and I know
6 Fred doesn't want me to say exactly this, but because
7 of the requirements for time margins -- and this is
8 Dennis Henneke from Duke Power, by the way. Time
9 margins and the automatic suppression, we have III.G.2
10 areas now without automatic suppression, without fixed
11 suppression and we determined that based on fire
12 hazards analysis, which is the correct way with
13 defense and depth, so it is likely if the rule went
14 through as proposed, that we would come through with
15 probably as many exemptions as we would if the rule
16 did not go through. So because we would have to put
17 an exemption for every manual action where we had an
18 area that didn't have automatic suppression, we would
19 also have to put an exemption or deviation through.
20 So we would -- there's no change in that regard if the
21 rule goes through as proposed.

22 CHAIRMAN ROSEN: But if the rule went
23 through without automatic suppression and fire
24 protection, it would be fewer?

25 MR. HENNEKE: I would say then we'd only

1 have issues with regard to time margin where we would
2 show the action was safe but we didn't meet the time
3 margin requirements. And Fred is going to go through
4 our slides on that.

5 MR. EMERSON: I think, in starting in on
6 this slide, I think I should make it very clear that
7 we agree that manual actions should be demonstrated as
8 safe, reliable and feasible, that that should be a
9 pre-condition for using them but if you can do that,
10 we believe that they present a reasonable alternative
11 to physical protection. That was the basis for this
12 slide. We expressed that opinion several years ago,
13 before the rulemaking started. We believe that these
14 criteria that were put in place in the inspection
15 procedure, they do -- they can be applied to all
16 manual actions. They address feasibility and
17 reliability acceptably and if the licensee carries
18 them out in the way that they're intended, they will
19 take care of the issue of demonstrating that an
20 equivalent degree of physical protection -- too the
21 physical protection could be provided.

22 The changes to the criteria that have
23 taken place are the three areas involving security,
24 detection and automatic suppression in the area of the
25 fire and the time margin factor that we've heard the

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1 staff describe. Just very simply and without
2 elaboration, we think that the security should be
3 separated from this issue.

4 In the area of detection and automatic
5 suppression, we would concur that detection in the
6 area where the fire occurs can be an asset to
7 crediting manual actions because --

8 MEMBER WALLIS: How do you take manual
9 action if you don't know the fire has occurred? You
10 have to detect the fire in order to know that you're
11 going --

12 MR. EMERSON: I agree and that's the point
13 of this slide.

14 MEMBER WALLIS: You must detect the fire.

15 MEMBER SIEBER: You can -- an operator can
16 see anomalous operation or something --

17 MEMBER WALLIS: But that's detection.

18 MEMBER SIEBER: -- and take an action
19 without knowing that there's a fire or where it is.

20 MR. HENNEKE: But I'll state two
21 exceptions. We often have large fire areas with sub-
22 areas or sub-zones that do not have detection because
23 they don't have hazards but they do not effect the
24 manual action and that is non-exception to this rule,
25 we would be required to put detection in those sub-

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1 zones. The second is, we often times put manual
2 actions in our procedure in our fire procedures that
3 are already in our emergency procedures. So
4 irregardless of detecting the steam generator over-
5 feed, we would perform that manual action locally
6 anyways. So detection would be nice but it's not
7 necessarily required to complete the manual action.
8 So there are exceptions which are not considered by
9 the rule.

10 MR. EMERSON: It's well understood the
11 detection is already supplied and has been in place
12 for many years in plants, too.

13 MEMBER WALLIS: You don't have a problem
14 with requiring detection.

15 MR. EMERSON: As I said --

16 MEMBER SIEBER: Apparently somebody does.

17 MR. EMERSON: Well, detection is already
18 a requirement and detection is already a part of the
19 defense in-depth philosophy that's been incorporated
20 into fire protection for several years, so of course,
21 I don't object to having detection. And we think that
22 if there are cases where detection will improve the
23 ability to carry out a manual action, then that
24 certainly seems reasonable. We think those were the
25 primary area where that might be useful is where you

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1 carry out pre-emptive manual actions rather than ones
2 that can be allowed to take place over a period of
3 time where you're reacting to the loss of a function.

4 So yes, short answer, yes, it can be an
5 asset, if it can help the operator carry out the
6 action. The requirement for suppression, we don't
7 feel, adds anything to the operator's ability to carry
8 out the actions. Again, suppression is already
9 required. Suppression has already been installed in
10 areas and the ability of the suppression to address
11 the defense in-depth aspects than the current Appendix
12 R. We don't feel like adding more suppression is
13 going to inherently help the operator carry out --

14 MEMBER WALLIS: Why would you add more
15 suppression if we've already got enough suppression to
16 suppress a fire? Why would you have to add more?

17 MR. EMERSON: Well, even if you didn't
18 have suppression, again, the manual action is being
19 carried out in an area remote from the fire.
20 Certainly if the manual action were being carried out
21 in the area of the fire, it would be very obvious.
22 Suppression would be an asset to perform any action.
23 But it's difficult to see how adding suppression in t
24 the area of the fire is going to help you carry out
25 the manual action at some distance away.

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1 MEMBER WALLIS: That wasn't the purpose.
2 The purpose was a defense in-depth.

3 MEMBER SIEBER: Well, it's the manual
4 action that's the defense in-depth. The detection and
5 suppression is the main way to control the --

6 MEMBER WALLIS: That's your response to
7 the fire is to try to suppress it. That makes sense
8 and then the manual action is a backup.

9 MEMBER SIEBER: Is a defense in-depth.

10 CHAIRMAN ROSEN: Isn't it a time question?
11 If you add suppression to the fire area, it gives the
12 operators time in the area that they're taking the
13 manual action outside that area more time to take it
14 and have it effected.

15 MR. HENNEKE: No, no, typically
16 suppression is -- if suppression fails the manual
17 action is required. So the addition of suppression
18 only lowers the frequency by which manual actions are
19 required.

20 MEMBER SIEBER: Manual actions are
21 required.

MR. HENNEKE: So what we've done
22 in our fire hazard analysis for all sites is that the
23 detection and suppression is performed based on the
24 ignition frequency on the fire side, based on the fire
25 hazard analysis. That's the first step in the

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1 defense of that is the ignition frequency, the
2 likelihood of the fire and the fire size.
3 Suppression detection is added upon that based on the
4 largest hazards, both ignition frequency and size and
5 then manual actions and alternate shut-down and safe
6 shut-down is the other layer of defense in-depth.

7 By turning it on its head, by saying we
8 now require backwards defense in-depth of suppression
9 for safe shut-down, that doesn't meet the defense in-
10 depth model as we see it.

11 CHAIRMAN ROSEN: You treat those two as
12 separate anyway.

13 MR. HENNEKE: So we can have III.G.2 areas
14 with not a thing in it, with not a fire ignition
15 source in it, that would now require automatic
16 suppression and that doesn't match our fire hazard
17 analysis and defense in-depth model.

18 CHAIRMAN ROSEN: You could have a III.G.2
19 area that require automatic suppression --

20 MEMBER WALLIS: When you can't have a
21 fire.

22 CHAIRMAN ROSEN: -- when you can't have a
23 fire there.

24 MR. HENNEKE: But the rule would require
25 that. We do not now require that but the rule would

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1 require it.

2 CHAIRMAN ROSEN: Yes, in order to take
3 credit for the manual actions which you already have
4 planned into your program.

5 MEMBER WALLIS: It just seems kind of
6 silly but the original idea of the suppression was to
7 put out the fire but then the manual action is a
8 backup and obviously the two together gets your more
9 safety than one by itself. So I don't see how you --

10 MEMBER SIEBER: If it's not a trade.

11 MEMBER WALLIS: It's not better to have
12 these two things rather than just one alone.

13 MR. HENNEKE: But prove it's unsafe. I
14 mean, we have a safe operating plant now.

15 MEMBER WALLIS: It's a question of safer.
16 You know, safe is a continuum, safety is a continuum.
17 We have two actions which contribute to safety
18 somewhat independently. If you're safer then you just
19 have one.

20 MR. EMERSON: At some point --

21 MEMBER WALLIS: That's just defense in-
22 depth.

23 MR. HENNEKE: That's a back-fed on what we
24 have now.

25 MR. EMERSON: At some point the staff made

1 a decision that the detection and suppression in an
2 area was adequate before we ever started talking about
3 manual actions.

4 MEMBER WALLIS: They've already decided
5 that? They had another --

6 MR. EMERSON: Well, it's been in place for
7 many years.

8 MEMBER WALLIS: They had 20 feet between
9 and other things you had to do as well.

10 MR. EMERSON: Right, and so at some point
11 before manual actions was a consideration, you know,
12 the staff made a decision or has reviewed all the
13 licensing programs and determined that the suppression
14 and detection is either adequate in an area based on
15 their defense in-depth principles or it isn't and at
16 this point to add another layer of suppression in an
17 area where they've previously decided that it wasn't
18 needed --

19 MEMBER WALLIS: I think this would also
20 fit into your response to the issuance of the rule for
21 comment. It doesn't prevent the rule from --

22 CHAIRMAN ROSEN: I don't think --

23 MEMBER WALLIS: It's a debatable issue and
24 it were --

25 CHAIRMAN ROSEN: -- NEI or Duke is arguing

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1 against the value of suppression. We're just saying
2 that --

3 MR. EMERSON: No, of course not.

4 CHAIRMAN ROSEN: -- that it improve the
5 overall -- reduce the overall fire risk but you've
6 already shown the manual actions in your case, in the
7 cases you're talking about was adequate to preserve,
8 I presume, functionality.

9 MEMBER WALLIS: All we have to worry about
10 as ACRS is whether we recommend putting out the rule
11 now for public comment or whether we should wait
12 because it's such a lousy rule or because -- or we
13 should say, "Everything is fine, we don't even need a
14 rule at all". Those are the three considerations.
15 And I have seen no argument which says we shouldn't
16 issue the rule for public comment.

17 CHAIRMAN ROSEN: What about the security?

18 MEMBER WALLIS: Well, that's a different
19 issue all together.

20 MEMBER SIEBER: But that can be a comment
21 to the rule.

22 CHAIRMAN ROSEN: I would say that there
23 are some questions here and we'll get a chance at the
24 end of this for the ACRS members to offer their
25 comments and I presume --

1 MEMBER SIEBER: Well, to the extent a
2 security event effects the time line, I think that it
3 has to be factored into the time line calculation to
4 determine the feasibility of the -- and reliability of
5 the manual action.

6 CHAIRMAN ROSEN: I'm going to give you
7 three extra minutes, Fred, because of the colloquy
8 between the ACRS members here. Go ahead.

9 MR. EMERSON: Okay, on the time margin
10 factor, the first slide has to do with our general
11 concerns. The staff described the elicitation process
12 and I would submit that it would have been more useful
13 if there were a greater degree of independence and
14 public input into that process similar to the manner
15 in which we included the public and the staff in our
16 deliberations on this -- on circuit failures. I think
17 that it tends to discount -- if a licensee is able to
18 demonstrate with his operating crews that manual
19 actions can be carried out. The imposition of an
20 arbitrary time margin factor tends to discount those
21 demonstrations and if we're moving toward a
22 performance based environment, it tends to detract
23 from our ability to take advantage of that.

24 It also doesn't differentiate to equal
25 zero, is treated differently between the staff's

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1 analysis an the time the thermal hydraulic analysis
2 which is intended to measure the consequences of a
3 spurious actuation or a functional failure and that's
4 an issue. And we think it just provides an excessive
5 degree of conservatism. We just don't think it really
6 adds anything. And I'll elaborate a little more on
7 that later.

8 There's some technical concerns that the
9 staff's applying a single standard of 100 percent of
10 a -- of the analyzed time margin to be applied as an
11 additional 100 percent to assure that the action can
12 be carried out. This may not be applicable to all
13 types of manual actions. There are immediate actions
14 that are needed called pre-emptive actions to prevent
15 immediate or unrecoverable consequences and then there
16 are actions that allow more time to take place before
17 you lose a function, the time frame can be completely
18 variable depending on the function that you're talking
19 about and the likelihood that the fire will impact the
20 equipment under consideration.

21 We think there are better methods
22 available for assuring this type of reliability than
23 the application of this factor. In addressing the
24 issue of how conservative this factor is, the type of
25 analysis that is conducted for transient analysis is

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1 already conservative. You assume that for a fire
2 outside the control room, you assume that the same
3 kind of time frame, the same kind of postulated damage
4 for fires outside the control room.

5 And the criterion you use for determining
6 performance is a loss of sub-cooling. Both of these
7 are already considered conservatisms. So the view of
8 the industry is that to apply this time margin factor
9 on top of this would be adding additional conservatism
10 on top of this analysis that is already conservative.
11 Again, I don't have any problem with making sure
12 something is safe but when you have to conduct
13 additional actions and additional analysis and you
14 don't end up with any increased degree of safety,
15 that's what I question.

16 MEMBER WALLIS: Do you have a measure of
17 this safety?

18 MR. EMERSON: Not with me, I don't.

19 MEMBER WALLIS: No one seems to have any
20 measure of safety in all of this discussion. That's
21 what I'd really like to see. If you could show me
22 some measure of safety that you're better off this way
23 than that way, then I can choose alternative A over B
24 on the basis of better safety, that might help me.
25 But if you just argue that you don't think it does or

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1 something, that doesn't help me at all.

2 MR. HENNEKE: Well, we've done analysis
3 and we've --

4 MEMBER WALLIS: Maybe you could present
5 that.

6 CHAIRMAN ROSEN: Were we provided that?

7 MEMBER WALLIS: Not now, but when you
8 actually critique the rule.

9 MR. HENNEKE: I think we provided that and
10 we show that the analysis as we performed it provides
11 more than adequate safety based on the conservative
12 summary of hydraulics, based on the conservative time
13 lines and the other conservatives we have in there and
14 so those are our supporting information.

15 MR. EMERSON: In answer to your question,
16 yes, we can address that in our comments. And just to
17 continue that theme, it will result in a lot of
18 additional analysis with not really any significant
19 improvement.

20 MEMBER WALLIS: I guess I'm rather
21 unsympathetic to all this continuing excuse that we
22 don't want to do better analysis and you guys should
23 be doing better analysis all the time.

24 MR. EMERSON: Well, I'm not saying -- we
25 think the analysis that we have already has an

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1 adequate degree of conservatism. We don't see what
2 adding additional conservatism is going to gain.

3 MEMBER WALLIS: But you would be better
4 off in the long run if you did realistic calculations.

5 MR. HENNEKE: But we have a certain
6 requirement for calculations whether it's small LOCA,
7 large LOCA, tube rupture. We perform the same thermal
8 hydraulic analysis for these types of actions that
9 have a certain pedigree as with regard to the ANSI
10 standard was discussed and now what you're talking
11 about is using the PRA type of calculations that don't
12 show a loss of steam generator cooling in 30 minutes,
13 they show a loss of, you know, steam generator level
14 in 54 minutes. Then we have to -- then we have to
15 pedigree all that analysis and put that in the
16 information. And then we have to do the ANSI standard
17 again for every type of walk-down we have, whether it
18 be III.D.3 actions or tube rupture it has a certain
19 requirement.

20 Now, we're going to have to do, you know,
21 say it doesn't take two minutes because we assume it.
22 We're going to say it takes 30 seconds and then
23 there's going to be a lot more question.

24 MEMBER WALLIS: Sounds like a student to
25 me that doesn't want to do the homework.

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1 MR. HENNEKE: But the point is a lot of
2 costs, a significant amount of costs, more than what
3 was predicted for no net safety gain, no reduction in
4 risk. And we have an alternative to that.

5 MEMBER SIEBER: In your last sub-board
6 there you say "validating the margin following testing
7 for lead screw versus what is done now verified that
8 each screw meets the time requirement". It seems to
9 me the margin is put into the factor, into the formula
10 because of the uncertainty. Are you going to
11 encounter something that you didn't anticipate in the
12 validation process of crew performance and that's
13 really why that's there. And to not put that in there
14 means that you are 100 percent certain that no
15 unforeseen condition or it will slow an operator down.

16 MR. EMERSON: Yeah, we recognize that one
17 of the rationales for the margin is to reflect the
18 fact that there's a difference among different crews
19 and their ability to carry it out but if you evaluate
20 each crew's ability to do that, that certainly reduces
21 the amount of uncertainty there is. You don't have to
22 assume that -- you know, you can assign your -- you
23 can decide on the operator's ability to carry it out
24 based on the worst case performance of the worst crew
25 in the bunch. You don't have to assign an arbitrary

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1 time margin factor to account for that.

2 MEMBER SIEBER: Well, granted it may be
3 arbitrary. On the other hand, when you test each
4 crew, you have a different environment than the fire
5 environment and you simulate everything so actual
6 difficulty in operating equipment, for example,
7 turning valves where you need a valve wrench or
8 something like that is not apparent.

9 MR. EMERSON: And that kind of margin is
10 already factored in. You know, we don't shave it down
11 to the second as far as demonstrating the operator's
12 ability.

13 MEMBER SIEBER: How do you factor it in?

14 MR. EMERSON: I can't answer that but I
15 know that from a operating standpoint --

16 MR. ERTMAN: Jeff Ertman with the
17 Department of Energy. We do have a validation process
18 for these actions so you also train on -- and you may
19 find the operator's already trained on particular
20 actions like stoking a valve or opening a breaker and
21 such, so you know the time that it takes for those
22 actions and that is considered when you do your
23 feasibility analysis.

24 CHAIRMAN ROSEN: Fred, you need to wrap
25 up.

1 MR. EMERSON: Okay. We have -- we believe
2 that there are different ways that you can address the
3 reliability of these methods. These include
4 conducting risk analysis performing an SDP type review
5 and focusing the application of these methods on the
6 actions that are really critical, not the ones that
7 you have hours to allow to unfold. In summary the
8 same points that I addressed in one of my first slides
9 separate security events, detection can be an asset
10 where it will assist the operator in carrying out a
11 manual action.

12 We don't think the automatic suppression
13 requirement improves the reliability of manual actions
14 and we think that there is -- there are other ways to
15 address the reliability than the time margin factors
16 which the staff has proposed. That concludes the
17 presentation.

18 MEMBER WALLIS: This doesn't tell us that
19 they should not put out this rule for comment. You
20 can comment on it in this way and I think you've got
21 some good points but it doesn't mean to say that --

22 MR. EMERSON: No, and I'm not suggesting
23 that the staff not put it out for comment. I'm
24 suggesting that there are portions of the rule that we
25 don't think will add anything and if they show up when

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1 it's put out for comment, we'll comment on it.

2 MEMBER WALLIS: It may be a little
3 difficult to resolve these --

4 MR. HENNEKE: We've commented on this
5 already and it hasn't changed the draft rule so we
6 don't suspect that if it gets through here that our
7 comments will be heard again.

8 MEMBER WALLIS: So your complaint really
9 is that the staff hasn't listened to you?

10 MR. HENNEKE: No. And in addition what
11 we're trying to cover here, that, you know, when we
12 need a sounding board and the staff doesn't seem to be
13 listening. One thing Fred did not cover, one example
14 is armored cable, multiple spurious or other factors.
15 Every manual action has to meet the same criteria but
16 if you have a low frequency sequence such as a
17 multiple spurious as required by RIS 2000-403, where
18 it's tandemized just to get to the spurious operation,
19 let alone cable damage, the manual action associated
20 with preventing that failure has to meet the same
21 criteria as the safe shutdown -- required safe
22 shutdown action and there really should be a
23 differentiation. You shouldn't have to have the same
24 time margin, the same requirements for actions that we
25 are now just adding in because of the RIS that you

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1 would for something that's a direct failure of say
2 shutdown. And there's a whole gambit of things with
3 regard to why those actions are performed and they
4 could be associated circuits, breaker fuse
5 coordination, single spurious, multiple spurious,
6 things of that sort.

7 It could be long term actions or short
8 term actions and to put them all under one, you know,
9 time margin factor, under one requirement for
10 suppression just doesn't make sense.

11 MEMBER WALLIS: So when the staff comes
12 back, all this stuff will be on the record and we can
13 ask them how they respond to it.

14 CHAIRMAN ROSEN: If this goes out for
15 public comment now. If not, you can make those
16 comments when it does. Okay, thank you very much,
17 gentlemen.

18 MEMBER SIEBER: Before we finish, I would
19 just -- the third bullet there, where it says
20 "automatic suppression requirement does not improve
21 reliability of manual actions", I think that you may
22 want to look at it differently. Automatic suppression
23 may reduce the requirement for manual actions which is
24 the goal. You want the automatic stuff to work first
25 and the manual actions as the backup not the reverse.

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1 MR. EMERSON: I understand your point.

2 MEMBER SIEBER: Okay.

3 CHAIRMAN ROSEN: Thank you very much.

4 MR. EMERSON: Thank you.

5 CHAIRMAN ROSEN: We now call Paul Gunter
6 of the Nuclear Information Resource Service.

7 MR. GUNTER: Thank you. First of all, Dr.
8 Rosen, I really appreciate you giving us the extra
9 time. It's going to give me some breathing room as
10 well as an opportunity to respond to some of the
11 issues and questions raised. And Dr. Wallis, I really
12 appreciate you bringing up the layman's questions. I
13 come to this as a layman. I think a little more than
14 the average, Information Resource Service was the
15 petitioner to the U.S. Nuclear Regulatory Commission
16 for emergency enforcement action back in 1992 with
17 regard to thermal-lag fire barriers.

18 So the reason that we're here before you
19 today is, in fact, the concern that we still have
20 those non-compliances with -- largely in part due to
21 the failure of the industry to come into compliance
22 and the failure of the NRC to effect enforcement. And
23 it is, in fact -- the whole concern here is that
24 unanalyzed, unapproved manual actions are being
25 proposed or actually right now are in effect. Some of

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1 those actions, in fact, in areas that are -- were to
2 be taken in areas where fires were to be, you know,
3 postulated. So I just wanted to make that
4 clarification.

5 You know, I was struck by a comment made
6 in November of 2003 with regard to the industry and
7 NRC have agreed and the quote was, "to suspending the
8 debate over fire protection history", and as you know,
9 there's an extensive history here that I think is a
10 little like the elephant in the middle of the room.
11 The issues have come to you time and time again. The
12 public is well aware of a history where the agency
13 attempted to respond to a fire experience and the
14 industry was resistant. Some of those areas where the
15 industry was resistant to NRC recommendations included
16 safe shut-down capability, fire barriers and
17 associated circuits.

18 The fire at Browns Ferry demonstrated that
19 a very large number of safety-related failures can
20 occur in a relatively short period of time, in that
21 case 15 minutes and the NRC undertook an effort to
22 restore protection against common mode failure by the
23 protection of cable functionability for redundant safe
24 shut-down systems evolving into the promulgation of
25 Appendix R and more specifically III.G.2.

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1 We became aware of the thermal lag issue
2 n 1991 when the -- it was revealed that 26 units at --
3 well, let's see it was more than that, it was 79 units
4 were using varying grades of this barrier that was
5 determined to be inoperable. In 1998 the -- after
6 spending a million dollars on fire barrier testing and
7 cable functionality, the agency issued orders
8 confirmed reaction orders to 17 sites for 26 units and
9 we thought at that point that in fact, enforcement
10 action was underway.

11 Unfortunately, SECY 2003-0100 basically
12 produced and acknowledged that the widespread use of
13 unanalyzed and unapproved manual actions were due
14 largely to unresolved and unimplemented thermal lag
15 action items. Part of that history also, we believe
16 has to look at the intent of Appendix R, III.G.2.
17 There are a number of documents but we chose the
18 American Nuclear Insurers document which identified
19 for insurance purposes that the maintenance of circuit
20 integrity in these Class IE circuits, safety circuits
21 during a postulated fire if of prime importance by
22 establishing what they determined a protective
23 envelope for redundant safety systems.

24 So the -- for insurance purposes, the
25 industry was instructed to focus on circuit integrity

1 and to provide the with a protective envelope. Of
2 course, this also included the cable separation. So
3 clearly as codified, Appendix R III.G.2 focused on
4 maintaining these redundant trains free from fire
5 damage and that intent is clear, it's explicit with
6 the protective envelopes and the physical separation
7 and the requirement for these barriers to be qualified
8 and with the inclusion for one-hour barriers and cable
9 separation for the use of detection and suppression
10 equipment.

11 This is our main point that we come to you
12 today. Manual actions are not equivalent to current
13 fire protection features of III.G.2. As we stated the
14 intent, the clear intent of III.G.2 is to provide for
15 -- and to protect cable functionality. It's -- that
16 cable functionality is qualified by a standardized
17 test criteria developed by the American Society for
18 Testing of Materials, the National Fire Protection
19 Association and Underwriters Laboratory. We submit to
20 you that this in fact, is the measure of safety that
21 you're asking about. It is -- it is using the fire
22 barriers and the cable separation to become a part of
23 the front line defense. It's our concern that manual
24 actions are taken after failure of circuit integrity
25 and cable functionality and are dependent upon human

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1 actions that are difficult to qualify under limited
2 fire and human behavior models and unrealistic
3 simulated fire conditions.

4 You know, you can postulate risk but there
5 always remains the concern of things like transient
6 combustibles. Clearly, there have been fires where
7 the introduction of combustible materials have -- that
8 were never conceived have arrived and contributed to
9 a fire. It's our concern that adding a Subsection C.1
10 to III.G.2 in effect is both inconsistent with the
11 intent of the protective qualities of III.G.2 and
12 significantly undermines the intent of the current
13 rule. In the context of what we've seen as an
14 enforcement struggle and a compliance struggle, since
15 we were first introduced to this issue back in 1991
16 and subsequently to the revelations of the bulletins
17 around thermal lag, that the -- that to introduce this
18 N III.G.2 is, in fact, an obvious Trojan Horse that
19 would defeat compliance enforcement of III.G.2 (A),
20 (B) and (C).

21 Here's just a case in point. Through a
22 FOIA that we filed 2003--358, we looked at a number of
23 operator manual actions that were unapproved and
24 unanalyzed. Crystal River really stands out in that
25 first of all, it relied extensively on thermal lag

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1 fire barriers in excess of 10,000 linear feet and
2 10,000 square feet was the criteria for extensive.
3 They were issued a confirmatory action order in May of
4 1998 for a thermal lag action plan. It was identified
5 that the operator sought no exemptions or amendments
6 concerning manual actions to compensate for not
7 protecting III.G.2 fire areas that were in questions
8 through the inoperable thermal lag barriers.

9 In fact, they incorporated a significant
10 number of operator manual actions to resolve thermal
11 lag with no written analysis. Now, this is of
12 significant safety concern. More so is the -- we
13 filed an allegation in August and were -- the response
14 that we got back from the Nuclear Regulatory
15 Commission was not comforting or provided us with
16 confidence. In fact, the response to the allegation
17 was that no attempt was made during the 2002 triennial
18 fire protection inspection to formally review the
19 licensee thermal lag resolution program or compliance
20 with the confirmatory action order in this area.

21 This is of tremendous concern because it
22 demonstrates an unwillingness on the part of the
23 Nuclear Regulatory Commission to effect the
24 enforcement. Now, you can establish operator manual
25 actions and substitute them for operable fire barriers

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1 or minimal separation requirements but if, in fact,
2 there's no resolve to enforce operator manual action
3 criteria, then we simply move to a new level of non-
4 enforcement policy and the public is quite disturbed
5 by this. And in fact, this is what draws a lot of the
6 controversy and the media attention to this issue is
7 that while it's true that there is an exemption
8 process --

9 CHAIRMAN ROSEN: Hold on, let me go back
10 to the prior --

11 MR. GUNTER: Certainly.

12 CHAIRMAN ROSEN: What is this FPL 50.59
13 analysis significant for?

14 MR. GUNTER: Well, the --

15 CHAIRMAN ROSEN: FPL is the licensee?

16 MEMBER SIEBER: Yeah.

17 MR. GUNTER: Yes, sir. Well, here's what
18 -- it's a follow-on.

19 CHAIRMAN ROSEN: Oh, I see.

20 MR. GUNTER: It's a follow-on to the
21 triennial fire protection inspection. Let me just
22 add, though, if you will --

23 CHAIRMAN ROSEN: Your slides in there, it
24 shouldn't be FPL. It should be FPC, I think.

25 MR. GUNTER: I'm sorry.

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1 CHAIRMAN ROSEN: I got confused.

2 MR. GUNTER: Okay, I see. But the 10.59,
3 50.59 analysis as reviewed by NRC they found that the
4 licensee did not consider complexity of new local
5 manual actions, the number of manual actions and time
6 available for completion, availability of instruments
7 to detect system and component mal-operations, human
8 performance under high stress, effects of products of
9 combustion on operator performance and available
10 manpower timing and feasibility of local manual
11 actions.

12 CHAIRMAN ROSEN: And all of these comments
13 have to do with Florida Power Corp., FPC.

14 MR. GUNTER: Yes, sir, okay, Florida Power
15 Corp., thank you.

16 CHAIRMAN ROSEN: Okay.

17 MR. GUNTER: As I was saying, you know,
18 there is an exemption process built in to Appendix R
19 for approaching III.G.2 problems. However, it's our
20 concern that codifying an exemption process into
21 Appendix R essentially defeats the primary strategy of
22 having protection systems in place for redundant
23 trains in a common fire area. Exemptions are intended
24 to be used sparingly, for unique circumstances and
25 more importantly, with a license amendment opportunity

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1 for public safety review process.

2 This III.G.C.1 would effectively be a
3 workaround for the public safety review process as we
4 see it. And we feel that it to be unreasonable and
5 unsupportable to contort a configuration exemption
6 process into what has already been demonstrated to be
7 a dubious industry-wide and turn it into a fire
8 protection standard. I mean, there have been a
9 significant number of problems associated with a clear
10 path for the industry to work through an exemption
11 process. And yet, they obviously didn't want to
12 pursue that path. And obviously, to us, they even
13 defied confirmatory action orders to work around these
14 issues.

15 So to now say that you want to incorporate
16 this into an industry-wide fire protection standard is
17 very alarming. Again, maintaining circuit integrity
18 and cable functionality is historically central to
19 defense-in-depth and is rooted in actual fire
20 experience. It's our concern and believe that local
21 operator manual actions are more appropriately
22 regarded as last ditch efforts and not substitutes for
23 maintaining front line passive fire protection
24 features.

25 Substituting manual actions for qualified

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1 pacifier protection features we believe significantly
2 erodes defense in depth and constitutes an undue risk
3 to public health and safety. As a closing point, we
4 believe that NRC must first enforce compliance with
5 what is now a duly promulgated law rather than develop
6 what really amounts to a compliance strategy that may,
7 in fact, under -- significantly undermine safety.

8 MEMBER WALLIS: I think this is one of the
9 issues we brought up earlier is this defense-in-depth
10 question. And there always is a question when you've
11 got two things in series. You've got something to do
12 with the FAR and then you've got something the
13 operators do. The combination of them works together.
14 How do you trade off one against the other and how do
15 you satisfy yourself you've got enough defense-in-
16 depth? Now you're taking a very conservative approach
17 and say you've got to have a very good defense here
18 and then a very good backdrop and that's defense-in-
19 depth. The agency seems to be softening and saying
20 we've got to have a reasonable defense here and then
21 a reasonable backup. That's good enough defense.

22 MR. GUNTER: Right.

23 MEMBER WALLIS: As long as it's always
24 qualitative, I don't know how to judge what's good
25 enough. There's no measure. I don't know how to

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1 judge which of these is right.

2 MR. GUNTER: Well, again --

3 MEMBER SIEBER: The original rules set up
4 physical apparatus, the physical barriers in
5 suppression and detection and made it a requirement to
6 seek an exemption to bolster or add defense-in-depth
7 through operator action. So the order of priority was
8 we will do the physical things first and then we rely
9 on the operators as a secondary thing and that's been
10 the history of Appendix R. And I think that's the
11 point you're making.

12 MR. GUNTER: Yes, it's curious to us,
13 though, and actually it's the subject of another FOIA
14 that we have yet to receive. Let's remember that the
15 Browns Ferry fire was rescued by operator manual
16 action. And yet, in -- you know, fresh from the fire
17 the Nuclear Regulatory Commission opted to preserve
18 cable functionality and circuit integrity. And you
19 know, frankly I think what that says is that operator
20 actions bring us too close for comfort and that the
21 agency and the fire protection analysis at that point
22 wanted that extra defense. And so now to propose that
23 to introduce operator manual actions into that III.G.2
24 component, I don't see how it can be argued that it
25 doesn't constitute a reduction.

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1 MEMBER WALLIS: You're saying it doesn't
2 belong in that box that we saw at all, it's something
3 else.

4 MR. GUNTER: Yes, sir. You know, we would
5 have no problem with the introduction of three -- of
6 Appendix R III.P as a stand-alone but to inject it
7 into the front line fire barrier system and the -- you
8 know the design features of -- the passive design
9 features, undermines our first line of defense. And
10 you know, as such, you know, we would support
11 developing this criteria for operator manual actions
12 because it makes sense to -- for the Nuclear
13 Regulatory Commission to be able to analyze and
14 qualify operator manual actions and, you know, to
15 judge them, but just don't make them our front line
16 protection system.

17 CHAIRMAN ROSEN: You see what complicates
18 this for me, Paul, is that when we talk about operator
19 actions in the control room, for instance taking an
20 action to prevent a low steam generator level, we rely
21 on our operators to scram the plant before they hit
22 the automatic set point. The automatic equipment is
23 a backup to the operators. And we train our operators
24 to sense degrading conditions and to verify the
25 conditions of degrading and to take the manual action

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1 to take the plant out of service under those
2 circumstances. If they don't take it quickly enough
3 the automatic systems will take it out. So you see in
4 that case we've got -- I think we've got it the other
5 way.

6 MR. GUNTER: But I understand --

7 MEMBER SIEBER: But that's not true.

8 MR. GUNTER: But I understand that but the
9 fire still represents, you know, a danger for residual
10 cooling as I understand it, so you still -- we still,
11 even after the plant is shut down, you still need that
12 measure of defense-in-depth to preserve and protect
13 the plant in that residual cooling period.

14 CHAIRMAN ROSEN: Well, I think we'll have
15 to end it there in order to give our next speaker his
16 time. Thank you.

17 MEMBER SIEBER: Let me ask one five-second
18 question. Your advice to us would be to say that the
19 rule should not be issued in its present form.

20 MR. GUNTER: Correct.

21 MEMBER SIEBER: Okay.

22 CHAIRMAN ROSEN: Okay, so that's
23 different. NEI said -- I think NEI said, okay, go
24 ahead and issue it.

25 MEMBER SIEBER: Yeah, and they would

1 complain.

2 CHAIRMAN ROSEN: And complain, yeah.
3 Well, we'll get a third vote here, I guess.

4 MEMBER SIEBER: Okay.

5 CHAIRMAN ROSEN: David, you don't have to
6 tell us what your vote is up front, but you can be
7 sure somebody will ask you.

8 MEMBER WALLIS: He might have changed his
9 mind.

10 MEMBER SIEBER: For the next seven days,
11 secret ballots are fashionable.

12 MR. LOCHBAUM: Thank you. I also agree
13 with Paul. I appreciate the subcommittee expanding
14 our time and also I appreciate the NRC staff
15 condensing theirs to make that time available. I
16 appreciate both those. I'd like to -- as far as the
17 vote, we agree with NEI and the subcommittee that this
18 issue should be separated from security issues. What
19 we would recommend is that the security issues be
20 resolved before this thing go out for rulemaking
21 because that has a big impact on what may or may not
22 be the right thing to do in this context. So we would
23 say postpone the rulemaking until after the security
24 issue. That way that will never be done in anybody's
25 lifetime here because --

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1 MEMBER SIEBER: Or you'll do it twice,
2 right?

3 MR. LOCHBAUM : Well, I don't think it
4 will ever be done once, so I don't think it will be
5 done twice.

6 MEMBER SIEBER: Okay, all right.

7 MR. LOCHBAUM : But I still think it's the
8 right thing to do because security measures do have a
9 big impact on operator manual action. So I think that
10 issue it would be wrong to put this out with that big
11 unknown hanging out there. So it would be -- the
12 smartest thing to do would be to wait until after that
13 was resolved. As far as our concerns, we have six of
14 them. Some of them have been discussed already.
15 We're concerned that operator manual actions can
16 reduce safety, can be unreliable. The revisit bad
17 times in the past. They substitute for real safety.
18 The reward bad behavior and they closely resemble --
19 I mean where we are today closely resembles the
20 staff's position on the PWR containment sump issue
21 which they stress did not think was ready for the
22 draft safety --

23 MEMBER WALLIS: How do operator manual
24 actions reward bad behavior?

25 MR. LOCHBAUM : Because the plant owners

1 who are in compliance, the ones that have not been
2 breaking the law for 15 years or whatever --

3 MEMBER SIEBER: Have spent a lot of money.

4 MR. LOCHBAUM : -- have spent a lot of
5 money to do that.

6 MEMBER WALLIS: So it's not the actions
7 themselves, this allowing operator manual actions.

8 MR. LOCHBAUM: To allow people to break
9 the law and get rewarded for it is the wrong message
10 for this agency to send out.

11 CHAIRMAN ROSEN: Now you're going to go
12 through and tell us why you came to those conclusions.

13 MR. LOCHBAUM : That's correct. As far as
14 manual actions reducing safety, the staff three years
15 ago cited a National Fire Protection Association
16 standard that said that when you substitute manual
17 actions for design features, risk may be increased.
18 I would agree with Chairman Rosen's point about manual
19 actions if they're feasible and reliable and all the
20 things like that, they can provide an equivalent level
21 of safety. Our concern is that the odds of achieving
22 that feasibility and reliability are less certain with
23 manual actions than they are with design features. A
24 related issue is that with design features, as you do
25 inspections both NRC and internal licensee inspections

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1 and find problems you hopefully converge on compliance
2 and a safety level.

3 With operator manual actions, you're more
4 likely to have oscillations where your good
5 performance drops and you actually diverge from safety
6 over time. And it's not as likely to do that with
7 design features. One of the things I was struck by
8 the presentations today was the lack of discussion by
9 the staff and the industry about the past exemptions
10 under 50.12 that have been granted for operator manual
11 actions. Some of the discussions that Dr. Wallis and
12 others had today about safety levels and whether
13 suppression was or was not needed seems would have
14 come up in that context and would have provided better
15 insight on whether these measures are consistent with
16 what the staff has granted in the past and also the
17 regulatory analysis.

18 Will the new rule, if it goes out as it's
19 proposed, require those to be backfitted if they don't
20 have fire suppression detection or not? The
21 regulatory analysis didn't seem to address those
22 issues and I don't know what the answer is. I
23 actually tried to do some research on that Monday but
24 ADAMS went down and --

25 CHAIRMAN ROSEN: Well, the conclusion you

1 have on the slide may be true but there's also a
2 conclusion that the staff offered that the risk may be
3 minimal -- may be increased by only minimally and so -
4 - and I think both are true.

5 MR. LOCHBAUM : Well, I agree. I don't
6 think there is one answer because it depends on what
7 the manual action is.

8 MEMBER SIEBER: Right.

9 MR. LOCHBAUM : Our concern is that there
10 is a range and if you look at the range of design
11 features, there you also may have -- the reason we're
12 here today is the design features weren't met in some
13 cases. We think over time you'll converge as those
14 design errors are weeded out whereas in operator
15 manual actions, you actually lose ground over time
16 because performance isn't there.

17 Cooper Nuclear Station had a problem a few
18 years ago with just a routine SCRAM, the operators
19 messed up badly because the operating performance had
20 gotten so good, they hadn't seen a SCRAM in awhile.
21 So the familiarity, the performance capability
22 dropped.

23 CHAIRMAN ROSEN: We hope they see fewer
24 fires than they see SCRAMS.

25 MR. LOCHBAUM : Well, I'm not proposing

1 alternatives to have more fires so they can get better
2 at it. That's not where --

3 MEMBER WALLIS: This doesn't help me much,
4 though, because risk could also be decreased. Without
5 some proper measure of risk, I don't really know where
6 we are.

7 MR. LOCHBAUM : I agree. I think one of
8 the concerns is, as the staff said earlier, was that
9 fire modeling can't be modeled or it's impossible I
10 think was the words they said. You know, so everybody
11 is basically guessing at this and that's why I led to
12 the conclusion between the analogue between this and
13 the PWR containment sump issue. There was concern
14 that there wasn't enough information on that issue to
15 go forward. I think there's even less information on
16 this issue to --

17 MEMBER WALLIS: So your argument would
18 have to be when everyone is guessing you need more
19 defense-in-depth. That would be because you're more
20 uncertain. Was that your argument?

21 MR. LOCHBAUM : Well, I think if everybody
22 is guessing, you might as well stick with something
23 you've had in place for 24 years.

24 MEMBER WALLIS: It might have been lousy.

25 MR. LOCHBAUM : It may be lousy but if --

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1 CHAIRMAN ROSEN: It's the devil we know.

2 MEMBER WALLIS: Maybe the operators would
3 do better if this thing had been in place.

4 MR. LOCHBAUM: That's an interesting
5 gamble with high stakes. You know, a poker game is
6 kind of rough. As far as the operator actions may be
7 unreliable. As Dr. Powers pointed out during an ACRS
8 meeting two years ago, in this case he was talking
9 about a fire that actually occurred at River Bend in
10 1995 or 1996. I have a typo here. The guys were in
11 the control room, they weren't in the control rood.
12 That's a different place altogether on the fourth
13 line. But here --

14 CHAIRMAN ROSEN: Now, was Dr. Powers
15 actually there to hear them say, "Oh, dear, oh, dear,
16 oh, dear, oh, dear"? It's in quotes.

17 MR. LOCHBAUM: Yeah.

18 MEMBER SIEBER: Must have been.

19 CHAIRMAN ROSEN: Oh, you're quoting Dana.

20 MR. LOCHBAUM: I was quoting Dana.

21 MEMBER WALLIS: Dana was probably
22 perplexed when they were saying it.

23 MR. LOCHBAUM: It might have been a
24 different word. I don't know. The issue is that
25 Waterford had a fire, they thought it was an

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1 electrical fire. They didn't put water on it for over
2 an hour even though one of the lessons learned from
3 Browns Ferry was that you put the fire out even if
4 it's an electrical fire. The concern here is that's
5 been drummed into training, as Dr. Powers points out,
6 there's been innumerable guidance documents and
7 information notices issued by the NRC and yet this
8 licensee still didn't get that message, didn't
9 ingrained it into -- they probably ingrained it into
10 their training but when the actual event occurred,
11 that training went out the window and they sat around
12 in the control room or control rood, befuddled.

13 As far as revisiting bad times, the NRC
14 staff has said that basically many plants or some
15 plants at least, have returned conditions to what they
16 were before the Browns Ferry fire, bad manual actions
17 and no physical separation, fire rep or whatever. I
18 think also, getting into the issue of the devil that
19 you know, that issue -- that regulation was
20 implemented in 1980. Twenty-four years later we're
21 still discussing compliance with it. Dr. Wallis
22 pointed out earlier there's been non-compliance for 15
23 years. The staff clarified that they didn't know
24 about it except for two years ago. We could go to
25 this new operator manual actions thing. How many

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1 years down the road will it be before the staff and
2 the industry actually get into compliance with the new
3 operator manual actions rulemaking?

4 You know, here we're 24 years later and
5 we're still not there. What we think this does is
6 essentially reset the clock on non-compliance and
7 that's the wrong thing to do. As Paul pointed out,
8 we'd be not complying with the new regulation instead
9 of trying to get into compliance with the regulation
10 that at least has been out there for awhile and has
11 been understood by many licensees, because not
12 everybody is in that boat.

13 Substitution for real safety, I've eluded
14 to a few --

15 MEMBER WALLIS: Now this compliance, I
16 understand that one compliance would be this 20-foot
17 separation. There may be a room where an existing
18 reactor you can't get 20-foot separation without vast
19 rebuilding of the whole building.

20 MR. LOCHBAUM: That's not the only
21 requirement. They also have the one-hour fire wrap and
22 the three-hour fire wrap.

23 MEMBER WALLIS: So I think part of these
24 exemptions respond to that kind of situation where
25 it's unrealistic to try to get a 20-foot separation by

1 rebuilding something where it really was impossible or
2 very, very difficult to rebuild it.

3 MR. LOCHBAUM: Yeah, we're not advocating
4 room stretchers.

5 MEMBER WALLIS: No, but so --

6 MR. LOCHBAUM: But there are other
7 provisions of Appendix R that are already on the books
8 that were implemented in 1980.

9 MEMBER WALLIS: So you could still put in
10 a big barrier or something instead of that?

11 MR. LOCHBAUM: One-hour fire wrap, three-
12 hour fire barriers.

13 MEMBER WALLIS: So there is something
14 reasonable that could be done.

15 MR. LOCHBAUM: Or you still have the
16 provision -- as many plant -- responsible plant owners
17 have done is seek an exemption under 50.12, not do a
18 blanket one just to make the paperwork easier for the
19 staff.

20 MEMBER WALLIS: So you'd still allow them
21 to seek exemption.

22 MR. LOCHBAUM: Or sure.

23 MEMBER WALLIS: That's the present
24 arrangement.

25 MR. LOCHBAUM: That's the present

1 arrangement.

2 CHAIRMAN ROSEN: I don't think that's up
3 to us or with respect to physical -- that's the rule
4 in CFR 50.

5 MR. LOCHBAUM: Well, I guess we're not
6 advocating that that should be eliminated or
7 discouraged or taken out of the rule. That is a
8 provision if you can't meet the current parts of 50.

9 MEMBER WALLIS: So your only complaint
10 with the present system is that it's not being
11 adequately enforced; is that right?

12 MR. LOCHBAUM: Exactly correct, exactly
13 right.

14 MEMBER WALLIS: So if the present system
15 were adequately enforced we wouldn't need a new rule.

16 MR. LOCHBAUM: That's right, we wouldn't
17 be here today if the regulation enacted in 1980 were
18 simply followed and enforced. The next slide talks
19 about the substitute for real safety. The staff's
20 2002 letter points out that many of these non-
21 compliances, the plants were in compliance and they
22 took themselves out of compliance due to lack of
23 understanding or misinterpretation or whatever with
24 Appendix R.

25 Our concern is Appendix R is fairly

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1 simple. It's 20 feet, one-hour fire analysis, three-
2 hour fire barrier. It's a little bit easier to
3 understand if you're on the right side of the line or
4 if not then these timelines, this feasible actions,
5 all this analysis, that's much more subjective, that's
6 much less enforceable.

7 MEMBER WALLIS: So it's more effective and
8 efficient then, which was the criterion I saw the
9 staff use for the new rule.

10 MR. LOCHBAUM: Well, never knowing that
11 you're out of compliance is not more efficient than
12 being out of compliance. You know, it's semantics.
13 You know, it takes the staff out of a lot of
14 enforcement paperwork but it doesn't achieve the
15 safety level that's there because right now, as Paul
16 pointed out, plants are out there with unapproved,
17 improperly analyzed operator manual actions. If this
18 rule goes through, that population will go up as the
19 regulatory analysis showed with the number of plants
20 that would go this way. You can't assume that all
21 those plants would do it right. That's just not the
22 history of this industry. And our concern is, how
23 many years would it take for the NRC to catch up with
24 the fact that those plants are in the wrong space?
25 The best way to avoid it is not let them get there.

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1 The issue about rewarding bad behavior is
2 that the staff's data shows that not every plant is in
3 this situation. There are many plant owners who did
4 the right thing, spent the money, did the homework
5 right, did the analysis right, did the modifications
6 right, are in complete compliance with Appendix R
7 III.G.2 as intended in 1980. This game that's being
8 played will basically tell those people that they were
9 suckers for spending that money getting it right
10 because if they'd just waited long enough, the staff
11 would have changed its rule to allow the under-age
12 drinkers.

13 CHAIRMAN ROSEN: Well, doesn't it also
14 suggest that those suckers have a safer plant?

15 MR. LOCHBAUM: But in today's economic
16 environment, the ability to pay a premium to get that
17 safety is going away and under this action by the
18 staff with a deregulated industry, they'll be driving
19 more people to spend on less safe plants rather than
20 on --

21 CHAIRMAN ROSEN: Just a comment thing on
22 those guys who did the right thing.

23 MR. LOCHBAUM: Oh, yeah, I admire them.

24 CHAIRMAN ROSEN: Most people have plants
25 that don't have this fire risk and since fire is one

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1 of the dominant risks, those people are just in better
2 shape. It protects their investment and so I'm not
3 sure sucker is exactly the right word.

4 MEMBER SIEBER: Well, I'm not either. You
5 know, in the plants where I worked we didn't have
6 thermal lag but that was a matter of happenstance.
7 You know, the engineering folks didn't buy it and so
8 we didn't end up with this huge problem. That doesn't
9 mean we spent a lot of money not to have that huge
10 problem. It just means we were lucky, you know.

11 CHAIRMAN ROSEN: Well, I understand your
12 point but sucker is not my choice of words. I think
13 those people that have done the right thing, have done
14 the right thing and it's commendable.

15 MEMBER SIEBER: Yeah, and we can move on
16 then.

17 MR. LOCHBAUM: I just don't -- to reward
18 those who didn't do the right thing or who were
19 unlucky just doesn't seem to be the right thing for
20 the agency to be doing.

21 MEMBER SIEBER: True.

22 MR. LOCHBAUM: I said several times, the
23 ACRS recently issued a letter on the PWR containment
24 sump issue saying the staff hadn't quite reached the
25 gel point for that to go out.

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1 CHAIRMAN ROSEN: I wish you wouldn't use
2 that word in that context.

3 MR. LOCHBAUM: Sorry about that, I didn't
4 even think of that.

5 MEMBER SIEBER: That's all right.

6 MEMBER WALLIS: I thought it was
7 deliberate.

8 MR. LOCHBAUM: No, I wish it was but no,
9 it wasn't. The -- we think this issue is very similar
10 and added to it is the security issue which doesn't
11 effect the containment but does effect the operator
12 manual actions component.

13 In conclusion, I think our view is that
14 Appendix III.G.2 as implemented in 1980 provided
15 crisp, clear requirements for fire protection. The
16 staff's proposals to substitute a vague, ill-defined
17 and virtually unenforceable requirement for those
18 crisp clear regulations and that's unacceptable. What
19 we thing the manual action that's needed now is to
20 throw this idea into the --

21 MEMBER WALLIS: Why do they think it's
22 more effective and efficient because it would seem to
23 me that one's crisp, clear and easy to enforce and the
24 other one is vague, ill-defined. The vague, ill-
25 defined one must be less effective and efficient.

1 MR. LOCHBAUM: They don't have to do any
2 enforcement action. You can never enforce it, so
3 there will never be any enforcement conferences.
4 There will never be any chances where the --

5 MEMBER WALLIS: So it saves money but it
6 can't be more effective.

7 MEMBER SIEBER: Well, in effect, what
8 they're doing is moving the review of each exemption
9 from an NRR reviewer to a region-based fire protection
10 inspector.

11 MR. LOCHBAUM: Right, and because it is so
12 vague, that region-based fire protection inspector
13 will never be able to find any non-compliances or
14 violations, so it saves the staff a whole bunch of
15 money.

16 CHAIRMAN ROSEN: So in summary, you say
17 don't do it but certainly don't do it now.

18 MR. LOCHBAUM: Right.

19 CHAIRMAN ROSEN: Until the security issues
20 are clarified.

21 MR. LOCHBAUM: Right.

22 MEMBER WALLIS: This word "cockamamie"
23 must be some Americanism that I'm unfamiliar with.

24 CHAIRMAN ROSEN: I looked it up and
25 couldn't find it.

1 MEMBER WALLIS: What does it mean?

2 MEMBER SIEBER: Yeah, it turned red on the
3 spell checker.

4 CHAIRMAN ROSEN: I think you very much,
5 Mr. Lochbaum. Do you have any final comments, I don't
6 mean to cut you off.

7 MR. LOCHBAUM: Thank you.

8 CHAIRMAN ROSEN: We are going to take a
9 five-minute break because we've been provided the time
10 for one by our excellent speakers and come back and
11 make our final comments before 5:30. Thank you very
12 much. Five minute break.

13 (A brief recess was taken.)

14 CHAIRMAN ROSEN: We now are at the stage
15 of the meeting where I get all the help I can get from
16 my colleagues to draft the letter for the full
17 committee, so I would appreciate any thoughts you
18 might have and I'll tell you what I think, but I'll
19 start with you, Jack.

20 MEMBER SIEBER: Okay. My comments are
21 solely mine. They differ from other members and are
22 subject to change if I gain a greater understanding.
23 I have a couple of concerns. One of them is that the
24 way Appendix R was originally structured, it relied on
25 plant design features like three-hour barriers,

1 suppression and detection for the main thrust of fire
2 protection defense and the staff gave exemptions which
3 are exceptions to the rule for certain operator manual
4 actions where the physical features of the plant may
5 not be adequate.

6 I am concerned that we may be losing the
7 order of importance of these things in the new rule
8 which makes it very easy for a licensee to self-
9 construct an exemption and therefore, jump to operator
10 manual actions as opposed to repairing physical
11 features of -- fire protection features of the plant.
12 And so, any rules that's finally published needs to
13 make clear that the original intent of Appendix R,
14 which is make sure the design features are in place,
15 and in those rare situations where it's impossible or
16 totally impracticable to achieve full compliance with
17 design features, then operator manual actions may be
18 considered. And so that maybe just puts a little
19 different emphasis on it but it makes me more
20 comfortable in that it preserves the original intent
21 of the writers of Appendix R back in 1979/1980 time
22 frame.

23 My second comment is that the -- I agree
24 that security issues need to be evaluated before all
25 this analysis is performed to justify deviations and

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1 the crediting of operator manual actions because I, as
2 well as others, believe it will have a significant
3 impact and so I think that it's -- it should not be a
4 part of this proposed rule. On the other hand, I
5 think resolution of whatever action is taken under
6 this rule has to take into account security issues and
7 whatever impediments they may present to the
8 accomplishment of operator action and the analysis of
9 the timeline. I just think that's important.

10 CHAIRMAN ROSEN: Let me make sure I
11 understand, Jack. You're saying the security issues
12 are important. I think everybody agrees but that
13 you're providing, in your view, two options; one, take
14 them into account now or provide a mechanism to take
15 them into account at some later time?

16 MEMBER SIEBER: Yeah, I think either one
17 from a regulatory standpoint is acceptable, either
18 alternative. On the other hand, the lateral one is
19 twice as much work and so, staff may want to take that
20 into account. And that would be my comments. I'm not
21 saying don't issue it because of this idea of
22 prioritizing what gets done first, you know, physical
23 features and as an alternative, a last ditch
24 alternative or defense-in-depth thing, operator manual
25 action as opposed to elevating the ease of

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1 incorporating operator manual actions so that physical
2 features sort of disappear.

3 That doesn't necessarily say don't issue
4 the rule. It's fix the rule to make that clear.

5 CHAIRMAN ROSEN: Graham?

6 MEMBER WALLIS: well, I think that yeah,
7 the question we have is issuing this rule for public
8 comment. I think we have to have a pretty good
9 argument if we said don't do it. We'd have to make
10 sure why we were saying that. I wasn't really very
11 convinced by anything I heard today. I do like the
12 argument Jack put forth that the original intent was
13 to have the physical barriers first. If that was the
14 intent if you go back to it and look at the statement
15 of considerations or something there, figure out that
16 was the intent instead of quoting something from some
17 Federal Register notice 24 years ago, you could
18 understand the rationale behind the original Appendix
19 R, we might know what it is we're changing. I think
20 that staff needs to give us that argument properly.

21 What I missed, as I've said several times
22 today, was a measure of plant safety. There was all
23 this talking about it but if someone could convince me
24 that plants would be safer if we did this, this or
25 this, then I'd have some basis for making a decision

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1 and I didn't see that. It's all this cursive stuff.
2 So besides the housekeeping chore of tidying things up
3 so we don't let people do things without there being
4 some check on what they're doing and checking whether
5 or not they're really complying and so on, which I
6 don't think is that job of ACRS, it's something the
7 staff should be doing all the time, I don't really
8 know what ACRS can add. So put out this rule and let
9 people substantiate their comments on it with good
10 arguments and hopefully some analysis or we'll see it
11 again.

12 And I think the staff needs to do a better
13 job of justifying what it's doing based on its effects
14 on plant safety and what their strategy is towards
15 assuring plant safety which may be and in the past was
16 to emphasize the physical things first and then put in
17 operator actions as a defense-in-depth and so make it
18 clear what the strategy it to achieving plant safety.
19 I need that framework before I can really make a
20 judgment about what's appropriate. And I think we'll
21 probably end up saying, put this rule out and let's --

22 CHAIRMAN ROSEN: Well, I have three
23 options. I'll say, "No, staff, you can't put this
24 rule out the way it is".

25 MEMBER WALLIS: Because it's fatally

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1 flawed in some way.

2 CHAIRMAN ROSEN: It's fatally flawed and
3 give my reasons. Or, "Yes, staff, you can put it out,
4 it's flawed but not fatally and here's the flaws". Or
5 we can say, "It's wonderful" and go with that. I
6 don't think anybody thinks that. So I think the
7 options you're suggesting is, yes, it's flawed but
8 here are the flaws. Put it out.

9 MEMBER WALLIS: Well, I think when we
10 write our letter, we might want to point out some of
11 these things that need to be sorted out in the process
12 of public comment.

13 CHAIRMAN ROSEN: Is that where you come
14 down, pretty much, Jack?

15 MEMBER SIEBER: Well, I think there's
16 three. Don't put it out, put it out and resolve
17 comments which will remove some minor flaws, or the
18 third option is, it has some flaws that ought to be
19 fixed before it's put out and that's sort of where I'm
20 at.

21 MEMBER WALLIS: Yeah, I would kind of like
22 it to be in better shape. I think it should be in
23 better shape.

24 CHAIRMAN ROSEN: Yeah, I agree with both
25 of you. It has some flaws that I would like to see

1 fixed before they put it out. And in particular the
2 one that bothers me most is the security flaw. Maybe
3 that's a simple fix. Maybe it's just a clarification
4 of how one does this, but I would be faced, if I were
5 back in the plant I used to be at of now knowing how
6 to do the analysis without having to do it over.

7 MEMBER SIEBER: I think a licensee would
8 end up doing it twice. It's not clear to me -- I
9 think some licensees would say, "Well, I'm going to
10 drag my feet and not do it at all until I get further
11 definition of the problem", and that's not a result
12 you want.

13 CHAIRMAN ROSEN: No, and I don't think
14 it's possible either because there will be enough
15 interim check steps where the licensee that's trying
16 that would --

17 MEMBER SIEBER: Well, all he has to do is
18 keep track of where the inspectors are and when
19 they're coming to his plant. Do you know what I mean?
20 And the other alternative is just giving up and say,
21 "I'll do it twice", and that has a cost associated
22 with it. And you may come out with different answers.
23 You know, if you put all the security things, manual
24 actions may not look all that attractive and so you're
25 into doing the physical things that you should have

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1 done in the first place.

2 CHAIRMAN ROSEN: Well, I think my comment
3 is the security flaws is a show-stopper until some
4 sort of reasonable process is defined and I think the
5 staff maybe can address that in time for the next
6 meeting, maybe not. I think it certainly should focus
7 on that. I didn't hear much discussion of this but I
8 understood that the objectives of this rulemaking were
9 really multiple. I went to the trouble of trying to
10 dig them out. Let's see if I can find it.

11 Four objectives; maintain safety and
12 increase public confidence, I'm not going to read the
13 whole objective, they're longer than that but that's
14 the first one. Provide quality and uniformity in
15 licensee assessments and documentation, that's really
16 number 2. Number 3 is, reduce the unnecessary NRC and
17 licensee burden, that's number 3. Number 4 is result
18 in more efficient use of resources by both licensees
19 and NRC. So there's safety, quality and uniformity,
20 reduce licensee NRC burden and more efficient use.

21 In listening to what NEI said, said and I
22 think it was the gentleman from Duke Power, that there
23 are going to be a lot of exemptions with the rule as
24 its presently put together. So that that's certainly
25 won't meet objectives 3 and 4 which are to reduce

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1 unnecessary licensing regulatory burden and result in
2 more efficient use of resources. So of the four
3 objectives only two of them are likely to be achieved
4 and two are unlikely to be achieved.

5 MEMBER WALLIS: The most important one,
6 the safety one, really people didn't have very much to
7 say about.

8 CHAIRMAN ROSEN: No, no.

9 MEMBER SIEBER: It's a draw.

10 CHAIRMAN ROSEN: So I'm sort of troubled
11 by doing a rule-making that is on the face of it,
12 can't get better than about 50 percent in your tests,
13 Graham, maybe not that high. So I'm troubled by that.
14 So I'm troubled by security and I'm troubled by not
15 meeting the objectives of the rulemaking. I'm also
16 troubled by the idea that fire detection and automatic
17 suppression requiring that, in order to take credit
18 for operator manual actions runs counter to the
19 Commission's preference which has been established
20 over a long time and embodied in the 1995 policy
21 statement on PRA and it really runs counter to their
22 preference to risk-informed and performance-based
23 approaches. So stick that in and say that's our
24 article of faith, our deterministic article of faith
25 and now you can calculate all these things and do all

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1 this --

2 MEMBER WALLIS: They refuse to do any
3 risk-informed --

4 MEMBER SIEBER: Yeah, but I would agree
5 with you, Steve, that it's a deterministic rule and
6 there's no risk information and so what do you do with
7 that?

8 MEMBER WALLIS: You enforce it.

9 MEMBER SIEBER: Right.

10 CHAIRMAN ROSEN: Well, I'm troubled by a
11 little different aspect of it. Maybe I did not make
12 myself clear, is that if this Commission is trying to
13 run a regulatory system in a risk-informed,
14 performance-based way, saying we're going to do that
15 but the shape of this table is -- before you can do
16 the risk-informed and performance-based analysis,
17 risk-informed because you're doing the PRA-like
18 analysis and performance-based because you're going to
19 demonstrate the manual actions that your taking, first
20 you have to agree that you're going to have automatic
21 suppression and fire detection in the area. That's
22 not the way you do risk analysis.

23 What you do with risk analysis is you take
24 what you have and you do the best estimate analysis of
25 the circumstances, come up with a number and you

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1 assess your uncertainties, and if they're large, you
2 add defense-in-depth. I mean, that's the standard, so
3 this is different than that. It starts priority with
4 the defense-in-depth and then goes off and --

5 MEMBER SIEBER: You can use those
6 arguments, though to say you really don't need
7 containment.

8 MEMBER WALLIS: I think we have enough to
9 go to the full committee and say these are some of the
10 issues.

11 MEMBER SIEBER: I think so.

12 CHAIRMAN ROSEN: Yeah, I'm going to take
13 a crack at it. Maybe -- I'll certainly put in the
14 ideas about the rulemaking objective is not likely to
15 be achieved and the security event stuff. I might
16 fool around with the thing I just mentioned, a little
17 bit running counter to the typical way --

18 MEMBER WALLIS: What do we have? We have
19 a one-hour meeting with the full committee or
20 something?

21 CHAIRMAN ROSEN: One and a half, Marvin.

22 MEMBER WALLIS: It's just the staff that
23 presents or do we have other ones?

24 MR. SYKES: It's just staff.

25 CHAIRMAN ROSEN: Just the staff unless we

1 make the -- we have the inputs from the other people.

2 MEMBER WALLIS: We can share the other
3 slides with the full committee.

4 MEMBER SIEBER: Or you can do it and
5 Steve, in his introduction can summarize what --

6 CHAIRMAN ROSEN: Well, I'll certainly
7 mention what's been said.

8 MEMBER SIEBER: -- what the others have
9 said.

10 CHAIRMAN ROSEN: But hearing no further
11 comments from the members, I look around and ask if
12 there's anybody who feels compelled to want to keep us
13 from going to supper.

14 MEMBER WALLIS: Well, I think it's a
15 cockamamie idea to think of going to supper.

16 MEMBER SIEBER: How do you spell that
17 again?

18 CHAIRMAN ROSEN: Thank you very much. We
19 are adjourned.

20 (Whereupon, at 5:40 p.m. the above
21 entitled matter concluded.)

22

23

24

25

CERTIFICATE

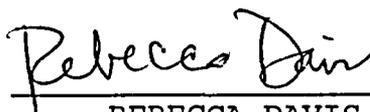
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Name of Proceeding: Advisory Committee on
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Subcommittee on Fire
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Docket Number: n/a

Location: Rockville, MD

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Post-Fire Operator Manual Actions Rulemaking

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October 27, 2004
ACRS Fire Protection Subcommittee Brief



Post-Fire Operator Manual Actions Rulemaking



- **Status**
 - Final preparation for EDO review and concurrence
- **Schedule**
 - ACRS Full Committee presentation early November 2004– Letter of Recommendation Request
 - Proposed rule to the Commission by early December 2004



Post-Fire Operator Manual Actions Rulemaking



- Background
- Elements Important to Rule Development
- Acceptance Criteria
- Key Issues
 - Time Margin Concept Development
 - Detection and Suppression
- Regulatory Analysis and Result
- Appendix– Proposed Rule Text

10/27/2004

ACRS Fire Protection Subcommittee
Brief

3



Background



- Revision of IP-71111.05 (March 2003)
- Operator Manual Actions in 10 CFR Part 50, Appendix R, Section III.G.3
- SECY 03-0100 Rulemaking Plan on Post-Fire Operator Manual Actions [ML023180599]
 - Revise 10 CFR Part 50, Appendix R, Section III.G.2
 - Codify operator manual actions option in section III.G.2
 - Consider enforcement discretion or other alternatives to provide regulatory stability

10/27/2004

ACRS Fire Protection Subcommittee
Brief

4



Background



- Staff Requirements Memorandum (SRM)
 - Commission approved staff rulemaking plan on September 17, 2003
- Rule Objective
 - Enhance Efficiency and Effectiveness
 - Use of feasible and reliable operator manual actions
 - Reduction in exemption requests

10/27/2004

ACRS Fire Protection Subcommittee
Brief

5



Background



- Stakeholder Interactions
 - September 9, 2003 ACRS Fire Protection Subcommittee on rulemaking plan
 - October 17, 2003 Public Meeting
 - Enforcement discretion interim acceptance criteria
 - November 12, 2003 Public Meeting and FRN publication
 - Solicit stakeholder comment on interim acceptance criteria
 - April 24, 2004 ACRS Fire Protection Subcommittee
 - Time margin – address ACRS reliability concern
 - Role of detection and suppression
 - Applicability of manual action to other sections of III.G

10/27/2004

ACRS Fire Protection Subcommittee
Brief

6



Background



- June 23, 2004 Public Meeting
 - Obtain stakeholder input on detection and suppression and applicability of manual action criteria to other sections of III.G
- September 2004, NEI Fire Protection Information Forum
 - Status of rule development
- Proposed rule text publicly available in advance of October 27, 2004 meeting with ACRS Fire Protection subcommittee

10/27/2004

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7



Elements Important to Rule Development



- Why provide acceptance criteria
 - Standards that provide a reasonable level of assurance that operator manual actions will be satisfactorily and reliably performed to bring the plant to a hot shutdown condition, thus protecting public health and safety.
- Address both “feasibility” (can it be done) and “reliability” (how well can it be done) of operator manual actions
- Permit both the licensees and NRC to establish consistency as to what operator manual actions will be allowed

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Acceptance Criteria



- Provide the parameters in which both licensees and NRC will use to conduct evaluations and inspections in a thorough manner.
- Criteria generally applied to human actions in other applications

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9



Acceptance Criteria



- Criteria developed from considerations that:
 - Fires are often the dominant contributor to plant risk
 - Fires present unique hazards in efforts to mitigate their effects, such as spurious actuation of components and potentially extensive activity outside the control room
 - Fires result in unique environmental conditions for operators, such as smoke, heat, toxic gases along with fire suppression activities such as fire brigade activities and suppressants (water)

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10



Acceptance Criteria (cont.)



- III.P.2(a)
 - Analysis
 - Fire time line and time margin
 - Environmental conditions (smoke, heat, etc.)
 - Functionality of and accessibility to equipment or cables
 - Indications (diagnostics, confirmatory, etc.)
 - Communications (radios, pagers, etc.)
 - Portable support equipment (ladders, tools, etc.)
 - Life support equipment (SCBA, protective gear, etc.)

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11



Acceptance Criteria (cont.)



- III.P.2.(b)
 - Procedures and Training (written procedures, periodic training)
- III.P.2.(c)
 - Implementation
 - Staffing (available, qualified personnel)
- III.P.2.(d)
 - Demonstration (complements time margin)
 - Walkdowns (simulated activities)

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Time Margin Concept and Development



- Address ACRS comments on proposed acceptance criteria for fire manual actions
 - address reliability as well as feasibility of manual actions
 - desire to use HRA as part of bases
- Solution
 - A time margin to address uncertainties as to the reliability associated with the time it takes to diagnose, perform, verify the desired action(s)

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13



Addressing Operator Manual Actions Reliability



- Issues needed to be addressed
 - Other rule criteria focus on the feasibility and only to some extent, the reliability of the actions
 - If other criteria met, uncertainties still remain that need to be addressed to achieve high reliability of the actions
 - *"If they're going to rely on a manual action in the event of a fire,, want it to be highly reliable"*
- Issues with reliability goals
 - Licensees would have to perform risk/reliability analyses
 - Concerns over consensus approach/model/data issues

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14



Addressing Operator Manual Actions Reliability (cont.)



- To deal with pluses/minuses related to developing reliability goals, we used the concept of time-margin
 - Concept: "feasibility + margin = high reliability"
 - Developed using HRA insights/lessons learned (somewhat risk informed)
 - The feasibility criteria address some key human performance aspects considered in an HRA, which, if met, should not contribute to uncertainty
 - Remaining uncertainties can be accounted for by using margins in action time estimations
 - Meeting "feasibility + margin" criteria, would ensure (with high confidence) small failure probabilities of manual actions

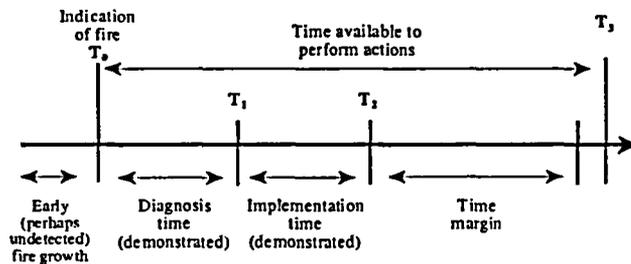
10/27/2004

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Brief

15



Time margin Concept



10/27/2004

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16



Development of Time Margin



- Expert Elicitation to derive time margin(s)
- Held in two sessions; each multiple-day meetings
- Reviewed procedures related to fire human actions from a sample of PWRs and BWRs
 - Identified types of actions licensees are implementing
 - Developed example scenarios
 - Identified various aspects of time estimations
 - Used Direct Numerical Estimate approach and guidance in NUREG/CR-2743, 3688, 6372

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17



Development of Time Margin (cont.)



- Panel Expertise
 - Inspection experience
 - Over 14 yrs including fire inspections
 - Fire protection
 - Operations experience
 - Former SRO at plant
 - Other operations experience
 - Reliability/risk analysis
 - PRA/HRA
 - Fire analysis
 - Engineering psychology
 - Human factors

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18



Considerations for Developing Time Margin



- **Types of margins**
 - Single vs. multiple/variable
 - Percentage vs. interval
- **Kinds of actions it would be applied**
 - Simple vs. complex actions
 - Preventive vs. reactive actions
- **Experience about time taken vs. time estimated**
 - ANSI/ANS Standard 58.8-1994, Time Response Design Criteria for Safety-Related Operator Actions
 - Inspection findings: less than vs. 3x pre-judged time estimates
 - Other (e.g., SRP 18.0, Human Factors Engineering)

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Brief

19



Considerations for Developing Time Margin (cont.)



- **Human performance issues taken into consideration through the feasibility criteria**
 - Diagnostic
 - Staff availability
 - Training/Procedures
 - Equipment availability, etc...

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20



Considerations for Developing Time Margin (cont.)



- Remaining uncertainties
 - random problems,
 - environmental,
 - range of fire severity and locations, and subsequent scenarios/timing,
 - action re-creation issues during demonstrations,
 - variability among humans (e.g., physical, cognitive, emotional)
 - not likely analyzed nor fully enveloped under the Timeline Criterion, nor re-created in demonstrations under the Demonstration Criterion

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21



Time Margin Result



- Single time margin (seems to work for wide range of situations and keeps it simple)
- A percentage, so time being added scales with number and complexity of actions
- Recommend: 100% of total demonstrated time
(double the demonstrated time (T_0 thru T_2) and show still within time available (T_3))

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22



Time Margin Result (cont.)



- Consistent with NEI-00-01, Rev. 0, Guidance for Post Fire Safe Shutdown
 - Do not screen (in preliminary screening) situations involving operator actions where time available is short (<1 hr) and estimated time to perform the action is >50% of available time (implies that a factor of up to 2 is desirable between estimated time to act and available time to act)

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23



Proposed Question in FRN on Time Margin



- Considering the factors for time margin discussed above (including the conditional dependence on a "reasonable, worst-case" demonstration meeting all the other acceptance criteria), should the time margin consist of a single multiplicative factor (e.g., 2 times), or a range of multiplicative factors (e.g., 2-4 times)? Please provide a basis for your proposed time frames or factors.
- If a range is appropriate, what should the range be and what parameters or variables should be considered in determining which part of the range is applicable in a given situation? Please provide a basis for your proposed time frames or factors.
- Should there be a minimum additive time (e.g., 10 minutes) for situations where the demonstrated time is so short that a multiplicative factor would not properly account for the required time margin (e.g., a demonstrated time of < 5 minutes). Please provide a basis for your proposed time frames or factors.
- Are there other means of demonstrating margin (e.g., through consideration of conservative assumptions in the thermal hydraulic timeline)? Please provide a technical basis.

10/27/2004

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Brief

24



- III.G.2.c-1. Operator manual actions that satisfy the acceptance criteria in paragraph III.P. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area



OPERATOR MANUAL ACTIONS FIRE DETECTORS AND SUPPRESSION

GRAPHICAL REPRESENTATION OF REQUIREMENT FOR FIRE DETECTORS AND AUTOMATIC FIRE SUPPRESSION SYSTEM FOR OPERATOR MANUAL ACTIONS OPTION III.G.2(C-1)

COMPLIANCE ACHIEVED (IMPLIED EQUIVALENCIES)

3-HR FIRE BARRIER	20-FT SEPARATION W/O INTERVENING COMBUSTIBLES	1-HR FIRE BARRIER	OPERATOR MANUAL ACTIONS WITH ACCEPTANCE CRITERIA
	AUTOMATIC FIRE SUPPRESSION SYSTEM		
	FIRE DETECTORS		

III.G.2(a)

III.G.2(b)

III.G.2(c)

III.G.2(c-1)



Key Issue



The basis for automatic suppression capability in III.G.2 is found in *Federal Register* notice 45 FR 76602 which stated, "The use of 1-hour barrier in conjunction with automatic fire suppression and detection capability . . . is based on the following considerations. Automatic suppression is required to **ensure prompt, effective application of a suppressant** to a fire that could endanger safe shutdown capability." The prompt, effective application of a suppressant to a fire also applies to III.G.2.b with 20 feet of horizontal separation with no intervening combustibles.

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27



Key Issue (cont.)



- FRN Nov 19, 1980, page 76608, M. *Fire Barriers Technical Basis*, states "The best fire protection for redundant trains of safe shutdown systems is separation by unpierced fire barriers...because these barriers are passive fire protection features, they are inherently reliable..."

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Brief

28



Key Issue (cont.)



- Rationale for fire detectors and automatic fire suppression systems
 - III.G.2(a) compliance with 3 hour fire barriers does not require fire detectors or automatic fire suppression (see Nov 1980 FRN)
 - III.G.2(b) and (c) currently require fire detectors and automatic fire suppression
 - Maintains defense-in-depth when utilizing operator manual actions in lieu of a fire barrier consistent with the requirement for protective features in III.G.2(b) and (c)
 - Enhances the ability of the operator to achieve and maintain safe shutdown from an unaffected area through prompt and effective application of suppressant to a fire that could endanger safe shutdown capability

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29



Key Issue (cont)



- Defense-in-depth (Appendix R, Section II.A)
 - Prevent fires from starting;
 - Detect rapidly, control, and extinguish promptly those fires that do occur; and
 - Provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant.

10/27/2004

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30



OPERATOR MANUAL ACTIONS FIRE DETECTORS AND SUPPRESSION



**GRAPHICAL REPRESENTATION OF REQUIREMENT FOR FIRE
DETECTORS AND NO AUTOMATIC FIRE SUPPRESSION SYSTEM
FOR OPERATOR MANUAL ACTIONS OPTION III.G.2(C-1)**

COMPLIANCE ACHIEVED (IMPLIED EQUIVALENCIES)

3-HR FIRE BARRIER	20-FT SEPARATION W/O INTERVENING COMBUSTIBLES	1-HR FIRE BARRIER	(IMPLIED GAP)
	AUTOMATIC FIRE SUPPRESSION SYSTEM		<small>OPERATOR MANUAL ACTIONS WITH ACCEPTANCE CRITERIA</small>
	FIRE DETECTORS		
III.G.2(a)	III.G.2(b)	III.G.2(c)	III.G.2(c-1)

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31



Proposed Question in FRN on Suppression



- Under the proposed option of using operator manual actions under III.G.2(c-1), when redundant trains are located in the same fire area, should the requirement for a suppression system in the fire area be automatic or fixed? Automatic suppression system is required in III.G.2(b) and (c). However, a fixed system is specified in III.G.3. Provide your rationale for why requiring fixed or automatic suppression would provide the appropriate level of protection.

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Brief

32



Operator Manual Actions Regulatory Analysis



- Alternatives
- Baselines
- Reactor Universe
- Costs and Savings
- Analysis of Alternatives
- Preferred Alternative

10/27/2004

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Brief

33



Alternatives



- **No Action (No Rulemaking) Alternative**
 - Manual actions for Part 50, Appendix R, III.G.2 would not be permitted without a § 50.12 exemption
- **Regulatory Guidance Alternative**
 - Manual actions for Part 50, Appendix R, III.G.2 would not be permitted without a § 50.12 exemption
 - Revised regulatory guidance clarifies existing regulations

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Brief

34



Alternatives



- Proposed Rule Alternative
 - Revise existing regulations to allow III.G.2 manual actions that meet generic acceptance criteria
 - Documentation of manual actions required
 - § 50.12 exemptions still required for III.G.2 manual actions that do not meet criteria

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35



Baselines



- Main Baseline
 - Assumes full compliance with existing regulations
- Industry Practices Baseline With interim enforcement discretion
 - Without interim enforcement discretion
 - Most realistic baseline (compared with alternatives)

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Brief

36



Reactor Universe



- **Universe Assumptions**
 - **Total Universe**
 - 52 pre-January 1, 1979, power reactors
 - **Present Affected Universe**
 - Of the 52 total reactors, 14 reactors could take immediate advantage of the proposed generic acceptance criteria
 - **Future Affected Universe**
 - 5 reactors per year over the next 30 years will document manual actions rather than submit an exemption request or make plant modifications

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37



Costs and Savings



- **Licensee Costs and Savings**
 - **Costs**
 - Document compliance with acceptance criteria (industry estimate: 300 hours)
 - **Savings**
 - Decrease in § 50.12 exemption requests (industry estimate: 2,500 hours per exemption request)
 - Decrease in plant modifications (NRC conservative estimate: \$250,000 per modification)

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38



Costs and Savings



- NRC Costs and Savings
 - Costs
 - Prepare regulatory guidance (NRC estimate: 480 hours)
 - Savings
 - Decrease NRC review of § 50.12 exemption requests (NRC estimate: 110 hours per exemption request)

10/27/2004

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Brief

39



Analysis of Alternatives



- Baseline: Industry Practices Without Enforcement Discretion
- Net Costs and Savings of Each Alternative at 7% discount rate
 - No Action (No Rulemaking) Alternative Net Cost: \$0
 - Revise Regulatory Guidance Alternative Net Cost: \$42,240
 - Proposed Rule Alternative Net Savings: (\$16,839,000)

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40



Analysis of Alternatives



- Net Costs and Savings of Each Alternative at 3% discount rate
 - No Action (No Rulemaking) Alternative Net Cost: \$0
 - Revise Regulatory Guidance Alternative Net Cost: \$42,240
 - Proposed Rule Alternative Net Savings: \$24,144,000

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41



Preferred Alternative



- Proposed Rule Alternative
 - Reduces NRC and licensee costs
 - Improves regulatory efficiency (clarification of regulation)
 - Public Perception

10/27/2004

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Brief

42



Appendix -- Proposed Operator Manual Actions Rule Requirements

10/27/2004

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Brief

43



Proposed Rule Requirements



- III.G.2.c. Enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire areas; or
- III.G.2.c-1. Operator manual actions that satisfy the acceptance criteria in paragraph III.P. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.
- III.P.1. For purposes of this section, operator manual actions means the integrated set of actions needed to ensure that a redundant train of systems necessary to achieve and maintain hot shutdown conditions located within the same area outside the primary containment is free of fire damage.

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44



Proposed Rule Requirements (cont.)



- III.P.2. A licensee relying on operator manual actions must meet all of the following requirements:
 - (a) Analysis. The licensee shall prepare an analysis for each operator manual action which demonstrates its feasibility and reliability.
 - (1) The analysis must contain a postulated fire time line showing that there is sufficient time to travel to action locations and perform actions required to achieve and maintain the plant in a hot shutdown condition under the environmental conditions expected to be encountered, including security events, without jeopardizing the health and safety of the operator performing the manual action. The fire time line shall extend from the time of initial fire detection until the time when the ability to achieve and maintain hot shutdown is reached, and shall include a time margin that accounts for all variables, including (i) differences between the demonstrated and actual conditions, and (ii) human performance uncertainties that may be encountered.

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45



Proposed Rule Requirements (cont.)



- (2) The analysis must address the functionality of equipment or cables that could be adversely affected by the fire or its effects but still utilized to achieve and maintain hot shutdown.
- (3) The analysis must identify all equipment required to accomplish the operator manual actions under the postulated time line, including (but not limited to) (i) all indications necessary to show the need for the operator manual actions, enable their performance and verify their successful accomplishment, and (ii) any necessary communications, portable, and life support equipment.
- (b) Procedures and training. Plant procedures must include each operator manual action required to achieve and maintain hot shutdown. Each operator must be appropriately trained on those procedures.

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46



Proposed Rule Requirements (cont.)



- (c) **Implementation.** The licensee shall ensure that all systems and equipment needed to accomplish each operator manual action are operable and readily accessible consistent with the analysis required by paragraph 2(a). The number of operating shift personnel required to perform the operator manual actions shall be on site at all times.
- (d) **Demonstration.** Periodically (at intervals not to exceed 12 months), the licensee shall conduct walkdowns using an established crew of operators to demonstrate that each operator manual action required to achieve and maintain the plant in a hot shutdown condition can be accomplished consistent with the analysis in paragraph 2(a) of this section. The licensee may not implement any operator manual actions until they have been demonstrated by a walkdown to be consistent with the analysis. The licensee shall take prompt corrective action if any subsequent periodic walkdown demonstrates that the operator manual actions can no longer be accomplished consistent with the analysis.



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Operator Manual Actions and Appendix R III.G.2

**David Lochbaum
Nuclear Safety Engineer
October 27, 2004**



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The Concerns

Operator manual actions:

- o **Can reduce safety**
- o **Can be unreliable**
- o **Revisit bad times**
- o **Substitute for real safety**
- o **Reward bad behavior**
- o **Resemble SE on PWR sump issue**



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Operator Manual Actions Can Reduce Safety

**National Fire Protection Association
standard 805 reports “*where manual
operator actions are relied on to provide the
primary means of recovery in lieu of
providing fire protection features, risk may be
increased.*” [1]**

**[1] NRC Presentation “The Use of Manual Operator Actions For
Achieving and Maintaining Fire Safe Shutdown,” NRC/NRR/Regions
I, II, III, IV Quarterly Workshop, November 14, 2001.**



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Operator Manual Actions Can Be Unreliable

Dr. Dana Powers commented about operator response to a recent fire: *“They sat around, the guys handling the fire were saying we want to spray water on this, and the guys in the control room were saying “Oh dear, oh dear, oh dear,” and yet it’s been in innumerable information notes and bulletins that say in electrical fires in nuclear power plants spray some water on it, because otherwise you can’t put out a cabinet fire, it just re-ignites every time you let the air in.”*[1]

[1] Transcript of June 19, 2002, ACRS Plant Operations and Fire Protection Subcommittees meeting, page 119.



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Operator Manual Actions Revisit Bad Times

Recent inspection [sic] have found that some licensee's [sic] have taken manual actions to the extreme interpretation such that no wrap is provided with operators solely relying on responding to mal-operations after they occur in III.G.2 fire areas. This condition is similar to the condition Browns Ferry was in prior to the 1975 fire. [1]

[1] NRC Presentation "The Use of Manual Operator Actions For Achieving and Maintaining Fire Safe Shutdown," NRC/NRR/Regions I, II, III, IV Quarterly Workshop, November 14, 2001.



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Operator Manual Actions Substitute for Real Safety

Findings which were identified during recent inspections indicated that licensees had removed rated fire barriers, which were required for compliance with Section III.G.2 of Appendix R to 10 CFR Part 50, and replaced those barriers with a manual action.[1]

[1] NRC Letter dated February 14, 2002, from Jon R. Johnson, Deputy Director – Office of Nuclear Reactor Regulation, to Joseph A. Murphy, Chairman – Committee to Review Generic Requirements.



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Operator Manual Actions Reward Bad Behavior

NRC's plan to allow operator manual actions to substitute for compliance with App. R III.G.2 sends perverse messages to the licensees who made the investment in the past to get and maintain their facilities in compliance.

It tells them they were suckers for doing the right thing.

It urges them to ignore other regulations with real hope of NRC bending its regulations to match their behavior if they get caught.



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Operator Manual Actions vs. PWR Sump Performance

ACRS letter of 10/18/2004 concluded that NRC staff had incomplete or confusion guidance and gaps in the empirical knowledge base at this time on PWR containment sump issue.

ACRS lacks reason to believe NRC staff is any better off on fire protection operator manual actions issue.



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Conclusion

Appendix R III.G.2 provides crisp, clear requirements for fire protection.

The NRC staff's proposal to substitute vague, ill-defined, virtually unenforceable manual actions for III.G.2 compliance is unacceptable.

The manual action needed now is the one that tosses this cockamamie idea into the rubbish bin.



Industry Views Manual Actions Rulemaking

ACRS Fire Protection Subcommittee

October 27, 2004

Fred Emerson, NEI



Summary

- Original feasibility/acceptance criteria achieve desired goals
- Some changes to these original criteria do not improve feasibility/reliability
 - Automatic suppression
 - Time margin factor
- Plant responses to security events should not be treated as a part of this rulemaking
- Improvements to criteria recommended in NEI comment letter in January 2004
- Better methods for inclusion in rulemaking



Base “Feasibility” Criteria

- Feasibility/acceptance criteria incorporated into Inspection Manual on Fire Protection 71111.05, 3/6/03 generally appropriate
 - Criteria can be applied to all required manual actions
 - Criteria adequately address both feasibility and reliability
 - If properly addressed by licensee, criteria help assure manual actions can be carried out in the time frame required and under the conditions prevalent

Changes to Criteria

- Changes to criteria include
 - Requirement for time line analysis reflecting consideration of security events
 - Requirement for detection and automatic suppression in area of fire for enforcement discretion consideration
 - Proposed “time margin factor” (ACRS FP Subcommittee meeting, 4/23/04)



Security Events

- Basis for Appendix R does not reflect security events
- Timeline analysis for manual actions should not reflect security events
- Plant responses to security events should not be treated as a part of this rulemaking

Detection and Automatic Suppression

- Detection in the area where the fire occurs is an asset to crediting manual actions
 - BTP 9.5-1, Appendix R, and NUREG-0800 already require detection and suppression based on fire hazards analyses
 - ◆ Detection needed to perform fire specific responses
 - No new detection should be required for most fire areas, unless additional detection is needed to initiate “pre-emptive” actions

Detection and Automatic Suppression

- Requirement for new automatic suppression capability in the area of the fire adds nothing to licensee ability to carry out manual actions in other areas (where manual actions are being taken)
 - Would not enhance either feasibility or reliability of these actions

Time Margin Factor

■ General concerns

- Concept developed via elicitations with no industry or independent public input
- Discounts actual licensee demonstrations that manual actions can be carried out
- Does not differentiate between 1) time of fire alarm and 2) time T-H analysis is started which is the time of first significant spurious actuation or reactor trip
- Provides excessive degree of conservatism



Time Margin Factor

- Technical concerns
 - Single “standard” not applicable to all types of manual actions
 - ◆ Actions to prevent immediate/unrecoverable consequences
 - ◆ Actions based on loss of function
 - Better methods available for assuring reliability

Time Margin Factor

- Bounding analysis reduces the cost of transient analysis but is very conservative
 - Conservatism:
 - ◆ Fires outside the control room in that the postulated damage in the control room fire likely will not occur in fires outside the control room
 - ◆ Performance criterion of loss of subcooling is very conservative
- Application of TMF would be adding conservatism on top of conservatism
 - Application of TMF requires licensees to strip conservatism out of the transient analysis calculations only to add it back
 - Result is same answer and considerable cost resulting in no safety benefit



Time Margin Factor

- Requiring a time margin factor will result in plants spending significant resources to change their process for time critical actions:
 - Develop realistic T-H calculations versus conservative
 - Remove conservatism from time estimates (for example from actions assumed before and after the timed action)
 - Validating the margin following testing of each crew, versus what is done now: verifying that each crew meets the required time
- These changes do not provide more reliable manual actions



Addressing Reliability of Manual Actions

- Summary of recommendations for addressing reliability
 - Apply alternate reliability methods....
 - ◆ Establish guidance on potential problem areas for manual actions:
 - Insufficient staff to perform all actions for a fire area.
 - Actions are physically difficult or overly complex
 - Others?
 - ◆ Perform SDP review of actions, and if needed, detailed PRA
 - ◆ Local manual actions $> 1E-06/\text{year}$ should be addressed by plant Corrective Action Program
 -To a smaller group of actions
 - ◆ Those required for preventing immediate and unrecoverable consequences

Summary

- Plant responses to security events should not be treated as a part of this rulemaking
- Detection in fire area is an asset for crediting manual actions
 - However, no new detection should be required for most fire areas, unless additional detection is needed to initiate “pre-emptive” actions
- Automatic suppression requirement does not improve reliability of manual actions
- Better methods exist for addressing reliability of manual actions than time margin factors, which add unnecessary conservatism



Rule Breaking by Rulemaking:
Local Operator Manual Actions in Lieu
of Compliance and Enforcement of

10 CFR 50 Appendix R III.G.2

Before the

NRC ACRS Subcommittee on Fire

October 27, 2004

Presentation by Paul Gunter

Nuclear Information Resource Service

NRC “suspending debate” over controversial fire protection history

- **Browns Ferry fire on March 22, 1975**
- **February 1976, NRC Special Review Group “Recommendations Related To Browns Ferry Fire,” stress importance of maintaining redundancy and physically protecting cable functionality of redundant safety systems from common mode failure due to a large fire**
- **Commission Order May 23, 1980 notes significant problems with the implementation of Appendix R due to industry disagreement and refusal to adopt recommendations including safe shutdown capability, fire barriers, and associated circuits.**
- **February 1992 NRR Special Review Team briefed ACRS Subcommittee re: Thermo-Lag fire barriers and Action Plan for restoring protection to safe shutdown cable functionality**
- **1998, NRC issues Thermo-Lag Confirmatory Action Orders to 18 sites**
- **NRC SECY 2003-0100 acknowledges widespread use of unanalyzed and unapproved manual actions due largely to unresolved and unimplemented Thermo-Lag action items.**

History on intent of Appendix R III.G.2

For insurance purposes, ANI, July 1979, states:

“The maintenance of circuit integrity in these class 1E safety circuits during a postulated fire is of prime importance” by establishing a “protective envelope” for redundant safety systems in the same fire area:

- 1) exposed to a fire outside of the safe shutdown cable system;
- 2) exposed to fire originating in an adjacent ‘protected-in-place’ cable system;
- 3) subjected to mechanical impact damage simulated by a standard fire fighting practices such as hose stream or other impact

Intent of Appendix R III.G.2 as codified

- **Appendix R III.G. 2 provides that redundant trains physically located in the same fire zone be maintained “free of fire damage” by:**
 - a) protective envelope with a qualified three-hour fire barrier;**
 - b) physical separation distance of a minimum 20-feet with no intervening combustibles and used in conjunction with smoke detectors and automated sprinkler systems.**
 - c) protective envelope by a qualified one-hour barrier used in conjunction with smoke detectors and automated sprinkler systems;**

Manual actions are not equivalent to current protective features of III.G.2

- **Appendix R III.G.2 provides for cable functionality qualified by standardized test criteria developed by ASTM, NFPA and UL supported by a large fire testing data base.**
- **Manual actions are undertaken after failure of circuit integrity/cable functionality and dependent upon human actions difficult to qualify under limited fire and human behavior models and unrealistic simulated fire conditions.**

Manual actions are not equivalent to current protective features of III.G.2

- **Adding subsection (d) to III.G.2 to allow local operator manual actions in lieu of qualified fire barriers and minimal cable separation requirements is inconsistent with intent of (a) (b) (c) and significantly undermines the intent of the current rule.**
- **Obvious “Trojan Horse” to DEFEAT compliance and enforcement of III.G.2 (a) (b) & (c)**

Crystal River: Case in point

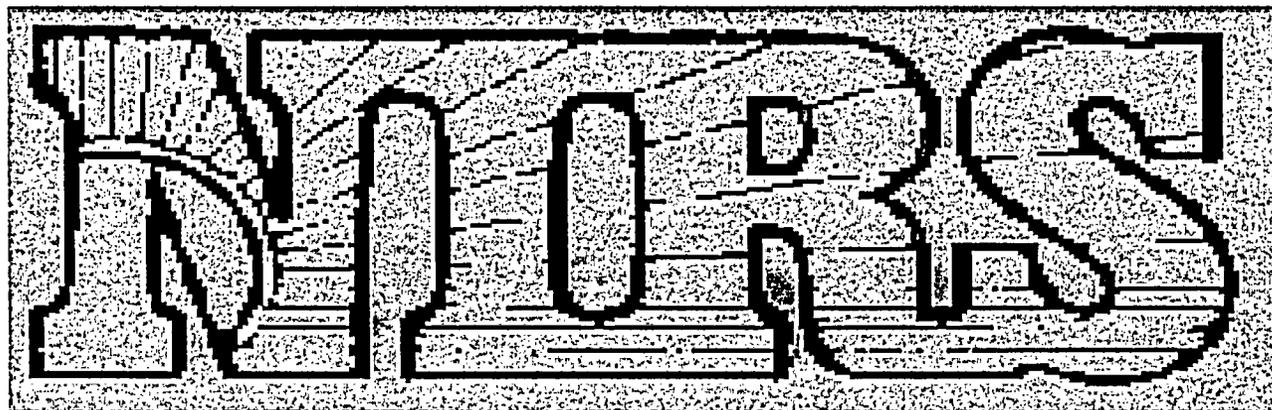
- **“Extensive” Thermo-Lag fire barriers**
- **Issued Confirmatory Action Order 05/21/1998**
- **July 2002, Triennial Fire Protection Inspection identifies “a significant number of local manual actions have been incorporated in OP-880 in order to resolve various Thermo-Lag issues.”**
- **FPL 10 CFR 50.59 analysis significantly flawed**
- **“No attempt was made during the 2002 triennial fire protection inspection to formally review the licensee’s Thermo-Lag resolution program or compliance with the confirmatory action order in this area.” [NRC Response 08/23/2004 to NIRS Allegation No. NRR 2004-A-0031 on Willful Noncompliance]**

Codify exemption to Appendix R III.G.2 (a), (b) &(c)?

- **Maintaining cable functionality and circuit integrity identified is the primary strategy for redundant trains in common fire area**
- **Exemptions are intended to be used sparingly for unique circumstances w/ license amendment opportunity for public safety review process**
- **It is unreasonable and unsupportable to contort a configuration-specific exemption process into a dubious industry-wide fire protection standard**

Rule breaking by Rulemaking Jeopardizes Defense-In-Depth

- **Maintaining circuit integrity and cable functionality historically central to Defense-In-Depth and rooted in actual fire experience**
- **Local Operator Manual Actions are more appropriately regarded as last ditch efforts and not substitutions for maintaining front line passive fire protection features**
- **Substituting manual actions for qualified passive fire protection features significantly erodes defense-in-depth and constitutes an undue risk to public health and safety.**



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