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UNITED STATES OF AMERICA

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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

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SUBCOMMITTEE ON RELIABILITY AND PRA

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TUESDAY,

AUGUST 18, 2009

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ROCKVILLE, MARYLAND

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The Subcommittee convened at the Nuclear Regulatory Commission, Two White Flint North, Room T2B3, 11545 Rockville Pike, at 1:00 p.m., Dr. George Apostolakis, Chairman, presiding.

SUBCOMMITTEE MEMBERS PRESENT:

GEORGE APOSTOLAKIS	Chairman
DENNIS C. BLEY	ACRS Member
WILLIAM J. SHACK	ACRS Member
JOHN W. STETKAR	ACRS Member
SAID ABDEL-KHALIK	ACRS Member
HAROLD B. RAY	ACRS Member
JOHN D. SIEBER	ACRS Member

NRC STAFF PRESENT:

SUNIL WEERAKKODY

STEVEN LAUR

DONNIE HARRISON

HARRY BARRETT

J.S. HYSLOP

STEPHEN DINSMORE

ALSO PRESENT:

LIZ KLEINSORG

BIFF BRADLEY

JOHN BUTLER

KEN CANAVAN

JEFF ERTMAN

STEVE HUTCHINS

A-G-E-N-D-A

P R O C E E D I N G S

(1:00 p.m.)

CHAIR APOSTOLAKIS: The meeting will now come to order. This is a meeting of the Advisory Committee on Reactor Safeguards, Subcommittee on Reliability and Risk Assessment.

I am George Apostolakis, Chairman of the Subcommittee. Subcommittee members in attendance are Said Abdel-Khalik, Dennis Bley, Harold Ray, Bill Shack, Jack Sieber, and John Stetkar.

The purpose of this meeting is to discuss the draft final Regulatory Guide 1.205, Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants, and Standard Review Plan Section 9.5.1.2, Risk-Informed Performance-Based Fire Protection Program.

The Subcommittee will gather information, analyze relevant issues and fact, and formulate proposed positions and actions, as appropriate, for the deliberation by the full Committee.

Mr. Girija Shukla is the Designated Federal Official for this meeting.

The rules for participation in today's

meeting have been announced as part of the notice of meeting previously published in the Federal Register on July 21st, 2009. A transcript of the meeting is being kept and will be made available as stated in the Federal Register notice.

It is requested that speakers first identify themselves and speak with sufficient clarity and volume so that they can be readily heard.

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

We will now proceed with the meeting and I call upon the NRR management to make introductory remarks.

DR. WEERAKKODY: Okay. My name is Sunil Weerakkody. I'm the Deputy Director, Fire Protection, NRR. This meeting is about the draft Reg Guide 1.205. About a month and a half ago, we came in front of this Subcommittee to provide you some information on the Reg Guide -- draft Reg Guide 1.205.

At that time, we had just received the stakeholder comments. We had not had time to disposition them. Today we are going to -- in addition to going over the Reg Guide, we will share with the members what type of comments we received and

how we dispositioned them.

Our DG presenter on this topic is Steven Laur. Steven is the Senior Technical Advisor in our division. So he'll make the DG presentation.

Sitting next to him is Harry Barrett. He is the Senior Fire Protection Engineer in the Fire Protection Branch.

Alex Klein, who is the Branch Chief, could not be here. He's out sharing good words about 805 with the international community at Helsinki so he couldn't be here. So Harry is the designated spokesperson for the Fire Protection Branch.

And then next to him is Donnie Harrison. He's the Branch Chief of PRA Licensing.

With that, I will turn it over to Steve.

CHAIR APOSTOLAKIS: So we are not just reviewing your response to public comments. We are reviewing the Regulatory Guide.

DR. WEERAKKODY: That is correct.

CHAIR APOSTOLAKIS: Okay.

MR. LAUR: Okay. Thank you, Sunil.

As Sunil said, I'm Steve Laur. I'm going to at least lead the presentation. And if you have very difficult questions, hopefully one of my colleagues will be able to jump in.

The objectives today, we'd like to present the final draft version of Reg Guide 1.205, Revision 1. We have received the public comments, as Sunil mentioned. I'd like to cover basically the key flavor or general type of comments we got. And how we resolved those comments. We'd like to obtain your recommendation that the full Committee endorse the Reg Guide 1.205, Revision 1.

And we got a little out of sync here with the SRP. The meeting we went through the Standard Review Plan section. I've mentioned they go and glove. They are -- obviously one is the guidance to industry of one acceptable means of meeting our regulations. The other side is how the staff reviews a License Amendment Request to that guidance. And we got out of sync while we were resolving some issues at the last minute.

So the Standard Review Plan section will comport with the final Reg Guide. In fact, right now it does 98 percent. But as you are aware, we sent some -- I guess two revised pages last week. That was very late in the game. So we're going to actually cover that in detail later in the presentation.

When we came on June 1st, we had what we thought the public comments were going to be. And

it's almost an identical slide. I think the second major bullet is different.

But basically there were a number of public comments that had to do with the fire PRA, as you can imagine. A number of these had to do with the methods. We had in the draft Guide that the methods for applying the PRA, you know, shall be or should be approved by NRC prior to use.

There was some confusion between the methods that are used to construct the base model and the methods for modeling the cause and effect relationship when you apply the model. And furthermore, it turns out the regulation in NFPA 805, which is included by reference in the regulation, does not require approved methods. It requires acceptable to the authority having jurisdiction.

The second thing is we proposed, I guess, a new and expanded license condition from what was in the original Reg Guide. And a part of that had to do with some transitional license conditions.

For instance if a plant says we're going to do a number of modifications to be fully in compliance however they are going to take place in the next refueling outage or two refueling outages, based on conversations with the Office of General Counsel

with NRR staff, we said those really need to be license conditions, not commitments. So we added those.

We also added some other things in there about how you can do self approval during the interim period before you are fully implemented. And the industry had comments having to do with that being too restrictive.

But the third major topic had to do with recovery actions which, if you remember from last June we talked about it quite a bit, recovery actions in NFPA 805 are similar to operator manual actions in the existing licensing basis. I say similar.

They sound identical but when you look at the definition -- there is a definition of recovery action in 805. It has to do with actions taken to meet the -- or necessary to meet the nuclear safety performance criteria that take place either outside the control room or outside the primary control station for the equipment being operated, including repairs and recovery.

But it is an interesting definition because it doesn't match what a typical PRA person would call recovery 100 percent. It doesn't match OMAs from the preceding licensing basis 100 percent.

So it is a little different.

Anyway, so --

CHAIR APOSTOLAKIS: Let me ask a more general question before you jump into the details.

You are free to disagree with NFPA 805, aren't you? You can publish a Regulatory Guide that says this part we don't agree with. We're not going to do this.

MR. LAUR: No.

CHAIR APOSTOLAKIS: No?

MR. HARRISON: Not in this situation.

CHAIR APOSTOLAKIS: Say again?

MR. HARRISON: Not in this situation. NFPA 805 was incorporated by reference so it becomes part of the --

CHAIR APOSTOLAKIS: With some exceptions.

MR. HARRISON: With some exceptions.

CHAIR APOSTOLAKIS: But the Regulatory Guide cannot add to the exceptions.

MR. HARRISON: And then the appendices also don't apply, right?

MR. LAUR: Right.

MR. HARRISON: So -- but the main body of NFPA 805 text comes over as part of the regulation.

CHAIR APOSTOLAKIS: So you can -- I mean

if there is some confusion about some definition and so on, then you are free to say this is how we --

MR. HARRISON: Right. We can clarify but we can't be in conflict with.

CHAIR APOSTOLAKIS: But we can still ask you questions on your Regulatory Guide?

MR. HARRISON: Yes.

CHAIR APOSTOLAKIS: And I believe that has come up before. And I still am amazed that such a thing is there.

On page three, it says although a licensee may transition to an NFPA 805-based FPP without a fire probabilistic risk assessment model, the NRC anticipates that the licensees will develop a plant-specific fire PRA. I don't understand that.

How can you transition to something that is presumably risk-informed performance-based without having a fire PRA? Now is that something you have to live with? You can't do anything about it? And all you can do is express a wish? Relying on the kindness of strangers? What?

MR. LAUR: That is an excellent question. I believe the existing version of the Reg Guide also has --

CHAIR APOSTOLAKIS: Yes, I read it from

the existing -- on page three.

MR. LAUR: Yes. And in practice, at least two out of two pilot plants are implementing full plant fire PRAs. And in practice, in order to achieve the maximum benefits from implementing 805 such as the self approval, et cetera, a licensee would typically opt to do an entire fire PRA.

CHAIR APOSTOLAKIS: But are there any licensees that as far as you know are planning to transition and not do a fire PRA?

CHAIR APOSTOLAKIS: No, not as far as I know, no.

CHAIR APOSTOLAKIS: No? No? Well, that's good. That's good.

And there was another thing. I guess it has been approved now but there is this diagram there in 805 -- a figure that says at some point -- you look at the fire area and you can go the deterministic way or the performance based, which is risk, right? You are familiar -- I'm sure you have read 805 several times.

So this is now all in a big box. It gives you options. But then the arrow out of the box says evaluate the risk. For the life of me, how can you evaluate risk if you do the deterministic thing? Is

there a magic there?

MR. LAUR: One of the sources of confusion, in my mind at least, and I've come on the scene relatively late in the process, has been between these two aspects of how risk is used in the rule. And in that figure you're talking about, which is 2.2 Methodology --

CHAIR APOSTOLAKIS: That is correct.

MR. LAUR: Okay.

CHAIR APOSTOLAKIS: 2-2.

MR. LAUR: Excuse me, 2-2 -- I should know that.

CHAIR APOSTOLAKIS: Yes, Steve, I caught you.

MR. LAUR: But the inner box you are talking about is actually, if you will, a flow chart within a flow chart. That happens on a fire area basis.

CHAIR APOSTOLAKIS: Yes.

MR. LAUR: Okay. Before you come into that, you are on a plant basis for citing the nuclear safety performance criteria and that sort of thing. When you come out of that, you are looking at what's called the plant change evaluation --

CHAIR APOSTOLAKIS: Yes.

MR. LAUR: -- which is a change to a previously approved fire protection program.

CHAIR APOSTOLAKIS: Right.

MR. LAUR: Okay. That is not -- even though all the words sound very similar, that's not the same as the -- one of the two performance-based methods that is inside that box, which is fire -- one of them is fire modeling and the other one is fire-risk evaluation.

CHAIR APOSTOLAKIS: Yes.

MR. LAUR: It's not the same. They point to the same acceptance criteria. They both have to be acceptable to the authority having jurisdiction. They both have to consider defense in depth and safety margins.

CHAIR APOSTOLAKIS: Right.

MR. LAUR: But it is a different animal.

CHAIR APOSTOLAKIS: Steve, when I get out of the big box, I have to do some risk evaluation to compare the risk of the plant as it should be complying with all the regulations and the requirements in an NFPA and subtract that from the risk with the current situation of the plant. And I don't know how you are going to do that if you do the deterministic part.

Now if you say that all the utilities are using -- have a PRA, maybe that is a moot point then. It doesn't matter.

MR. LAUR: Well --

CHAIR APOSTOLAKIS: But otherwise, I am having a hard time figuring out how a deterministic evaluation -- let's say that in one fire area, I don't comply. And I do my equivalency calculations and all that. And I convince you guys that yes, this is good enough. But I still don't comply. So I have to evaluate the risk from that.

MR. BARRETT: No, no, actually under 805 rules, you would --

CHAIR APOSTOLAKIS: You don't?

MR. BARRETT: -- you would be performance based and you would comply using performance-based analysis.

CHAIR APOSTOLAKIS: For that individual area.

MR. BARRETT: For that individual area.

CHAIR APOSTOLAKIS: And then I can be risk informed --

MR. BARRETT: You would consider that compliant with the code because the code is a performance-based code. And you'd do an analysis that

shows you meet the performance criteria. So once you show --

CHAIR APOSTOLAKIS: But it's all then --

MR. BARRETT: It is no longer a non-compliant condition any more. It's now compliant to --

CHAIR APOSTOLAKIS: That in itself is strange.

MR. LAUR: But there is another -- I guess from a higher viewpoint, there is a couple ways of interpreting this figure. The one that makes sense to me and it doesn't jive with what the industry guidance exactly says, everyone has latched on to this plant change evaluation as being the risk assessment. And like I say, it's virtually the same thing except for it shows up in two different places.

But it is not the same in the following sense. When you first -- if you have an existing licensing basis, that's Appendix R or some other traditional method, and you want to transfer or transition to NFPA 805, what the Commission has said is you can meet GDC-3 by meeting 50.48(a) and (b) or (a) and (c).

So the Commission has basically said there are alternative ways of having an acceptable fire

protection program. Now we can talk later about are you allowed to mix and match or whatever. But pretty much you have (a) and (b) or (a) and (c).

To say I'm going to evaluate using the plant-change evaluation, the plant-change evaluation, the baseline for comparison is your previously approved fire protection program compared to the change you wish to make.

The baseline for the one inside the box where you are looking at individual fire areas and say I have three things that don't meet the deterministic requirements, I want to use the fire risk, the baseline is the deterministic compliant configuration.

CHAIR APOSTOLAKIS: Yes.

MR. LAUR: Okay. That's a different baseline. And in fact, in theory that would never -- that baseline would never change. It would always go back to having everything 20 feet or three hours or the right suppression and detection.

CHAIR APOSTOLAKIS: No, eventually it may because if you showing using Regulatory Guide 1.174 that your deviations are acceptable, then you have a new basis.

MR. LAUR: Right. But the way the staff is looking at it now -- and it doesn't make a

practical difference except for in a couple minor areas -- is that when you want to go from 50.48(a) and (b) to (a) and (c), you don't need to do a plant-change evaluation to assess that risk.

That is not technically a risk-informed change because the Commission has already said if you comply with this set or with this set, adequate protection is assured, okay?

So in order to comply with this new set, if you don't meet the deterministic requirements, it gives you two performance-based methods. If you don't like those 50.48(c) has an exception which, obviously, is at a higher level than this incorporated by reference, that says you can propose an alternative as long as it meets the same performance goals criteria and whatever and has defense in depth and safety margins. And the staff has to consider that as a license amendment, okay?

And so in order to transition, the real important thing are the performance-based methods in that box. Once you have adopted 805 and you want to do this self approval --

CHAIR APOSTOLAKIS: Down later, yes.

MR. LAUR: Yes. Then now you are in a plant change because if we've approved something at a

certain level, then 1.174 would say small changes consistent with the Commission's safety policy goal statement, et cetera, that meet the regulation defense in depth, so that's where the plant-change evaluation, in our mind, really comes in.

CHAIR APOSTOLAKIS: But the basis there would be the new licensing basis --

MR. LAUR: Yes.

CHAIR APOSTOLAKIS: -- which may -- or will include previously approved alternatives or alternatives that have not been approved but they were shown with a risk evaluation that they were acceptable. So now we start anew after that.

But it is the position that confuses me a little bit but if it is clear to you and the industry, that's fine.

MR. LAUR: I missed that. Are you saying if it is clear to the industry or --

CHAIR APOSTOLAKIS: If it is clear to you and the industry --

MR. LAUR: Oh, okay.

CHAIR APOSTOLAKIS: -- then the fact that I am confused is of minor importance.

MR. LAUR: I think we'll hear later whether --

CHAIR APOSTOLAKIS: We'll come back to some of these prior approvals later.

MR. LAUR: Yes, we will.

CHAIR APOSTOLAKIS: Okay.

MR. LAUR: Okay, so I mentioned fire PRA methods being one large area. And the way I have arranged the slides, it was too much information if I took two slides. Otherwise it is on the same.

But I basically summarized the flavor of the public comment and said whether or not we did anything about it. And in your packages you got almost 30 days ago, hopefully you can see, you know, the red-line strike-out and the detailed resolution of the comment.

The first thing was clarify how to meet 805 requirement that methods be acceptable to the authority having jurisdiction, which is obviously the NRC, limit the discussion of fire PRA methods to the cause and effect relationship, and do not limit methods to those in topical reports. And that last one -- there is an editorial error on our part and it caused, I guess, some angst on the industry. But that wasn't our intent.

Our intent was any generic approval, e.g., topical reports. But -- so the way we addressed

these, we made significant changes to the draft guide. And I enumerated a number of the positions here. But basically what we did is we said for methods, for building our base PRA Regulatory Guide 1.200, which endorses with exceptions and clarifications, that the ASME PRA standard is what you do. That's all we've ever wanted.

As far as the cause and effect relationship, we backed off on the requirement that we previously approve and we have three bullets here that describe the type of things that we would normally find acceptable.

CHAIR APOSTOLAKIS: What does a cause/effect mean relationship?

MR. LAUR: In the case of an application of a PRA when you want to consider how the changed or proposed condition can be reflected in the PRA model with some measure of fidelity so that if, for example, this is a fire area. It is an A train fire area. And I have a B train cable that should not have been routed in here.

And I say well, I don't want to wrap it. What is the risk? And what I could do is assume -- well, the base case would be the cable wasn't in there. So whatever that risk of various fire

scenarios in the room would be would be my baseline.

And if that particular cable or whatever, since it is actually in there, if I assume it fails with a probability of one, then that would be my risk to compare it to. Well, the cause and effect relationship, in this case, I'm saying the fire has assumed the damage with certainty that cable.

CHAIR APOSTOLAKIS: You don't assume that it fails with probability one. I mean when you do the risk evaluation, you will have to have some model that tells you what the thermal environment is in the room.

MR. LAUR: Yes, what I was describing was a bounding --

CHAIR APOSTOLAKIS: But this is, again, during the transition, right? You will assume a B train is not there. After you approve it, after the transition and it is still there, then it is still there. That is the baseline now.

MR. LAUR: Right.

CHAIR APOSTOLAKIS: So -- okay. I still don't -- it is not very clear to me what cause/effect is.

MR. LAUR: So what we've written in the draft final Reg Guide is that the licensee may model this cause and effect relationship with methods that

have been used in the peer-reviewed baseline PRA, methods that have been endorsed by the NRC through a license amendment, or prior approval of the generic methods, or that have been demonstrated to bound the risk impacts.

So in the case -- the example I gave was I guess the third example. If it is too difficult to figure out the thermal hydraulics, the fire modeling, the failure modes and you assume that it fails with certainty and it is still well within our acceptance guidelines, then it would be acceptable.

CHAIR APOSTOLAKIS: So peer-reviewed baseline -- so if somebody uses a code like CFAST or something and shows that the probability of both trains failing is very, very low, that's not part of a baseline PRA. When you say baseline, you mean fire PRA?

MR. LAUR: I mean the baseline fire PRA.

CHAIR APOSTOLAKIS: Oh, okay, okay, okay. Then it is okay. All right.

MR. LAUR: Okay. The next set of comments from the public -- by the way, the bulk of our comments were from NEI. We received none from the public at large.

CHAIR APOSTOLAKIS: And so this is highly

unusual is it not?

MR. LAUR: Well, I don't know. Okay, so if the public comments could be summarized as provide guidance on the fire PRA model updates and upgrades after transition, provide clear fire PRA submittal guidance, and clarify when plant-change evaluations are required.

And the first two have to do with -- I want to say confusion -- I guess we weren't very clear when we wrote this but at least in my mind and I guess some of the minds of us that have done risk assessments using .174, it was very clear what we thought we meant. But when the industry read it, it wasn't clear.

So what we have done is once again referred to 1.200 and referred to the ASME standard. If you remember from reading our red-line strike-out version we sent you, Section 4.3, which is the fire PRA section, is almost all red or almost all strike-through anyway. It is basically totally rewritten.

And the reason was what was in there before didn't really rely as heavily on Reg Guide 1.200 as it could have. And, therefore, it kind of got wrapped around itself in the wording.

There was also some things in there --

when the original Reg Guide was written, there was not a fire PRA standard. Not even the ANS standard was out at that time.

So since that time, we've had that standard issued, the combined standard was issued, the Addendum A to that standard was issued, and Reg Guide 1.200 revision was issued.

And the second half of this is we have tried to further clarify this difference between the fire risk evaluation of NFPA 805, Section 4.2.4.2, as in that figure you are talking about, and the plant change evaluation of Chapter Two.

CHAIR APOSTOLAKIS: I still -- provide guidance on five PRA models updates and upgrades after transition. So I have transition. I have my baseline fire PRA model. Isn't that model supposed to comply with Regulatory Guide 1.200?

MR. LAUR: Yes.

CHAIR APOSTOLAKIS: And then 1.200, I don't remember now, has some guidance as to when to update the PRA?

MR. HARRISON: Yes, update and upgrade.

MR. LAUR: Yes. In addition, too, the standard has it. But I think the concern -- and like I said, I believe we'll be hearing this later in a

different presentation -- but I think one concern is that -- I shouldn't say for the first time but I guess for the first major program, a probabilistic risk assessment model is moving into the licensing arena, okay. And NFPA 805 says this model is supposed to reflect the as-built and as-operated- and-maintained plant.

Now it sounds like what we've talked about for years, maintenance rule and everything else. But there is a difference that is not necessarily slight. In the maintenance rule guidance and other guidance that I recall, it says reasonably reflect the as-built, as-operated plant. This says shall reflect, okay.

So I think the concern is that, you know, a plant may have a model update procedure that says every so many years, let's see if the data needs to be updated. Do we have more plant-specific data? We want to do a Bayesian analysis. That sort of thing.

But what we're trying to say is that this is already an agency position. 1.200 and the standard tells you the model update frequency. If you upgrade a model, you have to do peer reviews on the portions that have been upgraded and that sort of thing. And we're not trying to reinvent that.

CHAIR APOSTOLAKIS: Well, what was the NUREG number of this multi-volume report from EPRI and NRC?

MR. LAUR: Yes, 6850?

CHAIR APOSTOLAKIS: 6850.

MR. LAUR: Or EPRI 101.-989?

CHAIR APOSTOLAKIS: Yes. That was a PRA -- I mean fire PRA methodology, was it not?

MR. LAUR: Yes.

CHAIR APOSTOLAKIS: And last time we had a presentation here, the EPRI representative attacked it as if they had never participated in the development of that.

MR. LAUR: Yes.

CHAIR APOSTOLAKIS: So I'm doing my transition now. I have my fire PRA. I used the models that are out there now. And three years down the line, the joint EPRI/NRC effort comes up with an updated 5860 that has maybe different models here and there. Does 1.200 tell me what I should do? I mean should I update my models and make them compliant with the new version? And would that create headaches to people? I mean what does this thing --

MR. HARRISON: I'll answer the question this way. This is Donnie Harrison of the PRA Branch

within DRA. 6850 is guidance.

CHAIR APOSTOLAKIS: It is what?

MR. HARRISON: It is methodology guidance. The NRC and the EPRI folks worked together on that guidance.

A licensee does their fire PRA. If there are things that they need on a plant-specific basis, provide additional analysis to in developing their PRA, that's what they would do. That would go through its own peer review process.

And, again, it becomes a case of when the peer reviewers look at it against Reg Guide 1.200 or even when the licensee looks at it against Reg Guide 1.200, the issue is is the model, the fire PRA modeled correctly? Is it representing the plant?

There is no where where you have to be in compliance or are required to meet 6850 explicitly or that you are even required -- if 6850 updates and you want to leave your PRA model alone, you can. There is not a requirement to update it.

CHAIR APOSTOLAKIS: So I'm doing all that now. I pass the peer review.

MR. HARRISON: Right.

CHAIR APOSTOLAKIS: Three years down the line, a NUREG comes out and says well, you know, the

model uncertainty of CFAST is different now because NIST says so.

MR. HARRISON: Right.

CHAIR APOSTOLAKIS: Or something else changed. I'm not going to have another PRA review.

MR. HARRISON: Unless you choose to.

CHAIR APOSTOLAKIS: What?

MR. HARRISON: Right. Unless you choose to upgrade.

CHAIR APOSTOLAKIS: No, I'm not choosing any.

MR. HARRISON: Okay. Then you're not --

CHAIR APOSTOLAKIS: I'm happy with what I have so I will keep having that model even though there are better models out there. That's what the first question tells me.

MR. HARRISON: Yes, but --

CHAIR APOSTOLAKIS: Are you going to force people to go back and update the modeling?

MR. BARRETT: I think that would depend on whether or not the new information would change your answer.

CHAIR APOSTOLAKIS: Well, how would you know that?

MR. BARRETT: Well, you might not without

redoing the analysis. That's the unfortunate part about it. But let's say some new piece of information comes out that is vastly different than the assumptions that were used in your PRA --

CHAIR APOSTOLAKIS: But do you have a regulatory -- not rule but a way of asking the licensee to at least look?

MR. BARRETT: Yes. The NFPA 805 standard requires operating experience to be wrapped into the risk assessment. You have to keep up with whatever is going on --

CHAIR APOSTOLAKIS: Operating experience --

MR. BARRETT: -- in the industry.

CHAIR APOSTOLAKIS: -- includes modeling experience?

MR. BARRETT: Well, any new information that comes out that could change the answer, I believe that's true.

MR. HARRISON: Well, yes, you have to be careful. It's a case of if you find something that invalidates a prior model, it would be incumbent upon you to update it when that information comes out. But if it is a bounding to what your condition it, I don't think we would force a licensee to change something

that actually bounds the answer because we're fine turning or improving methods. That's not a requirement.

CHAIR APOSTOLAKIS: Well, it doesn't both me that much but --

MR. LAUR: Well, let me --

CHAIR APOSTOLAKIS: -- other things --

MR. LAUR: Let me add --

MR. HARRISON: But that becomes the issue.

MR. LAUR: Let me add just a little bit to that. I have two unpopular examples -- well, one -- two examples. One is Human Reliability Analysis. There is no -- to my knowledge, unless you guys did something this morning, there is no consensus method. But there are a whole bunch of methods and there is a subset of those -- of that universe of methods that are considered general good practices, I guess, okay? And they will pass a peer review.

And so if a much, much better method comes out, there is nothing -- there is no forcing function to require somebody to go back and change their model, okay? The other example that comes to mind is many years ago, there was a NUREG seal LOCA model that many people used.

And it fell into disfavor with new

information and there was a new -- the Rhodes model or the Westinghouse WOG 2000 or whatever -- that became a consensus approach, okay?

But that is kind of a preamble to the following. When a licensee comes in after a transition for a license amendment request, and that will happen when they try to do a combined change, which they are not allowed to self approve or they trip the self approval threshold, then the staff will do the typical review of PRA quality to make sure, you know, what they done since that time.

And if there are things such as this seal LOCA model or, in our case here, it might be something like the modeling of incipient detection just comes to mind but something that we hadn't solved yet, then a licensee in that application is supposed to identify the key assumptions -- the key assumptions, those assumptions that are driving the answer.

And in there will be this modeling thing, whatever it is.

CHAIR APOSTOLAKIS: So this is the time then when you can actually encourage the licensee to bring it up to date?

MR. LAUR: Yes.

CHAIR APOSTOLAKIS: But as long as the

licensee chooses not to come to you for a change, then the model can stay the way it is, right? That is really the net result of all of this, right?

MR. LAUR: Yes, I think that --

CHAIR APOSTOLAKIS: Which is fine with me. I mean --

MR. LAUR: Well, that will be in the inspection space though.

CHAIR APOSTOLAKIS: Okay.

MR. LAUR: Okay. Then the final -- the bullet -- we actually had this in this formal review plan, which industry commented on, but we didn't have it in the Reg Guide, so we've explicitly under the section that talks about risk evaluations, we have said there are three places where risk is used or risk analyses are used in 805.

There is the plant-change evaluation. And then there is the 4.2.4.2 we talked about. Then there is a more general thing that talks about the risk -- the additional risk of recovery actions which can be done one of two ways. So we clarified that as well.

Also in the area of models and risk evaluations, the comment was do not evaluate the total change in risk associated with implementation of 805 using Reg Guide .174. And there is no valid basis to

track human risk.

And we did not agree with those totally. The first one, which I've partially addressed, but the bottom line is .174 is the guidance we use. It was in the guidance in the existing Reg Guide but we did address it -- we addressed it in the sense that we clarified what we meant by the total risk. How the total risk should be calculated.

MEMBER STETKAR: Steven, are you going to elaborate on that particular point later in the presentation?

MR. LAUR: Yes.

MEMBER STETKAR: Okay. I'll wait until then. Continue.

CHAIR APOSTOLAKIS: I think you should clarify as you move on whether you are talking about the transition phase or post-transition because it makes a big difference.

MR. LAUR: Okay. For the total change, the risk associated with implementation, that is obviously just the transition. The cumulative risk, it applies in both kinds but we don't care about the cumulative for implementation because that is -- that total risk gives us what that is, okay? So cumulative is after transition.

CHAIR APOSTOLAKIS: And this is the cumulative risk resulting from all the changes they have requested over the years?

MR. LAUR: After --

CHAIR APOSTOLAKIS: After --

MR. LAUR: -- starting over --

CHAIR APOSTOLAKIS: Yes.

MR. LAUR: -- after transition.

CHAIR APOSTOLAKIS: As I recall 1.174, it says that it should be taken into account in the decision-making process but it doesn't say how.

MR. LAUR: And this refers to .174. It doesn't say how either. The vision -- and I'll ask Steve Dinsmore to chime in here if I don't get this 100 percent right -- but the way we have handled this -- I'll give you two examples. One I'm familiar with and one I just heard about.

But the first one is integrated leak rate testing, okay, years ago, plants started coming in. They said our licensing basis is once every ten years. We'd like to go once every 15 years. Here is an EPRI report. Here is our delta risk numbers, whatever.

And the staff asked an embarrassing question. They said well, we don't care what it is from ten years to 15, we want to know what it is for

once every -- excuse me -- three times every ten years. In other words, but the way the cumulative was handled was going back to the original licensing basis and looking at the total risk, not letting it be oh, you were granted three times every ten years. Now you are granted once in ten years. Now you want to go to once in 15 years.

CHAIR APOSTOLAKIS: But this was on a specific issue that really stretched over the years.

MR. LAUR: Right.

CHAIR APOSTOLAKIS: But the question here is, at least for me, I have transitioned. And then I want to change something. I come to you. We go back and forth. And you approve.

MR. LAUR: Right.

CHAIR APOSTOLAKIS: There was a delta CDF there. Three years later, I come back for another issue. Approved. Another delta CDF.

Five years down the line, I come back for the third time. And the way I interpret this that not only will you look at the delta CDF for that particular request but somehow the sum of the previous delta CDFs will play a role, the cumulative delta CDF.

MR. LAUR: It will play a role but --

CHAIR APOSTOLAKIS: In that cumulative --

1.174 says take it into account period. And I don't know how to do that.

MR. LAUR: Right. Well basically -- the analogy I was giving you and let me give it to you on the fires, what we're trying to ensure is that someone doesn't slice a risk increment that would not be acceptable into n smaller increments that individually would be acceptable.

So the example would be if this was a fire area and I have an automatic suppression detection --

CHAIR APOSTOLAKIS: It's a bundling.

MR. LAUR: -- right. Okay. And that's really -- that's how we are going to get at the cumulative risk. So if they do a change in this room and the other fire area and the other fire area, it is problematic, as you know, to try to figure out what this delta five years ago, how that compares with delta day. And we've had beta changes, model changes, method changes, etc.

But what we do want to avoid, like I said, is to have someone -- they can take us out on two steps. And each one looks like it's --

CHAIR APOSTOLAKIS: I understand that. And that is a very legitimate thing but the deal with cumulative deltas without concerns of this type, it

seems to me that is not appropriate.

I remember though when we were approving 1.174, that we were told, and I think the Committee agreed, that we don't want a plant that say has a CDF of ten to the minus five now to start changing things and five years later they have a CDF of ten to the minus four, which is a goal.

I mean that's something we really don't want. We don't want everybody to move to the goal in other words. And I think that is legitimate.

MR. HARRISON: And that's the intent here is to avoid risk creep, if you will.

CHAIR APOSTOLAKIS: Yes. But then, you know, having an upper bound of ten to the minus four, it would take a hell of a lot of changes to start approaching, you know, the goal.

So there is a lot of judgment that is exercised here. I mean the reviewer has to decide whether these deltas six months ago and eight months ago are really part of the same change, in which case you have to look at the total. Or they are separate, in which case, you know, you don't really look at the total.

Yes, John?

MEMBER STETKAR: According to the

guidance, the -- once the licensee has made the transition, they can self approve changes so long as the delta CDF is less than 1.000 times ten to the minus seven and the delta LERF is less than 1.000 times ten to the minus eight on a per change basis. Is that right?

MR. HARRISON: Yes.

MEMBER STETKAR: So I can self approve -- you know, pick a number -- 200 changes to my plant as long as either change is 9.9999 times ten to the minus eight or 9.999 times ten to the minus nine. And I don't need to report anything. However, when I -- and let's say that goes on for ten years.

And now in year number 11, I want to make another change and indeed this one comes out to be 1.001 times ten to the minus seven delta CDFs. So I now must go to you for approval of that change. Do I then suddenly report that my total core damage frequency is whatever it is --two times ten to the minus five? Okay.

But I don't have to report to you the fact that my total core damage frequency in year ten is two times ten the minus five because up until that point, I've not had to come -- I've not made any single change that has exceeded the individual change

criteria.

MR. LAUR: Actually, I don't think there is any requirement -- there is no requirement to submit the total core damage frequency unless that change is --

MEMBER STETKAR: You have to look at the -- well, the reason I asked it in this context is we are discussing the reporting and -- the writing to report if the cumulative effect of all changes and how that cumulative number might be used in the regulatory review process.

And as I understand it, you need to report the cumulative effect of all changes, right?

MEMBER BLEY: Even if you didn't have report the individual changes.

MEMBER STETKAR: Even if you didn't have to report the individual changes.

MR. LAUR: Oh, when you come in for the license, right.

MEMBER STETKAR: Well, when I come in, I'm talking about the change process now.

MR. LAUR: Okay, right.

MEMBER STETKAR: But say we implement NFPA 805 in year zero and I then, starting in year zero, start to make several changes to my plant. And each

change individually satisfies the acceptance criteria. So I do not need a staff review of any of those changes.

But in year number 11, I finally make a change that does not meet that individual change acceptance criteria and I need to then come to the staff for a review and acceptance of that change. At that time, in year number 11, as I understand the Reg Guide, I must indeed report to the staff the cumulative risk of all of the changes that I have made regardless of whether they were self approved or not. Is that correct?

And in year number 11, I have to report to you that my total core damage frequency has gone from X in year zero to X plus two times ten to the minus five --

MR. LAUR: Right.

MEMBER STETKAR: -- plus or minus some very small margin. Okay. But I don't have to report that if I never exceed the individual change criteria.

MR. HARRISON: And never make a risk-informed application, right.

MEMBER STETKAR: And never make a -- well, yes, a risk-informed request.

CHAIR APOSTOLAKIS: Because the threshold

for the individual change is so low, again coming back to my earlier point, if there is now a new model somewhere that if you use that one you really don't need to ten to the minus seven bound, then what happens? I don't know. I mean there would be all sorts of details that I cannot predict because now according to the new state of knowledge, you really should not self approve it.

MR. HARRISON: In other words --

CHAIR APOSTOLAKIS: But it is so low, it's so down in the noise there that I'm sure it --

MEMBER STETKAR: Well, it comes in with the cumulative effect. Individually you could argue -- unless this change in the methodology --

CHAIR APOSTOLAKIS: That's what I'm saying.

MEMBER STETKAR: -- uniformly effects every single --

CHAIR APOSTOLAKIS: Not every single but even one or two --

MEMBER STETKAR: -- change you ever made --

CHAIR APOSTOLAKIS: -- I mean they should not have self approved them. But, again, it is so low that I don't expect any change to take an estimate of

five ten to the minus eight and make it ten to the minus four. That's ridiculous. So even if it doesn't meet it, it will be small, a small change. So --

MEMBER STETKAR: Well, I mean --

CHAIR APOSTOLAKIS: -- I mean at some point you have to decide to be reasonable I think.

MEMBER STETKAR: Yes, well the presumption is also that there will not be a large number of changes --

CHAIR APOSTOLAKIS: Yes.

MEMBER STETKAR: -- that are close to the margin.

CHAIR APOSTOLAKIS: That's right. That's right.

MEMBER STETKAR: But at least not draw attention.

MEMBER RAY: I believe --

MEMBER STETKAR: Well, no, that are close and just --

MEMBER RAY: I understand. Don't repeat that. I understand. I'm just saying you invite a lot of attention if you did 10,000 changes, each one of which was below the threshold.

CHAIR APOSTOLAKIS: Ten to the minus four.

MEMBER RAY: Somebody would figure it out.

MR. LAUR: Well, at least at the triennial inspection for an NFPA 805 plant, it is being developing or maybe done, the triennial NFPA 805 inspection guidance.

And so if a plant has let's say it had a thousand rooms, a thousand fire areas and each one they made a made like a one minus seven -- you know, minus epsilon increase in risk, then it probably doesn't matter.

But if that was their systematic way of getting rid of -- from automatic to manual to another suppression in one room, it would matter. I think it would be noticed.

CHAIR APOSTOLAKIS: If they make such a small change, would the resident inspector know about it?

MR. LAUR: Individual change?

CHAIR APOSTOLAKIS: Yes.

MR. LAUR: If he happened to be looking, I would guess --

MEMBER RAY: Well, he could know about it, George. He could.

CHAIR APOSTOLAKIS: He could but not necessarily.

MEMBER RAY: But he wouldn't necessarily.

It is certainly visible.

MR. HARRISON: There is a document trail that would be there.

MEMBER RAY: Yes.

CHAIR APOSTOLAKIS: But is he being informed continuously as to at least what is happening? Or --

MR. HARRISON: I guess he'd take an initiative to.

DR. WEERAKKODY: Let me -- there's a couple of points with respect to inspection. We have already updated the period of time and procedure for 805. What we did was we took the deterministic procedure and we added a bullet that talks about during the triennial inspections, the inspectors need to sample a couple of the change evaluations. So that is going to be part of the focus during the triennial.

With respect to the residents, typically it is done at a higher level. So clearly we'll have something in the resident inspectors' training and inspection procedures, which they do quarterly, to capture at a high level if somebody is doing too many changes.

But one of the other questions that I think the Committee asked, I'm not sure whether we

fully answered, is with respect to the requirement on the model maintenance, even after we give the 805 license, the NFPA 805 licensees will use their PRA model to self-approve things to show that things are below ten to the minus seven.

They are bound by some configuration management requirements. Now I don't have the exact wording and I'm looking at Harry. And then we can get back to the Committee and confirm this, I believe that if you are doing self approval using the fire PRA model, there is an onus on the licensee to keep that model updated at a particular frequency.

Harry, do you have anything specific on that?

MR. BARRETT: Well, the standard requires that they end up maintaining both the PRA and the analysis up to date. It has got to be living analysis. So configuration management has to be followed. And they have to maintain it as things change.

MR. LAUR: Yes, but for the fire PRA, we're saying -- if you remember in the combined standard, there is a section on PRA model and update -- I guess that's what it is called -- and that is subject to the peer review. So the licensee will have

procedures in place to say how often we do the data and how often we do this, when do we trigger a peer review? So that is there.

CHAIR APOSTOLAKIS: Has anyone transitioned yet?

MR. BARRETT: They are in the process. Two pilots are in the process.

CHAIR APOSTOLAKIS: Has anybody transitioned yet?

MR. BARRETT: No, they are getting closer and closer.

CHAIR APOSTOLAKIS: You are learning a lot?

MR. BARRETT: Yes, of course. That's an understatement.

DR. WEERAKKODY: And -- sorry, this is Sunil Weerakkody again -- one additional thing we are doing for this Committee's information is we have created that draft final inspection procedure. Now we are in the process of developing additional guidance to the inspectors in order to know what to go after in a risk-informed manner.

And these types of things will be captured. For example, if somebody is doing too many self approval, obviously that would become, you know,

something that the inspectors would look at.

CHAIR APOSTOLAKIS: I know this is not part of your presentation but we keep hearing that the industry is expending too many resources on fire protection. Do you know why? That methods don't never seem to be finalized and mature? And, you know, it is consuming the industry. And this and that. What's going on? I mean is it because of this? Or this is trying to fix that?

MR. BARRETT: This is trying to fix that.

DR. WEERAKKODY: This is trying to fix this. This is trying to fix that. But I think we do acknowledge that -- this is -- the pilots have been a learning experience for both sides.

But definitely if you look at Rev 0 of the Reg Guide 1.205, and I know, Dr. Apostolakis, you were here raising some of the same concerns at that time, I believe that over the last couple of years, Steve Laur has spent a lot of time talking to different people, trying to make this more predictable.

CHAIR APOSTOLAKIS: So when NEI comes up here later today, they are going to say boy, this is great. It's going to save us --

DR. WEERAKKODY: We would expect them to say that. But they have not done that in the past.

(Laughter.)

CHAIR APOSTOLAKIS: Continue, Steve, unless you are -- yes, go ahead, go ahead.

MR. LAUR: Okay, if I'm sitting back there and you hear me fall out of my chair, that will have been what they said.

CHAIR APOSTOLAKIS: Well, this seems to be a serious problem though. And I'm trying to understand what is going on. I mean is it the pre-NFPA 805 situation that frustrates the industry? And they feel that there is never any closure in these issues?

Or it is this one? And they don't see this as a savior, so to speak? I mean I think that is a question we have to understand -- the answer to which we have to understand. And I don't mean to put you on the spot although I love to do that.

(Laughter.)

MR. LAUR: But I don't know the answer.

CHAIR APOSTOLAKIS: Okay. Well, fine.

MR. LAUR: Okay. The comments on the --

MEMBER SHACK: It happens, George?

CHAIR APOSTOLAKIS: What?

MEMBER SHACK: Things happen. You get fires. You get thermal lag. You get spurious

actuation. And these things all have to be dealt with.

CHAIR APOSTOLAKIS: That's true. Is that the reason? Thermal lag? I mean I don't know. I mean we're going to hear from them I think.

I think there was a major complaint on the methods, that they don't seem to know when, by doing something, this is it, that we reached closure. And if these things keep evolving, I mean, you know, after all the licensees are not research organizations. They have some other goal in mind.

Okay, Steve.

MR. LAUR: Okay. The next set of comments have to do with the sample licensee conditions. And it said the transition license conditions would preclude self approval of changes before full implementation. And that is correct. They would have, as written, we've changed it to basically say that if a change clearly does not increase risk, those changes can be made.

And then there is a set of non-risk-informed changes that were added into the draft guide that were not there before as a result of the frequently asked questions process. These had to do with two major categories: sufficient for the hazard

and equivalency --

PARTICIPANT: Equivalency.

MR. LAUR: Equivalency.

PARTICIPANT: Functional equivalency.

MR. LAUR: -- which are allowed -- equivalency is allowed in the standard directly. So we clarified that yes, you can make things that are equivalent, you can make that change. You don't need our permission.

And similarly, the sufficient for the hazard, I guess we had to put some defining words in there. But basically that is something that the plants have been allowed to do in the past that we're saying they can still do.

So we clarified -- actually rewrote the license condition to allow those kind of changes even before all the modifications have been installed to be an 805 plant.

MEMBER ABDEL-KHALIK: And the equivalency determinations are done by the licensees --

MR. LAUR: Yes, right.

MEMBER ABDEL-KHALIK: -- without NRC review and approval?

MR. LAUR: Yes.

Okay, we had some comments on my favorite

topic, recovery actions. These are the easy ones here.

One set of comments said clarify which recovery actions are needed to be included to plant-change evaluation, limit the scope of recovery actions to only those that are required in the regulation.

There was a comment that said you guys have provided a definition of primary control station. If you remember from last time, primary control station is used in the definition of recovery action in the rule. But primary control station itself is not defined.

So we have latitude to interpret that. And the comment was they didn't understand why you are doing that.

And then previously approved recovery action should be deemed to meet the deterministic requirements of paragraph 4.2.3 of the rule.

Now in response to that, the first one, we did clarify when recovery actions had to be using plant change evaluation. And we did limit the scope. But I have to really go back to that confusion I mentioned. When the industry says plant change evaluation, even though they know the different paragraphs obviously better than I do, but when they

say that, that is a catch-all for all these risk things.

And they're saying if we have a recovery action that is in our existing licensing basis and you have approved it, either you have approved it in a safety evaluation report, you were issued an exemption, whatever, then that doesn't go on a plant-change evaluation because nothing changed. And we have always agreed with that.

But it is the "but" part that gets them. We say but there is this 4.2.4.2 risk assessment where you are using the performance-based approach for a fire area that doesn't apply. It is a different -- it is used for a different purpose.

So yes, we clarified that if it was previously approved it doesn't go in the plant-change evaluation. That doesn't really address the concern. When we get to slide 12, we'll talk about the concern.

The skunk portion, to be honest with you, Harry wouldn't have missed this but I missed it when I was reading this paragraph 4.2.3.1, it is talking about recovery actions credited -- or recovery actions to ensure the availability of the equipment and systems that are credited for the safe shutdown.

That's not all the recovery actions. That's just all the ones that have to have the additional risk assessed. And when I wrote that portion, I missed that. So we changed it in the Reg Guide.

MEMBER STETKAR: I guess I got confused by that. I read that and if I think of a fire in this room and I designated a specific set of equipment as the equipment that is required for safe shutdown in this room, and in my analysis of this room I include credit for recovering other equipment, manual actions to mitigate the fire damage to other equipment in this room, does that mean I do not need to quantify the effects of those other --

MR. LAUR: Yes.

MEMBER STETKAR: -- actions?

MR. LAUR: Yes, right. But let me clarify just a little bit.

MEMBER STETKAR: What does the result of my risk assessment mean? Do I assume that they are 100 percent absolutely perfect? They have zero error rate?

MR. LAUR: No, no, no, no. Let me clarify your example just a little bit if I may be so bold. I have a fire area. For fires in this area, I am

crediting systems in some other area. That's the ideal design, right? You have three-hour barriers or some sort of --

MEMBER STETKAR: Right. But few plants meet that ideal design. So I have many, many systems in this fire area.

MR. LAUR: But they may, for a modern plant with maybe RHR, I don't know, but, okay, let's assume we have that, okay? So I have a fire in the B train room. I say well, I'm going to use the A train. I have a fire in the A train room, I'm going to use the B train.

Now if I have some -- for some reason there are some control cables from the other train in this room and they could spuriously fail the other -- the credited train but I say I can go down there and open a breaker. That manual action, that recovery action, it meets the definition of recovery action and it is to make sure that that credited train works per the deterministic rules.

Now I might also say well, you know, for this particular fire scenario in this B train room, all I have to do is flip one switch or open one breaker and the B train will work or some third train, okay? It is the fire-effected train. That, although

it is a recovery action if it is needed to meet the safety goals -- it may or may not be -- but it is not on the credited train. It is on the fire-effected train or it may be some other train. I don't know.

It must make some difference to some plants or industry wouldn't have made the comment. But from a practical standpoint, they can do all the actions they want that are unrelated to that fire -- to the credited train. And if they meet the definition of recovery action, they may meet the definition of recovery action as follows --

MEMBER STETKAR: But according to the rule, if I take credit for recovery action, I immediately fall into the risk-informed performance-based criteria.

MR. LAUR: No, no, no, no. That's the problem.

MR. BARRETT: That's the problem. If you read the way 805 was written, 4.2.3.1 states -- and if you pull it up we can -- it actually states that when recovery actions are required to assure the availability of a success path required to meet the nuclear safety performance criteria, that implies use of a performance-based approach, okay?

MEMBER STETKAR: Right.

MR. BARRETT: What that is say is it is similar to the discussion we had this morning with green box/orange box. If you use a recovery action to assure that green box stuff so that you have a charging pump to be able to put water in so that you don't end up losing inventory in the RCS, that recovery action, you've got to assess the risk. And it has got to be acceptable to the AHJ.

MEMBER STETKAR: I understand that. Suppose I use a -- I will not use the word recovery. Suppose I use an action, a human action, for example, in the flow path that we saw this morning for a person to mitigate the fire damage to the orange valve on the tank --

MR. BARRETT: Yes.

MEMBER STETKAR: -- is that -- that action is not required to be recovered -- quantified?

MR. BARRETT: No. You'd still have to do the action but you wouldn't necessarily have to do the delta risk because that's not differing from the deterministically compliant train. This is all set up to be based on the idea that you have a train you define for your success criteria.

And if you are not protecting that train, we want to know the delta risk for why you are not

doing it that way.

MEMBER STETKAR: So if I do an analysis and it says that that value, if it is open, will drain the tank in -- now I'll use the one hour and 15 minutes rather than the 45 minutes --

MR. BARRETT: Right.

MEMBER STETKAR: -- one hour and 15 minutes and I do the NUREG 1852 analysis that says that well, indeed, there is one hour and 15 minutes available and the operators can complete this action in one hour and 14 minutes --

MR. BARRETT: Then you'd have to protect it.

MEMBER STETKAR: -- then I do not need to quantify the likelihood that they can actually perform that action in one hour and 14 minutes --

MR. BARRETT: No, in order to meet your --

MEMBER STETKAR: -- because I have that one-minute delta. Is that the way it is interpreted?

MR. BARRETT: Well, in accordance with 805, in addition to doing the risk analysis, you also have to defense in depth and safety margin. In that particular instance, I would say you're not meeting defense in depth or safety margin because you have no margin there, okay.

MEMBER STETKAR: I've got a one-minute margin.

MR. BARRETT: You'd still end up having to protect it, okay. You'd still end up having to do the performance assessment to show that you meet the safety goals and criteria which would be that you've got to maintain pressurizer level or essentially you've got to maintain subcooling. You've got inventory pressure, all of those things. You still have to end up showing you can control the plant.

The difference is 805 specifically says you've got to tell me the delta risk for not protecting that protected train. That's all that is really saying. And that's all we --

MEMBER RAY: The protected train is -- you really mean the safe shutdown train?

MR. BARRETT: Yes.

MEMBER RAY: Okay. We should try and stick to the same words all the time because I get confused easily.

CHAIR APOSTOLAKIS: Isn't the rule a little bit fuzzy here? I mean if I go and you mentioned, both of you, to 3.1, it says previously approved alternatives from the fundamental protection program take precedence over the requirements

contained herein.

MR. LAUR: No, that is not fuzzy at all. That is the one --

CHAIR APOSTOLAKIS: Wait, wait.

MR. LAUR: That is the one clear part of this rule.

CHAIR APOSTOLAKIS: No, the fuzziness comes next.

MR. LAUR: Oh, okay.

CHAIR APOSTOLAKIS: Then you move on to 4.2.4 where it says now when you consider recovery actions, you have to do the performance-based approach.

MR. LAUR: Right.

CHAIR APOSTOLAKIS: What is confusing to me is what the NEI says there. If the recovery action is a previously-approved alternative, why on earth do I have to do this?

MR. LAUR: Oh, okay.

CHAIR APOSTOLAKIS: Then if you believe or the authors of this believe that human reliability evaluations are particularly uncertain, it seems to me that if I, as a previous alternative approval or alternative approach, I have demonstrated to the staff that a particular fire barrier would work, I know

enough of heat transfer calculations to tell you that that also is very uncertain.

So why don't you include that? So in other words, why don't you take all of the previously approved alternatives and throw them into the risk assessment? Why do you single out human recovery actions regardless of whether they have been approved or not in the past? I mean presumably the staff that approved them did a good job.

MR. LAUR: Well, we're going to get to that slide. Yes, I think that is probably the next slide. But let me just point out one thing. 3.1 where it says previously approved alternatives to the fundamental, okay, Chapter 3 is entitled Fundamental Elements in Design -- fundamental whatever design element, it is talking about Chapter 3. And Chapter 3 are the things such as the fire brigade, it's the fire --

CHAIR APOSTOLAKIS: It's the fundamental program.

MR. LAUR: Right. And that is what 3.1 refers to.

CHAIR APOSTOLAKIS: Yes.

MR. LAUR: Chapter 4 is totally different. And the only thing that is equivalent to that in

Chapter 4 is back in Chapter 2 -- 2.2.7 that says --

CHAIR APOSTOLAKIS: Let me --

MR. LAUR: -- if you can show using a deterministic approach an equivalent level of fire protection, that shall be acceptable. Okay? So if you have 15 feet of separation and you are supposed to have 20, NRC has granted you an exemption for 15 feet, okay --

CHAIR APOSTOLAKIS: Yes.

MR. LAUR: -- we are saying -- and the standard says that meets the deterministic requirements in here not directly through 4.2.3 but through paragraph 2.2.7. It says we have already determined that provides an equivalent level of fire protection.

CHAIR APOSTOLAKIS: Okay.

MR. LAUR: But when you get to that paragraph that Harry quoted from, it says if you have recovery actions that are necessary to maintain the availability of the credited train --

MR. BARRETT: Successfully.

MR. LAUR: -- that shall imply use of the --

CHAIR APOSTOLAKIS: Can we find that paragraph?

MR. LAUR: 4.2.3.1, it's on page --

CHAIR APOSTOLAKIS: Yes, I see that.

MR. LAUR: -- okay. It's a compound thought here. It says one success path of cables and equipment to achieve/maintain the nuclear safety performance criteria without the use of recovery actions shall be protected by the requirements of the following paragraphs. I left out the things. It is without use of recovery actions shall be protected.

And it says use of recovery actions to demonstrate the availability shall automatically -- oh, excuse me -- automatically shall imply use of the performance-based approach as outlined in 4.2.4.

So the rule itself has -- we can -- when I first read this, I had worries about the 15 feet as well. But somebody walked me through this rule and said no, there is a way out for virtually everything. Until you get to recovery actions, this rule calls them out.

Now in 2002 when this was a proposed rule, NEI and Alex Marion sent in a letter for the staff saying this paragraph, we have a comment. Please an italicized exception that says previously docketed recovery actions or human actions shall be deemed to meet the deterministic requirements.

And in our SECY answer to that, we did not incorporate that comment. We incorporated some other ones but we did not incorporate that one.

MEMBER RAY: Okay. But could you -- you've now explained the difference between recovery actions and other I'll call them exemptions because sometimes we use that word. Do you have any reason that you can give or why are they seemingly treated differently in this respect that we're talking about.

MR. LAUR: In the rule, George.

MEMBER RAY: Well, yes, I guess. But why should they be for any reason that you can think of?

MR. LAUR: I can't answer that.

MEMBER RAY: Okay. Well, because I had thought maybe they were different for some reason. That somebody would say that are different because -- other than that's the way it is.

MR. LAUR: I don't know if I agree with George that a barrier has more or equal uncertainty to an HRA or even getting back to --

MEMBER RAY: Okay, now we are getting to what I was going to say. But go ahead.

MR. BARRETT: I guess -- let's take your 15 feet versus 20 feet example of separation. All right the reason the staff will have found that

acceptable was because of an evaluation that determined there was no difference in combustibles between the 15-foot and the 20-foot separation. Therefore --

MEMBER RAY: The word equivalent appears.

MR. BARRETT: Or there was some equivalence that was done to make sure the 15 feet was okay.

MEMBER RAY: Yes.

MR. BARRETT: Right, that was part of the evaluation.

MEMBER RAY: But the word equivalence is never used with the recovery actions -- approved recovery actions are equivalent are --

MR. BARRETT: Right, right, right.

MEMBER RAY: -- to deterministic. That's the difference that I have seen. But I guess what I was trying to see is has anybody talked about why? I mean we can instinctively --

CHAIR APOSTOLAKIS: Or is it -- yes.

MR. BARRETT: I think the reason why is because this is really based on Appendix R even though it is not -- it doesn't really refer to Appendix R but the structure and the words in here are very similar. They are not identical but they are very similar to

the III.G.2 section of Appendix R where you pretty much have separation but you might have some cables that crisscross the areas.

The basic idea is that you protect those things that go in the opposite area so that you can end up doing all that stuff from the control room, okay? And this was written with the idea all right, we'll let you use manual actions. But you've got to tell us how risky they are. And they ended up having to meet some threshold as far as how risky.

MEMBER RAY: Fair enough. But somehow you come to an equivalence determination with regard to separation that you can't reach that same equivalence determination with respect to --

CHAIR APOSTOLAKIS: I still --

MR. BARRETT: Well, in every case, you may be able to do that with recovery actions. You may have a situation where you have the same room and you end up having it 15 foot. And you are talking about well, there is a recovery action in one of them and we can end up making the same kind of demonstration of that.

MEMBER RAY: So that's George's point about it being inconsistent to treat physical separation exemptions differently than recovery

actions.

CHAIR APOSTOLAKIS: Picking and choosing. I mean this previously-approved alternative is okay because I'm a deterministic guy and I trust those crazy people. But the human reliability I don't trust. So I want you to do a risk analysis.

And what I'm saying is if that -- does 4.2.3.1 imply that you should forget what we said in 3.1, that previously-approved alternatives take precedence and now we want you to do something in recovery actions, it seems to me it is an interpretation issue.

I can see you saying well, I look at 4.2.3.1. I says recovery actions but the previous one told me about previously-approved alternatives so I will focus on the recovery actions that were not previously approved. That would make perfect sense to me.

But right now it seems -- you know don't think it is an easy thing to say you are supposed to have 20 feet but we will approve only ten because they installed a one-hour barrier there. This one-hour barrier is something that comes from a stylized experiment and how the heat is transferred through it is another story.

So if you want -- if you are uncomfortable with the method for calculating human reliability, I would say you should be uncomfortable with the method that calculates the effectiveness of a three-hour or a one-hour fire barrier. And yet the rule doesn't do that.

MR. BARRETT: Yes, I think when Steve views the slide 12, you'll see we're not saying that we are questioning the previously-approved recovery action. We're not --

CHAIR APOSTOLAKIS: You are negating it.

MR. BARRETT: Well, no --

CHAIR APOSTOLAKIS: So this doesn't apply to recovery.

MR. BARRETT: -- that's not correct.

MEMBER RAY: But for purposes of quantification he means.

CHAIR APOSTOLAKIS: Yes, that's right.

MR. BARRETT: But it is not correct on how our current position is.

MEMBER RAY: Okay.

MR. BARRETT: Let's go to --

MEMBER RAY: You're still going to quantify it, I'll bet you. And that's the issue.

MR. LAUR: But I guess the reason I am

unable to answer the question is I don't think anybody in this room -- maybe some people in this room were on the original writing committee. Oh, okay, there are some people in this room. But I know members of our staff have contacted other members of the writing committee --

CHAIR APOSTOLAKIS: Who are the members of the writing committee?

MR. LAUR: It's not clear why that is in there.

CHAIR APOSTOLAKIS: Would you care to comment? You have to come here. Please identify yourself.

MS. KLEINSORG: Hi, I'm Liz Kleinsorg. The reason we called -- the reason the sentence was written to use the recovery actions implies the use of performance-based approaches is because the writing team felt that operator manual actions at the time are performance based because you had to demonstrate the feasibility.

So once you have to go out and demonstrate the feasibility of the action, that is a performance-based task we thought. So that is why that sentence is written there. It has nothing to do with risk. It had everything to do with the fact that demonstrating

an operator action can occur has to do with timing and looking at the situation and the room. And that's why that sentence got added.

CHAIR APOSTOLAKIS: Well, my problem -- and I think of some of my colleagues -- is that if that action had been approved at the fire time, then that feasibility was demonstrated then. Why do I have to go back?

MS. KLEINSORG: We agree with you.

(Laughter.)

MS. KLEINSORG: We do.

CHAIR APOSTOLAKIS: So where does that leave us now if she agrees with me? First of all, you know, this is just an oral statement of course. We have to go by the letter.

But it seems to me you have flexibility here. Between 3.1 and 4.2.4, you have some flexibility. And say previously approved actions are approved, period. So the new ones, that is where I'm coming from. But I'm sure the members will object.

MEMBER RAY: Well, George, I think -- we haven't let them get to 12 yet but I think they are going to separate the additional risk from the quantified total risk. And so probably you should express why you wouldn't even quantify this existing

previously-approved risk.

CHAIR APOSTOLAKIS: Yes.

MEMBER RAY: It is because it seems inconsistent to do that and not do it for other things.

CHAIR APOSTOLAKIS: Exactly.

MEMBER RAY: All right. But it doesn't do any harm --

CHAIR APOSTOLAKIS: Oh, well --

MEMBER RAY: -- in the sense that it transparently reveals what the risk contribution of all recovery actions is. That would be my --

CHAIR APOSTOLAKIS: But then you have this other problem, as you know very well, that there is guidance that says here is the risk but don't -- we don't give you any acceptance criteria for a particular part --

MEMBER RAY: We just say that --

CHAIR APOSTOLAKIS: -- which I think is crazy as well.

MEMBER RAY: -- we've quantified the risk that is previously approved. And now we are quantifying the additional risk.

At least my first reaction to that is okay, that's okay with me.

CHAIR APOSTOLAKIS: But maybe we'll let Steve cover the next two slides.

MEMBER RAY: Oh, why don't we. We're doing such a good job here.

MEMBER STETKAR: Before we do that, before we get to 12, the second bullet here still bothers me an awful lot. In our June meeting -- and I'll bring up the example that I brought up in the June -- or whenever we had the meeting -- and elaborate on that example because I want to understand what a recovery action is in the context of this Reg Guide because what the -- I understand what it is kind of in the context of NFPA 805. And that basically says that any action inside the main control room is not a recovery action.

Now, I need to define what actions outside of the main control room are recovery actions and which ones are not. So NFPA 805 does not define -- just brings into the fray the concept of a primary control station. Now, as I understand it, Reg Guide 1.205 tries to tell me what a primary control station is.

So I'll bring up the example that I brought up in June and try to help try to elaborate a little further. Suppose I have a motor-operated

valve. The motor-operated valve has an automatic signal. The valve does not have a control in the main control room. It does not have a control in the main control room.

Its control switch is located on a local panel down in the basement of the turbine building. Now the fire destroys the automatic signal for that valve. If the operator must go to the local panel in the basement now and operate the valve from that panel, is that a recovery action? No. Please say no.

MR. LAUR: No.

MEMBER STETKAR: Thank you.

If that valve is physically located two meters outside the door of the main control room and the operator goes outside the control room and opens the valve with the handwheel, is that a recovery action?

MR. BARRETT: Well, one thing that we've changed in the Reg Guide --

MEMBER STETKAR: I'd like a yes or a no first.

MR. BARRETT: I can't tell you that because I need to know why you are using that valve.

MEMBER STETKAR: I'm using it for the same reason that I went down in the basement and turned the

switch. It's the same valve.

MR. BARRETT: It's the same valve?

MEMBER STETKAR: It's precisely the same valve. The only difference is I'm not going in the basement of the turbine building turning the electrical switch. I am, indeed, walking out of the control room and turning the manual handwheel for said valve. It saves me a long way to walk.

MR. BARRETT: Oh, if it is the same valve -- the switch is down there, the valve is right here.

MEMBER STETKAR: The valve is right outside the control room door. The switch is in the basement of the turbine building.

MR. BARRETT: Is this in a basketball plant or --

(Laughter.)

MEMBER STETKAR: I mean what -- it is a plant.

MR. BARRETT: Well, the other difference is --

MEMBER STETKAR: I'm trying to understand the philosophy of defining a local control station.

MEMBER SIEBER: Yes, the other difference is --

MEMBER STETKAR: Primary control station.

MEMBER SIEBER: -- you no longer operate it electrically. You operate it by hand.

MEMBER STETKAR: I am going to get to that part in the follow on.

CHAIR APOSTOLAKIS: So you said when they had to walk down to the basement, that's not a recovery action?

MR. BARRETT: That is not a recovery action.

CHAIR APOSTOLAKIS: Then why isn't --

MEMBER STETKAR: Because that is the Reg Guide's interpretation of what -- this is now the Reg Guide's interpretation, not the rule.

MR. BARRETT: If that is a system -- if that is a component -- let me -- another caveat that is in the Reg Guide -- if that is the only way that is operated, and that you are not going that because you are not protecting an electrically-operated component that would be available from the control room, let's say you are talking about a charging system --

MEMBER STETKAR: No, no, I'm not -- don't talk about the charging system. I want to talk about my valve. My valve is a motor-operated valve. It does not have a switch in the main control room.

MR. BARRETT: Right.

MEMBER STETKAR: It is a motor-operated valve. Its only switch -- the only switch for this valve in the entire world is on a panel in the basement of the turbine building. The only way I can operate that valve electrically is to go to that panel in the turbine building and turn that switch.

MR. BARRETT: All right.

MEMBER STETKAR: That's the only way I can operate that valve electrically.

The valve happens to have an automatic signal also. That doesn't go through the main --

MR. BARRETT: That may be here or there.

MEMBER STETKAR: But the fire destroys the automatic signal so the valve doesn't open.

MR. BARRETT: Okay.

MEMBER STETKAR: Now I need to open that valve for my required system to work. That valve must open.

MR. BARRETT: Okay.

MEMBER STETKAR: So I can go down to the basement of the turbine building and turn the switch.

MR. BARRETT: All right.

MEMBER STETKAR: And the valve will open. Or I can walk outside of the main control room and turn the handwheel on that valve. The valve will also

open.

MR. BARRETT: Right.

MEMBER STETKAR: Either one of those will, in fact, result in an open valve.

MR. BARRETT: Right.

MEMBER STETKAR: It is my understanding that action number one, going down in the basement, turning the switch on the control panel, is not a recovery action. But action number two is a recovery action.

MR. BARRETT: Yes. The way the Reg Guide is written right now --

MEMBER STETKAR: Okay.

MR. BARRETT: -- your specific example, you are right.

MEMBER STETKAR: Okay.

MR. LAUR: But actually our definition doesn't cause that. No definition at all would cause that same thing.

MEMBER STETKAR: That's all -- I just wanted to understand that part first.

I now want to make the fact that this valve, my valve is not an electrically-operated valve. It is strictly a manual valve, mechanical, manual valve, rising stem mechanical valve. It is located

the same position, two feet outside of the main control room.

If I go outside the main control room and operate -- open that valve, is that a recovery action?

MR. BARRETT: It depends on why you are opening the valve.

MEMBER STETKAR: It's -- I need to open that valve to make my system work. Obviously I'm --

MR. BARRETT: Are you opening the valve because a component that is controlled from the control room could be damaged and you are bypassing that component with the manual valve?

MEMBER STETKAR: I haven't quite figured out every single fire scenario. I'm trying to understand the fact that I need to open this valve for some reason to satisfy my safe shutdown criteria.

MR. LAUR: Before you answer, let me just -- I don't think it is your question, it's the logistics. We've transmitted to this body about 30 days ago the new and improved Reg Guide, okay? But then last week we sent you a couple sections that were changed.

Now I'm trying to think, was this in the original we sent you? I think this was in what we sent you.

MEMBER STETKAR: Yes.

MR. LAUR: Okay, so in there it talks about -- it talks about what Harry is getting ready to discuss is -- it says in this one slide we added and we took away. If the reason you are having to operate that is because you very cleverly decided that I would draw my flow path and bypass all the motor-operated valves and just go through all the manual bypass valves and say ah-hah, there's no recovery actions. We closed the loophole --

MEMBER STETKAR: Right.

MR. LAUR: -- in our definition of primary control station.

MEMBER STETKAR: No, I wasn't trying to be quite that subtle. I was trying to understand -- it is my understanding and it is in the second bullet under your second bullet there -- it is my understanding that the clarification now says that if a valve can only be located -- operated via its local handwheel, then that local handwheel becomes the primary control station for that valve.

MR. LAUR: Right.

MEMBER STETKAR: Unless --

MR. BARRETT: There's some caveats in the Reg Guide as it is right now. If the reason why you

are using that valve is that you don't want to protect the circuits in the area for the remotely-controlled valve that would normally be used, then yes, that is a recovery action. Because in essence you are saying I'm going to use this local handwheel instead of protecting the cables for that other valve, okay?

MR. HARRISON: But to clarify, if the manual valve is the only valve you've got and it is the only valve in the flow path and you have to open it, you have to turn it, then that would not be a recovery action, right?

MR. LAUR: Right.

MEMBER STETKAR: But where I am trying to get to is that I now have an incentive to cut the cables to that motor-operated valve because now that valve suddenly -- I don't need to quantify any recovery action for that valve. It is a manual mechanical valve. I don't need to quantify it because it doesn't meet the criteria for being a local manual recovery action.

I solved my problem in terms of performance-based risk assessment by simply going out and saying poof, I'm not going to make that a motor-operated valve. I will make that a mechanical valve.

MR. BARRETT: But no, you still have to

assess the risk in the base PRA. You still have to end up modeling it correctly. We're just not asking for a delta risk on it because you're not calling it a recovery action. But it has to be modeled in the PRA.

MR. BARRETT: Every other -- you create other problems that are bigger than the ones you solved. If you fix your fire scenario in the control room, you may have created other area issues.

MR. LAUR: You would certainly have to pass 50.59 as well as any other -- plus you are making a change to your fire protection program potentially. I don't know. It is a good thought experiment. I still want to see the plant.

MR. BARRETT: I think you can always come up with a hypothetical that will end up making a set of criteria not work particularly well. You can always do that.

MEMBER STETKAR: I guess I could have also defined a primary control station outside of the main control room as being restricted only to the designated emergency shutdown panels period. And that any other action shall be deemed recovery action.

Now that would clarify my problem because running down to the local panel in the basement of the turbine building would be a recovery action. Cranking

the manual valve open would be a recovery action. Manually cranking open the motor-operated valve would be a recovery action.

If I defined -- and in the Reg Guide we have the latitude to clarify what is meant by a primary control station, my sense of NFPA 805 is they were thinking of control room fires and operating equipment from designated emergency control stations.

MR. BARRETT: Actually some of the comments we got from people within the NRC were just the opposite of that. And they tended to lean towards the local control. But I understand what you are saying. And we have a variety of people that are commenting on this. And we are trying to address all of their comments.

We have some licensees out there that currently have manual valves in their licensing basis because they were allowed. And we are trying to end up addressing that as well. So this is an attempt to -- you know, it is an impossible dream to try to -- you can't make everybody happy all the time. So --

MR. LAUR: Just very briefly so we don't -- and I'm not trying to delay getting to slide 12 but the first of those two bullets, what we did was we actually made it a little less burdensome in that if

you have a dedicated -- if you use a dedicated or alternative shutdown options of Appendix R and you have a location that meets the same criteria we had in last time, then that is considered primary.

In other words, what you have basically done -- the complaint was that there are no plants that have two separate control rooms. Well, actually there are. You've got a main control room and this little very sparse separate area that many plants have, okay?

And so if that has the necessary instrumentation and controls, manual controls where most of the control room team goes, for example, we're saying that could be considered primary. And the difference is last time we said the decision to evacuate and all that, well we took all that out.

It's just if you are evacuating and going to a dedicated or alternative -- the exception would be a distributed one where everybody goes a different place. We're not calling that primary. But it sounds like you would be in favor of saying --

MEMBER STETKAR: But you are calling it primary if those other places are the only locations.

MR. LAUR: We are now. But it sounds like you would be in favor -- oh, no, no, we're not. I'm

sorry.

MR. BARRETT: Well, it depends on whether or not you could have protected something. Yes, it depends.

MEMBER STETKAR: Anyway, I think we need to get on to --

MR. LAUR: Okay.

CHAIR APOSTOLAKIS: Can you explain though to me why you have to define some actions as being recovery and others not?

MR. LAUR: As opposed to all of them being --

CHAIR APOSTOLAKIS: As opposed to treating all human actions the same?

MR. LAUR: Because the rule -- or the standard, I should say, asks for the risk of certain recovery actions. So we have got to define what those certain --

CHAIR APOSTOLAKIS: Certain recovery actions?

MR. LAUR: -- recovery actions --

MEMBER STETKAR: The problem is the rule, and I'll read the definition in the rule. The rule says a recovery action. This is 1.6.52. Activities to achieve the nuclear safety performance criteria

that take place outside of the main control room --

CHAIR APOSTOLAKIS: Yes.

MEMBER STETKAR: -- or outside of the primary control station(s) for the equipment being operated including the replacement or modification of components. So the rule --

CHAIR APOSTOLAKIS: Yes.

MEMBER STETKAR: -- says that anything that I do inside the main control room --

CHAIR APOSTOLAKIS: Okay, tell me again what the paragraph is.

MEMBER STETKAR: It's 1.6.52.

CHAIR APOSTOLAKIS: Okay.

MEMBER STETKAR: So the rule excludes anything that I do inside the main control room.

CHAIR APOSTOLAKIS: Okay.

MEMBER STETKAR: And then the question becomes what do I define as a primary control station outside the main control room. So it's -- and the rule says absolutely nothing more about that. So the Reg Guide now needs to provide the interpretation of that other thing.

Now it's -- in the human reliability world, there is a question about why do I take full credit of every action inside the main control room.

But the rule says I must.

That's why I'm kind of hanging up on what is the definition of a primary control station. And differentiation between mechanically opening a motor-operated valve versus mechanically opening a mechanical valve versus electrically operating a motor-controlled valve from a place that might not necessarily be all that easy to reach.

CHAIR APOSTOLAKIS: Okay. How much more time do you need to finish?

MR. LAUR: I would like to cover slides 12 and 14. Probably about ten minutes.

CHAIR APOSTOLAKIS: We have time, yes.

MR. LAUR: I mean we could take longer.

Okay, previously approved recovery actions -- and in the preceding slides I talk about -- we had comments and here is how we've changed the Reg Guide. What I'm going to walk you through right now is the changes between what we sent you 30 days ago and what we sent you last week based on some internal discussions.

The latest version of the Reg Guide, the Reg Guide we'd like to go forward with, says that the additional risk of recovery actions, that's delta CDF and delta LERF, has to be evaluated. That's in the

rule and we're saying it doesn't differentiate between previously approved or not previously approved.

However, for the previously approved ones, it says the risk has to be acceptable to the authority having jurisdiction. We're declaring because it was previously approved, that is the acceptance criteria unless it trips the backfit adequate protection or cost-beneficial backfit.

So if somebody comes in with a two times E minus four increase in core damage frequency, we say well, that was previously approved. It's okay. However, that additional risk is factored in to the staff's decisions on all the other performance-based parts that are using the fire risk method in that plant.

So, for example, if you've used up the entire Reg Guide .174 allowable risk increase, you can have no other increases. No net increases in the plant.

MEMBER RAY: Now you've used --

MR. LAUR: I'm sorry?

MEMBER RAY: You've used the word additional. Could you just elaborate or define the word additional -- the intent of additional in that?

MR. LAUR: Yes, 4.2.4.2, which is the part

that says fire risk evaluations says if you want to not meet performance based -- instead of meeting the 4.2.3 deterministic requirements, the additional risk of that alternative compared to those deterministic criteria shall be provided.

MEMBER RAY: It's the same. You haven't changed that then? You have changed what additional means?

MR. LAUR: No.

MEMBER RAY: Okay.

MR. LAUR: No. Now the -- well, like I said, that gets factored in so it is easiest to show you on this flow chart here where all the arrows used to be straight.

You have to do this for each fire area and then you do it again in total. But it is easiest to talk about a fire area. So if you are in a fire area that is using the fire risk method, the first question you say is is do I have any previously-approved recovery actions. And if so, is there additional risk greater than the acceptance guidelines? Basically, does it put you in Region I of the charts in Reg Guide 1.174.

And if the answer is yes --

MEMBER RAY: You used previously and then

you used additional. Please --

MR. HARRISON: Yes.

MEMBER RAY: -- just make sure I'm tracking with you.

MR. LAUR: Okay.

MEMBER RAY: Is there any additional risk associated with the previously approved? Is that what you are saying?

MR. LAUR: Previously approved recovery action --

MEMBER RAY: Yes, yes.

MR. LAUR: -- additional risk compared to the deterministic criteria.

MEMBER RAY: Right.

MR. LAUR: Sorry.

MEMBER RAY: Sometimes people think additional means in addition to previously approved.

MR. LAUR: Okay, understand.

So if that puts you in Region I, then if you have what are called variances from the deterministic that you want to carry forward in the 805 that have some risk component, you would have to do something to reduce risk at least that much to offset the risk because you are in Region I of Reg Guide .174.

Now if you go and the answer is no, you have previously-approved recovery actions where the additional risk is within the acceptance guidelines, in other words, you are not in Region I, then you have additional delta risk you can have.

So if you have a variance from the deterministic, this cable going through the wrong room or something and it is two E minus eight, you can do that as long as you don't jump into Region I.

MEMBER SHACK: Okay, you are still going to add that. I mean if you are at .99, you are looking at the difference between that risk and the Region I-type risk.

MR. HARRISON: Right. You've got a .01 margin or yes.

MEMBER SHACK: Okay, that wasn't clear to me from the --

MR. LAUR: No, so what -- it's a dichotomy in the sense that previously approved means it carries forward. You can have it. But it informs the decisions being made on the rest of the transition. So that the cleanest way to transition is the way we put in the original draft guide and say hey, we're not going to carry any of these things forward, we're going to use the risk-informed fire risk analysis for

all of them.

But if you want to, you can carry -- if it is an exemption or previously approved through an SA, you can carry it forward, yes, sir.

MEMBER STETKAR: But I've been really struggling with this part of the Reg Guide and trying to understand what it means. And I've come up to -- I need an answer to what I hope is a simple question.

NFPA 805 requires a quantification of the change in risk from a deterministic situation versus let me call it the actual situation. Is that right? And that actual situation, you know, accounts for recovery actions whether they have been previously approved or not previously approved.

The transition from my current licensing basis to NFPA 805 also requires a quantification of the change in risk from my current risk today compared to the risk after I make the transition. Is that right?

MR. LAUR: Not according to our current Reg Guide.

MEMBER STETKAR: Under 1.174 it does.

MR. LAUR: This is not a risk-informed -- well, I may be corrected. This is not a risk-informed transition. It would be presumptuous to say that the

Commission allows two sets of alternatives and we have to justify the risk to go to the second one.

The Commission has found that meeting 50.48(a) and (c) is an acceptable of complying with a GDC 3. And, in fact, this part that says previously approved really is what enables the plant change and self approval and all that going forward. That's after you have transitioned.

CHAIR APOSTOLAKIS: So if I --

MEMBER STETKAR: I guess that even more confuses me.

CHAIR APOSTOLAKIS: If I take all the previously-approved actions and I calculate the delta risk and I violate Regulatory Guide 1.174, then the way that I understand this now I have other places where I don't comply. I evaluate the risk but really it is a no-no. It will not be approved because you already violated 1.174.

MR. HARRISON: It means you are going to have to provide some type of risk decrease to offset those other areas, right.

CHAIR APOSTOLAKIS: Okay.

MR. HARRISON: So you stay neutral essentially after transition.

CHAIR APOSTOLAKIS: So I can even go back

to the previously-approved actions and do something there to reduce the risk, right? I'm free to do it anywhere.

But the other areas, the previously approved will be approved because it was approved --

MR. HARRISON: Right.

CHAIR APOSTOLAKIS: -- even though it violates the Guide.

MR. HARRISON: And, again --

CHAIR APOSTOLAKIS: But nothing else.

MR. HARRISON: Right. And the caveat -- the caveat there is there is always the adequate protection or the safety-beneficial backfit perspectives. If someone came in and they had a very, very high risk associated with something that was previously approved, we would look at that under our normal processes.

CHAIR APOSTOLAKIS: Yes, right.

MEMBER SHACK: So the difference between this and the 30-day-old one is that you are now allowing the bundling with the decreases?

MR. HARRISON: No, I'd say this is fairly radically different than what we had provided 30 days ago.

MEMBER SHACK: Well, no because then you -

-

MR. LAUR: We've always allowed bundling. In fact prior to transition, the bundling could be a global change, you know, to subtract from all the fire areas.

MEMBER SHACK: But 30 days ago, you had to evaluate the delta risk.

CHAIR APOSTOLAKIS: Of the bundle.

MEMBER SHACK: And it had to be acceptable. And that's what you've got now.

MR. LAUR: No, the 30-day version carved out the previously-approved recovery action. This one over here said --

MEMBER SHACK: Well, one version I had said -- oh, okay, I guess I'm getting confused with the draft guide. This is basically the same as the draft guide then. How is it different from the draft guide?

MR. LAUR: It's different from the draft guide most significantly on the next slide where this burden of your previously approved actually carries forward after transition.

MR. HARRISON: But not only that though, I think even in the draft guide, that first diamond on the chart here where if it is previously approved, it

carries over.

And even if it is in Region I just based on the previously approved, we're not saying you have to reduce that risk. You can stay there with that approval whereas in the draft guide, that would have been an unacceptable situation. And you would have had to reduce that risk.

Here we're letting you carry something over. And it is in the Region I.

MEMBER SHACK: Oh, okay. So you could stay in Region I if you chose.

MR. LAUR: Right.

MEMBER SHACK: And that's the difference, okay.

MR. LAUR: Right.

MEMBER BLEY: Before you leave this one, Steve, would you explain the two boxes you come out of that first diamond, because I thought I understood it and when I look at the diamonds, I'm not sure I understand.

At the first diamond, does the delta risk of the previously-approved actions put you up in the bad region? If the answer is no, now you drop down to another diamond.

MR. LAUR: Right.

MEMBER BLEY: And explain that diamond to me.

MR. LAUR: Okay. The difference is --

MEMBER BLEY: Is everything else previously approved? What does this mean? The PB?

MR. LAUR: I'm sorry, performance based.

MEMBER BLEY: Yes, which ones are they? What are we talking about? New performance-based evaluations?

MR. LAUR: Yes, yes.

MEMBER BLEY: Oh, okay. If something new comes along --

MR. LAUR: And that includes recovery actions and --

MEMBER BLEY: And the box it relates doing the same thing? If there are new things --

CHAIR APOSTOLAKIS: What do you mean by new? In addition to previously approved?

MR. LAUR: Yes.

MEMBER BLEY: That is what is going on in this --

CHAIR APOSTOLAKIS: This refers to post transition?

MR. LAUR: After --

CHAIR APOSTOLAKIS: We are looking at

previously-approved actions and everything else --

MR. LAUR: Right.

CHAIR APOSTOLAKIS: -- during the transition.

MR. LAUR: That's right. And everything else are all the things that you have chosen to use the fire risk evaluation method 4.2.4.2.

CHAIR APOSTOLAKIS: Okay.

MR. LAUR: So it can be maybe you have 15 feet in a room but it wasn't an exemption and you can say here's a fire risk evaluation that shows that is two times ten to the minus eight per year increase over if I had 20 feet, whatever. Okay.

MEMBER BLEY: Now, if you do -- and now we're in that box to the right --

MR. LAUR: Right.

MEMBER BLEY: -- to get out of Region I.

MR. LAUR: Yes. But no, no, no, just to fully offset the --

MEMBER BLEY: Oh, just fully offset, okay, fully offset. Thank you.

MR. LAUR: Yes.

MEMBER BLEY: And the second -- the lower diamond, what you are saying is --

MR. LAUR: You can stay where you are.

MEMBER BLEY: In the lower diamond what you are saying is I have all these previously-approved recovery actions that have eaten up a certain amount of my -- but I'm not in Region I. I'm in Region Two or Three or whatever --

MR. LAUR: Right. And any additional increases from the non-previously-approved recovery actions, all your other variances from deterministic that you are going to say three minus eight and one minus six whatever, anyway, when you add all those up, they can't take more of that margin.

MEMBER BLEY: They can't put you into Region I?

MR. LAUR: That's right.

MEMBER BLEY: Okay. I think I got it. What we need is probably a bar chart and I've got to go back and read the words and make sure I understand.

MR. LAUR: No, no, that's very good.

CHAIR APOSTOLAKIS: Okay. Let's move on then.

MR. LAUR: Okay. And the next -- but the next step is we are going to add them all up and do it for the total plant the same way.

MEMBER BLEY: Okay.

MR. LAUR: But it is obviously more

restrictive in a fire area.

MEMBER RAY: We struggled to create that chart that you just gave us. Each of us had a different picture.

CHAIR APOSTOLAKIS: Good.

MR. LAUR: This is a totally new concept but because what we're saying is the way to comply with 805 is to comply with 805. But if we granted you previously-approved recovery actions, we're not going to renege on that previous approval.

It just has consequences when you transition. And it, in turn, has consequences after you transition. That is to say the way the draft guide says is after transition, your risk starts over. You get to go up in risk from that point on just like Reg Guide .174, okay.

But if you carry previous-approved recovery actions forward, we will still evaluate that as though it is another delta.

CHAIR APOSTOLAKIS: I don't understand what it means.

MR. LAUR: Let me see if I can clarify it because I know I didn't say that right.

If you come in this fire area and say I want to make -- here is a change but it is a combined

change. It's small but it is combined so I have to request NRC approval.

And we get it and say the net is two times ten to the minus eight increase. And we look on there and we say well that particular room had previously-approved recovery actions that you carried over whose delta risk sticks you in the Region I with this new little change. We're going to say no.

MEMBER RAY: You are saying Chart 13 continues to apply, aren't you? Isn't that a simpler way to say it than using examples? I mean you just have to live with Chart 13.

MR. HARRISON: Going forward.

MEMBER RAY: Yes.

MR. LAUR: Whereas if you transition without previously approved -- in other words, a plant could elect -- let's say they're all low and they could say well, don't count them as previously approved. Count them as performance based and we meet the metric. Then they are re-baselined as far as -- implementation is their starting over point for risk informed for plant-change evaluations.

CHAIR APOSTOLAKIS: Yes, so essentially what you are saying is that if in this area the delta risk is greater than 1.174, you are not allowed to do

anything increasing risk in that area forever. You will never be approved.

MR. LAUR: The staff would not normally approve that, that's right, risk increases in those rooms, yes.

CHAIR APOSTOLAKIS: I mean but what happened to the idea that after you transition, you now have a new licensing basis?

MEMBER RAY: That's what he is explaining. They took it away.

CHAIR APOSTOLAKIS: They took it away.

MEMBER RAY: Yes.

CHAIR APOSTOLAKIS: But the rule, I thought, said that.

MR. HARRISON: No, the rule doesn't say that.

CHAIR APOSTOLAKIS: It doesn't say that?

MR. HARRISON: No.

MR. LAUR: But the regulatory analysis I think says it.

MEMBER BLEY: So this kind of says if you are going to do this, you want to make sure you don't end up in this spot. It just wouldn't make sense.

MEMBER RAY: Something that -- it could be that you would do this for the benefit that well, I

just have to avoid a net increase in my risk. But I can approve my own changes as long as I don't create a net increase in risk.

MR. HARRISON: Right. Going forward you'd have to offset every time you have something in that room. So if you find something in the room, then you --

MR. LAUR: And then you'd just submit it to the staff.

MR. HARRISON: Right.

MEMBER BLEY: So you can't be self approved in that room.

MR. LAUR: We didn't say that.

MEMBER BLEY: But I thought that was what I just heard you say.

MR. HARRISON: We said the staff would not normally approve. We don't normally approve self approvals.

MEMBER BLEY: Oh, okay.

MR. LAUR: So we're not cutting that out.

MEMBER BLEY: Okay. So they could be in Region I and they could still do self approvals.

MR. LAUR: Because of the ten to the minus seven argument in favor of the lower threshold.

MR. LAUR: I don't know what is going to

come in. All we've seen so far are the two pilot plants, okay. But you could postulate some plant coming in with a -- not a high enough delta to question backfit protection but a high delta that would -- maybe like minus four, I don't know, due to previously-approved recovery actions, I don't think that we would want to be approving additional risk.

On the other hand, there's likely to be plants that have much smaller numbers that come in where they could actually chose to either maintain the exemption or the prior approval or they could meet this guideline. Or they would have just smaller margins.

CHAIR APOSTOLAKIS: But, I don't know, doesn't this go against the spirit of 1.174? It was made very clear to us years ago when we were discussing the guide that it refers to individual changes.

The only time they would look at the cumulative risk changes is, as I said earlier, if you are approaching the goal. I mean, you know, you have made so many changes that now you are ten to the minus four. And the intent was not to use risk-informed methods to push all the plants to the goal.

Here, this is a much more restrictive

interpretation. You are saying the cumulative risk is really what matters. You have reached the limit. You are not allowed to go beyond it for that area.

For another area, I'm allowed to do things, right? That's the way I am --

MEMBER RAY: George, isn't this -- another way of saying it is that is only true if you transition above --

CHAIR APOSTOLAKIS: Yes, you transition --

MEMBER RAY: You're already at the point that you said we were assuming you wouldn't reach by just incremental 1.174 changes, Region I. Isn't this analogous to having reached that limit in the case you are talking about?

CHAIR APOSTOLAKIS: But if I look at the transition as one individual licensing basis change, I am there. It has been approved. Now I have a new licensing basis. That's the idea of 1.174. So any new deltas will have to be evaluated against this new licensing basis which effects the horizontal position.

MEMBER RAY: But that wouldn't be true if you were at the goal in any other respect.

CHAIR APOSTOLAKIS: That is if CDF itself reaches a goal, no. That will never happen. I mean you'd have to have a million changes.

MEMBER RAY: Exactly. But all I'm trying to do is make the analogy between the two cases, which seem to me like it applies.

CHAIR APOSTOLAKIS: Maybe I'm not understanding what you are saying. I have this area, this room. And this is already above -- it is in Region I.

MEMBER RAY: Right.

CHAIR APOSTOLAKIS: And it is approved. Then now I am in the NFPA 805 domain. A year from now, I come to you and I say in another area, I want to make this change with this delta CDF. Does that upper right-hand side diamond still apply to me?

MR. BARRETT: Yes, that's what we're saying. For every room, regardless.

CHAIR APOSTOLAKIS: For every room? Not just this one?

MR. HARRISON: Well, again, when you do the total, you may have an offsetting risk somewhere that brings the entire plant risk down. That's acceptable. But that room may still be above the threshold. You can actually have those situations occur.

MEMBER SHACK: I don't think, George, that is terribly different from what they do with 1.174

whereas once you get into Region I with your total cumulative change, they are very reluctant to approve any further changes, which is --

CHAIR APOSTOLAKIS: No.

MR. HARRISON: For related changes. For example, when we do reviews where a licensee does a diesel generator AOT and they go from three days to seven days, if that licensee then comes back and goes from seven to 14, we will go back and look at what the change was from three days to 14, not seven to 14 because we're wanting to look at both of those changes in toto.

CHAIR APOSTOLAKIS: I think the difference, Donnie, is that in 1.174, if I -- the normal changes, if I come into the agency with a delta CDF that violates the guideline, the agency rejects that change.

In your case because it was previously approved, you have to live with it. That is a big difference.

MR. HARRISON: Right. No, that is a big difference.

CHAIR APOSTOLAKIS: The big difference is because you are accepting a change that already violates the guidelines.

MR. HARRISON: Right.

CHAIR APOSTOLAKIS: And then you are saying now, no more changes anywhere unless you do things to bring the total down. That is essentially what you are saying. You have already violated the guidelines. I have to live with it because it was previously approved. But don't ask me to approve anything else.

MEMBER RAY: But that was for one room. Let me --

CHAIR APOSTOLAKIS: No, no, they say for the whole plant.

MEMBER RAY: Okay, I've got to clarify.

MR. HARRISON: If you had one room that was just barely over the threshold and you have somewhere else where you've had a risk reduction, you could offset the whole total. But it is unlikely that you will be in that unique situation.

Usually if one room puts you up into Region I, you are most likely, as a total, going to be up in Region I.

MEMBER RAY: Okay. That's something I would --

CHAIR APOSTOLAKIS: So no other changes are approved, okay.

MR. HARRISON: So you are right. There, again, the big change there is we are allowing that situation to exist as opposed to saying --

CHAIR APOSTOLAKIS: Whereas in normal applications --

MR. HARRISON: Right. The original draft guide would have said that was unacceptable.

CHAIR APOSTOLAKIS: You'd have to do something --

MR. HARRISON: You'd have to do something to reduce that risk even though it was previously approved. We backed off from that stance.

CHAIR APOSTOLAKIS: But you said this is very recent. Has NEI had a chance to comment on this?

MR. HARRISON: No.

MR. LAUR: Well, they may in a few minutes. But for the record, that was Mr. Bradley speaking.

CHAIR APOSTOLAKIS: Can we do it today?

MR. BRADLEY: Assuming we ever get up there -- this is Biff Bradley -- we will be happy to address this as soon as we get our time on the --

CHAIR APOSTOLAKIS: That is a very good assumption.

MEMBER RAY: We need to have a coffee

break first.

CHAIR APOSTOLAKIS: Are you done?

MR. LAUR: Yes. I could show you one concluding slide but you can probably read it for yourself.

CHAIR APOSTOLAKIS: Yes.

MR. LAUR: The only thing I will say --

CHAIR APOSTOLAKIS: And you want the NCRS to write a letter in September?

MR. LAUR: We'd love for you to.

CHAIR APOSTOLAKIS: Regardless of what the letter says?

(Laughter.)

MR. HARRISON: And maybe we'll have a clean copy of the Reg Guide.

CHAIR APOSTOLAKIS: We'll recess for 15 minutes and reconvene at 3:10 or whenever I come back.

(Whereupon, the foregoing matter went off the record at 2:52 p.m. and went back on the record at 3:11 p.m.)

CHAIR APOSTOLAKIS: Okay. We're back to session.

Please introduce yourselves.

MR. BUTLER: I'll start us off. My name is John Butler. I'm Director of Operations Support at

NEI. With me at the table is Biff Bradley, who is the Director of Risk Assessment at NEI and Ken Canavan of EPRI with a long PRA background.

I'm going to start us off just making some opening remarks on the challenging process of NFPA 805 as reflected by the earlier discussion. And then I'm going to turn it over to Biff to go through some of our specific comments on the draft guidance that we've seen.

Now we have not had an opportunity to review the latest revision to the draft guidance so we're kind of operating with what we've seen in the past and what we've heard in the prior discussion. But we'll do the best we can.

And then Ken will go through some of the expanded discussion on some of the fire PRA challenges we're seeing.

CHAIR APOSTOLAKIS: Do we have copies of these slides?

PARTICIPANT: Yes. It's not colored like -- it's part of our austerity plan, you know.

PARTICIPANT: Where's your stimulus?

CHAIR APOSTOLAKIS: The one that says --

MR. BUTLER: It starts off 805 transition challenges.

CHAIR APOSTOLAKIS: Oh, well, okay. Thank you. No I have to have --

PARTICIPANT: A full-sized set?

PARTICIPANT: He's getting old.

(Laughter.)

CHAIR APOSTOLAKIS: I don't have it, John.

PARTICIPANT: You flunked your eye test.

CHAIR APOSTOLAKIS: Anybody else? Harold, you can make a copy. Please go ahead. I'm sorry.

MR. BUTLER: Our primary goal with fire protection is to have a stable, well-defined regulatory process. That especially counts -- well, it counts whether you are doing 805 or sticking with 50.48(a) or (b).

What we learned this morning or what we saw this morning is we are a lot closer to a well-defined, stable process with circuit failure analysis. I don't see that right now with 805. And one of the challenges we're -- global challenges we are seeing is that the process keeps changing.

And that's part of what you would expect with a pilot process. You are piloting things. And where you see things that need to be changed, you adjust.

However, the level of the changes, the

significance of the changes, the redirection of resources for some of these changes are very disconcerting this late in the pilot process, especially given that there are a number of, in effect, shadow pilots that are trying to implement 805 right along with the pilots because of the schedule pressures that they have to implement 805 effectively six months after the SERs are written on the pilots.

So it is very disconcerting to see some of the changes in staff interpretation of the regulation this late in the process. And that's what we're seeing. These are reinterpretations of the regulations.

The regulation hasn't changed since the pilots began. The regulations haven't changed since the first revision of 205 was issued. But there is a reinterpretation by the staff of what the regulations intended. And that is causing a lot of difficulty in implementing 805.

CHAIR APOSTOLAKIS: You are referring to the last three slides there where how 1.174 is to be applied to this?

MR. BUTLER: That's one of the biggest challenges we are seeing with the new interpretations, yes.

With that, I'll turn it over to Biff Bradley and let him kind of hit some of the major challenges we're seeing. We're not going through a detailed, point-by-point examination of our comments. We're trying to be a little bit more --

CHAIR APOSTOLAKIS: Let me understand this. This is the first time you saw that interpretation? Those three slides?

MR. BRADLEY: Yes.

CHAIR APOSTOLAKIS: And you are going to comment today?

MR. BRADLEY: Yes, we're going to do our best to comment given that we have about two hours of history on this.

CHAIR APOSTOLAKIS: But you will -- you plan to go back in the next week or two and write something?

MR. BRADLEY: Well, I think we would request ACRS to consider addressing this in whatever letter you write. Whether we -- given that the Reg Guide -- it really is a function of the Reg Guide coming out and what opportunities we have still to effect the final version. It is something we could consider putting additional comments in writing. I don't think we've made that determination yet.

MR. BUTLER: The opportunity for public comment period has been closed.

CHAIR APOSTOLAKIS: Well, that's why I'm asking these questions. I mean --

MR. BUTLER: There is nothing to prevent us from providing additional comments on any draft that is now released. But it hasn't been released yet.

There isn't -- it isn't incumbent upon the staff to incorporate our comments because the comment period has closed.

MR. BRADLEY: We are in a significant disadvantage, the members of the Committee and the NRC staff have had the opportunity to review the Reg Guide and to review the actual words, which are critical. There is a lot of difference between bullets on a slide and words in the Reg Guide. It is enforceable.

We need -- you know there would be great advantage to us having the opportunity to see the proposed final Reg Guide and make comments. There are significant changes coming late in the process.

I think the pilots who are here today can tell you that some of the things that are in this Reg Guide, they haven't done. This is above and beyond what the pilot plants have gone through. And they

pretty much believed they were nearing the goal line on this process. So these are significant revisions.

CHAIR APOSTOLAKIS: Sunil, when will NEI see the draft guide?

DR. WEERAKKODY: I didn't want to say anything because I didn't want to effect the flow. With respect to the changes, it is not fair to say two hours because one week ago I -- as soon as we draft finaled these slides, I set them to Steve Hutchins of NEI and Ken Canavan about one week. So I think it is an exaggeration to say this is like two hours.

MR. BRADLEY: You are right, Sunil. I found out about this yesterday. But --

DR. WEERAKKODY: Well, that's --

MR. BRADLEY: -- it wasn't a PRA. I've been primarily focused on PRA issues. And then we found out there was an additional issue. Personally, I wasn't aware of until

DR. WEERAKKODY: Yes because of what happened during the last meeting, we took extra efforts to share our slides with NEI to have a constructive meeting today. So we did that about a week ago.

But our point of contact was Steve Hutchins of NEI. So I expected him to share it with

the appropriate people.

The second thing I want to clarify is the change you saw today, George, it was -- you know, we don't want to make big changes after we get the public comments.

In the staff's understanding, we made the changes in response to a comment made by NEI. Apparently some of the explanations we gave with respect to what those changes may mean appear to have created some concern which we have to consider. So I just don't want to --

CHAIR APOSTOLAKIS: But Biff raised, I think, a legitimate point, that they would like to see the actual guide. They have not seen that. Is that the correct thing? When will they see it?

DR. WEERAKKODY: We could not made the Reg Guide that we shared with you public because of the pre-decisional considerations. We can only do that after the meeting. Obviously since we are having the meeting today, it will be available to NEI and everyone else today.

CHAIR APOSTOLAKIS: Okay. My other question is -- what's that?

DR. WEERAKKODY: She was saying only the slides become public. But I talked to the NRCR staff.

I think -- aren't you going to make everything public today? That was my understanding.

CHAIR APOSTOLAKIS: We will make it public? That's not our job.

DR. WEERAKKODY: Okay.

CHAIR APOSTOLAKIS: But the most important question, it seems to me, and that would come to your technical comments is I have this disturbing feeling that perhaps having you guys come to the full Committee in September is premature. There are too many things happening.

I mean NEI has not had a chance to digest and comment from these new changes. And, you know, having a meeting with the full Committee --

MEMBER SHACK: Well, we won't have official comments on it unless they come in September. They can take our comments today --

CHAIR APOSTOLAKIS: Who? Who is they?

MEMBER SHACK: The staff.

CHAIR APOSTOLAKIS: How about them?

MEMBER SHACK: Well --

CHAIR APOSTOLAKIS: They haven't even seen the guide. So that bothers me that we are going to have to write a letter on something that is still evolving. So maybe we can discuss this again at the

end of the day's meeting. But this is a bit unusual. I'm not used to this kind of situation where Sunil tried to explain it. But I believe the last three slides were new to a lot of people, including us.

MEMBER SHACK: Yes.

CHAIR APOSTOLAKIS: Okay. So that kind of thing usually doesn't happen after the public comment period is closed. So I'd like us to be a little sensitive to that fact. And see what kind of wisdom we can have at the end of the meeting.

Biff?

MR. BRADLEY: Thank you.

CHAIR APOSTOLAKIS: The floor is yours.

MR. BRADLEY: All right. Well, keeping on the theme that you were just discussing, I did want to speak. I think this has been pretty well discussed already in the staff's presentation and in the questions and answers.

But we do believe, and I second your concept that it would be great if we could see the actual changes because I think there is a lot of devil in the details in these types of changes, we do believe that the concept of applying Reg Guide 1.174 delta risk guidelines to previously approved changes that are already part of your licensing basis and were

not risk informed, these were deterministically approved, they are part of your plant that you operate today as part of your CLB, to back calculate that risk and use it as an offset against the risk that you are allowed to accumulate under this calculation is a totally new concept to me.

I've been involved in a lot of risk-informed applications. My understanding was that 1.174 guidelines were to address CLB change. CLB today, I make a change, CLB tomorrow, there's a delta. Now we're saying no, that's not it. It is some hypothetical CLB that you don't have -- that we approved your existing CLB but now you've got to measure against something else.

I don't think that is what 1.174 was written to do. And I don't believe the criteria that are in there -- or the guidelines actually, the risk guidelines were written with that in mind. They were written to look at actual CLB changes.

So there are some interesting other aspects of this. This is a very HRA-centric question that is being raised here that we've got to now go back-calculate risk of human actions. And we all know that prior HRA is one of the less developed aspects of the method.

So not only are we introducing a new concept, we're doing it, we're going to exacerbate an already existing problem with immature methods by putting a tremendous amount of concentration on the HRA --

MEMBER RAY: Biff, in that regard though, your first bullet says evaluation of changes. When you wrote that, perhaps you meant more than HRA. But we're just talking about HRA.

MR. BRADLEY: Recovery actions, yes. Yes, and this -- the 805 task force had brought this to our attention because as of this time yesterday or so, we had a presentation that solely concentrated on PRA methods. And so we have added this. I think it is in the context of recovery actions, which we have been talking about.

MEMBER RAY: Okay, so changes isn't a good word there maybe --

MR. BRADLEY: Yes, you are right.

MEMBER RAY: In the sense --

MR. BRADLEY: Recovery actions would be a preferred word.

MEMBER RAY: Okay.

MR. BRADLEY: I'm not clear -- and, again, having not seen the Reg Guide, I don't know whether

this means we have to go, you know, set all the A.2.ps to one. I don't know what it means to say calculate the risk of a previously-approved action against a hypothetical-compliant plant. There is a lot of -- that's a lot. And how you do that is very, very key if, in fact, we need to do that.

So that was basically all I wanted to say about that subject.

CHAIR APOSTOLAKIS: So I have a comment.

MR. BRADLEY: Yes.

CHAIR APOSTOLAKIS: Ideal plant here means this hypothetical plant that complies with all the requirements of 805. Is that what it means? That's the ideal plant because as you said, I mean, the deltas are calculated from that presumed ideal situation.

MR. BRADLEY: I think it means a plant that complies with Appendix R of 50.48 without any -- without credit for any previously approved recovery actions. So it's --

CHAIR APOSTOLAKIS: I thought ideal plant meant an NFPA 805.

PARTICIPANT: No.

CHAIR APOSTOLAKIS: Well, because all the changes -- I mean you are supposed to calculate the

delta risk between the actual plant and this ideal plant that complies with all the requirements of the standard unless I've been so wrong from the beginning. Isn't that what it means?

DR. WEERAKKODY: An ideal plant in NFPA 805, you have to look at the deterministic requirements. There is a section called deterministic requirements in Chapter 4.

CHAIR APOSTOLAKIS: The fundamental -- what do they call it -- the basic fire protection program.

DR. WEERAKKODY: The basic fire protection elements is Chapter 3.

CHAIR APOSTOLAKIS: Yes.

DR. WEERAKKODY: Chapter 4 has the deterministic requirement that --

CHAIR APOSTOLAKIS: Right.

DR. WEERAKKODY: -- sets out the characteristics of the ideal plant. So what they say is, you know, 20-foot separation or the three hour -- that is the ideal plant. And then some of this stuff is not in the rule but in the documents, the documents leading to the rule.

We also talk about in some of the rulemaking documents that the things like ordinary

shutdown is not part of the 805. Nevertheless, the primary control station gives us the latitude to create something realistic to accommodate that.

CHAIR APOSTOLAKIS: But the point is is that this ideal plant does not exist. Isn't that true?

MEMBER BLEY: And neither does a PRA of this ideal plant.

CHAIR APOSTOLAKIS: Yes.

MEMBER BLEY: So I guess unless somebody does a PRA of this ideal plant, how do you calculate --

MR. BRADLEY: That's my point. We've never done that before.

CHAIR APOSTOLAKIS: It does not exist. So I think --

MEMBER BLEY: And if you did the plant without these actions --

CHAIR APOSTOLAKIS: Why don't we take the general design John suggests?

MEMBER STETKAR: I mean, you know, that's an ideal plant.

CHAIR APOSTOLAKIS: That's an ideal plant with four trains coming north, east, west, and south. That would be ideal.

DR. WEERAKKODY: If I may, I think the ideal plant does exist. I think even though there's fussiness in 805, there's a method to the madness. An ideal plant, we have a control room and a safe shutdown panel. And its 3D2 areas, we'll rely on passive barriers. That would be an ideal plant.

An ideal plant will not have operator manual actions in 3D2 areas. An ideal plant will not have loosely-defined emergency control centers where -- or stations where you rely on operators to run around, operate a bunch of equipment, and then that being an acceptable reaction.

So I think -- I tend to -- when you look at the rule and what is leading to the rule, the picture of an ideal plant is pretty clear.

CHAIR APOSTOLAKIS: But the truth of the matter, Sunil, is that in all other applications of the Regulatory Guide 1.174, we don't have such a concept. We say this is the way the plant is. This is the baseline CDF and LERF. We've done a PRA. And we calculate the changes.

DR. WEERAKKODY: Right.

CHAIR APOSTOLAKIS: Here it is a different thing. I'm not saying it's wrong. But it is different.

DR. WEERAKKODY: Yes.

CHAIR APOSTOLAKIS: It is absolutely different.

DR. WEERAKKODY: I fully agree that it is different. In fact --

CHAIR APOSTOLAKIS: And it implies -- I mean I don't know that the use of ideal is correct here. I mean why is that ideal? Why aren't the German designs ideal? Right?

MEMBER RAY: Well, wait a minute. Why isn't it as simple as saying we just want to know what the risk is of the recovery actions? Forget about this ideal plant idea. Do you know what the recovery actions are? Yes. They are these. Can you calculate the risk of them? I can. Then that's the difference between the plant you have and a plant without --

CHAIR APOSTOLAKIS: The recovery actions.

MEMBER RAY: -- the recovery actions. Don't get hung up on this ideal plant.

MEMBER BLEY: Because if I take those recovery actions away, the risk is going to go up. They have been put in place to reduce the risk.

MEMBER RAY: Of course, Dennis, you are presuming --

MEMBER BLEY: So I'm not sure what is you

are saying or what they are saying.

MEMBER RAY: I'll explain it to you. I am presuming without attempting to define that there is a plant that would not, as he said, require recovery actions. And I'm merely quantifying the risks associated with the recovery action.

I'm not taking a step to define that ideal plant. Okay?

MEMBER BLEY: I don't know how to do that.

MEMBER RAY: I think you can do it very straightforward.

MEMBER SIEBER: Every recovery action is 100 successful.

MEMBER RAY: No, I'm just trying to do the arithmetic. I'm saying that this -- to me it is a strong man to say I don't know what an ideal plant is. It is simply a plant that doesn't require the recovery actions that you require.

MEMBER STETKAR: The -- as I interpret NFPA 805, I have -- let's not talk in hypothetical situations -- I have my plant. I have a four-loop Westinghouse Pressurized Water Reactor that's rated for 1200 megawatts electric. It has been running for 15 years. That's my plant.

If my plant complied with every

deterministic requirement in NFPA 805, my plant, that would -- if my plant complied with every deterministic requirement in NFPA 805, that, I believe, would be my ideal plant. It's not anybody else's ideal plant. It's my ideal plant.

MEMBER RAY: Okay, yes. But you do require the recovery actions.

MEMBER STETKAR: No, no, we're first determining what is the ideal plant. That plant has some risk associated with it.

MEMBER RAY: Yes.

MEMBER STETKAR: I don't know what that is. I've never quantified it. Nobody has ever quantified it. But it has some risk. I could conceivably develop a PRA to quantify the risk from that ideal plant that never has any electrical failures.

And I would probably say on the deterministic side but now I really do have a plant today that is not that ideal plant. But I don't need all of the ideal -- all of the deterministic criteria. I've taken credit for manual operator actions.

My plant today has some fire risk -- today. It's licensed. I'm operating the plant. I've been doing that. I don't know what that risk is

either. It is different from that ideal plant risk.

And then when I transition to NFPA 805, I will have a third measure of the risk of my plant that will account for all of the changes that I make during the transition period, perhaps not taking credit for actions, perhaps taking credit for more actions. I don't know.

CHAIR APOSTOLAKIS: If you keep talking, we will have --

MEMBER STETKAR: All right, I'll stop because the lights keep going off. The point is that the ideal plant is my plant that complies with all of the deterministic criteria for my plant. But I don't know what the risk for that is nor is it my plant.

MR. BRADLEY: I think --

MEMBER STETKAR: And I'm not sure why that risk is relevant to anything is what I'm saying.

MR. BRADLEY: Exactly.

MEMBER STETKAR: My current risk is relevant.

MEMBER RAY: Aren't we talking about the additional risk? Isn't that what we're always talking about here?

MEMBER STETKAR: It's not the additional risk. My risk today --

MEMBER RAY: I understand that you don't know the absolute risk. But aren't the words that appear on the screen additional risk? Not on this screen but on the one earlier? It was additional risk. That's all I was trying to say in response to Dennis is aren't we just talking about something called additional risk throughout all of this stuff?

MEMBER STETKAR: Additional to what? Compared to what?

MEMBER RAY: I asked that question and the answer was compared with a plant -- compared with a -- you know, a plant that didn't require --

CHAIR APOSTOLAKIS: Let's take an example here. If I have -- if the requirement is in a particular situation of 20-feet separation and they are allowed to have ten feet because of some recovery action, I think what Harold is saying, what is the difference in risk between the plant with 20 feet and the one with ten feet but with a recovery action? That's what you are saying.

MEMBER RAY: Well, if the recovery action is caused by the ten feet -- I'm really just saying there is some risk that I, at least as I read this stuff, we can calculate and add up and call additional risk that is associated with a recovery action. And

it doesn't require me to define --

CHAIR APOSTOLAKIS: If it fails you.

MEMBER RAY: -- at my plant --

CHAIR APOSTOLAKIS: If the recovery action fails, that's what you mean is the risk

MEMBER BLEY: Here's my problem. I can calculate how likely it is that it will fail to carry out the actions. Without the whole damn PRA, I can't tell you what the risk of failing is.

CHAIR APOSTOLAKIS: Yes, that's right.

MR. CANAVAN: Well, and I also, just as an aside, there's no ideal plant because there is going to be a manual action in some of the plants because you have a control room fire. You've got to go to remote shutdown panel. So there is already a place where you are going to have a -- well, you've go to leave the control room so it is ex control room.

So there is going to be a place where you have a manual action. And I liken this to the internal events analysis when you do an application using internal events analysis, you have to use a generator AOT, for example, you don't zero out all the operator actions in that model. Those aren't turned to one to evaluate what the effect of those are.

Here you use the fire PRA to transition

NFPA 805. Why are we zeroing out the valid operator action such as control room evacuation, which is a design basis accident for the control room fire. Why would we turn that off? Why would we set that to assess that hypothetically?

MEMBER RAY: But the term additional risk has been used in this forum for a long time. You've been required to deal with it. Are you saying you don't know how to calculate additional risk?

MR. CANAVAN: I'm saying that the additional risk isn't pertinent to the question at hand.

MEMBER RAY: All right. But that's a different point. You were implying we don't even know how to do it. It could be calculated.

MR. CANAVAN: No, I think we calculate it.

MR. BRADLEY: Yes, it is not trivial to calculate it. There is a lot of devil in the details in how you calculate it. We haven't seen the Reg Guide. There's been two hours of discussion on this. It is obviously not a minor issue.

MEMBER RAY: If we're going to make use of the time here and the point is --

CHAIR APOSTOLAKIS: But I think it is also important though when issues such as this are raised

to also bear in mind that there is a rule. In other words, we are not now questioning the rule itself are we? Yes what?

MR. BRADLEY: I don't know.

CHAIR APOSTOLAKIS: We have to be careful, Biff. I mean --

MR. BRADLEY: Yes, I don't know what, you know, what the interpretation of the rule is or why --

CHAIR APOSTOLAKIS: If it is in the method of interpretation, I agree with you. But if it is a matter of the fundamental assumptions and statements in the rule, then we have a problem.

MR. BRADLEY: If it is a fundamental statement of the rule, I don't know why we didn't know about it three years ago when we were starting off to implement. This came up at a very late -- to be a fundamental aspect of the rule --

MEMBER RAY: What is this now?

MR. BRADLEY: -- the idea that you have to offset your risk of previously-approved recovery actions.

MEMBER RAY: Okay. But the idea that you would calculate additional risk associated with certain recovery actions, that's not new.

MR. CANAVAN: If they are changed in an

application.

MEMBER RAY: Okay.

MR. CANAVAN: If they are changed because we are doing a PRA for the --

MEMBER RAY: I just want you to agree that there is nothing about additional risk that is just appearing here today.

MR. CANAVAN: No.

MEMBER RAY: Okay.

MR. BRADLEY: It might be that you could calculate it -- it is one thing to calculate it. It is another thing to calculate it and then use that as an offset against your actual CLB risk.

MEMBER RAY: That is a policy question. That is not a do it, okay? I mean we're acting like we don't know how to do something here all of a sudden.

MR. CANAVAN: I think we know how to do it. I would -- I'm not sure that it makes -- that it has any validity.

MEMBER RAY: Okay. That's an okay point. But don't make it sound like God, I don't know how to do this.

MR. BRADLEY: In this industry, saying you know how to do something and then actually doing it

and getting every little aspect of it in agreement with the regulator are two different things. And there are a lot of those little aspects involved in this particular determination.

CHAIR APOSTOLAKIS: Maybe the situation would be resolved if we said the plant is running today, right? This is the baseline risk or the current licensing basis. We can calculate that. We need a fire PRA based on what we have today.

And then take it from there. And they are saying in the future now, every change will be compared to that.

MR. BRADLEY: Yes, I mean just treat it like any other --

CHAIR APOSTOLAKIS: Then you have --

MR. BRADLEY: 1.174 application. CLB today, CLB tomorrow. There's your --

CHAIR APOSTOLAKIS: Right. The only problem might be that maybe I'm doing a few things today that have not been approved. And the staff will be reluctant to make that part of the licensing basis. You have to do something about that.

MR. BRADLEY: Well, if it's not approved --

CHAIR APOSTOLAKIS: If it is not approved.

MR. BRADLEY: -- I'm not talking about things that aren't approved.

CHAIR APOSTOLAKIS: I understand.

MR. BRADLEY: I'm talking about previously-approved actions.

CHAIR APOSTOLAKIS: That is my current licensing basis.

MR. BRADLEY: Yes.

CHAIR APOSTOLAKIS: Do your fire PRA. Tell me what it is today. And all changes should be compared to that.

MR. BRADLEY: Yes.

CHAIR APOSTOLAKIS: Which is what we do in other --

MR. BRADLEY: Yes.

MEMBER RAY: And I'm saying unless you get into Region I --

MEMBER STETKAR: Well, the other thing is what Harold just mentioned. That if that calculation of your current licensing basis puts you not on the vertical scale in 1.174 but on the horizontal scale in 1.174 out in Region I, does that have any implications?

CHAIR APOSTOLAKIS: Yes, sure. There's no Region I there. I mean you are violating the goals

but there were 18 plants that violated the goals. Remember -- no, no, no, I'm sorry.

MEMBER RAY: Were there any implications for those 18 plants, George? Were there any implications of that fact for the 18 plants?

CHAIR APOSTOLAKIS: As far as I know, we never asked them to do anything because then people would say oh, there is a difference between the goal and the --

MEMBER SHACK: Okay. That's a fair -- that's additional risk.

CHAIR APOSTOLAKIS: That's fine. I mean if you are way out there, I understand that. But that is consistent with existing regulations.

MEMBER SHACK: I mean what is the standard. Can anyone explain to us why they didn't choose that option?

CHAIR APOSTOLAKIS: Instead of working with that, what were the horizontal axis?

MEMBER SHACK: No, 1.174, 1.174 always requires you to look at the delta and the horizontal. Clearly everybody, I think agrees that if you took the current risk, that would set the horizontal factor.

CHAIR APOSTOLAKIS: Yes.

MEMBER SHACK: That may or may not allow you to have a delta risk. If it puts you out in Region I --

CHAIR APOSTOLAKIS: Absolutely.

MEMBER RAY: That's what the flowchart shows.

MEMBER SHACK: Well, no, no, no, it doesn't. It's different.

CHAIR APOSTOLAKIS: It's different.

MEMBER RAY: Well --

CHAIR APOSTOLAKIS: The flowchart is for the ideal plant.

MEMBER SHACK: No, no, the flowchart is for the ideal plant.

CHAIR APOSTOLAKIS: The ideal plant, that's a big difference.

MEMBER SHACK: Not with the current licensing basis.

CHAIR APOSTOLAKIS: Yes.

MEMBER SHACK: Well --

CHAIR APOSTOLAKIS: But we have --

MEMBER RAY: Wait a minute. You are saying this is for an ideal plant?

MEMBER SHACK: Yes. The delta there is coming from the ideal plant.

CHAIR APOSTOLAKIS: The delta is from the ideal plant.

MEMBER SHACK: Well, not the ideal plant. It is the non-ideal plant -- the only thing you have to compute the delta on are essentially the recovery actions. All the other deviations are acceptable.

CHAIR APOSTOLAKIS: Let me ask the Committee something.

MEMBER SHACK: We can compute the risk due to those but only the risk due to the recovery actions. So it is the semi-ideal plant.

CHAIR APOSTOLAKIS: The ideal of this particular session was to let the NEI guys speak.

MR. BRADLEY: Agreed, agreed. You can see we are struggling with this. But no, I appreciate it. I think it is a good discussion.

MEMBER SHACK: I would like to hear the staff's response because, I mean, obviously that's a very logical thing to do is to base it on 1.174 and just go to --

CHAIR APOSTOLAKIS: The horizontal.

MEMBER SHACK: -- the current licensing basis and compute that risk and use that.

MR. BRADLEY: I even have a comment on that if once the staff says their peace, if they want

to.

CHAIR APOSTOLAKIS: Sunil?

DR. WEERAKKODY: Well, since you asked the question from the staff let me try to answer. But I would agree that what you just explained is one way of doing it. I could explain as to why we took a different approach.

MEMBER SHACK: That is what I'd like to know.

DR. WEERAKKODY: Okay. It ties into a question that the Committee previously asked the staff members there which I felt needed more explanation. The question was why are we treating recovery actions as something different than anything else like, you know, 20 feet versus 15 feet.

The answer is if you, for a moment, forget 1.174 but look at how we have maintained fire safety at plants, one of the things we have rejected consistently whether it is in the deterministic or 805 space is that if you have recovery actions in an area that typically calls for passive protection, you've got to know -- I mean you should be discouraged from doing that. We do that in the deterministic area already.

So the same thought has been captured into

the 805. And one of the things I personally found out, you know, because this was a big discussion within the staff before we came here, if you read the rule and some of the key documents that led to the rule, we repeat in that dialogue that any time we use recovery actions, the staff must consider or it must be considered as a performance-based approach. And that is reflected in the rule itself.

And then when you look at a couple of the key requirements like 4.2.4.2, there is no ambiguity. We clear say that if you use performance-based approach, the staff needs to know the additional risk. So in a way that's why I apologize for the side remark here but when Dr. Apostolakis asked are we changing the rule, you know in a way we are because the words in the rule, if you look at 4.2.4.2, that is very clear.

Now what I'm seeing happening here is -- and I do agree with Biff when he characterized this -- in typical areas when we apply 1.174, we look at the change, okay? And there is something unique in fire protection in that we look at recovery actions as a way of complying only when you have exhausted other options. So, therefore, there is a difference.

And I do agree with Biff that in 805

space, we are creating in the approach that we have proposed here, we are creating recovery actions in a somewhat differently than we use 1.174.

MR. BRADLEY: And you are suggesting though that the 1.174 guidelines still apply even though this is a different application. Those were developed to look at real risk changes, not hypothetical values from an ideal situation.

I mean you could question any deterministic decision NRC has ever made. This sets an interesting precedent that anything that has ever been deterministically approved could now be questioned relative to its risk value. And what does that mean? I mean we're mixing apples and oranges here.

MEMBER RAY: But, Biff, to be fair and I think it behooves all of to try and do that, nobody is going back and questioning a prior approval, right? It is only a matter that if you trigger the exceedance delta that you then have to offset any further increases with reductions. So it is not quite the same as raising a decision made previously.

CHAIR APOSTOLAKIS: But the fundamental change though -- difference, Harold, is that this delta in one case is calculated from an ideal

situation. In the other case, which was the original intent of 1.174, it is calculated from the current situation.

MEMBER RAY: Okay. And --

CHAIR APOSTOLAKIS: And that makes a hell of a difference.

MEMBER SHACK: Current licensing basis, right?

CHAIR APOSTOLAKIS: The licensing basis yes.

MEMBER SHACK: You know this is an approved situation. It's not --

CHAIR APOSTOLAKIS: Because it -- I mean that is something that has bothered me also when I started reading these documents, I'm beginning to think that NFPA 805 needs a serious revision because, you know, let's not -- I mean we have to put ourselves in the shoes of the staff. And they have to comply with a rule.

And if the rule says recovery actions are treated this way, Sunil cannot come back and say well, I disagree. So I --

MEMBER SHACK: George?

CHAIR APOSTOLAKIS: -- I think we are going beyond interpretation now. It's not just

interpretation of the rule. It seems to me we are questioning the basic stuff that is there.

MR. BUTLER: George, the requirement --

CHAIR APOSTOLAKIS: And I don't know what to do with it.

MR. BUTLER: The rule requirement, the language that says you have to address -- to assess the risk of recovery actions has been the rule from the start. It was -- you know, the guidance was prepared on how you do that. The pilot LARs did that over a year ago with staff involvement and awareness.

It's just lately that how you do that has changed. Now you have to use Reg Guide 1.174 criteria to do that evaluation.

Perhaps we could get one of the pilots to give us a summary of how they met that --

CHAIR APOSTOLAKIS: I think we should do that. Well, maybe not today.

MR. BUTLER: -- before --

CHAIR APOSTOLAKIS: I mean today we have a problem.

MR. BUTLER: -- but it is different, you know.

MEMBER RAY: You are realizing the point -

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CHAIR APOSTOLAKIS: Yes.

MEMBER RAY: -- that is of interest to us for sure.

MEMBER STETKAR: Have the pilot applications calculated the delta between what we're calling --

MR. BUTLER: My understanding is --

MEMBER STETKAR: -- this ideal --

MR. BUTLER: -- that no, they have not done that. Not qualitatively but, you know, somehow the risk of recovery actions was assessed.

MEMBER RAY: You two guys are saying things that are just slightly enough different. I'd like you to define it a little better please.

MR. BUTLER: My understanding of the original -- the LAR applications -- submittals is they addressed the risk of recovery actions in a qualitative fashion. But there was not a specific number that was calculated for the risk of recover actions.

MEMBER RAY: Okay. And I guess there would be some people who would say well that never did comply with 805. So -- but surely people thought that it did. In what way? How did that satisfy this

requirement that you, yourself, just said was longstanding?

MR. BUTLER: I don't know but the language of the rule says you have to quantitatively assess the risk of recovery actions.

MEMBER RAY: So it was believed to satisfy the rule?

MR. BUTLER: Yes.

MEMBER RAY: And we'll get some more detail on it here. But now it has to be done in a different way, that's the words you used a little bit ago.

MR. ERTMAN: Right, right. This is Jeff Ertman, Progress Energy, the Project Manager for the 805 Project.

We did use the original revision of 1.205 as guidance for the information that we put in the LAR. For recovery actions, we did provide some -- for the variance from the deterministic that resulted in the operator manual actions, we did provide some risk information on the impact of those. And then we did qualitatively provide information for the control room recovery actions.

I mean essentially we understood that we needed to provide the NRC information on the risk and

recovery actions --

MEMBER RAY: Excuse me. You used the word control room recovery actions which I think --

MR. ERTMAN: Alternate shutdown.

MEMBER RAY: What?

MR. ERTMAN: What's that?

MEMBER RAY: You used the words control room recovery actions when I think you are talking about --

MR. ERTMAN: Okay.

MEMBER RAY: -- recovery actions as a defined term here.

MR. ERTMAN: Right. The recovery actions when you leave the control room.

MEMBER RAY: Right.

MR. ERTMAN: Right. I mean basically we used the guidance, the 1.205 and the NEI 04-02 that it references on how to do that.

MEMBER RAY: Do you hear that you would now have to do that again differently?

MR. ERTMAN: Yes, we do have to go back and decide how to do that. One approach at the pilot plant we were looking at is a bounding approach for the risk in the control room. But we have to go back and rethink that because if you bring a -- if you have

a bounding approach and a fairly delta CDF and we have to do this extra step and bring that forward, then that impacts future decisions. You know basically what NEI was discussing.

So, you know, we'd have to look at this information and, you know, we've been in contact with the staff that we will be taking a look and working through what can we do now with this interpretation.

MEMBER RAY: Well, George, it would be good to see an example. I think that would help us.

CHAIR APOSTOLAKIS: Would you be prepared to brief the Subcommittee at some time in the future on more details on this?

MR. ERTMAN: We could definitely brief on what we did.

CHAIR APOSTOLAKIS: Yes, and what you're doing.

MR. ERTMAN: And what we're doing, right.

MEMBER BLEY: I got lost on one thing there if I could ask this is I understood the earlier discussion, actions at the alternate shutdown panel, would that be -- that wouldn't be recovery by the new definition.

MR. ERTMAN: Right. One thing that is in this interpretation is a change of what is a recovery

action.

MEMBER BLEY: Yes.

MR. ERTMAN: So that is the other piece that we would be going back and looking at because previously we tended to -- if you leave the control room, it is a recovery action. But now with this interpretation in those slides --

MEMBER BLEY: It might not be that.

MR. ERTMAN: -- it provides some information on what really is a recovery action. And then also going back to what the previous morning session called green box/orange box. I mean that's referenced, too. So there are some other changes that I think would cut down the scope but still it is a change that we would need to go back and evaluate.

MEMBER BLEY: Thank you.

MR. ERTMAN: All right.

CHAIR APOSTOLAKIS: John, I gather from what you said that you could still live with 805 the way it is written but you can interpret it differently from what the staff is doing because my --

MR. BUTLER: Yes.

CHAIR APOSTOLAKIS: -- original --

MR. BUTLER: We have been interpreting it one way.

CHAIR APOSTOLAKIS: So we will --

MR. BUTLER: We thought we were in line with the staff's interpretation because we were following .205 Rev 0 --

CHAIR APOSTOLAKIS: Because I'm beginning to have, as I said, serious doubts about 805 itself.

MR. BUTLER: Well, clearly if it is so easy to change your interpretation, there are some problems.

CHAIR APOSTOLAKIS: Changing the rule is a big deal. But Biff said earlier I don't know why we didn't see those three years ago. So I'm beginning to think that you agree with me.

There are flaws in the rule itself -- I mean in the standard. It's not the rule, it's not.

MR. BUTLER: It is the rule. It is the rule by reference.

CHAIR APOSTOLAKIS: Flaws in the standard.

MEMBER RAY: In this case.

CHAIR APOSTOLAKIS: We have an issue with rules that are flawed.

MR. BUTLER: Okay, so moving on --

CHAIR APOSTOLAKIS: Let's go on. Let's go on.

MEMBER RAY: George, I want to make a

comment.

MR. HARRISON: I just wanted to clarify, the staff has asked RAIs regarding this additional risk. And, again, we haven't a response just because I think some of this was wanting to get played out before licensees actually responded.

But I think fundamentally the thought of having to calculate an additional risk element that has been there, the question was what the staff was going to use as the acceptance guidelines. So that's --

CHAIR APOSTOLAKIS: Well, I'll tell you what --

MR. HARRISON: -- that's been the real crux of the issue.

CHAIR APOSTOLAKIS: -- I still don't understand what additional risk from recovery actions means. Let's go on. Let's go on.

MR. BRADLEY: I'm going to try to transition off this whole subject. I know this is -- we've been on this for a while.

CHAIR APOSTOLAKIS: So next slide then.

MR. BRADLEY: No, I'm still on this slide.

CHAIR APOSTOLAKIS: Okay.

MR. BRADLEY: Before this cropped up, the

last big thing in 805 space was conservatism of PRA. And as you recall, there was -- Ken's been here before, I've been up here. We've talked about some of the issues that we've had with methodologies for fire PRA.

And, again, there was a statement -- at one point the staff said the rule, the language of 805 forced them as the AHJ to -- it's very similar to what we are hearing today. There was something in the rule that forced them to have to go beyond Reg Guide 1.200 and specifically approve the methods. We heard that at one point.

We made substantial comments on the Reg Guide to that effect. We don't know what the outcome of those comments was. So I'm, as I said, flying blind here. The staff may have entirely fixed this problem. And if we had had the Reg Guide, I might not even need to make this presentation.

On the other hand, I'm not sure how that final language of AHJ came out or where they stand with specific approval of methods. So I'm going to go ahead and go through this presentation.

As you all know from the previous discussions we've had with the Committee, we've had a long interaction with NRC to attempt to come up with

workable methods. This came out of 6850.

We discovered there were improvements that needed to be made. EPRI and NRC, working through an MOU, have had just countless interactions over the last 18 months or so to try to work some of these methods to a more realistic level.

Throughout that process, there has been I'd guess I'd call it a natural tendency of NRC staff, many of which are not PRA personnel, to try to impose conservatism and prescription into these methods in a manner that is different from the way we've previously done PRA and that went beyond 1.200.

So this has been an issue of concern for us. And it may be resolved. So if you have resolved that and the Reg Guide is clean, that's great. When we see the words, we'll know that for sure.

So we believe that 1.200, Rev 2, is sufficient. There doesn't need to be additional requirements on methods for PRA. And it looked like from your slide that you have reached that same conclusion. Again, we need to see the final words.

Anyway, that being said, even if we have gotten out of that box and are now able to use methods that have been developed that we believe are more consistent with internal events and realism, we still

have a -- even with that, we're still not to the goal line yet on fire PRA. We have a long way to go to really reach a level where fire PRA is on the same level as internal events.

It is a more difficult problem. You have spatial issues. You have fire growth propagation. You have all kinds of difficult technical issues that you have to address that you don't have to in internal events. So we're really not there yet.

We're charging into a very large industry-wide risk-informed application with a PRA that is somewhere, you know, maybe a teenager. It's not an infant but it is certainly not a mature, full-grown PRA such as our internal events PRAs are.

As we all know, you can make incorrect decisions on the basis of a PRA. Even putting conservatism in PRA can cause a skewing of results and insights such that it could lead you to make incorrect decisions. So there are some large decisions being made as the result of implementation of 805.

We're talking about major plant modifications, very extensive, large-scale, you know, kind of plant mods. Both pilots have committed to that. And I expect many other plants will be in the same boat as they work through 805.

CHAIR APOSTOLAKIS: Could you give us an example of a major change?

MR. BRADLEY: Sure. Harris is putting on alternate RCP -- it's either cooling or injection. Oconee has a whole new dedicated shutdown path that's partially due to this.

So these are large plant mods. We want to make sure that when we do these kinds of mods that they are based on the best state of knowledge, the best information we have.

There are also other things -- there are other fallouts from the use of these "immature methods." We're trying to do risk management in the sites. And we have internal events.

We have very mature risk management methods for Maintenance Rule A4 and other things. And now we have a fire model sitting there that we know has a different bias. It has a conservative bias. If we're not careful, it could skew the risk management actions we're doing at the plant.

We have to correctly look at the results of these models and make determinations as to the correct risk management actions. You could actually dwarf many of your internal events risk management actions if you believe the results of some of these

conservative fire PRAs. It would basically render a lot of things we do now seemingly insignificant.

The other problem is just the depiction of the plant risk. We need to be careful in how we depict the plant risk. I mean the one thing the PRA does, it actually tells you a core damage frequency. It actually tells you where you stand with respect to the subsidiary objectives.

So we need to make sure that we don't rush out and start using immature and what we believe to be conservative risk values and depicting the actual risk of the plants.

We realize 805 is pretty far down the road. This is not -- in my opinion, it is being driven by the Commission. It is being driven by external forces. It is not something that is likely to change.

And what we're asking for here is that the process, somewhere in the process for 805 and the licensing, we need to be able to adjust, as we learn more -- and Ken is going to talk about all the work the industry has and NRC and others have underway through testing, methods enhancements, there's a lot on the plate that is going to take several more years to get done -- so we're going to get different

insights and different results a couple of years from now than we have now.

And what we're asking for is some flexibility in the 805 process to allow us to revise what we commit to in a reasonably efficient way as we learn more with these models and refine the models.

So we're concerned that with these thousand-page LARs and the complexity of this process that we don't just lock in something today that we know is not the right thing to do a year from now. We need a way to revise that in a reasonable way that doesn't involve another thousand pages of LAR.

One of the things that some of the pilots are doing --

CHAIR APOSTOLAKIS: As a practical matter, though, how -- I mean I don't know -- how do we do that?

MR. BRADLEY: I don't have an answer to that at this point. It is more of a -- I think it is a licensing question really. My perception is though that the complexity and volume of these submittals is going to create a difficult thing to unravel yourself from. And that when you have different or better PRA insights in the future, in the near future hopefully, it is going to be difficult, even with that insight,

to go undo some commitment you've made.

Or maybe the staff has already thought this through and there is a mechanism there. I'm just saying we're trying to be constructive here and say look, we're doing everything we can to make these methods better.

But it is going to take time. So let's not -- let's not lock in things in the plant that turn out later not to make as much sense as we thought they did. It's just a general observation. I don't have a specific mechanism as to how we would do that.

To give you an example of this, one of the areas we really struggle with in fire PRA is on fire growth heat release rates. And we end up assuming rapid growth to large heat release rates that typically is not what we have observed in most of the fires we've seen in the plants.

A good way to offset this when you model it is to put in incipient detection. Now one of the pilots has done that in these types of cases.

Now maybe in a few years when we have better models, better understanding of heat release rates, you'll find out that it was really an artifact of the model that drove what you did. It wasn't a real fire safety issue in the plant. It was just the

way you were -- you had to model it led you to believe there was a higher risk.

Incipient detection is a good way to deal with that at least, if nothing else, as an interim method, you know, as opposed to, say, putting in a large full-blown plant modification that a year from now you find out well, I probably didn't really need to do that. So incipient at least is a fairly, you know, in the scheme of things, a minor modification to the plant that does provide, in our opinion, a lot of risk benefit and --

MEMBER BLEY: Is there anything in the rule or the Reg Guide that tells you what you need to do with respect to calculation of a high risk from fire? It doesn't give you the option you were just describing?

MR. BRADLEY: Well, I haven't seen the final Reg Guide. But --

MEMBER BLEY: In any of the drafts you've seen?

MR. BRADLEY: Yes, that would -- say it again so I make sure I understand you.

MEMBER BLEY: Well, you are talking about alternative solutions to --

MR. BRADLEY: Right.

MEMBER BLEY: -- a calculation of high risk.

MR. BRADLEY: Yes.

MEMBER BLEY: I'm asking is there any guidance you've seen from NRC that mandates the fixes you must put in place if the risk --

MR. BRADLEY: No.

MEMBER BLEY: -- turns out to look high?

MR. BRADLEY: I understand your question. I don't think there is specific guidance on that. But we have had a lot of interaction with the staff relative to the amount of credit you should be able to get for incipient detection. And I think the tendency of the staff has been to try to limit that.

And that dialogue is still going on. And what I'm trying to tee up here is, in my opinion, it would be useful to provide reasonable credit for incipient detection and not to, you know, overly limit it if for no other reasons than in many cases where we're trying to use it is addressing an artifact of the modeling more so than a real plant situation.

So my limiting that, the staff is de facto driving you to do more significant modifications. And we're not asking for carte blanche to throw in incipient detection. We know there are limits on the

technology. We've done extensive looking at the data.

But I'm just saying that this is one of the elements that would be greatly beneficial to us in being able to go forward in this context of changing models and changing insights.

Another area I wanted to bring up, which is another favorite subject of ACRS, is aggregation of risk from different initiators. As I mentioned, we have internal events that has been very mature. We'll probably have 20- to 25-years experience with internal events.

And we have five PRA that we are rapidly developing for 805 that is not as mature and has what many believe to be a conservative bias. So there's going to be a natural tendency to take those two numbers and just add them, sum them. And we believe that in this case, given the apparent biases that are there, that's probably going to lead to misleading information.

We understand that you do need to represent the total risk of a plant. And we're not saying we would disregard the risk. But what we're trying to say is we need to be careful in how we aggregate these risks.

And there is existing guidance out there.

NUREG-1855, which is the uncertainty report, touches on this. Also, there is a companion EPRI report and there is an additional EPRI report specifically on -- that's the number 68, right, that's the one that specifically addresses aggregation.

We would recommend that the staff look at those reports, be cognizant of them, and we would recommend that extreme care needs to be used in simply summing the immature fire PRA result we get today with internal events and stating that that is a depiction of the overall plant risk. We don't believe it is that simple.

There are already indications that some of the staff is trying to do that. They are approaching the pilots, suggesting they need to sum the fire risk with the internal events risks for all their risk-informed decision-making. And there are a lot of reasons that that is probably not the right thing -- right way to go at this point. So just a caution there, possibly something ACRS might want to consider in their letter.

In conclusion -- we have one more slide after this but --

MEMBER BLEY: Biff, let me ask you a question.

MR. BRADLEY: Yes?

MEMBER BLEY: One thing you haven't touched on and I don't think it is coming, in these areas where there seems to be a consensus of people doing the work that their models are conservative in specific aspects of modeling. Has anybody approached this with the treatment of uncertainty to try to address that in any of the work that you have been involved in?

MR. BRADLEY: Most of -- and Ken may be able to speak to more detail than I can -- most of our work on uncertainty was focused on internal events because the ASME standard in 1.200 elevated the treatment of uncertainty significantly.

So EPRI and the NRC staff, working together, put together this -- it is a pretty elaborate, pretty lengthy guidance on addressing that. What happens is we got overtaken by events.

And now the fire thing has hit and there is a tremendous pressure to move forward the fire PRA. And we really haven't evolved that lengthy document to address all the elements of fire modeling -- model -- model uncertainty, not fire modeling but model uncertainty for fire PRA.

So I think the short answer to your

question is no, we haven't been able -- I know it is required, as part of the LAR, you do have to -- and as part of the PRA standard, you have to do that.

But to be honest, we really haven't, because the time of this is just going so rapidly, we haven't had a chance to do that thoroughly.

MR. CANAVAN: Yes, a short answer is NUREG-1855 and the EPRI 1016737 together, those reports taken together, address uncertainty for internal events. And the process that is there can be applied to fires.

What isn't done is the generic cases and the plant-specific way you would treat and identify those uncertainties. So that work is planned. Planned but not scheduled so we have a plan to move forward and no schedule, as of yet, although we were hoping for fall to start. It will probably take a little bit of time.

MEMBER BLEY: It just seems to me some of the issues you are raising are probably appropriately dealt with by uncertainties --

MR. BRADLEY: Yes.

MR. CANAVAN: Yes.

MEMBER BLEY: -- because some of these modeling assumptions probably are true some of the

time but not all of the time.

MR. BRADLEY: Exactly. And I think if we did have mature guidance on treat of uncertainty, we would be a lot further along. But unfortunately, that just doesn't fit in with the schedule for 805.

CHAIR APOSTOLAKIS: So you are saying we are rushing?

MR. BRADLEY: Yes. As you see on my next slide --

CHAIR APOSTOLAKIS: How -- what would you recommend we do?

MR. BRADLEY: Okay, well let me speak to that. I mean there is a lot of external pressure coming down on the staff. I mean the Commission, external forces are all at work to move the industry to 805. There is a checkered history of fire protection. There are a lot of exemptions on the books --

CHAIR APOSTOLAKIS: True.

MR. BRADLEY: -- valid exemptions that fully met all the criteria at the time but somehow seem to have some taint to them now. And so there is a lot of external pressure to move this to resolution fast.

And in the midst of this, we're dealing

with some pretty thorny issues with fire PRA. We're trying to evolve methods, you know, in order of magnitude faster that we did with internal events. We had a lot more time to do that right.

We don't believe these issues are trivial. And we can't just dismiss them in the face of we've got to do this on a certain schedule. So the best answer I have is to put flexibility in the process to let us fix this once we have better answers.

If we have to implement 805 on the schedule we're on and my sense is we're sort of on that schedule because of all of the pressure, at least put something into place that we can fix as we get better.

So I'd like to do this once, at least, and try to do it right with some adjustment rather than coming back and reinventing the wheel here in a few more years.

We're trying to -- fire protection has been difficult. And it always has been. It is just a difficult issue. And we are going to fix it once and for all. Let's really try to fix it once and for all.

CHAIR APOSTOLAKIS: It looks like the reason why we had so many exemptions to Appendix R, it was because Appendix R itself was rushed into.

MR. BRADLEY: Well, it was a -- yes, I mean it was a backfit.

CHAIR APOSTOLAKIS: We aren't giving people an opportunity to really reflect. Right?

MR. BRADLEY: Right. I would agree.

Many of the older plants were built before this regulation came to be. I mean it wasn't a design issue for these plants. They were already designed and built. So it is a difficult problem.

CHAIR APOSTOLAKIS: Yes, so you are saying it would be wise to slow down?

MR. BRADLEY: It would be wise to slow down.

CHAIR APOSTOLAKIS: But how would we do that? I mean delay, for example, the issuance of 1.205? And think about it?

MR. BRADLEY: My sense is from sitting in Commission briefings and everything else that we can't slow down. That there is -- but all we can do is try to provide that flexibility to implement this. But at the same time allow us to revisit and fix things as we learn even post-implementation.

Or to have some way to, you know -- I mean in a perfect world, I'd say we need several more years to do this right. But I don't think, given the

history and the Commission attention to this, that we're going to get several more years to do this right. So absent that, the best we can do is make it so it is fixable.

CHAIR APOSTOLAKIS: If we end up with another thousand exemptions to 805, it seems to me we will have failed miserably.

MR. BRADLEY: Why don't you go to the next slide? And this is the last slide.

CHAIR APOSTOLAKIS: Ken has a whole presentation I see here, right?

MR. BRADLEY: Yes, he does.

CHAIR APOSTOLAKIS: Okay.

MR. BRADLEY: This is just specific proposals we have. I think we've talked about all of these. One is to go back to the way we originally did risk of recovery actions, as John discussed, to do it qualitatively with the rules that we understood at the time and not to go to a totally new method of doing that using Reg Guide 1.174.

CHAIR APOSTOLAKIS: John is not Mr. Stetkar, right? It's the other John?

MR. BRADLEY: John, Mr. Butler.

CHAIR APOSTOLAKIS: Oh, his John, okay.

MR. BRADLEY: And, again, we should

compare the baseline for the change evaluations to be the existing CLB and not a hypothetical plant that is fully compliant.

We had a lot of comments on 1.205. We haven't seen the revision. We don't know if they were addressed sufficiently to, you know -- and I'm not saying we expect every comment to be addressed to our satisfaction. But it would certainly be nice to see, given the importance of this, where this ended up. And possibly to have another shot at looking at some of these comments based on what we've heard today.

Again, you know, we mentioned a scheduler component of this is difficult. There is a sense out there that we have been noncompliant although I think that is debatable. And because of that we have enforcement discretion that expires and tremendous incentive for plants to get out this box. So --

MEMBER SIEBER: Well, that brings up the question how does this whole process fit into the enforcement discretion for associated circuits? And how does that lead to resolution? What is going to happen?

MR. BRADLEY: Yes, and that's out of my school. But John --

MEMBER SIEBER: Yes, but it is not out of

mine.

MR. BRADLEY: Yes, that's a good question.

MEMBER SIEBER: And I think that is a big issue the way I see it because it determines what the baseline is unless you ignore the fact that enforcement discretion is really there. And it is not obvious how, in amongst all this jumble of stuff, you've put that in there, too, to make it another power of ten more difficult.

So if somebody could answer it, that would be okay. If not --

MR. BRADLEY: I'm just the PRA guy here. We have experts on that aspect of it that may want to speak to that. I don't know.

MR. BUTLER: Are you referring 805 pilot plants or 805 plants utilizing the circuit failure methods 00-01? A non-805 plant utilizing those methods can proceed forward. They are the ones who need to get that accomplished within 36 months.

The schedule for accomplishing those analyses within an 805 schedule are probably very challenging. But --

MEMBER SIEBER: I think that --

MR. BUTLER: -- I'd have to kind of refer to the -- those who have a little bit more experience.

CHAIR APOSTOLAKIS: Jack, would you repeat what the issue is?

MEMBER SIEBER: The issue is -- the way I look at it is your current licensing basis is the approved and, in some ideal sense, sets the baseline for the risk. On the other hand, current licensing basis has some flaws in it. And those flaws are exemplified by the fact that the staff is granted enforcement inspection over associated circuits issues.

MEMBER RAY: And discretion, enforcement discretion.

MEMBER SIEBER: Right. I used the wrong word but perhaps that expresses the meaning. And to me that clouds what the baseline is.

CHAIR APOSTOLAKIS: I see.

MEMBER SIEBER: And I'm curious. I think that has to be resolved some place in this thing. And I don't see how you can move past that point until you have that resolution in hand.

MR. BRADLEY: Well, yes, I mean to the extent we're dealing with previously-approved actions, I mean the question is are you compliant or not. What is your CLB? And those are more licensing-type questions.

MEMBER SIEBER: Yes, but the compliance with the rule is a licensing kind of thing, you know.

MR. HUTCHINS: If I could make a comment -- Steve Hutchins from NEI -- there are two distinct different enforcement discretions. 805 has its own enforcement discretion which expires six months after the second SER is issued. Non-805 plants are under the EGM, which is the second enforcement discretion for mobile spurious. So they are two distinct things.

Right now the 805 plants are using NEI 00-01, Rev 1, to do their mobile spurious review, not Rev 2. So there are two distinct discretions.

MEMBER SIEBER: Well, it seems like we are preparing lifetimes of work for young people.

(Laughter.)

MR. BRADLEY: Yes, we are. We're doing some good.

My final bullet, and I'd probably like to correct this bullet on the basis of today's discussion, I'd like a little stronger bullet there that says we should have another opportunity to see 1.205 before it is issued even for trial use.

Certainly I don't think it is ready to be issued final. And this bullet was actually written before the additional issue came up on previously-

approved manual actions.

So, John, unless you have something further to add, I'm going to turn it over to Ken.

MEMBER BLEY: But before you turn it over --

MR. BRADLEY: Yes?

MEMBER BLEY: -- I just want to clear up a little bit back on your fourth slide, you don't have to pull it up --

MR. BRADLEY: I don't mind.

MEMBER BLEY: -- you talked about the immature state of fire PRA and the drive to modifications that might not be justified. On the one hand, fire PRAs have been around for almost 30 years now. Maybe they didn't move as fast as we wanted because many people didn't do them, which is where you learn a lot.

But we had that major effort between NRC and EPRI. And now we've applied that approach to fire PRA.

When you do that and you get a result that looks high, what is the prudent thing to do?

MR. CANAVAN: Well, if it's -- I mean my presentation is going to go mostly to that.

MEMBER BLEY: I'll be happy to wait.

MR. CANAVAN: So if you could indulge me for a few minutes --

MEMBER BLEY: I don't forget.

MR. CANAVAN: -- and I hope you don't.

MR. BRADLEY: There are cases where we're going to find fire risk is a real contributor. Certainly we're going to find. I mean for no other reason than you only have one train of protection versus two for most of the other things we look at. So I'm not sitting here telling you it is always going to be insignificant even once we fix these models.

MEMBER BLEY: And if it is, you ought to be able to make a good case for that I would think. But go ahead.

MR. CANAVAN: Okay.

George?

CHAIR APOSTOLAKIS: Yes, sir.

MR. CANAVAN: Always a pleasure to speak before the Subcommittee.

CHAIR APOSTOLAKIS: Come on.

MR. CANAVAN: Last time I was here, our time was short so I sort of started a presentation in the middle, having assumed that you had heard a lot about our efforts in the area of fire PRA methods development.

And I think I was remiss in starting in the middle because we left out all the good parts. And hopefully I'll have the opportunity to spend a little bit more time today -- not crazy time but a little bit of time to clarify the record in a few key areas.

So my first slide, I just started with some slides that we gave to the Commission back in May or June of last year. And that is a little bit on the EPRI PRA fire PRA philosophy, which I'll go through these relatively quickly but we are consistent with that policy statement.

And we are committed to that risk-informed performance-based approach to fire protection. That includes our realistic inputs and realistic methods and a way to monitor our feedback. And I'm going to keep stressing that because when I say monitoring feedback, I don't necessarily mean just data. That's one way of monitoring feedback. The other monitoring feedback is to improve the methods.

Next slide. Consistent with this, EPRI and NRC developed the 6850 or EPRI 1011989 -- thanks for remembering that this morning, Steve -- in a collaborative effort. And that piece of work was a significant improvement over existing methods in fire

PRA research. And pieces of that were piloted at a variety of units. And it was not until we piloted our first two what I'd call integrated pilots, Oconee and Harris, did we come to some newer conclusions that we had long suspected and that were not unexpected. And I stress not unexpected.

This is the first time out of the box for these methods being applied in an integrated fashion. And we expected to see extremely large core damage frequencies and we expected those to be conservative as a result of all the individual minor to moderate conservatisms that were made along the way. None of this was a surprise.

What was a surprise was that our first risk-informed initiative would be NFPA 805, almost a risk-based application of a method that is under trial development. So we didn't have the 15 years or 20 years that the IPE has gradually worked their way into PRAs and gradually became applied in varying degrees of necessary rigor coming from the PRA and coming from deterministic blends. We jumped right to using an untried method in a full-blown regulatory application.

And what you see here is not a result of the people who developed the methods not being fastidious. It is a result of the people who

developed those methods with purpose are into the conservative area of the method and moving on and deciding that if the application of that part of the methodology was determined to be too conservative or impact the result, it would be refined.

The problem then becomes the first risk-informed application has a time limit. That time limit creates a situation in which as the methodology begins to improve, we need to handle issues on a very rapid basis.

And the initial first-identified several issues are not small items. They actually range from -- actually we picked a spectrum. It was a couple of small ones but some pretty big ones here like how do you handle fire ignition frequencies, credit for some incipient detection or new methods, and treatment of large oil fires, et cetera. All these entered what was called a frequently asked question process.

That frequently asked question process involved members of NRC RES, NRC NRR, EPRI, EPRI contractors, and vendors, as well as the owners groups in trying to get interim solutions on all these issues. And those several issue that you see have been solved. The top three were documented in EPRI 1016737. And all of them were documented in the FAQ

process in a public way.

The reason why 1016737 was published was there was difficulty reaching consensus at the time. And time pressure and the thought of involving others was the basis for publication of that document.

CHAIR APOSTOLAKIS: It is interesting though that we're still talking about fire ignition frequencies.

MR. CANAVAN: There you go.

CHAIR APOSTOLAKIS: The first paper was published in 1981.

MR. CANAVAN: It's been revised in --

CHAIR APOSTOLAKIS: More than ten years ago.

MR. CANAVAN: -- '84 or '85 time frame. Yes. It's been revised several times. I think we're still there. If you go to the next bullet --

CHAIR APOSTOLAKIS: What is the difficulty, Ken? Why can't we say, you know, for this room, for this thing, here is the reasonable distribution of the frequency. I mean --

MR. CANAVAN: I think there are two difficulties. One is the fact that engineers never throw anything out. And that's something that we need to do in the fire ignition frequencies. We need to

throw events out.

You know there are events in the database which we like to keep and we like to retain because they provide some level of information. On the other hand, they are not real fire events. They are events that on paper look like fire events.

And I think there are a few other problems. Our penchant for being a little conservative because we are in nuclear power creeps up on us here and we tend to try and keep those events because we figure okay, well something could have happened. It did not but it could have. So we'd like to retain it.

The problem is when the time comes to screen it out from the couldn't, you know didn't develop, we have a problem with that, too. So I'll get to a timeline that explains it a little bit more in a minute. And I will talk about information quality. We do suffer from the fact that the older fire records are certainly incomplete.

And that people were asked to make judgments on events without full description. They did a decent job.

The other part --

MEMBER BLEY: Can I take you back to what

George said?

MR. CANAVAN: Sure.

MEMBER BLEY: And I don't remember what came out in those reports. Did those groups come up with distributions for the ignition frequencies? Or did they try to make a single estimate that would be applied?

MR. CANAVAN: Our emphasis was on a point estimate.

MEMBER BLEY: See I think if one brings in that uncertainty approach, you can still give credit to those -- some credit to those things that are uncertain of their actual applicability but get much better estimates.

CHAIR APOSTOLAKIS: More it is certainly more defensible.

MR. HYSLOP: 6850 produced distributions, not point estimates.

CHAIR APOSTOLAKIS: Who are you?

MR. HYSLOP: My name is J.S. Hyslop from Research. And 6850 produced distributions.

CHAIR APOSTOLAKIS: Say your name again.

MR. HYSLOP: J.S. Hyslop of Research.

CHAIR APOSTOLAKIS: And now what is your point?

MR. HYSLOP: That -- I think there was a comment about 6850 to produce point estimates or distributions. At least that's what I thought I heard.

MR. CANAVAN: Yes.

MR. HYSLOP: And so I'm responding that it produced distributions for fire frequency.

MR. CANAVAN: Yes. The estimates --

CHAIR APOSTOLAKIS: Why then are these distributions still debatable?

MR. CANAVAN: Because the -- you can develop a distribution but if the input data is suspect or not representative of or conservatively classified --

CHAIR APOSTOLAKIS: From Day One, which goes back to the Indian Point fire PRA back in 1980, one of the most controversial parts was if normally there are no combustibles in that room, can you assume that there will be some human error or something and there will be some combustibles?

And there were three or four incidents at the time when they found oil where it is not supposed to be and so on. And that was very controversial. You know I remember arguing with the guys from New York.

So I mean that is something that probably cannot be resolved definitively.

MR. CANAVAN: I agree completely that there might be events that are, quote, borderline.

CHAIR APOSTOLAKIS: But you can't rely on statistical evidence of actual fires. I mean there are other things.

MR. CANAVAN: Well, actually the database contains 2700 or 2900 events or so through just 2000. And when you look at some of those events, you would conclude that they -- I think you can conclude they have been conservatively classified. But they were not actually fires.

For example, if a relay smoked and didn't --

MEMBER BLEY: All that effort didn't purge those from --

MR. CANAVAN: Again, conservatively classified because when they contribute -- again, I believe that they were conservatively classified because when it was felt that something contributed, we could remove them at a later date. We could address them.

MR. HYSLOP: There was a category -- J.S. Hyslop again -- there was a category called

undetermined. And for some of these cases where there was little information provided, it was placed in that category. And those related half of the amount of the potentially-challenging fires. So there was a gradation in an attempt to recognize that some fires have more evidence than others. And some are definitely potentially challenging where others don't have that same amount of evidence.

CHAIR APOSTOLAKIS: John?

MEMBER STETKAR: I think the problem -- and there has been some work done on this -- is that the fire database that is used to support NUREG/CR-6850 includes all fires back from 1968 through 2000.

Having done quite a bit of looking at the records in the '60s and '70s, even the early '80s, you do find many, many records where if you just do a word search on an LAR, something is called relay smoked and there is no further elaborations. No more information.

And an engineer who reads that says well, I don't know whether this was a fire or not. So I will count it as a fire. Or if I assign a weight, maybe I will assign it a 30-percent weight that it was a fire. If I have three of those, suddenly I have a fire.

What you find is that beginning in the early 1980s where reporting requirements A, became much more stringent, and B, you know, it was the early 1980s, so it was after the Browns Ferry Fire. People were paying a lot more attention to the oh, the word fire in their reports.

You find a lot more useful information in the reports to support your ability to screen those events whether they were an actual fire, the extent of the fire, and so forth. So the data -- your ability to use the information after the early to mid-1980s is substantially better than your ability to use the information pre-1980s.

Now what does that mean in practice? Well, what it means in practice is that someone needs to make a decision about some cutoff date prior to which you basically don't use the information for a variety of reasons.

It is pre-Browns Ferry fire experience so the plants were not applying the same level of vigilance to fires, they weren't reporting the fires in the same amount of detail, and the amount of information in the raw data that you have is just not there.

So I think that there is some merit to the

argument that the data that is used in NUREG/CR-6850 may have an element of conservatism in it despite the fact that indeed there are uncertainty distributions, which is certainly good.

On the other hand, subsequent analyses that don't account for the uncertainties are flawed worse than the NUREG/CR-6850 analyses because, indeed, there are huge uncertainties in the fire frequencies. Just saying that well, if I look at the data from 1985 through 2005 and here is a point estimate of ten to the minus four fire frequency for a particular type of fire --

MR. CANAVAN: Right.

MEMBER STETKAR: -- doesn't solve that problem.

MR. CANAVAN: Well, and I'll take the issue. In handling the FAQ, which is listed in our bullet there, there was a report and then a subsequent NRC EPRI MOU meeting where this was discussed and we did work out a cutoff date that eliminated -- I think it was 1991 -- 1990 that we agreed to. And all the events prior to 1990 were removed from the database.

However, I'll still note that even within the database, there are conservatively-classed information that I do not believe personally represent

a significant or challenging fire. And the information is there to determine whether or not it is. And in your backup material under ignition example, I included two of those events under the electrical cabinet fire example.

So just two events that I chose --

MEMBER STETKAR: I think we also have to be careful of cutting it off at 1990 because there were a lot of valid fires in the '80s that were quite well known.

MR. CANAVAN: Well, we did statistical --

CHAIR APOSTOLAKIS: I don't like the idea of cutting off based on a year. I can understand the problems that you are guys are mentioning and maybe do it on an incident-by-incident basis.

MR. CANAVAN: It was done on a statistical basis where there was an inflection in the curve.

CHAIR APOSTOLAKIS: It doesn't say everything --

MR. CANAVAN: Sorry?

CHAIR APOSTOLAKIS: But again, the issue you are raising though, I mean is there going to be resolution of any kind?

MR. CANAVAN: Yes. I'll get to the resolutions at the end. I realize there are a lot of

questions.

But what, George?

CHAIR APOSTOLAKIS: Why didn't that happen in 6850?

MR. CANAVAN: Again, we were -- we just had our two pilots. So they are not even done yet as far as I can tell. And so the pilots aren't done. The two pilots are Oconee and Harris being done for 805. And they used this database. And the point of the pilot is to get information to revise the pilots. And we're off doing that.

MR. HYSLOP: Yes. I think, you know, as a part of this -- I don't mean to take over too much of your presentation, Ken, but --

MR. CANAVAN: That's okay.

MR. HYSLOP: -- as a part of this EPRI research program, we're collecting additional data beyond 2001. We're going to be folding that in.

I think the pre-1990 data in your presentation went into the development of a prior distribution --

MR. CANAVAN: Yes, we used it as a prior.

MR. HYSLOP: -- rather than being thrown away. So, you know, that's part of the program to collect more recent data. This is data that we have.

We'll have more fidelity. We will be able to follow up on it. We will be able to do the types of things that you were talking about in terms of, you know, getting better information and having more confidence in classifying them.

MR. CANAVAN: Yes. And I probably shouldn't rush. I probably should take the necessary time to explain that if you look at EPRI 1016735 and the frequently asked question resolution to the fire ignition frequency FAQ, which is 080046 or 48, one or the other, in that there is a full description of how it was resolved.

Basically, statistically the ignition frequencies were looked at and the inflection point was found in the data, statistical tests applied, and the data prior to 1990 was used to form a prior, which was updated with the data after that. And I believe distributions were developed for all of that.

CHAIR APOSTOLAKIS: It seems to me that some of the issues that you have there in the continuing work will just refine the distributions if you have them. It will bring more recent data into it.

MR. HYSLOP: Right.

CHAIR APOSTOLAKIS: But I don't see a

revolution happening there.

MR. CANAVAN: This is an evolution.

CHAIR APOSTOLAKIS: Evolution.

MR. CANAVAN: This is an evolution.

CHAIR APOSTOLAKIS: When it comes to hot shorts, maybe in suppression and so on, I think there you might argue, hmm, you'll have a better argument that you may be very conservative. In other words, the fire frequency --

MR. CANAVAN: Factors of three.

CHAIR APOSTOLAKIS: -- how much can it change? That's my point that --

MR. CANAVAN: Three to five.

CHAIR APOSTOLAKIS: What?

MR. CANAVAN: Factors of three to five.

CHAIR APOSTOLAKIS: Oh, even that, I think --

MR. BRADLEY: It is the compound effect of these that really has the impact individually.

CHAIR APOSTOLAKIS: We have to have a closure at some point.

MR. BRADLEY: Okay.

CHAIR APOSTOLAKIS: And they're saying we've been working on frequencies now for 28 years.

MR. BRADLEY: Right.

CHAIR APOSTOLAKIS: And I don't know. I mean if we do what J.S. just described --

MR. CANAVAN: We are doing that.

CHAIR APOSTOLAKIS: -- are we going to be --

MR. CANAVAN: We are doing what J.S. described.

CHAIR APOSTOLAKIS: And when will that be closed? We'll say now we have a good set of distributions of fire frequency.

MR. CANAVAN: That's a really good question. We're looking at the first half of 2010 to have a new version of that.

CHAIR APOSTOLAKIS: So in five, six months, seven months, eight months.

MR. CANAVAN: Okay, yes, months.

CHAIR APOSTOLAKIS: Not 28 years.

MR. CANAVAN: Months, not 28 years.

CHAIR APOSTOLAKIS: Okay.

MR. CANAVAN: And, you know, everybody says we've been working on this but I'm not aware of how much work we've doing over the last many years. I think we were doing a little bit of work.

And along came 805 and now we're doing a lot of work. And we're doing a lot of work in a

really short period of time.

And along with these initial issues which, as George points out I think correctly, a lot of these are sort of evolutionary. We're evolving the method. We're not -- there's no revolution here. But there are a few revolutions coming.

And some of emerging issues that are listed here are quite significant. And they have been around even longer than 28 years. Fire growth and propagation, heat release rates are some of the issues. Fire modeling will be some more of the issues that we'll probably see as we go down the road.

CHAIR APOSTOLAKIS: So what is the probability of a hot short?

MR. CANAVAN: Well, there would be another revolution. AC or DC circuit? Because there could be a difference.

CHAIR APOSTOLAKIS: Yes, it was .2? Okay. So this is a blank slide. That's good.

MR. CANAVAN: Okay, we'll I'm taking you back. And I'm not sure how comfortable I am taking you back to June but I guess the example that was began back there, I took the liberty of taking that example and flushing out some of the details and making myself another target for some of the thoughts

but showing you some of the areas I think that need to be continued and improved.

And what we did here was we pulled together a quick timeline and the timeline looks from the adverse condition to the fully-developed fire. And if you look at the -- when the adverse condition occurs, that can be something like a relay starting to overheat. So the relay becomes hot.

And over a period of -- over some period, that relay begins to become damaged. And so over some period of time, we have minimal damage occurring to the surrounding area but perhaps some damage occurring to the relay.

During this period of time, there's no other components that are damaged. And this is the incipient indications. And those indications are heat. Maybe there is pre-pyralisis products given off, in other words the pre-combustion products can be given off.

And then eventually that heating relay starts to smoke and smolder. And that is when the "event" occurs. And in that particular case, the component usually starts to become damaged. At this particular point in time, it also becomes possible for people to start smelling or seeing the fire.

If the fire should grow and propagate beyond the component, we then see that the component -- the panel that the component is in can then become damaged or lost. And should the fire continue from there, we might get some targets that are damaged, potentially cables, for example, on the further side of the room may become enveloped in a hot gas fire.

The timeline looks sort of like this. Adverse condition can be days or weeks. Sometimes even months before we get to where smoking and smoldering occurs and component damage from that onset is usually in terms of hours.

And then potentially-challenging fires can be tens of minutes from that smoking. And then when we look at fully-developed fires, typically that is on the order of sort of minutes. And this is just to give you an order of magnitude time scale.

MEMBER BLEY: I mean this kind of makes sense. And most of us have seen equipment in various changes along here.

MR. CANAVAN: Right.

MEMBER BLEY: Do you have a set of experiments that have watched this? Or is this just some guy sitting around saying I think this is what happens? I thin it is tens of minutes.

MR. CANAVAN: We have -- don't have any -- we have experiments that we've done for many other purposes where we have actually had trouble getting it to change through these various damages of fire.

MEMBER BLEY: This is such a nice smooth continuum. I'm not at all convinced that this is the way --

MR. CANAVAN: Well, that's why we left it sort of fuzzy at the ends and overlapping.

MR. BRADLEY: This isn't a high energy kind of fault.

MR. CANAVAN: Yes. This is an electrical fire, a cabinet --

MR. BRADLEY: Right.

MR. CANAVAN: -- progression, not a high-energy fault. So this is one of --

MEMBER BLEY: This is not -- it looks nice. It's just not at all clear to me this is the way the real world --

MR. CANAVAN: I actually wrote in panel here because it is specific to an electrical panel, not a high energy arcing fault or other energetic electrical problems.

And I don't believe it is as smooth as this. I believe that minimal damage can be anywhere

from hours and days and weeks to something that transitions. And component damage can be on the order of hours to minutes, depending. So these are all overlapping.

MEMBER BLEY: We found relays, you know, completely charred. And there was never a fire.

MR. CANAVAN: Yes. Well, I guess that was my point with putting should the fire progress as I was speaking. And one of the things of showing this is I wanted to show that in the database, when you look at the database, going back to that, when we look at the minimal damage and the component damage areas, 90-plus percent of the events that are in the database are in that area of this curve.

As a matter of fact, none of the electrical panels proceed to target damage. We don't have a fire that goes to target damage in the database. All those fires are somewhere in between component damage and panel function loss with very few becoming panel function loss.

So when we look at the data that created the prior that is used -- that created the prior and the frequency for the fire electrical panel, what we find is that there are actually very few events that went there.

But yet the ignition frequency is used exactly as that, it is used as an event that went to target damage. Because when we model in the PRA, and it starts the ignition, it is assumed to be capable of going to target damage.

And then what we use is the database to figure out well, when was that event -- sorry -- when was that event detected? When was it suppressed? So we start looking at okay, here is the plant response. They detected it at some place hours or minutes before the event or around the event.

And the reason why it goes before the event is perhaps you can smell the fire. And then that smoldering occurs and then -- and perhaps it is visually detected or perhaps it is detected with smoke detectors. And then there is some point in time after detection that operators can then respond in a brigade response.

And then we look at the brigade response window and this flowchart was largely made to describe incipient detection and how it can be useful extending the response window into the time at which incipient indications are available. So that's why you see --

CHAIR APOSTOLAKIS: So you are proposing then that we do more of a time-dependent modeling of a

fire incident, which I think, you know, time was always embedded in these evaluations. But this is more explicit.

MR. CANAVAN: Well, what I think I'd like --

CHAIR APOSTOLAKIS: And also where in the data. I think you made the point that at one phase, we have data but we've never seen the actual target damage --

MR. CANAVAN: Right.

CHAIR APOSTOLAKIS: -- which may have implications in the way we do calculations.

MR. CANAVAN: I think -- yes, I think the answer is yes. I think what is missing from the current PRA studies is we do a database that results in our getting the ignition frequencies. That database also supplies the suppression probabilities.

And then that database that supplies the suppression probabilities then also supplies -- that is assumed to result if the fire is not suppressed. It is presumed to grow and propagate with a 1.0.

So that -- every event that appears in that database, that smoldering relay, for example, that may or may not have turned into a fire, is assumed to have to be suppressed over some period of

time. So let's say the relay -- let's say somebody opened the cabinet, that the relay was smoking, and they stood there and they watched it smolder for an hour. And they declared the fire out an hour later.

That hour is used as the suppression time. That's how long it took to suppress that fire. That's what is in the database. And if you look, you can find events like this. I'm not saying every event is like this. Some events are.

But then that event just models in the PRA as not being suppressed for an entire hour. And then that event is modeled with a peak heat release rate assumed one foot underneath the top of the cabinet. And then hot gas layers are modeled in the fire model, that damaged to target.

So the smoking relay that never became a fire, that didn't really require an hour to be suppressed, eventually becomes the raging inferno that fails the other cabinets.

And so what are we doing? We need to interdict this event sequence somewhere along the line. Can we include all the smoking relays in the fire ignition frequency? The answer is yes as long as you take them out appropriately in the suppression.

But we've erred a little bit

conservatively in each one of those steps. And so while each step individually is probably not all that bad, some of them need to be fixed but they might not be terrible by themselves. Collectively, they turn the smoking relay into the raging inferno that damages Division Two cables.

Now this isn't always the case. If you go in the database, you can find real events that really did burn up. They really did cause a fire in a cabinet. They may or may not have propagated. That's the rarity not -- that's the exception, not the rule.

And our conservatism has made it more the rule by us calling fires that may or may not be challenging, challenging. Us calling fires that lasted for 60 minutes that were controlled, calling them unsuppressed because they were controlled.

CHAIR APOSTOLAKIS: Yes, that was a point that was made with Browns Ferry, too. I mean if you look at the actual time they put out the fire, it is more than seven hours from the beginning.

MR. CANAVAN: Yes.

CHAIR APOSTOLAKIS: But for, I don't know, six-and-a-half hours, they knew that no more damage would --

MR. CANAVAN: Right.

CHAIR APOSTOLAKIS: -- occur. So it is not really a fair thing to say seven hours.

MR. CANAVAN: Right.

CHAIR APOSTOLAKIS: I notice you don't have any recovery actions in the diagram. But that's --

MR. CANAVAN: There's no such thing.

CHAIR APOSTOLAKIS: Can you speed it up, Ken?

MR. CANAVAN: I'm almost done.

CHAIR APOSTOLAKIS: You're almost done?

MR. CANAVAN: I am almost done.

CHAIR APOSTOLAKIS: So you are going to skip some of these other slides?

MR. CANAVAN: I think Biff has made a really good point on many of these. And I spoke to these.

CHAIR APOSTOLAKIS: Okay. We agree with the methods and all that. That point has been made.

MR. CANAVAN: But I do want to be very careful here because the one thing I want to caveat is I gave you an example of a smoking relay. And in the backup slides, there are some database examples of what is really in the database.

But I want to point out there are also

real fires in the database. We shouldn't -- you can't -- we just need to be a little bit less conservative than we were the first time through. And a little bit more conscious about what our classifications do to effect this.

And we need to add additional information to the database. We need to add more current and more detailed information so that we can appropriately map our PRA -- our events to our PRA.

And one -- just to mention one other thing, one of the pilots mentioned to me that one of the things that we should do when we are done with our PRA, at least one thing that should happen is we should be able to see the past in our study as being screened out and going to an appropriate -- we should be able to map all those events and those events shouldn't go to core damage. They should fall out where they would if we would have mapped them and modeled them in an appropriate sequence.

And, again, we're getting there. And that's why I want to bring us to our efforts to date. I want to say that EPRI and NRC specifically RES have been expending considerable resources to address all these issues and improve the methods.

There are members of the national lab,

members of various consulting organizations who are participating this effort. And over the last 18 months, we've made some recent advances in closing out some of these FAQs, including the interim solution on the ignition frequencies.

Consensus is always hard to get. We always have that issue. I think that that is specifically challenging in this case because this is a regulatory initiative. And the tendency to be conservative in a regulatory environment is understood and expected. The problem is --

CHAIR APOSTOLAKIS: In other words, you don't have a tendency to be optimistic, do you?

MR. CANAVAN: Well, certainly not if you might find out later that it wasn't the situation that you perceived. But I would argue --

CHAIR APOSTOLAKIS: Let's not accuse conservatism all the time. I mean --

MR. CANAVAN: Right.

CHAIR APOSTOLAKIS: -- it is a problem that is reached eventually.

MR. CANAVAN: Well, I think in the case of the PRA, what we should shoot for is we should shoot for realistic.

CHAIR APOSTOLAKIS: The presentation of

the current state of knowledge.

MR. CANAVAN: Of the current state of knowledge.

CHAIR APOSTOLAKIS: I agree.

MR. CANAVAN: And the rest should fall into our area of our uncertainty and our sensitivity studies.

CHAIR APOSTOLAKIS: Sure.

MR. CANAVAN: And that we should allow the regulation to be conservative such as self approval at 1E to the minus seven, which is a pretty small number.

CHAIR APOSTOLAKIS: Of course I don't know what your last bullet means in terms of NFPA 805. I mean Biff referred to the urgency that is coming from above.

MR. CANAVAN: Oh, I understand the urgency there. But I'm trying to do PRA methods. And we'll make them happen as quick as we can.

CHAIR APOSTOLAKIS: Okay.

MR. CANAVAN: And hopefully they will be supported.

CHAIR APOSTOLAKIS: Very good. So you are complete then, sir?

MR. CANAVAN: My last part is --

CHAIR APOSTOLAKIS: As stated before, Ken,

could you move on?

MR. CANAVAN: -- our future activities.

CHAIR APOSTOLAKIS: Because I have two guys waiting to speak.

MR. CANAVAN: Yes.

CHAIR APOSTOLAKIS: And we're already late. Do you have anything to say that has not been said before?

MR. CANAVAN: Well, one other item.

CHAIR APOSTOLAKIS: Sure.

MR. CANAVAN: We're involving the owners groups in all these activities. I want to make sure --

CHAIR APOSTOLAKIS: I'm sorry. What was that?

MR. CANAVAN: We're involving the owners groups in these activities as well.

MR. BRADLEY: I just wanted to note there is a lot of work planned here, as you can see.

CHAIR APOSTOLAKIS: Yes.

MR. BRADLEY: We're not -- we recognize the issues with taking action to try to get better models. We're not just sitting back and complaining about them. We're trying to make this result better.

CHAIR APOSTOLAKIS: We appreciate that,

yes.

MR. CANAVAN: And more data in March. I gave you a better date on the slide. And the conclusions we've been through.

CHAIR APOSTOLAKIS: Very good.

MR. CANAVAN: That concludes my remarks.

CHAIR APOSTOLAKIS: Mr. Dinsmore and Mr. Laur are here. Do you mind if we take a five-minute break?

MR. LAUR: Not at all.

CHAIR APOSTOLAKIS: Steve?

MR. DINSMORE: Okay.

CHAIR APOSTOLAKIS: Okay. All right. We'll take a five-minute break.

(Whereupon, the foregoing matter went off the record at 4:53 p.m. and went back on the record at 5:05 p.m.)

CHAIR APOSTOLAKIS: We are back in session. We'll hear from Mr. Laur and Mr. Dinsmore on a few comments they want to make.

MR. LAUR: Yes, thank you.

CHAIR APOSTOLAKIS: Who wants to go first?

MR. LAUR: Me. That way I can be first out the door.

CHAIR APOSTOLAKIS: Okay.

MR. LAUR: Okay. Steve Laur still. Senior Level Advisor in the Division of Risk Assessment, NRR.

I'm here basically to talk about a differing professional opinion that I submitted per Management Directive 10.159. And the reason for that has to do with I guess intensive and continuing discussions within the staff pretty much regarding how to handle the additional risk of recovery actions that are previously approved.

I fully supported what we issued as a draft Reg Guide in February. In discussions since that time and the public comments and with the Office of General Counsel, we've had several iterations.

The version that we sent to the ACRS on the 30th of -- I'm sorry, excuse me, 30 days prior to this meeting --

CHAIR APOSTOLAKIS: Thereabouts.

MR. LAUR: Thereabouts, yes, we were a little bit late -- had some issues with it. Actually I believe Steve's slide will cover that because the issues were virtually the same.

So what I want to take my time to do is to basically step back and look from a higher level and make some comments on, I guess, lessons learned not

just from the DPL but from this -- from this -- at least from my involvement in this entire rule. And I'd like to look at alternative rules in general.

An example could be 10 CFR 50.69 for special treatment. Another example could be the alternative source term. And one example, of course, is the risk-informed, performance-based fire protection.

It is not clear to me -- one of the fundamental things that I've been trying to strive for in my short involvement with this is to have a clear set of requirements such that if I look at something, if an inspector looks at something, if a licensee looks at something, or the general public looks at something, there is a common understanding that compliance has been achieved.

And this thing about carrying over from one set of requirements to another, it's not clear to me that mixing and matching these individual requirements always is guaranteed to assure adequate protection.

And I've got the two sub-bullets there. I won't read them but the bottom line is a hybrid approach could hit all the necessary elements in one case and other necessary elements in another but they

may not, by picking and choosing, still cover all the bases.

The statement of considerations of this rule goes through a great deal of effort to say these two are different however it is okay to use 805 because -- and it goes through all the points of how a GDC3 and 10 CFR 4048(a) would be met by a risk-informed common space plant.

CHAIR APOSTOLAKIS: But are you -- I mean, the plants are licensed to operate. Some of the recovery actions have been approved. What do you mean by mixing? I mean are you saying that these should not be carried over to the new licensing basis? Is that what you are saying?

MR. LAUR: Yes. Although I fully support --

CHAIR APOSTOLAKIS: But they have been approved.

MR. LAUR: -- the position we put out today as well. But it is kind of kludgy.

CHAIR APOSTOLAKIS: But they have been approved, Steve. I mean this agency has been accused many times that it is not -- that there is no regulatory stability. Now we're going to start taking things we approved and say well, no, we don't like

them anymore.

Don't you get some -- I don't know, I mean that is an issue, isn't it? We can't just drop things we have approved and say well, there is this new standard now.

MR. LAUR: But that's not what we're doing.

CHAIR APOSTOLAKIS: I'm trying to understand that.

MR. LAUR: That's not what we're doing.

CHAIR APOSTOLAKIS: Okay.

MR. LAUR: What we're doing is offering two alternative rules, either one of which the Commission has decided affords adequate protection.

CHAIR APOSTOLAKIS: Okay.

MR. LAUR: Okay? And in this particular case, they are very similar. The deterministic requirements of Appendix R and the deterministic requirements here are identical if you talk to some people.

But there are obviously differences when you get down to the details that I don't understand. But they look the same -- 20 feet, three-hour barriers, that kind of stuff. So it gets a little confusing.

But just conceptually saying that this set of rules is okay and this set of rules is okay does not mean that one from Column A and one from Column B is okay. And so that if I have a voluntary choice of complying with these, my current licensing basis, or this new alternative rule, then I, as the licensee, am the one that actually decided to reevaluate.

And this particular rule, in the case of the previously-approved recovery actions, that paragraph we keep talking about, the additional risk of recovery actions, that's how you demonstrate compliance with this rule.

It says meet the deterministic requirements or show us that the risk of not meeting them, of your alternative, is acceptable to the authority having jurisdiction. That's the issue. And it doesn't say previously approved. It doesn't say -- it just says recovery actions have to go that route.

So that when an inspector comes into the room and says how does this comply, they're going to say well, it used to comply under Appendix R. He's going to look at your license and say but you don't have an Appendix R license. Your license condition says NFPA 805.

And that type of thing happened back when

we transitioned from Appendix A to Appendix R where inspectors actually questioned exemptions, if I recall.

So -- but this is my opinion. So I guess I have to preface that.

The other thing is one thing that led us down this path is a phrase called safe today, safe tomorrow. You can almost say that is a goal. That is to say we want the plants to be safe when they are conceived and safe when they are operated and safe up until they are decommissioned.

But it is not a philosophy, as I've heard it called. If it were a philosophy, we'd never have a generic safety issue. We'd never have a legitimate backfit. We'd never have new information about spurious actuations.

So -- but that is the key thing that people point to that says well, you've been approved today under this set of rules. And that's a check valve. That's a preexisting thing to which I can add additional changes.

Now I'm looking at it from a compliance standpoint. But the safety aspect comes in as follows. If I'm the reviewer for an exemption request under Appendix R and somebody says can I have a manual

action instead of protecting the circuit and I look at it and I say it is feasible and it somehow provides enough public safety, okay, that's acceptable.

Now maybe we'd make that same determination under the new rule but the new rule requires core damage frequency delta, delta LERF, and acceptable to the authority. Well, that wasn't done that way, okay?

But the other thing that is missing is most of these plants that are transitioning have significant numbers of variances from their current licensing basis. They don't meet their current licensing basis.

So this fire area that has one approved exemption for a recovery action may have three other exemptions -- excuse me -- three other non-approved recovery actions that if you don't factor it in holistically, you get a pass on this one that might be the biggest of the three and you get these little small increments on the other ones and we say oh, you meet the rule.

So it is not clear to me that it has been evaluated previously in light of what they are going to be allowed to carry over under NFPA 805.

And then the final bullet -- I'm not

trying to cut off a question -- I'm trying to be mindful of the time here -- the final bullet is I think we need to be careful in setting precedent. The biggest argument that we've had internally and with OGC has been just what you said. The staff granted this, therefore adequate protection is assured. And that's true as far as just looking at the one event but not as a whole.

The problem is it leads to possible a precedent in other areas. And an example recently, a licensee came in with -- or wants to come in with a alternate source term request. Okay, they have an existing exemption to a requirement under that rule that they said they want to carry forward.

Now since that time, it looks like they are going to voluntarily fix this. But the discussion we had internally was well, we can't make them comply with this new rule. It is a totally different part of 10 CFR 50.

But this idea of cherry-picking, like I say, it is not clear to me that unless it was explicitly thought out when the rule was developed, it's not clear to me that you have full coverage of all the aspects that were thought about when the Commission issued this to assure public health and

safety.

That's it.

CHAIR APOSTOLAKIS: I would say that perhaps a lot of these concerns would go away if we asked the licensee who wants to transition to do a fire risk assessment of the plant as it is today and we then look at that and decide whether it is acceptable or not -- the risk is acceptable or not. And forget about deltas from ideal plants.

I don't know why I would have to single out recovery actions and not look at other things that have been previously approved as I said earlier today. The installation of a fire barrier, I don't know how that was approved. I'd like to see a risk assessment.

So that would make much more sense to me. You use the word cherry-picking. It seems to me you are doing that by singling out the recovery actions and finding the risk of those. But everything else, because it is hardware-related, I will accept as being good enough. And I have difficulty with that.

By the way, your written exposition was much clearer than what you just said. But I understand the pressure of time. It made much more sense to me when I read it. You assume too much. You assume that we know too much in your presentation. I

was trying to catch up with you all the time.

Shall we move on to Steve and then maybe -- no, you don't have unless you want to leave.

MR. LAUR: I was going to pull his presentation up is all.

MR. DINSMORE: Okay. This is Steve Dinsmore from the PRA Branch in NRR as well. Just to segue a little bit, when you said, Dr. Apostolakis, that maybe we should just look at the total risk of the plant, that wouldn't be a bad idea. But we don't have any guidance on how to do that. I mean it is a big, complicated process. And that cuts the basis of --

CHAIR APOSTOLAKIS: I noticed that today, Steve and Steve. We are mixing technical arguments with process arguments, you know.

MR. LAUR: Right.

CHAIR APOSTOLAKIS: There was a question earlier to Sunil and he said well, but that's what the rule says essentially. The question though was more of a technical nature. So here again the same thing.

It would be nice to do it from the technical point of view but the rule says something else. And I'm really beginning to think that the standard has significant flaws but I don't know what

that means and -- well, I know what it means but in terms of regulatory process, I think that would open up all sorts of problems.

So both of you are taking, as a starting point, the existing standard. And you are interpreting what the standard says. And you reach your conclusions. So let's make that clear.

MR. DINSMORE: Yes, the existing standard in the existing framework that we are working within.

CHAIR APOSTOLAKIS: Fine.

MEMBER SIEBER: Well, just a quick question. During that process, is this evolving? Or are you developing a focus? Because I get the feeling that there has been changes in interpretation as time went on as to what to do and what it means, what the baseline is, and in the deterministic world, we're further along than that.

MR. DINSMORE: Well Steve mentioned earlier, there was a comment a long time ago from NEI about this phrase. So this phrase has been on the table since --

MR. LAUR: 2002.

MR. DINSMORE: -- 2002. And the possible difficulty of plucking out a special subset of stuff and treating it special.

CHAIR APOSTOLAKIS: Yes.

MR. DINSMORE: And at that time, it was kind of just -- it wasn't very well gotten rid of. The SECY just said something that we chose not to change.

But as far as my personal experience in this, which is where I was going to come from with this presentation, is I'm the APLA reviewer for Oconee. And as soon as Oconee came in with their pilot application, I was going through their submittal to see what was in there and comparing it what is in the rule.

And it popped out immediately that this number, which the rule says they should submit, was not in the application. So the first thing we did was went back and said well, where is this number.

So this has been on the table for probably at least -- it was either last October or the October before that. I'm not sure.

CHAIR APOSTOLAKIS: Anyway, coming back to your slide now, your first bullet there refers to I think a different issue. You are talking about --

MR. DINSMORE: No, he skipped to the second. I'm still setting up.

MR. LAUR: Oh, did you want to stay on the

first slide? I'm sorry.

MR. DINSMORE: I'm sorry. Okay.

CHAIR APOSTOLAKIS: So what questions can we have here? Is your name really Dinsmore?

MR. DINSMORE: Yes.

MR. LAUR: And it is misspelled.

MR. DINSMORE: Okay. So this issue came up a long time ago when we were trying to compare the submittal to the rule. So it really came into force at that point in time. The staff said hey, look, this number is missing.

And then the draft Reg Guide that Steve was talking about, it was put into the draft Reg Guide you need to do this calculation and the result will be summed and compared to 1.174.

CHAIR APOSTOLAKIS: Which calculation are you referring to?

MR. DINSMORE: The additional risk from recovery from previously-approved recovery actions that protect the success path. It is a small subset of recovery actions. I'm not quite sure how big it is but it is a set of these actions.

And we said well, the rule says that you need to calculate it. So if you are going to have to calculate it and give it to us, we're going to have to

accept it. So the draft Reg Guide said we're just going to add it together and accept it based on the change in risk from 1.174.

The Reg Guide that came over here not quite 30 days ago had been changed to simply say well, you'll do this calculation and you'll give us this number effectively. And so the DPO which I found was that is not enough.

And we can go to the second slide. And it is not enough because when we write a Safety Evaluation for this application, somewhere in that Safety Evaluation it's going to have to say well, the staff received this number and it is acceptable because.

And I don't know quite what to put for that because. If it is a small number, it would be easy. It's just well, that's a very small number. It's below this and that. But it could well be a pretty large number. And the indications are it might be a pretty large number.

So then each -- the reviewer is faced with well, okay, I have a fairly large number here. We'll have to discuss it. I have to either find it acceptable -- if I don't find it acceptable, I have to somehow go back through management and try to deal

with that.

CHAIR APOSTOLAKIS: That's because the guidance says calculate it? So there is no guidance as to what is acceptable.

MR. DINSMORE: That's right. That's one major issue.

CHAIR APOSTOLAKIS: You would like to see that guidance.

MR. DINSMORE: Yes, I think that that guidance should be provided in some form or format. But it needs to be provided.

CHAIR APOSTOLAKIS: Actually what it says now -- or at least from what we have heard today -- no matter what it is, it is declared acceptable because the recovery action has been approved.

MR. DINSMORE: Right. That's a new addition.

CHAIR APOSTOLAKIS: You are saying if I see something that is five times ten to the minus five, I'm not sure I would agree that that is acceptable.

MR. DINSMORE: Well, no, I'm saying that if I see something that is five times ten to the minus five, the SE would need to say well, five times ten to the minus five is acceptable because according to Reg

Guide 1.205, all such previously approved -- or the risk from all such previously --

CHAIR APOSTOLAKIS: Yes, okay, okay, I understand.

MR. DINSMORE: So it has to be very --

MEMBER RAY: I don't think it is just acceptable. It may be acceptable but in Region I, which puts you out the other side of the decision.

CHAIR APOSTOLAKIS: That's right. From the point of view of 1.174, it may not be. But right now it says because it is an approved thing, that's it.

MEMBER STETKAR: But I think we're talking about horizontal and vertical axes in 1.174. Right now, you are looking for acceptance criteria basically on the vertical axis, on a delta risk calculation and artificial starting point, that being that so-called ideal plant --

MR. DINSMORE: Well, I'm not sure --

MEMBER STETKAR: -- whereas there could also -- rather than thinking about it as an acceptance criteria and on that artificial delta, you could say well, they are required to calculate that delta. The rule is clear.

On the other hand, that that delta might

be acceptable if they meet 1.174 criteria on the horizontal axis as long as their overall plant risk is less than, you know, not Region I.

CHAIR APOSTOLAKIS: His argument is don't ask -- don't give me a number without telling me whether it is acceptable or not.

MEMBER STETKAR: That's right. I understand. I was just curious whether acceptability has to be welded to the vertical axis.

CHAIR APOSTOLAKIS: That is what the purpose is, I think.

MR. DINSMORE: It could be a total. It could be a total but we have no total.

CHAIR APOSTOLAKIS: Yes, the total. You are right.

MEMBER SIEBER: In order to find out where you are, you need to have them give you two numbers. You would have to have two numbers.

CHAIR APOSTOLAKIS: That's correct. That's another flaw actually. But anyway, keep going.

MR. DINSMORE: The only other two things I just wanted to briefly mention was that if we use acceptance guidelines for this additional risk, we actually might require changes that reduce risk beyond the more traditional risk-informed tradeoff of

identifying changes that reduce risk in order to implement other changes that increase risk.

In other words, built into this rule is -- it looks to me like there was some question about -- some people at least had questions about the -- whether these operator actions were really the best thing to let them do. And I wanted to revisit the risk associated with those actions. And perhaps get them to change.

And without any acceptance criteria on this subset, we probably are not going to get them to change. It would simply be well, we'd have to accept it.

And that last one is a little bit what Steve was talking about where if we get them to give us this number and we don't really do anything with it, these numbers are going to be -- kind of establish some type of new acceptance criteria that if some similar situation comes up in the future, licensees will simply say well, you've been accepting numbers like this for the last ten years.

So there is a lot of difficulties involved unless we get some type of acceptance --

MEMBER RAY: When you say you don't do anything with it, do you include the flowchart that we

saw earlier which said if it is Region I, I now require all future changes to be -- is that not doing anything with it?

MR. DINSMORE: No, that's completely new.

MEMBER RAY: Got it. Thank you.

CHAIR APOSTOLAKIS: So even you had not seen that?

MR. DINSMORE: I hadn't seen the write up. I'd heard the discussions, yes.

MR. LAUR: The DPOs were written on the version we sent you almost 30 days ago. This new position is, like I say, I can support it. I think it is kludgy. I think it is pretty obvious if anybody reads what it says, they'll want to transition the way we originally had it laid out so it encourages people to do it cleanly. But it does allow the carryover.

I didn't mean to interrupt your time. Sorry.

MR. DINSMORE: But that's -- I would agree with it, too. But it is just a matter of NEI wants to see it written down and finalized. And so do we.

CHAIR APOSTOLAKIS: Oh, so let me understand this. With these three slides we saw today, you would be happy?

MR. DINSMORE: Yes.

CHAIR APOSTOLAKIS: They meet your --

MR. DINSMORE: They provide clear acceptance guidelines that we can use.

CHAIR APOSTOLAKIS: Okay.

MR. DINSMORE: Sure.

MR. LAUR: So it is resolved.

CHAIR APOSTOLAKIS: So it is resolved.

MR. DINSMORE: Right.

CHAIR APOSTOLAKIS: Does anyone want to make a comment on what we heard? Staff first.

DR. WEERAKKODY: If you have any specific questions --

CHAIR APOSTOLAKIS: On what the two gentlemen presented. Presumably you are the management they disagreed with.

DR. WEERAKKODY: Yes, sir, we are.

CHAIR APOSTOLAKIS: So --

(Laughter.)

DR. WEERAKKODY: No.

CHAIR APOSTOLAKIS: Okay, that's fine.

Members? I'm sorry. I assumed you guys would jump in without --

MEMBER BLEY: I've got a couple of questions --

CHAIR APOSTOLAKIS: Sure, sure, sure.

MEMBER BLEY: -- that I want to just slip in.

One goes -- and I'd like to do them both -- one goes back to where George started. If you forget about the letter of 805 and you think conceptually about how you would have liked to have seen it, would you have applied the same logic that you have argued for for the other already-approved exceptions to Appendix R that you would have applied to the previously-approved human actions?

MR. LAUR: Well, actually we did. In one of our earlier drafts, not the public one, but actually some people will remember at public meetings I expressed that sentiment.

But it turns out there is written in 805 -- Harry had to show me where it was -- but back in Chapter Two, there is an equivalency thing for the deterministic criteria of Chapter Four. And so it is easy to say that if you had an exemption for 15 feet that the NRC has already determined that is an equivalent level of fire protection, which means you now meet, through this equivalency argument, the rule.

But the problem is, as I stated during the main presentation --

MEMBER BLEY: I was trying to ask you to

step away from the legal language of the rule and think conceptually about --

MR. LAUR: If I were to --

MEMBER BLEY: -- the two things.

MR. LAUR: -- this is naive but I believe that if it was up to me, I would say take your compliance with Appendix R through a Reg Guide 1.74 risk-informed change and that would be the new rule. I mean you wouldn't have all these strange permutations or gyrations.

MEMBER BLEY: I'm a little curious and I address my second question to the staff. Now I can read 4.2.3.1, which refers you over to 4.2.4.2 for how you do the performance-based approach. And that gives you criteria, which flips you back to 2.4.4.1, which says changes needed to be evaluated this way. Does anyone argue that since these aren't changes to the previous condition that that excludes it? And did the legal folks say on this -- now I'm thinking of the legal side.

MR. LAUR: Yes, that was argued quite vehemently. 2.4.4.1 has two major paragraphs on the report. That's the acceptance criteria. It says the additional risk of public health or whatever from any change shall whatever.

And then the second paragraph says, when more than one change is contemplated, additional requirements shall apply. It talks about bundling.

MEMBER BLEY: Right, right, right.

MR. LAUR: Okay. So you could read most of that to say that we're talking about changes. In fact the whole thing is in the plant-change evaluation section.

But when you get to 4.2.4.2, it says the acceptance criteria for this delta risk you just did shall be the stuff back there. The acceptance criteria is you shall use --

MEMBER BLEY: I got that as your interpretation. I was just asking --

MR. LAUR: That is my interpretation.

MEMBER BLEY: -- if folks had argued the other side of that. And if OGC had weighed in on this thing. They aren't here today. No?

Okay. That's all I wanted to ask about.

CHAIR APOSTOLAKIS: Okay.

Yes, sir?

MEMBER RAY: The argument that this is a voluntary move to 805 or to the rule seems like a strong and persuasive argument for well, this is what is required. You don't have to do it. So nobody is

imposing on you some new onerous obligation.

But I do notice that there is a staff requirements memorandum, I believe, saying that the agency should encourage licensees to adopt 805. Why? In other words, what is the reason that we would look for some way to make it --

CHAIR APOSTOLAKIS: Attractive.

MEMBER RAY: -- well, attractive is maybe a stronger term than I would use but at least make it not objectionable for people and attractive, I won't object to that -- that's almost what the Commission has said -- to do this?

And that element doesn't seem to me to be part of your consideration here. Like I say, I can fully appreciate this is a voluntary thing. You don't have to do it. This is the right way to do it. End of story.

But how do you respond to this apparent injunction that we ought to be trying to get people to do this?

MR. LAUR: I really don't --

MEMBER RAY: No answer?

MR. LAUR: I have no --

MEMBER RAY: Well, somebody somewhere ought to have a response, it seems to me, to the

Commission saying that. Perhaps that is not your role but --

MR. LAUR: Well, I will say this. In the fall of last year, I drafted a SECY, I guess, Commission decision paper that had two options. And I didn't even recommend an option. But it was basically a rule change to clarify this issue.

And the first option was to add in 10 CFR 50.48(c)(2), which is the exceptions, and make a new one, (2)(8) that said notwithstanding this prohibition, whatever, these recovery actions do count if they are previously approved and the other option, which was clarify that they don't, okay?

But it is an arduous process to go through a rulemaking. And it looked like at that point in time that we could avoid rulemaking by basically sticking with what we thought was the letter of the rule.

MEMBER RAY: Yes, I did come to that conclusion after studying the issue. Okay --

MR. DINSMORE: It is also not clear to me that this is the make-or-break. I mean I don't quite -- I know that industry has indicated -- and I'm sure they'll indicate again -- that if we require this and that they have to do it, many of them will withdraw

although I haven't really seen that written down.

But I'm not quite sure that it is so intimately connected as you seem to be implying, that you think that nobody will do this if we --

MEMBER RAY: I'm only implying it maybe because I'm asking you this question at the same time we were talking about the other matter. I'm just asking you why is it that the Commission wants people to sign up for 805?

CHAIR APOSTOLAKIS: They may --

MEMBER RAY: I think you may find --

CHAIR APOSTOLAKIS: -- think it is better than Appendix R.

MR. DINSMORE: Yes, they might -- it is supposed to be easier in the long term.

MEMBER RAY: Well, okay, if you want somebody to do something because it is better, I guess --

CHAIR APOSTOLAKIS: Then you will, you know, you will not have to have so many exemptions, so many of this --

MEMBER RAY: Well, that's why it would be attractive, I think, to both sides to find a way to implement this. On the other hand, I appreciate the points that these gentlemen have made.

CHAIR APOSTOLAKIS: Okay. Are the members --

MEMBER BLEY: Done for the day? Or just --

CHAIR APOSTOLAKIS: No, no, just these two gentlemen.

MEMBER SIEBER: Wishful thinking.

CHAIR APOSTOLAKIS: Well, thank you very much.

MR. DINSMORE: Thank you for your time.

CHAIR APOSTOLAKIS: And we come to this happy hour now where each member will tell me what they think. In particular, I think we have a question in front of us whether we want to have this full Committee briefing in September, which means we have to write a letter, or postpone it. So I really would like to know what you think.

So who wants to go first? Jack or Dennis? Are you ready?

MEMBER BLEY: Okay.

CHAIR APOSTOLAKIS: Whoever is ready. Okay. Okay.

MEMBER BLEY: Yes, I'd like to see us postpone it. I'd like to see another Subcommittee meeting, a substantial one. I'd really like to hear

from the pilot studies and hear how that's going, hear how this effects you.

I look forward to seeing the revised Reg Guide. If you keep it in the vein of those notorious three slides now, I'd love to see the flowchart make it in and I'd like to see this ideal plant somehow defined and tell people how to do that calculation.

I'd like an awful lot of what I saw today. I especially like the way Ken Canavan began because I think this idea of piloting, in fact, implied things aren't going to go great the first time and we're going to have to learn from it and clean things up.

And I think that's really appropriate. I like the idea of going at the fires from the ignition point of view and the pre-ignition. And kind of clearing that end of the fire analysis up, which is probably long overdue.

And so my side comment, I think, a real treatment of the uncertainty on these crucial issues in the fire PRA probably gets rid of the the supposed problems we've been hearing about.

CHAIR APOSTOLAKIS: John?

MEMBER STETKAR: Yes. I think I'd echo Dennis' conclusion that we ought to have another Subcommittee meeting on it. Specific concerns, mine,

on the Reg Guide itself, are its interpretation of what is a primary control station, which is key to defining these things that we are calling actions, which seem to be a real sticking point.

The second is the whole issue that we were just discussing is how do the criteria -- the risk-acceptance criteria of Reg Guide 1.174 relate to what an interpretation of the rule requiring it for computing some sort of delta risk.

And the third is a simple thing that Jack brought up. And I hope I don't steal your thunder, Jack. Is that we're now in a situation today -- we've had presentations in the morning and the afternoon on two Reg Guides related to fire protection. 1.189, in particular, endorses Rev 2 of Reg Guide -- I'm sorry, of NEI 00-01 --

MEMBER SIEBER: Well, it doesn't quite but --

MEMBER STETKAR: Well, it endorses a lot of it. The multiple spurious action stuff, circuit analysis type stuff, this Reg Guide, which I would characterize as a more progressive theoretically Reg Guide focused toward a performance-based assessment, endorses Rev 1 of that NEI document, which is a step back from the evaluation of multiple spurious

actuations compared to Rev 2 of NEI.

MEMBER SIEBER: Yes.

MEMBER STETKAR: So now we have Reg Guide 1.205 endorsing an out-of-date version and something that is deterministic --

MEMBER SIEBER: The deterministic guys are always ahead.

MEMBER STETKAR: What?

MEMBER SIEBER: You know that.

MEMBER STETKAR: So that's perhaps programmatic but it is kind of an indication of where we are in 1.205 space.

CHAIR APOSTOLAKIS: Okay.

MEMBER BLEY: Can I --

CHAIR APOSTOLAKIS: Yes.

MEMBER BLEY: -- John just triggered in my mind -- I would be real interested in hearing, and maybe the pilot plants are the place to tell me, with this definition of recovery action that excludes actions in primary control stations, I'm real curious as to how many of these previously-approved human actions really are recovery actions. Is it a lot? Or is it just a couple of them? Because I think most of them were analyzed out of things that might well be called primary control stations.

MEMBER STETKAR: I think that's true because I think they were using a previous version, weren't they --

MEMBER SIEBER: Well, yes, okay.

MEMBER STETKAR: -- that said anything outside the control is considered a recovery action.

MEMBER SIEBER: But that gets to your question.

MEMBER STETKAR: It gets to my question, yes.

MR. ERTMAN: Can I make couple comments? You know we are going to have to evaluate -- oh, Jeff Ertman, Progress Energy -- we are going to have to take a look at, with this definition, what is the impact. And it would be expected that our scope of recovery actions definitely would change.

I don't have a sense right now if it is less or not. We'll have to further clarify with the staff exactly what the definition is.

As far as the old 00-01 and 805 using Rev 1, the 805 transition, it uses the deterministic part of it, which really did not change. You know that's -- so --

MEMBER STETKAR: But the probabilistic would.

MR. ERTMAN: Right. But the probabilistic uses, under 805, you know, full PRA and some additional guidance in NEI 04-02. So there's more current in the FAQ and other things, there is more current.

MEMBER STETKAR: But 04-02 endorses a different -- an intermediate circuit analysis approach, for example.

MR. ERTMAN: Well, for the circuit analysis, both methods take the input from the owners groups' list of issues. But the process on how you analyzed that, you know the 805 uses the full PRA, which has that advantage that maybe the others don't.

So I think it's -- there is a reason for it, you know, but we can definitely explain that later if you want the pilots to explain more of what they did. So --

CHAIR APOSTOLAKIS: Would a month from now be good enough for you guys? Or is it too soon?

MR. ERTMAN: No, I think that would be good. We can give the status of where we're at whenever the next meeting is. You know we are going through the RAIs now. But that process is ongoing.

MR. HUTCHINS: Just a point of clarification -- Steve Hutchins from NEI -- the 00-01

Rev 2 of the document basically blatantly stole the fact process, the methodology, the expert panel review process, and the generic list from the 805. So they do sync somehow.

There was a FAQ 4 for 805 --

MEMBER STETKAR: Rev 2 does.

MR. HUTCHINS: Rev 2 does, right.

MEMBER STETKAR: Not Rev 1 though.

MR. HUTCHINS: Rev 1 does not.

MEMBER STETKAR: Okay.

MR. HUTCHINS: But there is a FAQ in the 04-02 that basically uses the expert panel.

CHAIR APOSTOLAKIS: Okay? Harold?

MEMBER RAY: George, you weren't here for Jack's meeting this morning but amazingly, it was as difficult to summarize as this one is.

I guess I would -- in fact everybody said I've got to think about this before I say anything, right, Jack? I would say if we had to write a letter in September -- and I'm not eliminating the possibility that we are going to be told we have to because of certain considerations we haven't dealt with yet -- but anyway, I don't think anybody would like it.

And I really crave -- members know that

the first comment I had when I saw this coming up is we need more time to explore the issues and certainly to have a chance to talk with the pilot plants I think would be very, very helpful.

The problem of reaching a decision, I think here, is sufficient that it should justify another meeting, in my opinion.

Mr. Bradley's comments about needing more flexibility because of the uncertainty that exists presently, I think would be difficult to accommodate. But I certainly agree with the premise that there is a lot of uncertainty in terms of how to go forward here.

We're stuck between a rock and a hard place, I think. Trying to find the best solution is not going to be easy. As usual, I crave the participation of more of the Committee than we have sitting here right at the moment. And we've got to get that, I think, in another Subcommittee meeting. And appeal to people to come and work with us to try and find a solution.

Because otherwise, if we take it to the full Committee and like I say, nobody is going to like it. Not us. Not the staff. And certainly not the industry.

CHAIR APOSTOLAKIS: Even if we don't write a letter, we can use the time that has been already given to a presentation on this subjection at the full Committee meeting to brief the Committee. And we -- the present members here can express their views on what we heard and why we decided that it is preferable to postpone is.

So we'll try to bring up the other members up to speed although I do agree, I mean if you are not present during the Subcommittee deliberations, you are at a disadvantage.

But the Committee will be briefed one way or another, either by us or by the staff. The way things are going, I think it will be by us.

Are you done Harold?

MEMBER RAY: I am.

CHAIR APOSTOLAKIS: Jack?

MEMBER SIEBER: Yes, I usually work on the deterministic side of fire protection and so this isn't new to me. On the other hand, it is very enlightening. I agree with everybody that if we were to write a letter in September, it would not be a good letter.

And my feeling is is that there is areas where there is not a consensus between the staff --

what the staff is now proposing what the rules are and what the industry is doing. And until we get closer to heading in the same direction, I think there will be perhaps wasted motion on the part of the industry in trying to adjust itself to whatever the rules are going to be.

And so I think that there needs to be more interaction, greater specificity in what the requirements really are, and I would like to see a closer connection between the philosophy of the rule and the practicality of the analysis that licensees have to do.

To be brief, I feel uncomfortable after what I've heard today -- this afternoon.

CHAIR APOSTOLAKIS: Do you want to come back to your issue of enforcement discretion? Or you can bring it up at the full Committee as long as you remember.

MEMBER SIEBER: Yes, the enforcement discretion is one of the issues. The definition of how one treats an existing plant that was approved under deterministic situations, and how you evaluate the current risk, for example, I see a concept where if the plant was acceptable today, it is acceptable tomorrow.

But the risk profile of tomorrow's plant once it becomes evaluated, may be troublesome. And perhaps things would need to be done to bring it into line.

And I also agree that better defining what operator actions are, what control stations are because it is not clear to me that we aren't masking some effects by the definitions that we've used.

CHAIR APOSTOLAKIS: Well, I agree with all of the comments that have been made. And one thing that is not clear to me is whether the rule or the standard and the rule are okay. And the only issue is interpretation. Or whether there are actually flaws in the standard itself --

MEMBER SIEBER: That's a good question.

CHAIR APOSTOLAKIS: -- which would raise all sorts of other issues now because, you know, it has been approved in the rule by reference. And changing the rule is something that is really a long process which, by the way, would be consistent with the argument from the industry that the methods are evolving and we need time.

So that is something that is not clear to me yet whether it is a matter of interpretation or there is actually some flow in the way the rule is

stated -- the standards is stated.

So it looks like there is unanimous conclusion that we do need another Subcommittee meeting, a longer meeting with additional presentations from the pilots and also, you know, NEI can come back with the benefit of having digested what the latest changes to the Regulatory Guide are.

NEI, do you want to make any comments before we adjourn?

(No response.)

CHAIR APOSTOLAKIS: Are we there?

(No response.)

CHAIR APOSTOLAKIS: The staff?

DR. WEERAKKODY: No, the only thing I wanted to say was -- oh, Sunil Weerakkody -- the only thing I wanted to say was that we will work through our process to release the Reg Guide. And work with the staff to come back here and make another presentation.

And in the mean time, we will have a meeting with the public stakeholders to provide clarifications on the changes we made.

CHAIR APOSTOLAKIS: Very good. NEI?

(No response.)

CHAIR APOSTOLAKIS: EPRI?

(No response.)

CHAIR APOSTOLAKIS: The public?

(No response.)

CHAIR APOSTOLAKIS: Well, thank you all. This has been very useful. And we'll set up another meeting in the reasonably near future when everybody will be ready.

Thank you.

(Whereupon, the above-entitled meeting was concluded at 5:51 p.m.)

Stephen Dinsmore

Senior Reliability and Risk Analyst

Division of Risk Assessment

Office of Nuclear Reactor Regulation

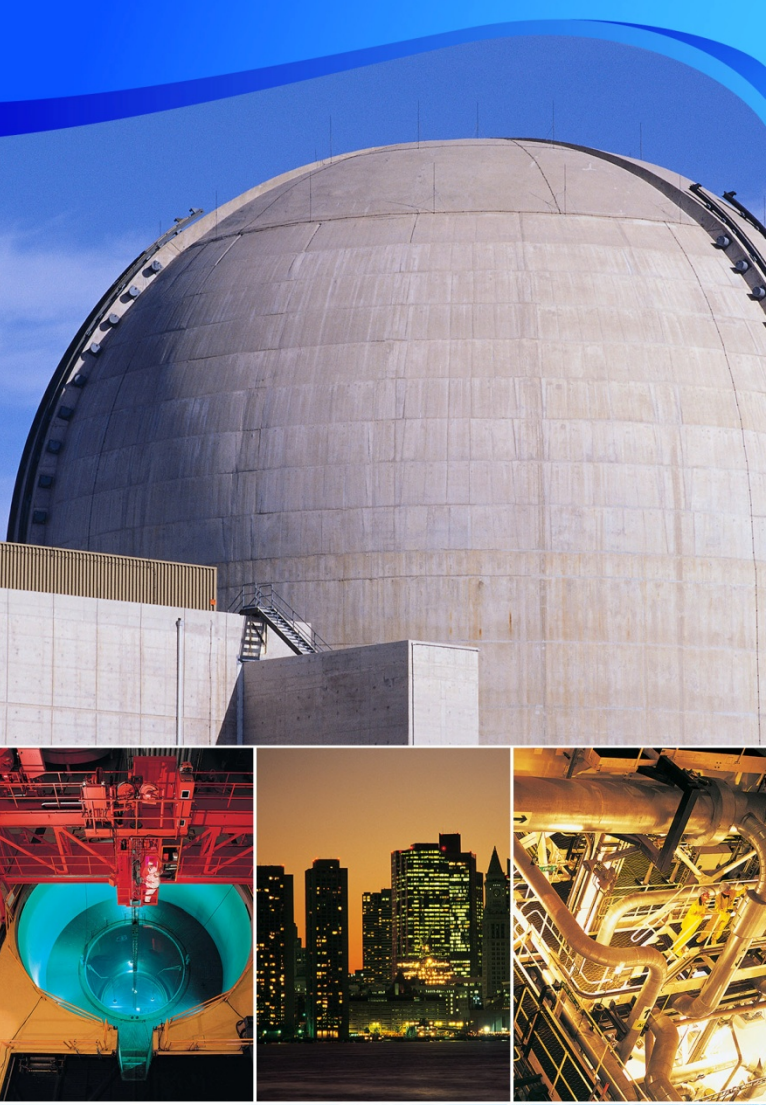
Acceptance Guidelines for previously approved recovery actions

ACRS PRA Subcommittee

August 18, 2009

Quantitative acceptance guidelines on additional risk from previously approved recovery actions are needed

- Without acceptance guidelines – each NRC staff reviewer must decide and justify the acceptability of the additional risk
  - Simple if small additional risk, very problematic for “not small”
- Acceptance guidelines could require changes to reduce risk
- Not using RG 1.174 acceptance guidelines would establish a new category of “acceptable” additional risk values



EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Fire PRA and NFPA 805

ACRS Meeting
August 2009

Ken Canavan
Senior Program Manager
Risk and Safety Management

EPRI Fire PRA Philosophy

- Consistent with the PRA Policy Statement
  - "Use of the PRA technology should be increased in all regulatory matters to the extent supported by the state of the art …"
- Committed to risk-informed, performance based approach to fire protection
  - Realistic methods
  - Realistic input
  - Monitoring and feedback process

Fire PRA Methodology Development

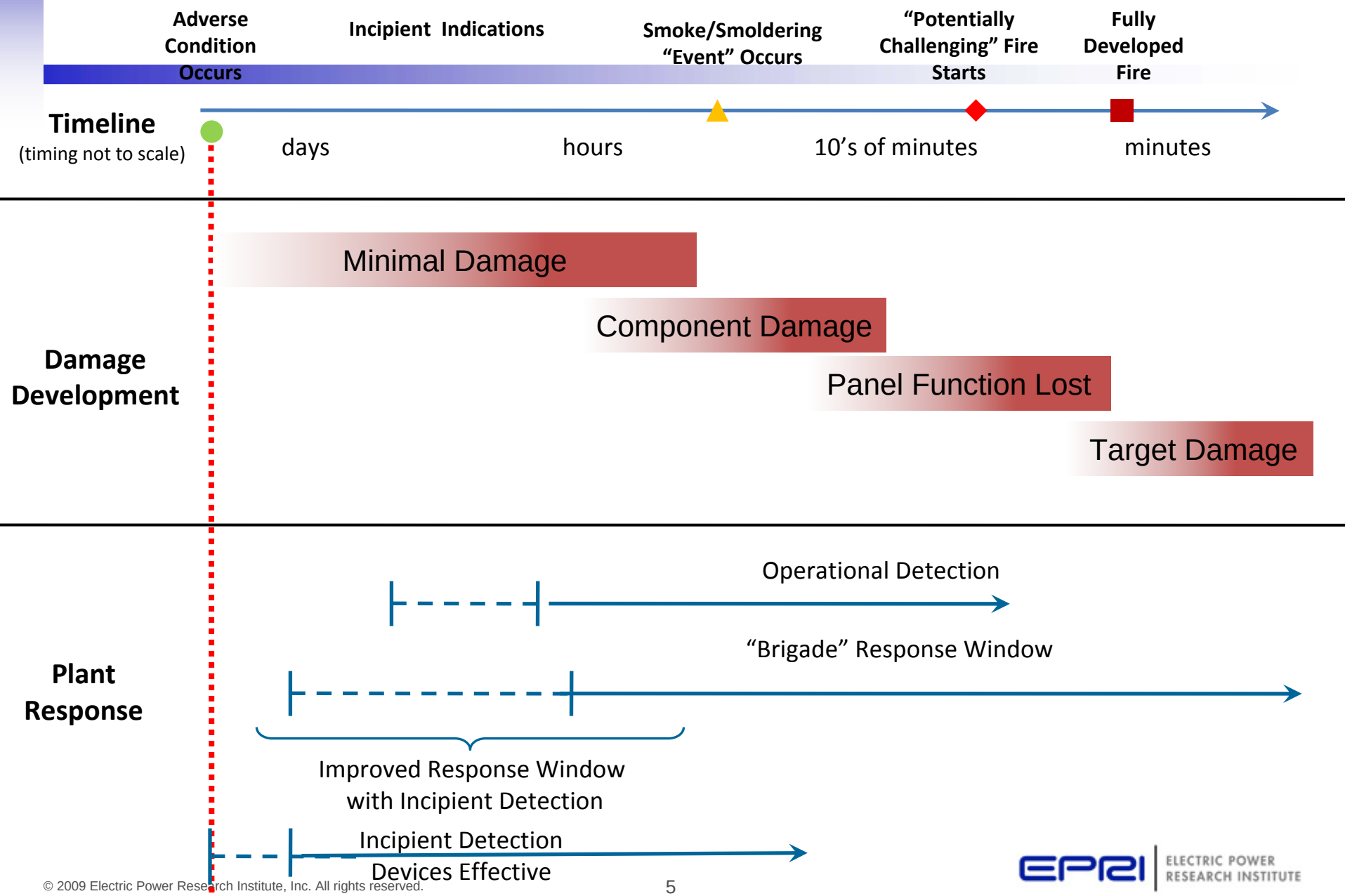
- NUREG/CR-6850 is guidance for developing a Fire PRA
  - NRC–RES / EPRI collaboration (EPRI 1011989)
  - Significant improvement in methods
  - Only pieces piloted (initially)

- Two Fire PRA Pilots (Oconee and Harris)
  - Initial results are conservative
  - Not unexpected
  - Result of individual minor to moderate conservatisms

Fire PRA Methodology Issues

- Several issues handled under FAQ program
  - Fire Ignition Frequencies
  - Credit for Incipient Detection
  - Treatment of Large Oil Fires
  - Credit for Fire Suppression
  - Hot Short Susceptibility, Probability and Duration
  - High Energy Arcing Faults
- Some initial resolutions will need to be revisited
- Some emerging issues –
  - Fire growth and propagation
  - Peak Heat Release Rates

Electrical Fire Progression



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An Example … the result

- Numerical Impact
  - Frequency of occurrence – overestimated
  - Probability of suppression – underestimated
- Phenomenological Impact
  - Fire Growth – Peak heat release rate – overestimated
  - Propagation assumed
  - Impacts – overestimated
- **The example provided is illustrative**
  - **Individual conservatisms can be significant**
  - **Combined effects can be extreme**

Fire PRA Methods

- Elements of the current fire PRA methods
  - Are in need of refinement for intensive applications
  - Are evolving quickly with changes in the state of knowledge
  - Are likely to continue to evolve

- Extreme care should be exercised concerning
  - **Application** to other risk informed applications
  - **Comparison** results with other hazard groups
  - **Conclusions** reached – if comparison necessary

Efforts to Date

- NRC and EPRI expending considerable resources to address issues and improve methods
- Over 18 months of continuous interactions to discuss methods with NRC staff through EPRI/NRC MOU
  - Some recent advances
  - Consensus and cultural issues are difficult
- Very far to go for completely realistic Fire PRA methods

Industry Activities

- Industry efforts being increased to address known conservatisms and method issues
  - Summary of Fire PRA Method Enhancements (Oct)
  - Revision on the Fire Events Database
    - More recent and more complete data (March 2010)
    - Component based transition in (late 2010)
  - Re-Analysis of Heat Release Rate test data
    - Review and analysis of test data (2009)
    - Additional test program (if warranted – 2010)
  - DC Circuit Testing (NRC RES & EPRI)
  - Consideration of “Fire Severity Factor”
  - New efforts planned by PWR and BWR Owners Groups

Conclusions

- Realistic Fire PRA methods required
- EPRI and industry have accelerated efforts to improve Fire PRA methods
  - Advance the state of knowledge
  - Develop new infrastructure
- Need to continue to encourage rapid improvement – flexibility in methods and specifically RG 1.205 needed
- Care should be exercised in using early results as these will have limitations (i.e., are conservative)

Backup Slides

An Example – Ignition Frequency

- Electrical Cabinet Ignition Frequency (6850 Prediction)
  - Generic ignition frequency for electrical cabinets - 4.5E-02/yr
  - Equivalent to ~5 fires per year across industry
- EPRI Fire Events Database includes some events that are conservatively classified as significant, such as:
  - Short in light bulb. No fire equipment used. Equipment was deenergized (Event No. 1213)
  - Light socket on the 2A diesel generator control panel arched while changing the light bulb. 8 fire brigade members responded to the event. The fire was discovered at 0922 and reported extinguished at 0922 (Event No. 2269)
- Fire Event Database Issues
  - Conservatively classified events
  - Information quality

An Example – Fire Detection and Suppression

- Detection and suppression curves based on the fire events in the database.

- Some of these events are conservatively classified:
  - Fire watch was on routine patrol when an unusual odor was noticed. Control room was notified immediately. Due to their rapid response, major equipment damage to the electrical bus was prevented (Event No. 642) – Duration 50 minutes
  - While performing routine rounds, an equipment operator observed smoke emitting from the 2C Reactor Feed Pump (RFP) discharge piping. As it was initially suspected an oil leak was causing the smoke. The fire was extinguished using fire extinguishers and fire water (Event No. 662) – Duration 60 minutes (Oil Fire)

- Fire Event Database Issues include:
  - Information quality
  - Fire control versus suppression

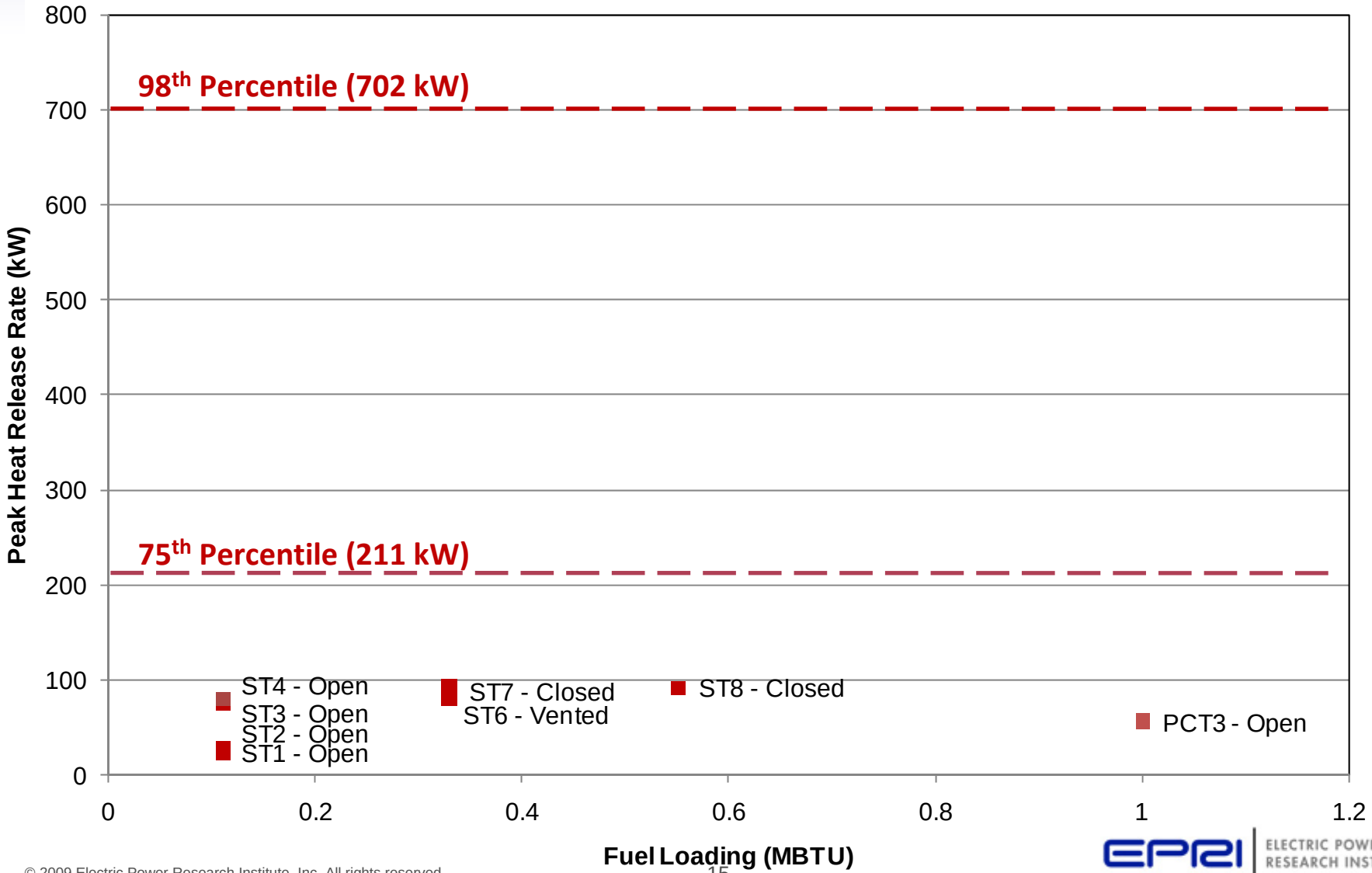
An Example – Fire Growth and Propagation

- For electrical cabinets, fires are assumed to grow to peak Heat Release Rate (HRR) in 12 minutes
  - Probability of non-suppression prior to 12 minutes = ~0.8 (assuming 10 minute brigade response)
  - ~4 fully developed electrical cabinet fires are predicted per year
  - ***Does not comport with experience (~ 0 per year fully developed electrical cabinet fires – all are suppressed)***

- Electrical Cabinet Peak HRR Perspective:
  - 75^{th}% = 211 kW (roughly equivalent to 1 sq ft of gasoline)
  - 98^{th}% = 702 kW (roughly equivalent to 2 ft pool of gasoline)

- Fire Growth and Propagation Issues include:
  - Assumed cubicle to cubicle propagation
  - Assumed 100% fire growth
  - Conservative interpretation of experimental data

Vertical Cabinet Test Results (NUREG/CR-4527)
(Qualified Cable)



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Concern – Setting a Precedent in how the "Risk of Recovery Actions" Issue is Resolved

ACRS PRA Subcommittee

August 18, 2009

Existing Licensing Basis versus Compliance with an Alternate Rule

- It is not clear that "mixing and matching" individual requirements between two alternative rules always provides adequate protection
  - Licensee's election to adopt advantageous requirements in an alternative rule should allow re-visiting of any relevant parts of the existing licensing basis
  - Hybrid approach may create real safety concerns
- Phrases such as "safe today, safe tomorrow" should not be elevated to the status of an NRC position or philosophy
- NRC staff should be careful not to set a precedent by saying "whatever the risk, elements of the licensing basis previously approved under a different rule transfer to the alternative rule"
  - Unconstrained "carry over" of parts of an existing licensing basis in lieu of meeting the requirements of an alternative rule should not be encouraged

NFPA 805 Transition Challenges

ACRS

Reliability & PRA Subcommittee

August 18, 2009

NUCLEAR ENERGY INSTITUTE

Industry Concerns with DG-1218
Draft Revision to RG 1.205

- **Significant changes in Implementation Guidelines**
  - **Evaluation of changes against "Ideal Plant" vs. current approved Plant (Safe Today / Safe Tomorrow)**
  - **Misapplication of RG 1.174 criteria**

- **Use of immature / conservative Fire PRA methods could lead to incorrect decision making for NFPA 805 and other PRA applications**

Fire PRA Methods

- **Elements of current methods are currently immature and additional industry and NRC work will be required to achieve realism**
  - **NRC staff tendency has been to impose conservatism and prescription into methods**
  - **RG 1.205 should endorse RG 1.200 as necessary and sufficient for PRA technical adequacy**
  - **Industry has not had opportunity to review final RG in this regard**

Fire PRA Methods

- **Use of immature and conservative methods could lead to incorrect decision making for NFPA 805 and other PRA applications**
  - **Plant modifications to reduce perceived fire risk**
  - **Risk management actions, especially with respect to more realistic internal events scenarios when compared to fire**
  - **Incorrect depiction of total plant risk through simple summing of risk metrics**

Fire PRA Methods

- NFPA 805 process needs to recognize these issues and allow for adjustments as models are refined
  - "Locking in" initial FPRA as part of licensing basis is problematic
  - Proposed plant modifications should be capable of being re-assessed and adjusted through reasonable regulatory process as method improvements are developed and implemented into plant models

Plant Modifications

- Advanced detection systems are one practical solution to the conservative fire growth and heat release rates that must be assumed in the PRA
- However, in many cases this modification is addressing the conservative methods, not a real fire safety issue
- Absent reasonable treatment of this solution, major plant modifications that are not risk informed could result

Fire PRA Methods

- **Aggregation of risk results should be approached with caution**
  - Large disparity in level of conservatism between internal events and fire at this point in time
  - NUREG 1855 and EPRI reports 1016737 and 1010068 provide information regarding aggregation of models with different biases
  - Simple summing of risk results is not appropriate in this case

Conclusion

- Transition to NFPA 805 is driven by Commission, and there is a rush to "fix" the fire protection issue once and for all
  - However, there are difficult technical issues that must be faced irrespective of schedule pressure
  - FPRA issues are not trivial and will have impact on plant safety and operations
  - Process must allow flexibility to address future method improvements
- In the push to transition, we need to do it right

Proposed Solutions

- Allow treatment of “risk of recovery actions” to be treated as proposed in Pilot Plant LARs
- Pre-transition licensing basis should be baseline for NFPA 805 change evaluations
- NRC comments on NEI 04-02 should be resolved prior to issuance of RG 1.205, Rev. 1 to improve regulatory stability.
- Provide schedule relief to Non-Pilot Plants to allow establishment of stable LAR template.
- Issue revision to RG 1.205 for “Trial Use”