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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

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MEETING

+ + + + +

WEDNESDAY,

OCTOBER 27, 2004

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ROCKVILLE, MARYLAND

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

COMMITTEE MEMBERS:

STEPHEN L. ROSEN, Chairman

JOHN D. SIEBER, Member

GRAHAM B. WALLIS, Member

ACRS STAFF PRESENT:

MARVIN D. SYKES

ALSO PRESENT:

SUZANNE BLACK, NRR

DAVID DIEC, NRR

FRED EMERSON, Nuclear Energy Institute

JEFF ERTMAN, Progress Energy

RAY GALLUCCI, NRR

PAUL GUNTER, Nuclear Information and Resource Service

DENNIS HENNEKE, Duke Power

LESLIE KERR, NRR

ALEX R. KLEIN, NRR

ALAN KOLACZKOWSKI, SAIC

DAVID LOCHBAUM, Union of Concerned Scientists

ERASMIA LOIS, RES

PHILLIP QUALLS, NRR

BRIAN THOMAS, NRR

SUNIL WEERAKKODY, NRR

I-N-D-E-X

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

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

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

MR. DIEC: Yes.

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

MR. KLEIN: Yes.

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

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

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

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

(Laughter.)

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

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

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

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

MS. BLACK: Yes. Thank you. Suzie Black, Director of Division of Systems Safety and Analysis. I want to thank you for holding this subcommittee. I think it's important to hear all the views of all the stakeholders, because this has been controversial, to say the least.

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

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

Now, the rule language itself has not been that easy to develop, and it may not be able to cover all situations which are safe, but, nonetheless, may

not meet the criteria. They'd end up in the final rule, and so there may be some exemptions still required for some situations that we still believe are safe.

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

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

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

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

But risk-informing this one piece of Appendix R would be much more difficult, and we support more of a holistic approach through 50.48(c). But let me reiterate that it is not our intention to

permit unsafe, unfeasible, non-reliable manual actions in lieu of protection through fire protection features in this rulemaking.

That concludes my opening statement.

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

MS. BLACK: Sure.

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

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

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

MS. BLACK: Yes.

MEMBER WALLIS: Okay. Thank you.

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

MS. BLACK: Thank you.

(Laughter.)

CHAIRMAN ROSEN: David?

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

With me today, who will make the presentation as we go through the talk today, are Erasmia Lois from the Office of Research; Alex Klein from the Office of Nuclear Reactor Regulation; Alan Kolaczkowski is from SAIC, who is supporting Research in this effort; and Leslie Kerr, who is from the Reg Analysis group of NRR.

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

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

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

MEMBER WALLIS: David, are you going to demolish the arguments that we're going to hear after your presentation -- in your presentation? Or how do

we get an answer to the public comments, if that's the end of the session today?

MR. DIEC: I'm sorry?

MEMBER WALLIS: We're going to hear some public comment at the end of today, right?

MR. DIEC: Right.

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

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

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

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

MS. BLACK: Yes.

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

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

MEMBER WALLIS: Okay. We're not going to say it's a great rule. We're just going to say --

MS. BLACK: Right.

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

MS. BLACK: Correct.

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

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

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

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

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

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

CHAIRMAN ROSEN: And we can list our reservations.

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

MR. DIEC: I will go through the background agenda for the discussion today, and elements of importance to the rule development will be discussed by Alex. Acceptance criteria also will be discussed by Alex.

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

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

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

The NRC indicated that the current requirement in the Section III.G.2 cannot reasonably be interpreted to allow the use of operator manual action, other than fire barrier distance separation

detection to bring the plant down to the hot safe shutdown condition.

We also recognize that while operator manual action is judged to be in compliance with the regulation, the use of such action to achieve safe shutdown as an alternate approach is acceptable through exemption requests.

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

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

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

MEMBER WALLIS: So you're on your next slide now, David?

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

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

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

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

I mean, this is fine, but presumably the agency is always trying to be efficient. But its mandate is to do something about safety. So I'm

surprised you don't have a rule objective which is some -- has some measure of safety in it.

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

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

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

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

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

MS. BLACK: Well, I think -- this is Suzie Black. When we first put out the inspection criteria back in March 2003, we used criteria that we had been using through -- to review III.G.3 areas, and other --

we have other manual actions that are used in the plant, not just in fire protection. So we used that information to put out the inspection criteria.

But through the ACRS meeting and other comments, we have been refining that. So I'd say in some ways we are writing things down that I think that we probably -- when we did an exemption review we thought about these things, but there was no explicit criteria.

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

MEMBER SIEBER: Okay. Which --

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

MEMBER SIEBER: Well, it's more than that, because there is no way for us to make that judgment, because it hasn't been strictly codified in the past. And so now this is a -- sort of an initial attempt to put in Title X the requirements that otherwise existed in inspection plans and the standard review plan, to

some extent, or was otherwise assumed to be implicitly known by everyone.

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

MEMBER SIEBER: Well, that's a laudable goal, and I think that putting aside whether we're more efficient or not, the fact that you write down what your expectation is and can then cite something official like Title X is the appropriate way to go, provided that the proposed rule is really a good rule.

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

MS. KERR: They're not discussed --

MEMBER SIEBER: Come to a microphone. Any one.

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

MEMBER SIEBER: And your name?

MS. KERR: Leslie Kerr.

MEMBER SIEBER: Okay.

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

MS. BLACK: I don't know that there is so much a safety benefit as it is maintaining safety. We believe that we're going to permit manual actions through this rule that we would have permitted through the exemption process or the approval process for post-1979 plants. But in this way we're putting it in the rule, and, therefore, when we approve it we don't need to give an exemption,.

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

MS. BLACK: Exactly. Yes.

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

So in that respect, I believe that, you know, we're putting down on paper a standard, if you will, that would ensure safety when you -- when a

licensee implements an operator manual action under III.G.2.

MEMBER WALLIS: Okay.

MR. DIEC: We have met with various stakeholders, including the subcommittee a number of times. In September of last year, we briefed you on the rulemaking plan itself, and in October of last year we discussed the interim acceptance criteria with a number of stakeholders, and subsequently we've released that through the Federal Register notice to solicit stakeholder comments on the interim acceptance criteria.

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

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

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

In the proposed rule package itself, we proposed the Commission to endorse the approach that we would ask a number of questions, to present a number of questions to the public and ask for a response in these areas, whether or not the -- what will be the appropriate margin for the time margin consideration or whether or not the types of suppression systems being considered, and whether or not there will be advantages or disadvantages by applying operator manual action in other sections beyond what we're considering for Section III.G.2.

One point I wanted to -- let me go back to -- to the next slides. In June -- following shortly after that, in June of this year, we held a Category 3 public meeting where we invited not only industry representatives but other public interest groups to participate in a meeting. The purpose was to obtain additional information, and help us to gather the

information and consider those for the formulation of the proposed rule.

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

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

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

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

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

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

MEMBER WALLIS: I don't know how we bring that into the discussion. That would help me.

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

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

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

MR. DIEC: Thank you.

CHAIRMAN ROSEN: Actually, one minute ahead.

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

I've been with the agency almost a year and a half now, and I've been involved with operator manual actions now a little over four months. I've been given that dubious distinction of providing the technical lead on this project.

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

MR. KLEIN: Yes, sir.

MEMBER WALLIS: -- on fire protection?

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

MEMBER WALLIS: That's very good. I mean, I just wondered if you had that sort of background or

if you'd been transferred from somewhere else and you were learning.

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

MEMBER WALLIS: Thank you.

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

But I want to just give you a little bit of background on why we provided acceptance criteria, because the acceptance criteria provides the standard to which -- that provides a reasonable level of assurance that the operator manual actions can be satisfactorily, reliably, and feasibly accomplished.

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

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

MR. KLEIN: We're going to talk about the criteria, and I will provide to you some details of

the criteria that will provide what I believe is a reasonable level of assurance. Did I answer your question?

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

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

MEMBER WALLIS: Well, I always get a little nervous when I get these vague terms. And I have a reasonable level of assurance that I won't hit my finger when I'm chopping wood, but I did last time I did it. I mean, so, you know, what's the sort of expectation of probability of success? Are you going to tell us something about that?

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

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

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

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

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

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

MEMBER WALLIS: Can you give me a ballpark? Are you saying that they'll perform the

right action 50 percent of the time or 90 percent or 99 percent? What kind of ballpark are you talking about when you say "reasonable level of assurance"?

MR. KOLACZKOWSKI: Alan Kolaczkowski, SAIC. I'll try to give you a general -- at least a rough idea. I think that if all these criteria are met, many of which basically address performance shaping factors as we would consider them in human reliability analyses, etcetera, that if you were to put it through an HRA model and say, "Okay, you have instrumentation, you have the necessary time, you have accessibility, you know the equipment will operate," etcetera, etcetera. I have a feeling most HRA models would predict numbers down in the 10^{-2}, 10^{-3} failure probability, if not lower. That's my own personal opinion.

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

CHAIRMAN ROSEN: Now, Alan --

MEMBER SIEBER: But that's subjective, right?

CHAIRMAN ROSEN: -- let me examine that for a moment. 10^{-2} to 10^{-3}, that's with time margin that meets the requirements of the rule, the two times

the required time? I just want to be sure I understand what you're saying.

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

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

MR. KOLACZKOWSKI: Is enough time to do it.

CHAIRMAN ROSEN: Is the staff is properly recognized.

MR. KOLACZKOWSKI: Certainly.

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

MR. KOLACZKOWSKI: Yes.

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

MR. KOLACZKOWSKI: Yes. That's --

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

MR. KOLACZKOWSKI: That is correct.

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

MR. KOLACZKOWSKI: I mean, the only other acceptance criteria are in the rule. And they all play a role in human performance. I mean, obviously, if a piece of equipment is not accessible, you can't get to it, I don't care if you have a whole lot of time, you can't perform the action.

MEMBER SIEBER: But that's --

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

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

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

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

MS. BLACK: Excuse me.

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

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

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

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

MEMBER WALLIS: Lost it. Okay.

MS. BLACK: Right.

CHAIRMAN ROSEN: Alex?

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

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

And the last bullet speaks to the fact that the criteria that we've developed generally apply to human actions and other applications. In other words, the criteria that we've developed we believe is not anything that's new.

It's criteria that we've used in other areas, and I'll give a very quick example -- is under Appendix R, Section III.I, which is fire brigade training area. You'll see that there's some very

specific requirements in there for training, for instructions, for practice, and for drills.

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

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

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

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

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

So with that, let me just quickly go through the acceptance criteria. You've seen a lot of this in different wording, I believe. What we've done is we've restructured the criteria somewhat. We've got under the proposed rule language under III.P.2(a) a criteria for analysis, which basically determines the feasibility and reliability of the operator manual action, where the licensee is required to develop a fire timeline and the time margin that we'll talk about.

The licensee needs to consider the environmental conditions that I just spoke about, consider the functionality of and the accessibility of

the equipment or the cables that he might need to access. He needs to consider the indications, diagnostics, confirmatory, so forth. Certainly, communications are important. Portable support equipment -- you know, is he going to need a ladder? Is he going to need a key? Is he going to need a flashlight? Things like that.

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

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

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

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

MR. KLEIN: Yes.

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

MR. KLEIN: Well, as Suzie indicated, the fire takes place in the area where you've got

potentially unprotected, redundant trains. For example, because you've got the lack of fire barrier.

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

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

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

MR. KLEIN: No.

MEMBER WALLIS: -- totally inappropriate.

MR. KLEIN: The reason we put the criteria for portable support equipment in here is because of the timing issue. We also do not want an operator in a plant looking for a piece of equipment that's vital for him to perform that manual action.

MEMBER WALLIS: It's going to be there.

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

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

MR. KLEIN: Yes.

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

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

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

MR. WEERAKKODY: That's --

CHAIRMAN ROSEN: -- that I have to close.

MR. WEERAKKODY: That's correct. There will all be -- I mean, even today that's what the expectation is. If you are relying on a procedure, the pre-staging and the equipment is there.

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

MR. WEERAKKODY: Yes.

MR. KLEIN: That's right.

CHAIRMAN ROSEN: In training.

MR. WEERAKKODY: Yes.

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

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

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

In other words -- and I'll give you an example. If the fire brigade has on its staff two equipment operators, the licensee, in our viewpoint, could not utilize any of those two fire brigade numbers to go ahead and perform a manual action, because that operator now has a collateral duty, which

we believe is not feasible and reliable to perform that manual action.

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

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

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

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

MR. KOLACZKOWSKI: Alan Kolaczkowski, SAIC. I think you'll find that most, if not all, licensees' procedures, upon suspecting a fire, one of the first things they usually do is first confirm whether there is a fire or not. I believe all the procedures are written that way.

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

MEMBER SIEBER: No.

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

MEMBER SIEBER: No.

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

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

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

MR. KOLACZKOWSKI: To some extent.

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

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

MR. KOLACZKOWSKI: No.

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

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

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

The next -- I would like to introduce Erasmia Lois from the Office of Research, who will

start the discussion on the time margin concept and development.

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

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

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

The ACRS concerns last year were that the feasibility only to some extent addressed the reliability of reactions, the existing qualitative criteria, and if the -- these criteria were met, uncertainties will still remain that need to be

addressed and ensure high reliability of reactions. And here I'm quoting the ACRS from last year.

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

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

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

MS. LOIS: Do you want to answer this?

MR. WEERAKKODY: Yes. First, fires --

CHAIRMAN ROSEN: Sunil, say who you are. We know, but --

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

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

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

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

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

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

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

MR. WEERAKKODY: Yes.

MS. LOIS: If you --

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

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

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

MS. LOIS: And we believe we did. If we -- if we just go to the next slide.

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

MS. LOIS: Yes. That's right.

Next slide, please.

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

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

So a lot of the issues that we would build with in the human reliability analysis, and as part of our -- all the uncertainty, if you wish, are now much

more deterministically determined -- I mean, set -- because the staffing will be there, the equipment will be there, so these are not uncertainties, are not dealt in the uncertainty area anymore.

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

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

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

MS. LOIS: That's --

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

MS. LOIS: It's a concept.

MEMBER WALLIS: -- we shouldn't take it literally?

MR. WEERAKKODY: It's a conceptual --

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

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

(Laughter.)

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

(Laughter.)

CHAIRMAN ROSEN: All right. Go ahead.

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

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

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

MR. KOLACZKOWSKI: First of all, just so that we can all envision -- be envisioning the same thing, this is our concept of what the time margin is

and what it's trying to do. This is a timeline going from left to right, and it's trying to depict, in a general sense, what a fire scenario -- how it might evolve, where the fire begins and may or may not be noticeable right from the beginning.

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

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

Between T_0 and T_1 there is what we call a diagnosis time at which the crew is actually determining, is there really a fire? That's when they're going to send down an observer or something and say, "We suspect there might be a fire in Room X.

Please go check. Is there flames? Is there smoke?" Etcetera, etcetera, and so forth.

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

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

(Laughter.)

MR. KOLACZKOWSKI: There you go.

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

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

And at some point, once they actually confirm there's a fire, they're going to probably call the fire brigade and begin to determine -- these are the procedures we're actually going to enter. Usually those are fire location-specific. Depending on where the fire is, they'll enter a certain procedure,

because that means certain trains are now suspect of equipment, which means they want to protect certain other equipment.

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

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

MEMBER WALLIS: What determines T_3?

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

MEMBER SIEBER: To get a result.

MR. KOLACZKOWSKI: -- "some undesired state, and so that I can maintain -- achieve and maintain safe shutdown." So that's an analytically derived time, a calculational-type thing.

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

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

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

MR. KOLACZKOWSKI: Or clearly --

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

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

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

MR. KOLACZKOWSKI: That's true.

MEMBER WALLIS: -- did I do the right thing or not?

MR. KOLACZKOWSKI: That's true.

MEMBER WALLIS: Yes.

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

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

MR. KOLACZKOWSKI: That is true, Dr. Wallis. And at some point, I suppose a lot of extra time just doesn't matter.

MEMBER WALLIS: Doesn't help at all.

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

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

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

MEMBER WALLIS: I hope we are.

CHAIRMAN ROSEN: Much narrower.

MEMBER WALLIS: Those guys were trained, too.

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

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

MR. KOLACZKOWSKI: Conceptually, this is what we're trying to -- this is what the time margin

is. It's trying to provide a buffer between the total time it will take to diagnose and implement actions, the time at which those actions have to be implemented.

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

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

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

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

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

CHAIRMAN ROSEN: One crew, once a year.

MR. GALLUCCI: This is Ray Gallucci. Yes, it's -- right now, the option to have all crews perform -- it was discussed earlier -- considered to be too restrictive. It was reduced to one random crew that would do it once a year, and the following year a different crew would do it. But all crews would be trained, but only one crew would perform the demonstration on a 12-month calendar cycle.

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

MR. GALLUCCI: Twenty crews or 20 scenarios?

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

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

CHAIRMAN ROSEN: Is that clear in the rule?

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

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

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

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

We reviewed a lot of the procedures, and we identified the types of actions that the licensees

are implementing or want to implement. We developed some example scenarios, and I'll talk a little bit about the nature of those in just a moment.

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

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

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

We had analytical experience in the reliability risk PRA, HRA, fire analysis areas, and

then we had people also who had backgrounds in either or both engineering psychology and human factors, which, again, are also going to play important roles in the human performance aspect of this whole manual action issue.

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

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

Recognizing, also, that the kinds of actions were going to apply to time margin, too, also varies. Some actions are very simple. We talk about closing the valve -- very simple, although that

happens to be an in control room action. But, nevertheless, some actions are --

CHAIRMAN ROSEN: It may not be.

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

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

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

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

Considering all of that, and considering the experience -- what little experience there was about time taken versus time estimates that were out there, and I believe Dave talked about the fact that

we looked an existing ANSI standard that talks about providing sufficient time to perform actions and what that margin ought to be, and so on and so forth.

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

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

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

Looking at all of this, and recognizing the following -- that, again, we've already alluded to the fact that a lot of the human performance issues that we're trying to account for are already considered through many of the feasibility criteria. In other words, the other criteria would make sure that the staff is available, that they're trained,

that the procedures are adequate, that the equipment availability exists, and so on and so forth.

So the time margin wasn't to address -- was not to address these things. What it was to address is the remaining uncertainties, that you can still have random problems. You go to turn the hand wheel by hand to close a valve, and it's stuck, and now you've got to go get a crowbar and now -- so you'd need 30 more seconds to go get a crowbar.

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

Environmental -- we can try to predict what the environmental conditions are. But, you know, smoke has a way of going places that you don't predict, and toxic gases have a way of going places where you don't predict. And the next thing you know you've got to put on an SCBA that you didn't assume you were going to have to go get and put on. Another example why it might take a little longer than what

you actually demonstrate, and so on. You can see there's a host of --

MEMBER SIEBER: There you go.

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

MR. KOLACZKOWSKI: Just like this.

CHAIRMAN ROSEN: With computers, for sure.

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

And as I already indicated, you cannot always recreate in demonstrations under the demonstration criteria the actual conditions. You have to pretend to move the valve, because you can't really move it, because right now the plant is operating and you can't go close that valve. So you just have to pretend that you moved the valve as

opposed to really moving it and find out that it's stuck.

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

MR. KOLACZKOWSKI: That's this variability among humans.

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

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

So considering all of that, going through the expert elicitation process, etcetera, what it all boiled down to was that it looked like a single time margin would, in fact, work -- that when you considered the range of the types of actions, that some where going to be preventive, some reactive, and

so on and so forth, all the issues that I talked about earlier.

And also, keep the rule simple -- so that we didn't end up with five different time margins that applied to five different conditions and now you would have to specify what those conditions were, and so on and so forth. It seemed as though with the range of time margins that the experts came up with that they were all around the recommended time margin that we're going to propose in a moment. And so we said, "Well, why don't we just stick with one time margin."

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

If, on the other hand, the action is very complex, it's going to take a long time, there's a lot of steps, and so on and so forth, yes, it's going to take a long time, but that's also, therefore, the

situation in which you probably need more margin, because more can go wrong. You might do a step out of sequence, you find out you've got to go back and redo something that you did incorrectly the first time, etcetera, and so forth. So we thought the percentage concept works very well, because it scales.

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

MR. KOLACZKOWSKI: That is true.

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

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

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

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

MR. KOLACZKOWSKI: That's correct.

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

MEMBER WALLIS: The clock starts.

CHAIRMAN ROSEN: The clock starts on Room Z.

MR. KOLACZKOWSKI: And you now diagnose you've got to do something because the fire has gone to Room Z, and eventually you're going to implement steps for Room Z.

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

MR. KOLACZKOWSKI: It might change. It might change.

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

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

MR. GALLUCCI: This is Ray Gallucci. If you have a scenario that can become that complicated, you probably don't want to be taking manual actions.

You'll probably want to fall back to one of the original protective measures. You've probably gone beyond the realm of manual action feasibility and reliability.

CHAIRMAN ROSEN: Well, that's drawing an a priori conclusion. I think to me that would come out of the analysis of Room Z, and now you're doing Room X -- taking Graham's scenario -- you're performing the actions in Room X, and that takes a certain amount of time and certain number of people and resources.

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

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

MEMBER WALLIS: But the -- from behind me, it's now being brought into the conversation that as a result of this analysis you might conclude that you

should not allow manual actions for this type of event.

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

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

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

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

CHAIRMAN ROSEN: Correct.

MEMBER WALLIS: You would do something else.

CHAIRMAN ROSEN: Exactly.

MEMBER WALLIS: Okay.

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

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

CHAIRMAN ROSEN: That's true. And I would -- before we caution -- I would caution you, before we run off and say that manual actions are not likely to be credited, that we all fly on airplanes and other -- take other credit for manual actions, we wouldn't want to fly on an airplane without crew members who are trained to take manual actions.

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

MEMBER SIEBER: Okay.

MR. KOLACZKOWSKI: The final two points I want to make are -- the last bullet on this slide. This is what the expert elicitation eventually recommended -- that 100 percent of the total demonstrated time be the time margin. So effectively what you're doing is taking the demonstrated time for the action or actions, doubling it, and then comparing to the T_3 calculation.

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

MR. KOLACZKOWSKI: Yes. I mean, a lot of the very early actions usually have to do with things like PORV block valve protection, RCP pump seal protection, and some of those do have to be done in relatively short time. But they also -- the actions themselves, you know, including the diagnostic and implementation, may only take 10 or 15 minutes.

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

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

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

MEMBER SIEBER: Right.

MR. KOLACZKOWSKI: My last --

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

MR. KOLACZKOWSKI: That is correct.

Just as an aside -- and it's the last slide here, and then I think Alex and Dave want to make a point about the time margin. And this was just more coincidence than anything, but -- and also recognize that this was developed for a very different purpose. But I think, still, that the coincidence is kind of striking.

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

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

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

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

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

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

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

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

Now, that's a strawman. What we're saying is that that is not our final decision on this. That's why we've put a question out to -- to the stakeholders. We offered that number as our best estimate right now, and we are using that as a basis to obtain additional stakeholder feedback.

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

That's all I have to say about that.

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

I'm astonished that there isn't some -- something already that's standard in other industries

or something about human performance. You should be starting from square one, as if no one knows anything about this. And you're saying two might be good and -- there's nothing you can appeal to which is more substantial?

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

MR. GALLUCCI: This is Ray Gallucci again. That was a question that -- there was a fairly extensive literature search done at the beginning of the expert elicitation -- in preparation for the expert elicitations, and people were contacted who, you know, worked in industry as well through the members of the panel here. And except for that ANSI standard, which gave very crude, "Don't do anything outside the control room unless you have at least 30 minutes," there was nothing established that we found.

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

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

MR. KLEIN: Yes.

CHAIRMAN ROSEN: Okay. We have -- it's 12 minutes to the hour. We actually gained two more minutes on our program, so I'll -- and I said we were going to take 10 minutes? Oh, five minutes off the

15-minute break. We have a 10-minute break from 2:48 to 2:58.

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

CHAIRMAN ROSEN: We're back after the break.

Alex, please continue.

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

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

What I want to make clear is, and we had some public comments on this with respect to the November 2003 Federal Register Notice where we had

published that requirement. Some of the stakeholders out there were under the impression that the detection and suppression was required in the area where the manual actions take place. The requirement is for detection and suppression to be in the area where the fire takes place. It's in the fire area. I wanted to make that clear.

What I want to do is I want to put up a picture for you to explain, I guess, the relationship between the proposed rule language under III.G.2(c-1) and the existing rule language that we have so that we can understand how manual actions and detection and suppression fits into the overall scheme of the rule itself.

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

Then what we have under III.G.2(b) is the other compliance option of 20 feet of separation with no intervening combustibles with automatic suppression and fire detectors in the fire area. We have the very same thing for III.G.2(c) except that in lieu of 20

feet of separation we've got the one-hour fire barrier.

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

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

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

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

MR. KLEIN: Okay.

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

You just have to say if you can show me with or without a three-hour fire barrier, with a 20-foot separation, without intervening combustibles or across the board if you can show me that you can take operator manual actions and meet our acceptance criteria with reliability, then all of it is even.

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

What I want to do -- there are a lot of words on here but what I want to do is provide you a little bit of historical background with respect to why did the Commission back in 1980 when Appendix R

was formulated put in the requirement for suppression and detection in the rule.

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

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

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

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

MEMBER WALLIS: Well, I think you would have real difficulty making anything other than very qualitative arguments that these three things, 20-foot separation, one-hour fire barrier, and operator manual actions were somehow equivalent.

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

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

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

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

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

MEMBER WALLIS: You're just legislating it.

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

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

CHAIRMAN ROSEN: Twenty-eight.

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

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

MEMBER WALLIS: For three hours.

CHAIRMAN ROSEN: For three hours. In fact, that isn't true. We know that barrier do get pierced. They are not perfect. They have seals in them and so on. We've had experience to know that they are like everything else. They have a percentage reliability. Now, granted it's high but it isn't 100

percent and that's just the point I want to leave you with.

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

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

MR. KLEIN: Correct. That's true. We accept that. The rationale for why the staff has proposed to put in fire detectors and automatic suppression systems under III.G.2(c-1), as stated previously a three-hour barrier is considered an acceptable fire protection feature without detection and suppression.

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

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

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

MR. KLEIN: Yes.

CHAIRMAN ROSEN: -- that the three-hour barrier will be penetrated before three hours. It's low, perhaps even minimal but it is still there. It isn't perfect. We're not dealing with impervious barriers.

MR. KLEIN: That is correct.

CHAIRMAN ROSEN: I think I would point out --

MR. KLEIN: I agree.

CHAIRMAN ROSEN: -- because I'm trying to make a point that as you suggest in this material that you sent to us, SECY-03-0100 makes the point that operator manual actions if they are feasible the

overall risk increase can be minimal so we are really dealing with the same thing.

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

MR. GALLUCCI: This is Ray Gallucci. If the three-hour barrier has a certain unreliability, the one-hour barrier would have a higher unreliability. If you were to remove detection suppression across the board, you would effectively be saying three-hour barrier equals one-hour barrier equals 20-foot separation.

I don't think that because of the relative strengths of the different conditions whether they -- although we call it implied equivalencies, I don't think that will be a valid statement. Similarly with the operator manual actions, I don't believe that in the case where you are dealing with the deterministic

rule where you are not performing HRA that you would want to go in and try to cover all cases by saying that the reliability based on operator manual actions is going to be comparable to a three-hour barrier without some sort of defense and depth attached to it.

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

MR. GALLUCCI: Yes, I agree and those are the types of cases that would be handled in the Reg Guide 1.174 exemption process or the 50.48(c) where you would try to -- where you would be relieved of having to follow deterministic criteria but you are still faced with within the limits of III.G.2(c) or III.G.2, which is where this rulemaking is focused, you don't have that freedom to just --

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

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

MR. GALLUCCI: Under certain circumstances, yes.

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

MEMBER SIEBER: I think the difficulty is we don't have risk information so it's hard to make these categorical decisions, how much is good enough. In the deterministic world you try to balance what you apply to the given situation by the logic of the rule that you put forward since you don't have risk information.

To me the ultimate solution to this kind of problem is to develop the risk information and make the rule risk informed. At this point in the world that's not feasible in a short period of time so we are sort of stuck with this layered approach and

assumed equivalency even though you can't show what that equivalency is.

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

MR. KLEIN: Okay. Let me continue on. We talked about the defense-in-depth which is my third bullet here. I'll put up a slide here in a moment about defense-in-depth. But the last bullet here, enhances the ability of the operator to achieve and maintain safe shutdown from a unaffected area through the prompt and effective application of fire suppressant, those are the same types of words that were used -- the prompt and effective application of fire suppressant are the same types of words that the original Appendix R FRN used.

Now, the reason why the staff feels that it could enhance the ability of the operator although he might be conducting that manual action outside of the area where the fire takes place is because we believe that the addition of a detection and

suppression system would either delay or prevent, for example, spurious actuation caused by a fire inside that room that contains the redundant trains.

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

CHAIRMAN ROSEN: Now, Alex, is that the best the staff can do in terms of a reference, this reference on slide 28, to the Federal Register Notice that is now 24 years old? Is that the best reference in the regulatory body for the preference for fire barriers or is there something better? Did you just pull that out of your hat because you happened to be looking at that Federal Register?

MR. KLEIN: No. Actually --

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

MR. KLEIN: And I agree with you.

MEMBER SIEBER: Don't you say them?

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

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

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

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

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

CHAIRMAN ROSEN: You understand my difficulty is that quoting a 24-year-old Federal

Register notice to me as gospel leaves me somewhat unimpressed.

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

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

Of course, the recent rule change under 50.48(c) which allowed fire protection to be risk informed. Other than that, I cannot point to any other regulation that we've done. We've lived with this rule now, as you say, for over 20 years so that is the best that I can do at this point.

MR. WEERAKKODY: Chairman Rosen, are you asking us whether we have anything more recent and substantial than a 24-year-old notice as the basis when we grouped or when we said we need detention and suppression with manual actions or are we solely relying on something like this as the basis because

based on your earlier questions with respect to some probability of a three-hour fire barrier? I just wanted to make sure that we convey --

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

MR. WEERAKKODY: No, we do.

MEMBER WALLIS: Oh, you do?

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

CHAIRMAN ROSEN: And the ones I pointed out.

MR. WEERAKKODY: So it's possible that there could be a whole spectrum of those things. The challenge is the regulation has to color the whole spectrum and we recognize that some of these numbers could be relatively high. In judging whether to require detection and suppression we had to make a

judgment as to whether the manual actions would come closer in the liability to the three-hour passive barrier or the other two. We based on our best judgment grouped with the other two.

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

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

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

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

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

CHAIRMAN ROSEN: You'll understand that those of us who have been in debates other than fire protection about risk analysis have heard the refrain often in those debates that the reason one can't use risk information in a given circumstance is that it doesn't preserve defense-in-depth. We are also unimpressed with that argument in general.

It needs to be flushed out much more specifically in order to be given the credence that the user of the argument likes to ascribe to it. It's almost uttered as if it were a religious mantra. In

fact, it's only a concept so understand that when we're talking about the use of risk, which is risk analysis in this case, it's surrogate risk analysis, time origin approach, the utterance of the word defense-in-depth has less impact on some of us than on others.

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

When you talk about defense-in-depth you are essentially trying in the deterministic world to put a pseudo quantitative value on the uncertainty. I think if you do a pure risk analysis when you quantify the uncertainty and if you are comfortable that you've accounted for it very well, that is a way of accounting for defense-in-depth in a risk calculation.

Unfortunately, unless we deal strictly in worse case analyses I think in a deterministic world you look for a surrogate for this type of uncertainty. I think in my mind that is the way I view the defense-

in-depth concept as a uncertainty type, as a way to handle uncertainty in a deterministic world.

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

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

MEMBER WALLIS: It depends what's in depth. If you say that you first try to put the fire out with the suppression system, if it doesn't work your defense is the operators can fix things up. If the operators are the defense-in-depth, that's one thing but if the operators are the primary response and the automatic suppression system is the defense-in-depth, then you have a different rationale.

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

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

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

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

MR. KLEIN: I'm sorry?

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

MR. KLEIN: That's correct.

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

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

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

CHAIRMAN ROSEN: No, no, no.

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

CHAIRMAN ROSEN: I'm saying credit manual action.

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

MR. KLEIN: This is another picture if --

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

MR. KLEIN: This shows the scenario where there is no automatic suppression in the scenario where you have operator manual actions with acceptance criteria. Again, we understand this is a picture and, again, with implied equivalencies that there is some sort of implied gap there in terms of protection.

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

features. On the III.G.2(c) we have a combination of passive and active fire protection features.

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

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

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

MR. KLEIN: That's right.

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

MR. KLEIN: It's a qualitative argument. That's right. Because this issue is somewhat controversial with the stakeholders, what we've attempted to do is to ask a question in the FRN to promote some discussion and feedback from our stakeholders.

Because the staff is of the opinion that suppression and detection should be a requirement under operator manual actions, we framed the question

in such a way that it asked the question with respect to automatic versus fixed fire suppression because there's a difference. On the III.G.2 the requirement calls for automatic suppression.

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

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

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

CHAIRMAN ROSEN: Why don't you ask the question more broadly rather than just say because we believe that automatic suppression and detection is required with III.G.2?

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

MR. KLEIN: Yes, there are some.

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

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

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

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

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

CHAIRMAN ROSEN: I understand but aren't you trying to fix the game by the questions you ask? Kind of like these polls they take about who's going to win.

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

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

MR. KLEIN: We're not timid.

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

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

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

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

CHAIRMAN ROSEN: Who knows? You might get a response that people agree with your point of view. You might even get that from ACRS. Or at least added comments.

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

At this point that ends my discussion with respect to suppression and detection. What I would

like to do is to pass it over to Leslie who will talk about the reg analysis. Are we on time?

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

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

CHAIRMAN ROSEN: Leslie.

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

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

We'll look at the alternatives that were considered in the reg analysis. We'll also look at some of the baselines that were compared to the alternatives. We'll look at the reactor universe which is just the universe of reactors that we think could be affected by the alternatives.

We'll look at the quantitative cost and savings associated with the alternatives. Finally

we'll compare the cost and savings and also bring in the qualitative attributes that could be affected by the proposed rule. Finally, I will present the preferred alternative in the reg analysis.

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

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

MEMBER SIEBER: Some have, some haven't.

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

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

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

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

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

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

MEMBER WALLIS: Was the confusion yours or the licensee?

MS. KERR: Perhaps both.

MEMBER WALLIS: Conclusion and confusion.

CHAIRMAN ROSEN: More likely confusion than collusion.

MS. KERR: The proposed rule alternative is what we've been talking about today for the most part which is to revise the existing regulations to allow III.G.2 manual actions that meet the generic acceptance criteria that have been presented.

Documentation of those manual actions

would be required. 50.12 exemptions would still be required for III.G.2 manual actions that do not meet these criteria.

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

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

Here is the reactor universe. The total universe that could be affected by our alternatives are the 52 pre-January 1, 1979 power reactors. We split these reactors into present and future actions that they could possibly take. Of the 52 total reactors we assumed that 14 reactors could take immediate advantage of the proposed generic acceptance

criteria and document compliance with those criteria rather than come into compliance with current III.G.2.

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

MS. KERR: Right.

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

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

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

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

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

MS. KERR: Correct. The future looking ahead after the immediate affect of the proposed rule we assume that five reactors per year over the next 30 years will document manual actions rather than submit an exemption request or make plant modifications so they can actually build III.G.2 manual actions into their plans in the future.

CHAIRMAN ROSEN: Where do we get these 150 reactors?

MS. KERR: I'm sorry?

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

MS. KERR: Oh.

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

MS. KERR: Correct.

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

MEMBER SIEBER: They have to do something.

MEMBER WALLIS: So how can they wait?

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

MEMBER WALLIS: The purpose of the rule is to make sure they comply with regulations. Isn't it?

MS. KERR: Correct.

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

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

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

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

MEMBER WALLIS: The barriers will decay in some way.

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

MS. KERR: Or technology could change.

MEMBER WALLIS: Fires will get hotter.

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

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

MEMBER WALLIS: I thought the objective here was to bring everyone into compliance, not to make assumptions about who's going to do something.

Aren't you trying to solve the problem of noncompliance? Isn't that what you're trying to do?

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

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

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

MR. GALLUCCI: This is Ray Gallucci. let me offer that I went through the reg analysis and tried to do a simplification as well for myself. I think a lot of these questions, the nature of the reg analysis requires that the baseline assume compliance so all the things that you would normally expect to be included in the reg analysis which is coming into

compliance has already been subsumed in the definition of the base case and that is an idiosyncracy of the way these regulatory analyses are done.

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

MS. KERR: It's not costed into the mean baseline but that's why we went to an industry practice baseline so that we could assume that some plants are currently out of compliance so we can capture the benefits of coming into compliance, the cost and the benefits, as well as the cost and benefits going into the future. I believe we are solving the problem.

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

MS. KERR: I'm sorry?

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

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

Yes, technically speak we have determined that licensees are not incompliance with the regulation. That is the fundamental problem and so we are trying to make them fix that problem. That's basically the technical issue.

MEMBER WALLIS: It seems to me there are two things. If it's a compliance issue, they are not playing the law, then presume that they have to obey the law. If it's a question of how should we modify the law in some way, then you can look at cost and

benefits but it seems to be very clear if they are not obeying the law, are you going to now modify the law so they can obey it? Is that what you're going to do?

MEMBER SIEBER: No.

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

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

MEMBER WALLIS: Just make them obey the rule.

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

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

MEMBER SIEBER: To make it more efficient.

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

MEMBER SIEBER: That's about right.

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

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

MEMBER SIEBER: Under 21.

MEMBER WALLIS: Under 21. And so I say, well, I want to codify the existing practice. I want to somehow twist the law so it lets them drink in the way they have been drinking.

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

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

MEMBER SIEBER: No.

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

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

Now, when we made that decision in 2002 that based on the OGC and CID position that there are no compliance out there, we had a couple of choices in front of us. It was like a fork in the road. One choice was to tell the licensees that, "You guys

unless you ask our approval, send us exemption request and get us to reviews and approval those requests, you have a problem."

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

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

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

MR. THOMAS: That's correct.

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

MR. WEERAKKODY: Exactly.

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

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

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

MEMBER WALLIS: I think because of the nature of this arcane regulatory world, I think you

have to put it in terms that the public will understand so that they can realize whether you are dealing with a student drinking problem type thing but they are breaking the law, or whether you are doing something quite different which is clarifying sort of exceptions which are perfectly reasonable and don't affect safety.

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

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

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

We used an industry estimate of $300 for that. Savings or avoided cost include decrease in 50.12 exemption request. Again, an industry estimate of $2,500 per request. And also a decrease in plant

modifications where we used a conservative estimate of $250,000 per modification.

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

MS. KERR: Correct.

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

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

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

MS. KERR: We're doing it --

MEMBER WALLIS: -- for cost here.

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

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

MEMBER SIEBER: No.

MR. THOMAS: The reg analysis -- the focus of the reg analysis is just on the rulemaking and

you've got to look at the technical issue that's being challenged in the rulemaking itself which is --

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

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

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

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

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

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

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

MS. KERR: Yes.

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

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

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

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

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

MS. KERR: They are all neutral. Correct.

MEMBER WALLIS: All the same?

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

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

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

MEMBER WALLIS: It must be a safety benefit.

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

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

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

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

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

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

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

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

MEMBER SIEBER: Give it back to the rate payers.

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

MEMBER WALLIS: How many years is this spread over?

MS. KERR: Thirty years.

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

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

MEMBER WALLIS: Saving the Government 10 million bucks.

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

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

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

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

Public perception. This one I believe has both positive and negative connotations. The positive one, of course, we discussed as the public perceiving

the NRC and the licensees as following a much clearer set of rules.

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

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

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

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

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

MEMBER SIEBER: Very good.

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

But mainly going through this fairly quickly, we are introducing the existing III.G.2(c)

with the entry into different option for using operator manual action as III.G.2(c-1). That is the fourth option in the III.G.2 section area.

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

With that --

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

MR. DIEC: Right.

CHAIRMAN ROSEN: Under Item 1.

MR. DIEC: Let me --

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

MR. DIEC: Right.

MS. BLACK: I thought Cathy Haney was going to address that but I think I can take care of it since she doesn't seem to be here anymore. When this rule was being written there were questions about how we address the safety and security interface in our regulatory framework and it is still under discussion.

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

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

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

If you don't do that, then it understates the importance of this issue dramatically. Just throwing in that phrase can't capture for anyone, certainly not for a member of the public just how much more complicated this would be.

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

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

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

MS. BLACK: Exactly.

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

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

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

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

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

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

CHAIRMAN ROSEN: So I think what one needs to understand is that this needs to be accompanied in some way with a careful set of guidance and properly

classified venues on how to deal with security issues and so my only comment on this slide. Now, go ahead.

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

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

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

CHAIRMAN ROSEN: In the reg analysis environment?

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

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

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

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

MR. DIEC: Correct, it talks about demonstration but not to the extent that you are asking questions.

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

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

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

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

CHAIRMAN ROSEN: All right, thank you very much. Mr. Emerson of Nuclear Energy Institute has the

floor now and we'll try to accord him the 20 minutes we've promised him.

MEMBER SIEBER: Slide show?

MR. EMERSON: I'm Fred Emerson from the Nuclear Energy Institute. Joining me here are Dennis Henneke from Duke Energy who is a PRA expert with a lot of experience in fire PSA and on my right is Jeff Ertman from Progress Energy with many years experience in fire protection and safe shutdown at several nuclear plants. We appreciate the opportunity to talk to the ACRS and present at least briefly the industry perspectives on what the staff is proposing. I'll start off with a summary slide. The -- in our view, where we started with this two years ago, we started down the rulemaking path to address this issue.

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

Since that time there have been a number of changes as this rulemaking has progressed among

which are the automatic suppression and the time margin factor. We don't feel that these improve safety. They just add an unnecessary layer of conservatism and don't really improve safety at all. The third item has to do with the security events that Dr. Rosen brought up a minute ago.

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

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

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

MR. EMERSON: Okay, I understand the question. The issue the Dr. Rosen just brought up having to do with security events, we feel that there's a different mechanism for dealing with security issues. We should not mix the consideration of security events into the time line analysis that's being proposed by the staff, so it should be handled separately. The -- we had recommended -- in response to a Federal Register notice back in January we

recommended a set of improvements in the criteria the staff were proposing. That's just for general reference.

And lastly, we think there are better methods for addressing these issues related to improved reliability in the rulemaking process and we'll --

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

MR. EMERSON: That's correct.

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

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

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

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

MR. EMERSON: We're suggesting that the original concept was quite reasonable. We think some of the changes that have taken place over the last couple of years have not added anything to the

licensee's ability to have safe and effective manual actions.

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

MEMBER WALLIS: Hold up issuing this rule?

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

MEMBER SIEBER: In its present form.

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

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

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

MR. EMERSON: Only to say this --

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

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

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

MEMBER WALLIS: Now, you can add whatever you want.

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

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

MEMBER SIEBER: Yeah.

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

CHAIRMAN ROSEN: Okay, I'm just being sure I understood I heard you now that you think that the rulemaking didn't take place, it would likely be a lot of exemption.

MR. EMERSON: Yes.

MR. HENNEKE: I'd like to say, and I know Fred doesn't want me to say exactly this, but because of the requirements for time margins -- and this is Dennis Henneke from Duke Power, by the way. Time margins and the automatic suppression, we have III.G.2 areas now without automatic suppression, without fixed suppression and we determined that based on fire hazards analysis, which is the correct way with defense and depth, so it is likely if the rule went through as proposed, that we would come through with probably as many exemptions as we would if the rule did not go through. So because we would have to put an exemption for every manual action where we had an area that didn't have automatic suppression, we would also have to put an exemption or deviation through.

So we would -- there's no change in that regard if the rule goes through as proposed.

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

MR. HENNEKE: I would say then we'd only have issues with regard to time margin where we would show the action was safe but we didn't meet the time margin requirements. And Fred is going to go through our slides on that.

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

equivalent degree of physical protection -- too the physical protection could be provided.

The changes to the criteria that have taken place are the three areas involving security, detection and automatic suppression in the area of the fire and the time margin factor that we've heard the staff describe. Just very simply and without elaboration, we think that the security should be separated from this issue.

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

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

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

MEMBER WALLIS: You must detect the fire.

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

MEMBER WALLIS: But that's detection.

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

MR. HENNEKE: But I'll state two exceptions. We often have large fire areas with sub-areas or sub-zones that do not have detection because they don't have hazards but they do not effect the manual action and that is non-exception to this rule, we would be required to put detection in those sub-zones. The second is, we often times put manual actions in our procedure in our fire procedures that are already in our emergency procedures. So irregardless of detecting the steam generator over-feed, we would perform that manual action locally anyways. So detection would be nice but it's not necessarily required to complete the manual action. So there are exceptions which are not considered by the rule.

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

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

MR. EMERSON: As I said --

MEMBER SIEBER: Apparently somebody does.

MR. EMERSON: Well, detection is already a requirement and detection is already a part of the defense in-depth philosophy that's been incorporated

into fire protection for several years, so of course, I don't object to having detection. And we think that if there are cases where detection will improve the ability to carry out a manual action, then that certainly seems reasonable. We think those were the primary area where that might be useful is where you carry out pre-emptive manual actions rather than ones that can be allowed to take place over a period of time where you're reacting to the loss of a function.

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

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

MR. EMERSON: Well, even if you didn't have suppression, again, the manual action is being carried out in an area remote from the fire.

Certainly if the manual action were being carried out in the area of the fire, it would be very obvious. Suppression would be an asset to perform any action. But it's difficult to see how adding suppression in t the area of the fire is going to help you carry out the manual action at some distance away.

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

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

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

MEMBER SIEBER: Is a defense in-depth.

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

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

MEMBER SIEBER: Manual actions are required. MR. HENNEKE: So what we've done in our fire hazard analysis for all sites is that the detection and suppression is performed based on the ignition frequency on the fire side, based on the fire hazard analysis. That's the first step in the defense of that is the ignition frequency, the likelihood of the fire and the fire size. Suppression detection is added upon that based on the largest hazards, both ignition frequency and size and then manual actions and alternate shut-down and safe shut-down is the other layer of defense in-depth.

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

CHAIRMAN ROSEN: You treat those two as separate anyway.

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

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

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

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

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

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

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

MEMBER SIEBER: If it's not a trade.

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

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

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

MR. EMERSON: At some point --

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

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

MR. EMERSON: At some point the staff made a decision that the detection and suppression in an area was adequate before we ever started talking about manual actions.

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

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

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

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

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

CHAIRMAN ROSEN: I don't think --

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

CHAIRMAN ROSEN: -- NEI or Duke is arguing against the value of suppression. We're just saying that --

MR. EMERSON: No, of course not.

CHAIRMAN ROSEN: -- that it improve the overall -- reduce the overall fire risk but you've already shown the manual actions in your case, in the cases you're talking about was adequate to preserve, I presume, functionality.

MEMBER WALLIS: All we have to worry about as ACRS is whether we recommend putting out the rule now for public comment or whether we should wait because it's such a lousy rule or because -- or we should say, "Everything is fine, we don't even need a rule at all". Those are the three considerations. And I have seen no argument which says we shouldn't issue the rule for public comment.

CHAIRMAN ROSEN: What about the security?

MEMBER WALLIS: Well, that's a different issue all together.

MEMBER SIEBER: But that can be a comment to the rule.

CHAIRMAN ROSEN: I would say that there are some questions here and we'll get a chance at the end of this for the ACRS members to offer their comments and I presume --

MEMBER SIEBER: Well, to the extent a security event effects the time line, I think that it has to be factored into the time line calculation to determine the feasibility of the -- and reliability of the manual action.

CHAIRMAN ROSEN: I'm going to give you three extra minutes, Fred, because of the colloquy between the ACRS members here. Go ahead.

MR. EMERSON: Okay, on the time margin factor, the first slide has to do with our general concerns. The staff described the elicitation process and I would submit that it would have been more useful if there were a greater degree of independence and public input into that process similar to the manner in which we included the public and the staff in our deliberations on this -- on circuit failures. I think that it tends to discount -- if a licensee is able to

demonstrate with his operating crews that manual actions can be carried out. The imposition of an arbitrary time margin factor tends to discount those demonstrations and if we're moving toward a performance based environment, it tends to detract from our ability to take advantage of that.

It also doesn't differentiate to equal zero, is treated differently between the staff's analysis an the time the thermal hydraulic analysis which is intended to measure the consequences of a spurious actuation or a functional failure and that's an issue. And we think it just provides an excessive degree of conservatism. We just don't think it really adds anything. And I'll elaborate a little more on that later.

There's some technical concerns that the staff's applying a single standard of 100 percent of a -- of the analyzed time margin to be applied as an additional 100 percent to assure that the action can be carried out. This may not be applicable to all types of manual actions. There are immediate actions that are needed called pre-emptive actions to prevent immediate or unrecoverable consequences and then there are actions that allow more time to take place before you lose a function, the time frame can be completely

variable depending on the function that you're talking about and the likelihood that the fire will impact the equipment under consideration.

We think there are better methods available for assuring this type of reliability than the application of this factor. In addressing the issue of how conservative this factor is, the type of analysis that is conducted for transient analysis is already conservative. You assume that for a fire outside the control room, you assume that the same kind of time frame, the same kind of postulated damage for fires outside the control room.

And the criterion you use for determining performance is a loss of sub-cooling. Both of these are already considered conservatisms. So the view of the industry is that to apply this time margin factor on top of this would be adding additional conservatism on top of this analysis that is already conservative. Again, I don't have any problem with making sure something is safe but when you have to conduct additional actions and additional analysis and you don't end up with any increased degree of safety, that's what I question.

MEMBER WALLIS: Do you have a measure of this safety?

MR. EMERSON: Not with me, I don't.

MEMBER WALLIS: No one seems to have any measure of safety in all of this discussion. That's what I'd really like to see. If you could show me some measure of safety that you're better off this way than that way, then I can choose alternative A over B on the basis of better safety, that might help me. But if you just argue that you don't think it does or something, that doesn't help me at all.

MR. HENNEKE: Well, we've done analysis and we've --

MEMBER WALLIS: Maybe you could present that.

CHAIRMAN ROSEN: Were we provided that?

MEMBER WALLIS: Not now, but when you actually critique the rule.

MR. HENNEKE: I think we provided that and we show that the analysis as we performed it provides more than adequate safety based on the conservative summary of hydraulics, based on the conservative time lines and the other conservatives we have in there and so those are our supporting information.

MR. EMERSON: In answer to your question, yes, we can address that in our comments. And just to continue that theme, it will result in a lot of

additional analysis with not really any significant improvement.

MEMBER WALLIS: I guess I'm rather unsympathetic to all this continuing excuse that we don't want to do better analysis and you guys should be doing better analysis all the time.

MR. EMERSON: Well, I'm not saying -- we think the analysis that we have already has an adequate degree of conservatism. We don't see what adding additional conservatism is going to gain.

MEMBER WALLIS: But you would be better off in the long run if you did realistic calculations.

MR. HENNEKE: But we have a certain requirement for calculations whether it's small LOCA, large LOCA, tube rupture. We perform the same thermal hydraulic analysis for these types of actions that have a certain pedigree as with regard to the ANSI standard was discussed and now what you're talking about is using the PRA type of calculations that don't show a loss of steam generator cooling in 30 minutes, they show a loss of, you know, steam generator level in 54 minutes. Then we have to -- then we have to pedigree all that analysis and put that in the information. And then we have to do the ANSI standard again for every type of walk-down we have, whether it

be III.D.3 actions or tube rupture it has a certain requirement.

Now, we're going to have to do, you know, say it doesn't take two minutes because we assume it. We're going to say it takes 30 seconds and then there's going to be a lot more question.

MEMBER WALLIS: Sounds like a student to me that doesn't want to do the homework.

MR. HENNEKE: But the point is a lot of costs, a significant amount of costs, more than what was predicted for no net safety gain, no reduction in risk. And we have an alternative to that.

MEMBER SIEBER: In your last sub-board there you say "validating the margin following testing for lead screw versus what is done now verified that each screw meets the time requirement". It seems to me the margin is put into the factor, into the formula because of the uncertainty. Are you going to encounter something that you didn't anticipate in the validation process of crew performance and that's really why that's there. And to not put that in there means that you are 100 percent certain that no unforeseen condition or it will slow an operator down.

MR. EMERSON: Yeah, we recognize that one of the rationales for the margin is to reflect the

fact that there's a difference among different crews and their ability to carry it out but if you evaluate each crew's ability to do that, that certainly reduces the amount of uncertainty there is. You don't have to assume that -- you know, you can assign your -- you can decide on the operator's ability to carry it out based on the worst case performance of the worst crew in the bunch. You don't have to assign an arbitrary time margin factor to account for that.

MEMBER SIEBER: Well, granted it may be arbitrary. On the other hand, when you test each crew, you have a different environment than the fire environment and you simulate everything so actual difficulty in operating equipment, for example, turning valves where you need a valve wrench or something like that is not apparent.

MR. EMERSON: And that kind of margin is already factored in. You know, we don't shave it down to the second as far as demonstrating the operator's ability.

MEMBER SIEBER: How do you factor it in?

MR. EMERSON: I can't answer that but I know that from a operating standpoint --

MR. ERTMAN: Jeff Ertman with the Department of Energy. We do have a validation process

for these actions so you also train on -- and you may find the operator's already trained on particular actions like stoking a valve or opening a breaker and such, so you know the time that it takes for those actions and that is considered when you do your feasibility analysis.

CHAIRMAN ROSEN: Fred, you need to wrap up.

MR. EMERSON: Okay. We have -- we believe that there are different ways that you can address the reliability of these methods. These include conducting risk analysis performing an SDP type review and focusing the application of these methods on the actions that are really critical, not the ones that you have hours to allow to unfold. In summary the same points that I addressed in one of my first slides separate security events, detection can be an asset where it will assist the operator in carrying out a manual action.

We don't think the automatic suppression requirement improves the reliability of manual actions and we think that there is -- there are other ways to address the reliability than the time margin factors which the staff has proposed. That concludes the presentation.

MEMBER WALLIS: This doesn't tell us that they should not put out this rule for comment. You can comment on it in this way and I think you've got some good points but it doesn't mean to say that --

MR. EMERSON: No, and I'm not suggesting that the staff not put it out for comment. I'm suggesting that there are portions of the rule that we don't think will add anything and if they show up when it's put out for comment, we'll comment on it.

MEMBER WALLIS: It may be a little difficult to resolve these --

MR. HENNEKE: We've commented on this already and it hasn't changed the draft rule so we don't suspect that if it gets through here that our comments will be heard again.

MEMBER WALLIS: So your complaint really is that the staff hasn't listened to you?

MR. HENNEKE: No. And in addition what we're trying to cover here, that, you know, when we need a sounding board and the staff doesn't seem to be listening. One thing Fred did not cover, one example is armored cable, multiple spurious or other factors. Every manual action has to meet the same criteria but if you have a low frequency sequence such as a multiple spurious as required by RIS 2000-403, where

it's tandemized just to get to the spurious operation, let alone cable damage, the manual action associated with preventing that failure has to meet the same criteria as the safe shutdown -- required safe shutdown action and there really should be a differentiation. You shouldn't have to have the same time margin, the same requirements for actions that we are now just adding in because of the RIS that you would for something that's a direct failure of say shutdown. And there's a whole gambit of things with regard to why those actions are performed and they could be associated circuits, breaker fuse coordination, single spurious, multiple spurious, things of that sort.

It could be long term actions or short term actions and to put them all under one, you know, time margin factor, under one requirement for suppression just doesn't make sense.

MEMBER WALLIS: So when the staff comes back, all this stuff will be on the record and we can ask them how they respond to it.

CHAIRMAN ROSEN: If this goes out for public comment now. If not, you can make those comments when it does. Okay, thank you very much, gentlemen.

MEMBER SIEBER: Before we finish, I would just -- the third bullet there, where it says "automatic suppression requirement does not improve reliability of manual actions", I think that you may want to look at it differently. Automatic suppression may reduce the requirement for manual actions which is the goal. You want the automatic stuff to work first and the manual actions as the backup not the reverse.

MR. EMERSON: I understand your point.

MEMBER SIEBER: Okay.

CHAIRMAN ROSEN: Thank you very much.

MR. EMERSON: Thank you.

CHAIRMAN ROSEN: We now call Paul Gunter of the Nuclear Information Resource Service.

MR. GUNTER: Thank you. First of all, Dr. Rosen, I really appreciate you giving us the extra time. It's going to give me some breathing room as well as an opportunity to respond to some of the issues and questions raised. And Dr. Wallis, I really appreciate you bringing up the layman's questions. I come to this as a layman. I think a little more than the average, Information Resource Service was the petitioner to the U.S. Nuclear Regulatory Commission for emergency enforcement action back in 1992 with regard to thermal-lag fire barriers.

So the reason that we're here before you today is, in fact, the concern that we still have those non-compliances with -- largely in part due to the failure of the industry to come into compliance and the failure of the NRC to effect enforcement. And it is, in fact -- the whole concern here is that unanalyzed, unapproved manual actions are being proposed or actually right now are in effect. Some of those actions, in fact, in areas that are -- were to be taken in areas where fires were to be, you know, postulated. So I just wanted to make that clarification.

You know, I was struck by a comment made in November of 2003 with regard to the industry and NRC have agreed and the quote was, "to suspending the debate over fire protection history", and as you know, there's an extensive history here that I think is a little like the elephant in the middle of the room. The issues have come to you time and time again. The public is well aware of a history where the agency attempted to respond to a fire experience and the industry was resistant. Some of those areas where the industry was resistant to NRC recommendations included safe shut-down capability, fire barriers and associated circuits.

The fire at Browns Ferry demonstrated that a very large number of safety-related failures can occur in a relatively short period of time, in that case 15 minutes and the NRC undertook an effort to restore protection against common mode failure by the protection of cable functionability for redundant safe shut-down systems evolving into the promulgation of Appendix R and more specifically III.G.2.

We became aware of the thermal lag issue n 1991 when the -- it was revealed that 26 units at -- well, let's see it was more than that, it was 79 units were using varying grades of this barrier that was determined to be inoperable. In 1998 the -- after spending a million dollars on fire barrier testing and cable functionality, the agency issued orders confirmed reaction orders to 17 sites for 26 units and we thought at that point that in fact, enforcement action was underway.

Unfortunately, SECY 2003-0100 basically produced and acknowledged that the widespread use of unanalyzed and unapproved manual actions were due largely to unresolved and unimplemented thermal lag action items. Part of that history also, we believe has to look at the intent of Appendix R, III.G.2. There are a number of documents but we chose the

American Nuclear Insurers document which identified for insurance purposes that the maintenance of circuit integrity in these Class IE circuits, safety circuits during a postulated fire if of prime importance by establishing what they determined a protective envelope for redundant safety systems.

So the -- for insurance purposes, the industry was instructed to focus on circuit integrity and to provide the with a protective envelope. Of course, this also included the cable separation. So clearly as codified, Appendix R III.G.2 focused on maintaining these redundant trains free from fire damage and that intent is clear, it's explicit with the protective envelopes and the physical separation and the requirement for these barriers to be qualified and with the inclusion for one-hour barriers and cable separation for the use of detection and suppression equipment.

This is our main point that we come to you today. Manual actions are not equivalent to current fire protection features of III.G.2. As we stated the intent, the clear intent of III.G.2 is to provide for -- and to protect cable functionality. It's -- that cable functionality is qualified by a standardized test criteria developed by the American Society for

Testing of Materials, the National Fire Protection Association and Underwriters Laboratory. We submit to you that this in fact, is the measure of safety that you're asking about. It is -- it is using the fire barriers and the cable separation to become a part of the front line defense. It's our concern that manual actions are taken after failure of circuit integrity and cable functionality and are dependent upon human actions that are difficult to qualify under limited fire and human behavior models and unrealistic simulated fire conditions.

You know, you can postulate risk but there always remains the concern of things like transient combustibles. Clearly, there have been fires where the introduction of combustible materials have -- that were never conceived have arrived and contributed to a fire. It's our concern that adding a Subsection C.1 to III.G.2 in effect is both inconsistent with the intent of the protective qualities of III.G.2 and significantly undermines the intent of the current rule. In the context of what we've seen as an enforcement struggle and a compliance struggle, since we were first introduced to this issue back in 1991 and subsequently to the revelations of the bulletins around thermal lag, that the -- that to introduce this

N III.G.2 is, in fact, an obvious Trojan Horse that would defeat compliance enforcement of III.G.2 (A), (B) and (C).

Here's just a case in point. Through a FOIA that we filed 2003--358, we looked at a number of operator manual actions that were unapproved and unanalyzed. Crystal River really stands out in that first of all, it relied extensively on thermal lag fire barriers in excess of 10,000 linear feet and 10,000 square feet was the criteria for extensive. They were issued a confirmatory action order in May of 1998 for a thermal lag action plan. It was identified that the operator sought no exemptions or amendments concerning manual actions to compensate for not protecting III.G.2 fire areas that were in questions through the inoperable thermal lag barriers.

In fact, they incorporated a significant number of operator manual actions to resolve thermal lag with no written analysis. Now, this is of significant safety concern. More so is the -- we filed an allegation in August and were -- the response that we got back from the Nuclear Regulatory Commission was not comforting or provided us with confidence. In fact, the response to the allegation was that no attempt was made during the 2002 triennial

fire protection inspection to formally review the licensee thermal lag resolution program or compliance with the confirmatory action order in this area.

This is of tremendous concern because it demonstrates an unwillingness on the part of the Nuclear Regulatory Commission to effect the enforcement. Now, you can establish operator manual actions and substitute them for operable fire barriers or minimal separation requirements but if, in fact, there's no resolve to enforce operator manual action criteria, then we simply move to a new level of non-enforcement policy and the public is quite disturbed by this. And in fact, this is what draws a lot of the controversy and the media attention to this issue is that while it's true that there is an exemption process --

CHAIRMAN ROSEN: Hold on, let me go back to the prior --

MR. GUNTER: Certainly.

CHAIRMAN ROSEN: What is this FPL 50.59 analysis significant for?

MR. GUNTER: Well, the --

CHAIRMAN ROSEN: FPL is the licensee?

MEMBER SIEBER: Yeah.

MR. GUNTER: Yes, sir. Well, here's what -- it's a follow-on.

CHAIRMAN ROSEN: Oh, I see.

MR. GUNTER: It's a follow-on to the triennial fire protection inspection. Let me just add, though, if you will --

CHAIRMAN ROSEN: Your slides in there, it shouldn't be FPL. It should be FPC, I think.

MR. GUNTER: I'm sorry.

CHAIRMAN ROSEN: I got confused.

MR. GUNTER: Okay, I see. But the 10.59, 50.59 analysis as reviewed by NRC they found that the licensee did not consider complexity of new local manual actions, the number of manual actions and time available for completion, availability of instruments to detect system and component mal-operations, human performance under high stress, effects of products of combustion on operator performance and available manpower timing and feasibility of local manual actions.

CHAIRMAN ROSEN: And all of these comments have to do with Florida Power Corp., FPC.

MR. GUNTER: Yes, sir, okay, Florida Power Corp., thank you.

CHAIRMAN ROSEN: Okay.

MR. GUNTER: As I was saying, you know, there is an exemption process built in to Appendix R for approaching III.G.2 problems. However, it's our concern that codifying an exemption process into Appendix R essentially defeats the primary strategy of having protection systems in place for redundant trains in a common fire area. Exemptions are intended to be used sparingly, for unique circumstances and more importantly, with a license amendment opportunity for public safety review process.

This III.G.C.1 would effectively be a workaround for the public safety review process as we see it. And we feel that it to be unreasonable and unsupportable to contort a configuration exemption process into what has already been demonstrated to be a dubious industry-wide and turn it into a fire protection standard. I mean, there have been a significant number of problems associated with a clear path for the industry to work through an exemption process. And yet, they obviously didn't want to pursue that path. And obviously, to us, they even defied confirmatory action orders to work around these issues.

So to now say that you want to incorporate this into an industry-wide fire protection standard is

very alarming. Again, maintaining circuit integrity and cable functionality is historically central to defense-in-depth and is rooted in actual fire experience. It's our concern and believe that local operator manual actions are more appropriately regarded as last ditch efforts and not substitutes for maintaining front line passive fire protection features.

Substituting manual actions for qualified pacifier protection features we believe significantly erodes defense in depth and constitutes an undue risk to public health and safety. As a closing point, we believe that NRC must first enforce compliance with what is now a duly promulgated law rather than develop what really amounts to a compliance strategy that may, in fact, under -- significantly undermine safety.

MEMBER WALLIS: I think this is one of the issues we brought up earlier is this defense-in-depth question. And there always is a question when you've got two things in series. You've got something to do with the FAR and then you've got something the operators do. The combination of them works together. How do you trade off one against the other and how do you satisfy yourself you've got enough defense-in-depth? Now you're taking a very conservative approach

and say you've got to have a very good defense here and then a very good backdrop and that's defense-in-depth. The agency seems to be softening and saying we've got to have a reasonable defense here and then a reasonable backup. That's good enough defense.

MR. GUNTER: Right.

MEMBER WALLIS: As long as it's always qualitative, I don't know how to judge what's good enough. There's no measure. I don't know how to judge which of these is right.

MR. GUNTER: Well, again --

MEMBER SIEBER: The original rules set up physical apparatus, the physical barriers in suppression and detection and made it a requirement to seek an exemption to bolster or add defense-in-depth through operator action. So the order of priority was we will do the physical things first and then we rely on the operators as a secondary thing and that's been the history of Appendix R. And I think that's the point you're making.

MR. GUNTER: Yes, it's curious to us, though, and actually it's the subject of another FOIA that we have yet to receive. Let's remember that the Browns Ferry fire was rescued by operator manual action. And yet, in -- you know, fresh from the fire

the Nuclear Regulatory Commission opted to preserve cable functionality and circuit integrity. And you know, frankly I think what that says is that operator actions bring us too close for comfort and that the agency and the fire protection analysis at that point wanted that extra defense. And so now to propose that to introduce operator manual actions into that III.G.2 component, I don't see how it can be argued that it doesn't constitute a reduction.

MEMBER WALLIS: You're saying it doesn't belong in that box that we saw at all, it's something else.

MR. GUNTER: Yes, sir. You know, we would have no problem with the introduction of three -- of Appendix R III.P as a stand-alone but to inject it into the front line fire barrier system and the -- you know the design features of -- the passive design features, undermines our first line of defense. And you know, as such, you know, we would support developing this criteria for operator manual actions because it makes sense to -- for the Nuclear Regulatory Commission to be able to analyze and qualify operator manual actions and, you know, to judge them, but just don't make them our front line protection system.

CHAIRMAN ROSEN: You see what complicates this for me, Paul, is that when we talk about operator actions in the control room, for instance taking an action to prevent a low steam generator level, we rely on our operators to scram the plant before they hit the automatic set point. The automatic equipment is a backup to the operators. And we train our operators to sense degrading conditions and to verify the conditions of degrading and to take the manual action to take the plant out of service under those circumstances. If they don't take it quickly enough the automatic systems will take it out. So you see in that case we've got -- I think we've got it the other way.

MR. GUNTER: But I understand --

MEMBER SIEBER: But that's not true.

MR. GUNTER: But I understand that but the fire still represents, you know, a danger for residual cooling as I understand it, so you still -- we still, even after the plant is shut down, you still need that measure of defense-in-depth to preserve and protect the plant in that residual cooling period.

CHAIRMAN ROSEN: Well, I think we'll have to end it there in order to give our next speaker his time. Thank you.

MEMBER SIEBER: Let me ask one five-second question. Your advice to us would be to say that the rule should not be issued in its present form.

MR. GUNTER: Correct.

MEMBER SIEBER: Okay.

CHAIRMAN ROSEN: Okay, so that's different. NEI said -- I think NEI said, okay, go ahead and issue it.

MEMBER SIEBER: Yeah, and they would complain.

CHAIRMAN ROSEN: And complain, yeah. Well, we'll get a third vote here, I guess.

MEMBER SIEBER: Okay.

CHAIRMAN ROSEN: David, you don't have to tell us what your vote is up front, but you can be sure somebody will ask you.

MEMBER WALLIS: He might have changed his mind.

MEMBER SIEBER: For the next seven days, secret ballots are fashionable.

MR. LOCHBAUM: Thank you. I also agree with Paul. I appreciate the subcommittee expanding our time and also I appreciate the NRC staff condensing theirs to make that time available. I appreciate both those. I'd like to -- as far as the

vote, we agree with NEI and the subcommittee that this issue should be separated from security issues. What we would recommend is that the security issues be resolved before this thing go out for rulemaking because that has a big impact on what may or may not be the right thing to do in this context. So we would say postpone the rulemaking until after the security issue. That way that will never be done in anybody's lifetime here because --

MEMBER SIEBER: Or you'll do it twice, right?

MR. LOCHBAUM : Well, I don't think it will ever be done once, so I don't think it will be done twice.

MEMBER SIEBER: Okay, all right.

MR. LOCHBAUM : But I still think it's the right thing to do because security measures do have a big impact on operator manual action. So I think that issue it would be wrong to put this out with that big unknown hanging out there. So it would be -- the smartest thing to do would be to wait until after that was resolved. As far as our concerns, we have six of them. Some of them have been discussed already. We're concerned that operator manual actions can reduce safety, can be unreliable. The revisit bad

times in the past. They substitute for real safety. The reward bad behavior and they closely resemble -- I mean where we are today closely resembles the staff's position on the PWR containment sump issue which they stress did not think was ready for the draft safety --

MEMBER WALLIS: How do operator manual actions reward bad behavior?

MR. LOCHBAUM : Because the plant owners who are in compliance, the ones that have not been breaking the law for 15 years or whatever --

MEMBER SIEBER: Have spent a lot of money.

MR. LOCHBAUM : -- have spent a lot of money to do that.

MEMBER WALLIS: So it's not the actions themselves, this allowing operator manual actions.

MR. LOCHBAUM: To allow people to break the law and get rewarded for it is the wrong message for this agency to send out.

CHAIRMAN ROSEN: Now you're going to go through and tell us why you came to those conclusions.

MR. LOCHBAUM : That's correct. As far as manual actions reducing safety, the staff three years ago cited a National Fire Protection Association standard that said that when you substitute manual

actions for design features, risk may be increased. I would agree with Chairman Rosen's point about manual actions if they're feasible and reliable and all the things like that, they can provide an equivalent level of safety. Our concern is that the odds of achieving that feasibility and reliability are less certain with manual actions than they are with design features. A related issue is that with design features, as you do inspections both NRC and internal licensee inspections and find problems you hopefully converge on compliance and a safety level.

With operator manual actions, you're more likely to have oscillations where your good performance drops and you actually diverge from safety over time. And it's not as likely to do that with design features. One of the things I was struck by the presentations today was the lack of discussion by the staff and the industry about the past exemptions under 50.12 that have been granted for operator manual actions. Some of the discussions that Dr. Wallis and others had today about safety levels and whether suppression was or was not needed seems would have come up in that context and would have provided better insight on whether these measures are consistent with

what the staff has granted in the past and also the regulatory analysis.

Will the new rule, if it goes out as it's proposed, require those to be backfitted if they don't have fire suppression detection or not? The regulatory analysis didn't seem to address those issues and I don't know what the answer is. I actually tried to do some research on that Monday but ADAMS went down and --

CHAIRMAN ROSEN: Well, the conclusion you have on the slide may be true but there's also a conclusion that the staff offered that the risk may be minimal -- may be increased by only minimally and so -- and I think both are true.

MR. LOCHBAUM : Well, I agree. I don't think there is one answer because it depends on what the manual action is.

MEMBER SIEBER: Right.

MR. LOCHBAUM : Our concern is that there is a range and if you look at the range of design features, there you also may have -- the reason we're here today is the design features weren't met in some cases. We think over time you'll converge as those design errors are weeded out whereas in operator

manual actions, you actually lose ground over time because performance isn't there.

Cooper Nuclear Station had a problem a few years ago with just a routine SCRAM, the operators messed up badly because the operating performance had gotten so good, they hadn't seen a SCRAM in awhile. So the familiarity, the performance capability dropped.

CHAIRMAN ROSEN: We hope they see fewer fires than they see SCRAMs.

MR. LOCHBAUM : Well, I'm not proposing alternatives to have more fires so they can get better at it. That's not where --

MEMBER WALLIS: This doesn't help me much, though, because risk could also be decreased. Without some proper measure of risk, I don't really know where we are.

MR. LOCHBAUM : I agree. I think one of the concerns is, as the staff said earlier, was that fire modeling can't he modeled or it's impossible I think was the words they said. You know, so everybody is basically guessing at this and that's why I led to the conclusion between the analogue between this and the PWR containment sump issue. There was concern that there wasn't enough information on that issue to

go forward. I think there's even less information on this issue to --

MEMBER WALLIS: So your argument would have to be when everyone is guessing you need more defense-in-depth. That would be because you're more uncertain. Was that your argument?

MR. LOCHBAUM : Well, I think if everybody is guessing, you might as well stick with something you've had in place for 24 years.

MEMBER WALLIS: It might have been lousy.

MR. LOCHBAUM : It may be lousy but if --

CHAIRMAN ROSEN: It's the devil we know.

MEMBER WALLIS: Maybe the operators would do better if this thing had been in place.

MR. LOCHBAUM: That's an interesting gamble with high stakes. You know, a poker game is kind of rough. As far as the operator actions may be unreliable. As Dr. Powers pointed out during an ACRS meeting two years ago, in this case he was talking about a fire that actually occurred at River Bend in 1995 or 1996. I have a typo here. The guys were in the control room, they weren't in the control rood. That's a different place altogether on the fourth line. But here --

CHAIRMAN ROSEN: Now, was Dr. Powers actually there to hear them say, "Oh, dear, oh, dear, oh, dear, oh, dear"? It's in quotes.

MR. LOCHBAUM: Yeah.

MEMBER SIEBER: Must have been.

CHAIRMAN ROSEN: Oh, you're quoting Dana.

MR. LOCHBAUM: I was quoting Dana.

MEMBER WALLIS: Dana was probably perplexed when they were saying it.

MR. LOCHBAUM: It might have been a different word. I don't know. The issue is that Waterford had a fire, they thought it was an electrical fire. They didn't put water on it for over an hour even though one of the lessons learned from Browns Ferry was that you put the fire out even if it's an electrical fire. The concern here is that's been drummed into training, as Dr. Powers points out, there's been innumerable guidance documents and information notices issued by the NRC and yet this licensee still didn't get that message, didn't ingrained it into -- they probably ingrained it into their training but when the actual event occurred, that training went out the window and they sat around in the control room or control rood, befuddled.

As far as revisiting bad times, the NRC staff has said that basically many plants or some plants at least, have returned conditions to what they were before the Browns Ferry fire, bad manual actions and no physical separation, fire rep or whatever. I think also, getting into the issue of the devil that you know, that issue -- that regulation was implemented in 1980. Twenty-four years later we're still discussing compliance with it. Dr. Wallis pointed out earlier there's been non-compliance for 15 years. The staff clarified that they didn't know about it except for two years ago. We could go to this new operator manual actions thing. How many years down the road will it be before the staff and the industry actually get into compliance with the new operator manual actions rulemaking?

You know, here we're 24 years later and we're still not there. What we think this does is essentially reset the clock on non-compliance and that's the wrong thing to do. As Paul pointed out, we'd be not complying with the new regulation instead of trying to get into compliance with the regulation that at least has been out there for awhile and has been understood by many licensees, because not everybody is in that boat.

Substitution for real safety, I've eluded to a few --

MEMBER WALLIS: Now this compliance, I understand that one compliance would be this 20-foot separation. There may be a room where an existing reactor you can't get 20-foot separation without vast rebuilding of the whole building.

MR. LOCHBAUM: That's not the only requirement. They also have the one-hour fire wrap and the three-hour fire wrap.

MEMBER WALLIS: So I think part of these exemptions respond to that kind of situation where it's unrealistic to try to get a 20-foot separation by rebuilding something where it really was impossible or very, very difficult to rebuild it.

MR. LOCHBAUM: Yeah, we're not advocating room stretchers.

MEMBER WALLIS: No, but so --

MR. LOCHBAUM: But there are other provisions of Appendix R that are already on the books that were implemented in 1980.

MEMBER WALLIS: So you could still put in a big barrier or something instead of that?

MR. LOCHBAUM: One-hour fire wrap, three-hour fire barriers.

MEMBER WALLIS: So there is something reasonable that could be done.

MR. LOCHBAUM: Or you still have the provision -- as many plant -- responsible plant owners have done is seek an exemption under 50.12, not do a blanket one just to make the paperwork easier for the staff.

MEMBER WALLIS: So you'd still allow them to seek exemption.

MR. LOCHBAUM: Or sure.

MEMBER WALLIS: That's the present arrangement.

MR. LOCHBAUM: That's the present arrangement.

CHAIRMAN ROSEN: I don't think that's up to us or with respect to physical -- that's the rule in CFR 50.

MR. LOCHBAUM: Well, I guess we're not advocating that that should be eliminated or discouraged or taken out of the rule. That is a provision if you can't meet the current parts of 50.

MEMBER WALLIS: So your only complaint with the present system is that it's not being adequately enforced; is that right?

MR. LOCHBAUM: Exactly correct, exactly right.

MEMBER WALLIS: So if the present system were adequately enforced we wouldn't need a new rule.

MR. LOCHBAUM: That's right, we wouldn't be here today if the regulation enacted in 1980 were simply followed and enforced. The next slide talks about the substitute for real safety. The staff's 2002 letter points out that many of these non-compliances, the plants were in compliance and they took themselves out of compliance due to lack of understanding or misinterpretation or whatever with Appendix R.

Our concern is Appendix R is fairly simple. It's 20 feet, one-hour fire analysis, three-hour fire barrier. It's a little bit easier to understand if you're on the right side of the line or if not then these timelines, this feasible actions, all this analysis, that's much more subjective, that's much less enforceable.

MEMBER WALLIS: So it's more effective and efficient then, which was the criterion I saw the staff use for the new rule.

MR. LOCHBAUM: Well, never knowing that you're out of compliance is not more efficient than

being out of compliance. You know, it's semantics. You know, it takes the staff out of a lot of enforcement paperwork but it doesn't achieve the safety level that's there because right now, as Paul pointed out, plants are out there with unapproved, improperly analyzed operator manual actions. If this rule goes through, that population will go up as the regulatory analysis showed with the number of plants that would go this way. You can't assume that all those plants would do it right. That's just not the history of this industry. And our concern is, how many years would it take for the NRC to catch up with the fact that those plants are in the wrong space? The best way to avoid it is not let them get there.

The issue about rewarding bad behavior is that the staff's data shows that not every plant is in this situation. There are many plant owners who did the right thing, spent the money, did the homework right, did the analysis right, did the modifications right, are in complete compliance with Appendix R III.G.2 as intended in 1980. This game that's being played will basically tell those people that they were suckers for spending that money getting it right because if they'd just waited long enough, the staff

would have changed its rule to allow the under-age drinkers.

CHAIRMAN ROSEN: Well, doesn't it also suggest that those suckers have a safer plant?

MR. LOCHBAUM: But in today's economic environment, the ability to pay a premium to get that safety is going away and under this action by the staff with a deregulated industry, they'll be driving more people to spend on less safe plants rather than on --

CHAIRMAN ROSEN: Just a comment thing on those guys who did the right thing.

MR. LOCHBAUM: Oh, yeah, I admire them.

CHAIRMAN ROSEN: Most people have plants that don't have this fire risk and since fire is one of the dominant risks, those people are just in better shape. It protects their investment and so I'm not sure sucker is exactly the right word.

MEMBER SIEBER: Well, I'm not either. You know, in the plants where I worked we didn't have thermal lag but that was a matter of happenstance. You know, the engineering folks didn't buy it and so we didn't end up with this huge problem. That doesn't mean we spent a lot of money not to have that huge problem. It just means we were lucky, you know.

CHAIRMAN ROSEN: Well, I understand your point but sucker is not my choice of words. I think those people that have done the right thing, have done the right thing and it's commendable.

MEMBER SIEBER: Yeah, and we can move on then.

MR. LOCHBAUM: I just don't -- to reward those who didn't do the right thing or who were unlucky just doesn't seem to be the right thing for the agency to be doing.

MEMBER SIEBER: True.

MR. LOCHBAUM: I said several times, the ACRS recently issued a letter on the PWR containment sump issue saying the staff hadn't quite reached the gel point for that to go out.

CHAIRMAN ROSEN: I wish you wouldn't use that word in that context.

MR. LOCHBAUM: Sorry about that, I didn't even think of that.

MEMBER SIEBER: That's all right.

MEMBER WALLIS: I thought it was deliberate.

MR. LOCHBAUM: No, I wish it was but no, it wasn't. The -- we think this issue is very similar and added to it is the security issue which doesn't

effect the containment but does effect the operator manual actions component.

In conclusion, I think our view is that Appendix III.G.2 as implemented in 1980 provided crisp, clear requirements for fire protection. The staff's proposals to substitute a vague, ill-defined and virtually unenforceable requirement for those crisp clear regulations and that's unacceptable. What we thing the manual action that's needed now is to throw this idea into the --

MEMBER WALLIS: Why do they think it's more effective and efficient because it would seem to me that one's crisp, clear and easy to enforce and the other one is vague, ill-defined. The vague, ill-defined one must be less effective and efficient.

MR. LOCHBAUM: They don't have to do any enforcement action. You can never enforce it, so there will never be any enforcement conferences. There will never be any chances where the --

MEMBER WALLIS: So it saves money but it can't be more effective.

MEMBER SIEBER: Well, in effect, what they're doing is moving the review of each exemption from an NRR reviewer to a region-based fire protection inspector.

MR. LOCHBAUM: Right, and because it is so vague, that region-based fire protection inspector will never be able to find any non-compliances or violations, so it saves the staff a whole bunch of money.

CHAIRMAN ROSEN: So in summary, you say don't do it but certainly don't do it now.

MR. LOCHBAUM: Right.

CHAIRMAN ROSEN: Until the security issues are clarified.

MR. LOCHBAUM: Right.

MEMBER WALLIS: This word "cockamamie" must be some Americanism that I'm unfamiliar with.

CHAIRMAN ROSEN: I looked it up and couldn't find it.

MEMBER WALLIS: What does it mean?

MEMBER SIEBER: Yeah, it turned red on the spell checker.

CHAIRMAN ROSEN: I think you very much, Mr. Lochbaum. Do you have any final comments, I don't mean to cut you off.

MR. LOCHBAUM: Thank you.

CHAIRMAN ROSEN: We are going to take a five-minute break because we've been provided the time for one by our excellent speakers and come back and

make our final comments before 5:30. Thank you very much. Five minute break.

(A brief recess was taken.)

CHAIRMAN ROSEN: We now are at the stage of the meeting where I get all the help I can get from my colleagues to draft the letter for the full committee, so I would appreciate any thoughts you might have and I'll tell you what I think, but I'll start with you, Jack.

MEMBER SIEBER: Okay. My comments are solely mine. They differ from other members and are subject to change if I gain a greater understanding. I have a couple of concerns. One of them is that the way Appendix R was originally structured, it relied on plant design features like three-hour barriers, suppression and detection for the main thrust of fire protection defense and the staff gave exemptions which are exceptions to the rule for certain operator manual actions where the physical features of the plant may not be adequate.

I am concerned that we may be losing the order of importance of these things in the new rule which makes it very easy for a licensee to self-construct an exemption and therefore, jump to operator manual actions as opposed to repairing physical

features of -- fire protection features of the plant. And so, any rules that's finally published needs to make clear that the original intent of Appendix R, which is make sure the design features are in place, and in those rare situations where it's impossible or totally impracticable to achieve full compliance with design features, then operator manual actions may be considered. And so that maybe just puts a little different emphasis on it but it makes me more comfortable in that it preserves the original intent of the writers of Appendix R back in 1979/1980 time frame.

My second comment is that the -- I agree that security issues need to be evaluated before all this analysis is performed to justify deviations and the crediting of operator manual actions because I, as well as others, believe it will have a significant impact and so I think that it's -- it should not be a part of this proposed rule. On the other hand, I think resolution of whatever action is taken under this rule has to take into account security issues and whatever impediments they may present to the accomplishment of operator action and the analysis of the timeline. I just think that's important.

CHAIRMAN ROSEN: Let me make sure I understand, Jack. You're saying the security issues are important. I think everybody agrees but that you're providing, in your view, two options; one, take them into account now or provide a mechanism to take them into account at some later time?

MEMBER SIEBER: Yeah, I think either one from a regulatory standpoint is acceptable, either alternative. On the other hand, the lateral one is twice as much work and so, staff may want to take that into account. And that would be my comments. I'm not saying don't issue it because of this idea of prioritizing what gets done first, you know, physical features and as an alternative, a last ditch alternative or defense-in-depth thing, operator manual action as opposed to elevating the ease of incorporating operator manual actions so that physical features sort of disappear.

That doesn't necessarily say don't issue the rule. It's fix the rule to make that clear.

CHAIRMAN ROSEN: Graham?

MEMBER WALLIS: well, I think that yeah, the question we have is issuing this rule for public comment. I think we have to have a pretty good argument if we said don't do it. We'd have to make

sure why we were saying that. I wasn't really very convinced by anything I heard today. I do like the argument Jack put forth that the original intent was to have the physical barriers first. If that was the intent if you go back to it and look at the statement of considerations or something there, figure out that was the intent instead of quoting something from some Federal Register notice 24 years ago, you could understand the rationale behind the original Appendix R, we might know what it is we're changing. I think that staff needs to give us that argument properly.

What I missed, as I've said several times today, was a measure of plant safety. There was all this talking about it but if someone could convince me that plants would be safer if we did this, this or this, then I'd have some basis for making a decision and I didn't see that. It's all this cursive stuff. So besides the housekeeping chore of tidying things up so we don't let people do things without there being some check on what they're doing and checking whether or not they're really complying and so on, which I don't think is that job of ACRS, it's something the staff should be doing all the time, I don't really know what ACRS can add. So put out this rule and let people substantiate their comments on it with good

arguments and hopefully some analysis or we'll see it again.

And I think the staff needs to do a better job of justifying what it's doing based on its effects on plant safety and what their strategy is towards assuring plant safety which may be and in the past was to emphasize the physical things first and then put in operator actions as a defense-in-depth and so make it clear what the strategy it to achieving plant safety. I need that framework before I can really make a judgment about what's appropriate. And I think we'll probably end up saying, put this rule out and let's --

CHAIRMAN ROSEN: Well, I have three options. I'll say, "No, staff, you can't put this rule out the way it is".

MEMBER WALLIS: Because it's fatally flawed in some way.

CHAIRMAN ROSEN: It's fatally flawed and give my reasons. Or, "Yes, staff, you can put it out, it's flawed but not fatally and here's the flaws". Or we can say, "It's wonderful" and go with that. I don't think anybody thinks that. So I think the options you're suggesting is, yes, it's flawed but here are the flaws. Put it out.

MEMBER WALLIS: Well, I think when we write our letter, we might want to point out some of these things that need to be sorted out in the process of public comment.

CHAIRMAN ROSEN: Is that where you come down, pretty much, Jack?

MEMBER SIEBER: Well, I think there's three. Don't put it out, put it out and resolve comments which will remove some minor flaws, or the third option is, it has some flaws that ought to be fixed before it's put out and that's sort of where I'm at.

MEMBER WALLIS: Yeah, I would kind of like it to be in better shape. I think it should be in better shape.

CHAIRMAN ROSEN: Yeah, I agree with both of you. It has some flaws that I would like to see fixed before they put it out. And in particular the one that bothers me most is the security flaw. Maybe that's a simple fix. Maybe it's just a clarification of how one does this, but I would be faced, if I were back in the plant I used to be at of now knowing how to do the analysis without having to do it over.

MEMBER SIEBER: I think a licensee would end up doing it twice. It's not clear to me -- I

think some licensees would say, "Well, I'm going to drag my feet and not do it at all until I get further definition of the problem", and that's not a result you want.

CHAIRMAN ROSEN: No, and I don't think it's possible either because there will be enough interim check steps where the licensee that's trying that would --

MEMBER SIEBER: Well, all he has to do is keep track of where the inspectors are and when they're coming to his plant. Do you know what I mean? And the other alternative is just giving up and say, "I'll do it twice", and that has a cost associated with it. And you may come out with different answers. You know, if you put all the security things, manual actions may not look all that attractive and so you're into doing the physical things that you should have done in the first place.

CHAIRMAN ROSEN: Well, I think my comment is the security flaws is a show-stopper until some sort of reasonable process is defined and I think the staff maybe can address that in time for the next meeting, maybe not. I think it certainly should focus on that. I didn't hear much discussion of this but I understood that the objectives of this rulemaking were

really multiple. I went to the trouble of trying to dig them out. Let's see if I can find it.

Four objectives; maintain safety and increase public confidence, I'm not going to read the whole objective, they're longer than that but that's the first one. Provide quality and uniformity in licensee assessments and documentation, that's really number 2. Number 3 is, reduce the unnecessary NRC and licensee burden, that's number 3. Number 4 is result in more efficient use of resources by both licensees and NRC. So there's safety, quality and uniformity, reduce licensee NRC burden and more efficient use.

In listening to what NEI said, said and I think it was the gentleman from Duke Power, that there are going to be a lot of exemptions with the rule as its presently put together. So that that's certainly won't meet objectives 3 and 4 which are to reduce unnecessary licensing regulatory burden and result in more efficient use of resources. So of the four objectives only two of them are likely to be achieved and two are unlikely to be achieved.

MEMBER WALLIS: The most important one, the safety one, really people didn't have very much to say about.

CHAIRMAN ROSEN: No, no.

MEMBER SIEBER: It's a draw.

CHAIRMAN ROSEN: So I'm sort of troubled by doing a rule-making that is on the face of it, can't get better than about 50 percent in your tests, Graham, maybe not that high. So I'm troubled by that. So I'm troubled by security and I'm troubled by not meeting the objectives of the rulemaking. I'm also troubled by the idea that fire detection and automatic suppression requiring that, in order to take credit for operator manual actions runs counter to the Commission's preference which has been established over a long time and embodied in the 1995 policy statement on PRA and it really runs counter to their preference to risk-informed and performance-based approaches. So stick that in and say that's our article of faith, our deterministic article of faith and now you can calculate all these things and do all this --

MEMBER WALLIS: They refuse to do any risk-informed --

MEMBER SIEBER: Yeah, but I would agree with you, Steve, that it's a deterministic rule and there's no risk information and so what do you do with that?

MEMBER WALLIS: You enforce it.

MEMBER SIEBER: Right.

CHAIRMAN ROSEN: Well, I'm troubled by a little different aspect of it. Maybe I did not make myself clear, is that if this Commission is trying to run a regulatory system in a risk-informed, performance-based way, saying we're going to do that but the shape of this table is -- before you can do the risk-informed and performance-based analysis, risk-informed because you're doing the PRA-like analysis and performance-based because you're going to demonstrate the manual actions that your taking, first you have to agree that you're going to have automatic suppression and fire detection in the area. That's not the way you do risk analysis.

What you do with risk analysis is you take what you have and you do the best estimate analysis of the circumstances, come up with a number and you assess your uncertainties, and if they're large, you add defense-in-depth. I mean, that's the standard, so this is different than that. It starts priority with the defense-in-depth and then goes off and --

MEMBER SIEBER: You can use those arguments, though to say you really don't need containment.

MEMBER WALLIS: I think we have enough to go to the full committee and say these are some of the issues.

MEMBER SIEBER: I think so.

CHAIRMAN ROSEN: Yeah, I'm going to take a crack at it. Maybe -- I'll certainly put in the ideas about the rulemaking objective is not likely to be achieved and the security event stuff. I might fool around with the thing I just mentioned, a little bit running counter to the typical way --

MEMBER WALLIS: What do we have? We have a one-hour meeting with the full committee or something?

CHAIRMAN ROSEN: One and a half, Marvin.

MEMBER WALLIS: It's just the staff that presents or do we have other ones?

MR. SYKES: It's just staff.

CHAIRMAN ROSEN: Just the staff unless we make the -- we have the inputs from the other people.

MEMBER WALLIS: We can share the other slides with the full committee.

MEMBER SIEBER: Or you can do it and Steve, in his introduction can summarize what --

CHAIRMAN ROSEN: Well, I'll certainly mention what's been said.

MEMBER SIEBER: -- what the others have said.

CHAIRMAN ROSEN: But hearing no further comments from the members, I look around and ask if there's anybody who feels compelled to want to keep us from going to supper.

MEMBER WALLIS: Well, I think it's a cockamamie idea to think of going to supper.

MEMBER SIEBER: How do you spell that again?

CHAIRMAN ROSEN: Thank you very much. We are adjourned.

(Whereupon, at 5:40 p.m. the above entitled matter concluded.)