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NUCLEAR REGULATORY COMMISSION

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501ST MEETING

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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THURSDAY, APRIL 10, 2003

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ROCKVILLE, MARYLAND

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The Committee met at 8:30 a.m. at the Nuclear Regulatory Commission, Two White Flint North, Room T2B3, 11545 Rockville Pike, Mario V. Bonaca, Chairman, presiding.

COMMITTEE MEMBERS:

MARIO V. BONACA	Chairman
GEORGE E. APOSTOLAKIS	Member
F. PETER FORD	Member
THOMAS S. KRESS	Member
GRAHAM M.. LEITCH	Member
DANA A. POWERS	Member
VICTOR H. RANSOM	Member
STEPHEN L. ROSEN	Member-at-Large
WILLIAM J. SHACK	Member

COMMITTEE MEMBERS: (cont.)

JOHN D. SIEBER	Member
GRAHAM B. WALLIS	Member

ACRS STAFF PRESENT:

JOHN T. LARKINS	Designated Federal Official; Executive Director, ACRS/ACNW
SAM DURAISWAMY	Technical Assistant, ACRS/ACNW
HOWARD J. LARSON	Special Assistant, ACRS/ACNW
TIMOTHY KOBETZ	Senior Staff Engineer, ACRS
RICHARD F. DUDLEY	NRR/DRIP
GLENN KELLY	NRR/DRIP
MICHAEL SNODDERLY	
BOB PALLA	NRR/DSSA/SPSB
FRANK GILLESPIE	
MARY DROUIN	RES/PRAB
GARETH PARRY	NRR
MARK REINHART	NRR/DSSA/PSAB
JACK HAYES	NRR/DSSA/PSAB
MARK BLUMBERG	NRR/DSSA/PSAB
STEVE LaVIE	NRR/DSSA/PSAB

ALSO PRESENT:

BIFF BRADLEY	NEI
STEPHEN SCHULTZ	NEI
JIM RILEY	NEI
ALEX MARION	NEI
JOHN DUFFY	NEI
ROBERT CAMPBELL	NEI

I-N-D-E-X

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

(8:30 a.m.)

1) OPENING REMARKS BY THE ACRS CHAIRMAN

1.1) OPENING STATEMENT

CHAIRMAN BONACA: Good morning. The meeting will now come to order. This is the first day of the 501st meeting of the Advisory Committee on Reactor Safeguards.

During today's meeting, the committee will consider the following: draft final risk-informed revisions to 10 CFR 50.44 standards for combustible gas control system in light-water-cooled power reactors; draft final regulatory guide, DG-1122, determining technical adequacy of PRA results for risk-informed activities; control room habitability; items scheduled for meetings with the NRC commissioners; proposed ACRS reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Dr. John Larkins is the designated federal official for the initial portion of the meeting.

We have received written comments from Sid Bernsen, chairman of the ASME Committee on Nuclear Risk Management regarding DG-1122. You should have a

copy of his letter in front of you.

We have received no requests for time to make oral statements from members of the public regarding today's sessions. A transcript of portions of the meeting is being kept. It is requested that the speakers use one of the microphones, identify themselves, and speak with sufficient clarity and volume so that they can be readily heard.

1.2) ITEMS OF CURRENT INTEREST

CHAIRMAN BONACA: I will begin with some items of current interest. First of all, you have in front of you a pretty sizeable package of items of interest that are inside two recent staff and requirements memoranda that are of interest there. There are a number of speeches by the commissioners. There is quite a bit of congressional correspondence. And I think some of this is quite interesting, too. Finally, there is some operating plant information.

On a separate item of interest, next week we have the regulatory portion conference. For those of you who are interested in participating in that, please contact John Larkins. He will set up registration.

Mr. Ramin Assa, who has been on the ACRS staff for the past six months, has joined RES

effective April 7, 2003 as the programs and communication liaison officer. On behalf of the committee, I would like to thank him for his contributions to the committee's review of several matters, including the Peach Bottom licensing renewal application and the PTS reevaluation project. There you are.

(Applause.)

CHAIRMAN BONACA: Also, Mr. Tim Kobetz, who has been with the ACRS staff for about a year, will be joining NMSS as a project manager in the Division of Waste Management. I would like to thank him for his outstanding contributions to the ACRS review of several licensing renewal applications, regulatory guides, resolution of certain GSIs and fire protection models.

Good luck to both Mr. Assa and Mr. Kobetz.

(Applause.)

MEMBER POWERS: Do we have rats abandoning the ship here or something like that?

CHAIRMAN BONACA: Yes, but, fortunately, we have a heavyweight joining us. And that is Mr. Ralph Caruso. He has joined ACRS staff on April 7, 2003. In front of you, you will find his professional experiences. You have a sheet of paper with

information about that.

Welcome aboard.

(Applause.)

CHAIRMAN BONACA: With that, I think we can now move to the regular agenda. We have in front of us a presentation on draft final risk-informed revisions to 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors." I believe Dr. Shack will take is through this presentation.

2) DRAFT FINAL RISK-INFORMED REVISIONS TO 10 CFR 50.44, "STANDARDS FOR COMBUSTIBLE GAS CONTROL SYSTEM IN LIGHT-WATER-COOLED POWER REACTORS"

2.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

MEMBER SHACK: We've discussed 50.44 in the past. The staff came up with a proposed option for a risk-informed rule. They have now prepared a draft final rule for this and addressed some public comments that they have received on their initial proposals for a risk-informed 50.44. The staff will lead us through the discussion of that final rule and the resolution of those public comments.

Mr. Dudley?

2.2) BRIEFING BY AND DISCUSSIONS WITH REPRESENTATIVES OF THE NRC STAFF REGARDING THE

MR. DUDLEY: Okay. I'm Richard Dudley. I have recently been assigned as project manager for this rule. I have been doing this for about a month now. The previous project manager, Tony Markley, received a promotion. And he is off working in the events assessment area now.

With me today at the table is Glenn Kelly of the Probablistic Safety Assessment Branch. He can discuss any questions or issues you might have with risk analysis.

Back in the audience, we have Jim Pulsipher and Dave Cullison of the Plant Systems Branch. We have Kevin Williams of the emergency preparedness group. And we have an attorney, Brooke Smith, from the Office of General Counsel. All of them worked on the team for this rule.

The objectives today, of course, are to discuss the draft final rule for 10 CFR 50.44 and the associated guidance documents. We will also discuss the staff evaluation of significant public comments. And we would like to receive ACRS feedback on current staff plans for proceeding with the final rule.

A little bit of background. Maybe it has been gone over before, but we first met with the ACRS

in December of 2001 to discuss the proposed modifications. We received the letter from the ACRS dated December 12, 2001, where the ACRS concluded that the proposed rule would result in more efficient and effective regulations to deal with combustible gases.

And the ACRS made a recommendation to us that the proposed hydrogen source term for BWR Mark III and PWR ice condenser containments should be included not in the rule, not as a prescriptive requirement in the rule, but in the regulatory guide, perhaps as a performance-based requirement. I will discuss the way we handle that later on when I talk about the comments.

The rule went to the commission in SECY-02-0080 in May of 2002. The commission issued an SRM on June 27th and directed the staff to publish the proposed rule. The rule was published on August 2, 2002, and the 75-day comment period expired on October 16, 2002. The staff has completed its analysis of comments and has prepared the final rule and the associated guidance.

We had comments from 15 commenters, 7 licensees, 2 industry groups, 2 vendors, 2 private citizens, a citizens group, and comment/recommendation from the ACRS.

The comments are grouped into four general categories. The first group is general concerns that people had, generally public citizens and public interest groups, about the advisability of reducing any requirements whatsoever related to nuclear safety.

The second category was questions and clarifications that most licensees and vendors had about the equipment, qualification, and survivability requirements for the remaining combustible gas control equipment.

The third concern was the concern of the prescriptive requirement in the rule that the ACRS had.

And the fourth concern and the one that actually caused the most substantial changes from the proposed rule to the final rule was the comment regarding the applicability of the proposed rule to future plants, particularly to non-light-water reactors.

First I'd like to discuss the general concerns about reducing requirements on nuclear safety. Commenters expressed doubts that the NRC had an adequate technical basis for concluding that public safety was maintained. They referenced possibility of voids or improper rebar in placement in concrete

containments and concerns about hydrogen generation studies and the adequacy of the risk analyses we did.

Concerns were expressed that reductions were only to provide financial benefits to licensees. A comment was raised about the need to complete NRC evaluations of generic safety issue 191 and GSI 189 before we reduced combustible gas requirements.

Concern was raised about allowing 90 minutes to initiate the hydrogen monitoring, instead of the 30 minutes, as it currently is; concerns about if you vented hydrogen from the reactor coolant system. If you allowed that, that would increase the possibility or could increase the possibility of containment failure; a concern that passive auto-catalytic recombiners, which are being required now for PWRs in France but are not being required in the United States; and also a concern about the need for performance criteria for atmospheric mixing systems.

MEMBER WALLIS: I think there was also a concern about the defense-in-depth aspect of this, that you were abandoning some aspect of --

MR. DUDLEY: Any time you would reduce the requirement, you would be reducing defense-in-depth.

MEMBER WALLIS: Which is a thing that is

rather intangible.

MR. DUDLEY: Yes, it is. It certainly is. The way we evaluated these concerns or comments was to look at them and see if any new technical information or new technical data or bases or issues were raised that we were not aware of when we prepared the proposed rule.

As we went through these comments, we found that generally they were assertions that things weren't good enough, but there weren't any technical bases provided that would specifically say why the rule was not adequate in any particular area.

Many of these questions we looked at already. For example, the commission in an SRM asked us to look at the passive auto-catalytic recombiners, and we did so. We did a value impact study in SECY-02-0080 that showed that these recombiners for large dry containments in the U.S. had little safety or risk benefit for a very large expenditure of resources. So we concluded that they were not cost-beneficial.

MEMBER POWERS: One would presume, maybe against contrary indicating evidence, that people in France aren't totally irrational. Why have these concluded these things are cost-beneficial?

MR. KELLY: This is Glenn Kelly from the staff. It's our understanding that their decision was not driven so much by the cost associated with the recombiners as it was with their significant consideration about the potential for off-site deposition of various fission products. And they chose to place their money towards providing additional assurance that there would be no off-site or a smaller probability of off-site consequences.

MEMBER KRESS: They don't use the same $2,000 per man-rem that we used in the cost-benefit.

MR. KELLY: I'm not exactly sure of what value they used for doing that. It's my understanding, in part, that when they make their considerations, that it's not --

MEMBER KRESS: If they did a cost-benefit study, that is likely to be where the difference would be, don't you think? The costs, you know, would end up being like I say. It would be land contamination or higher population density, sites, and things like that might make a big difference in France, you might think.

MR. KELLY: It's possible that that made the difference. It is not our understanding, though, that the decision was made primarily based on a $2,000

per man-rem-type consideration.

MEMBER WALLIS: While we're on this slide, I was impressed by the amount of effort you made in the written record to answer these questions raised by members of the public.

MR. DUDLEY: Thank you.

MEMBER APOSTOLAKIS: I am a little bit disturbed here. Glenn, you keep saying it's your understanding. I mean, you didn't talk to anybody in France? Why did they do this? You didn't review any documents? I mean, they seem to be going in the opposite direction. Why is it your understanding? Why didn't you say, "I know that they are doing this because of this reason"?

MR. KELLY: I had the fortune of joining this particular evaluation of 50.44 after most of the technical work had already been performed. And we had previously done an analysis on this where we had provided already in a previous document the significant write-up about the French technical position and our position about the cost-benefit value of the auto-catalytic recombiners. And because those words had been chosen so carefully and that we had used previously, we used those words again because they had particular significance in consideration of

a country that we share a lot of nuclear information with.

MR. DUDLEY: That value impact study was provided to the commission on May 13, 2002.

MEMBER KRESS: Regardless of what the French position is, you have to be constrained by our backfit rule. If it's not a compliance issue or it's not an issue of substantial increase in protection, then you have to go by the backfit rule. If you do a cost-benefit and it doesn't pass, you have no recourse.

Is there any other thing you could do? I mean, if you said, "Well, it's not a compliance issue, and it doesn't give substantial increase in safety. It doesn't cost the price-to-cost-benefit," do you have any other recourse at all?

MR. KELLY: You would have to indicate somehow that there is a violation of the current rules and that, therefore, regardless of the costs, that they would have to do something to mitigate this. It's not in the rules as such. So we don't have to --

MEMBER KRESS: I was wondering if there was a way to invoke defense-in-depth in there. I guess there must not be.

MR. KELLY: Well, we already have a lot of

capabilities in defense-in-depth. And what turned out as a result of when we did the cost-benefit analysis, in looking at it, it turned out that it really had very little benefit. PRA numbers in themselves don't directly provide you with defense-in-depth arguments, but in this case, there were so many different ways that we had for providing defense-in-depth. But we felt that this was adequate the way it was.

MEMBER POWERS: If you had gone through and done a completely similar analysis for the containment itself, would you have come up with a similar result?

MR. KELLY: I'd have to defer to someone who has actually down that type of analysis.

MEMBER KRESS: Of course, it's required by the regulations.

MEMBER POWERS: What I'm asking, Tom, is that if you come through and you do a PRA kind of analysis on any single component of the system, you come up and say they're not very valuable.

MR. KELLY: If one were to look at certain plants, let's take, for example, Grand Gulf, which has a very low core damage frequency --

MEMBER POWERS: Well, Grand Gulf would not be an appropriate one to look at, though, would it?

It does have hydrogen igniters required for it.

MR. KELLY: I understand, and that is because on a generic basis, we have determined that that is a valuable --

MEMBER POWERS: I think a better example would be to look at a large dry containment.

MR. KELLY: Okay. Well, you can take South Texas or you can take another one of the plants where you have a low estimate of the core damage frequency. If you're going by assuming that the safety goals constitute adequate protection and use those numbers, then you would say in those cases, you would not necessarily need a containment if you were merely going by a numerical --

MEMBER POWERS: I think that is correct. I think you would come up with that result. I bring it up only to point out that there is a vulnerability and a passion to that.

Now, I think you did the right thing here on this particular issue, but one has to be very careful about those results because of the defense-in-depth argument.

My own feeling is defense-in-depth is probably misplaced here. This once again gets into the realm where PRA is probably the right tool to

decide whether you need this or not.

MEMBER APOSTOLAKIS: Did the French do a PRA for this issue or they said, "In the name of defense-in-depth, we require the recombiners"?

MR. KELLY: I'm not aware of whether or not they did. I don't know if Mike Snodderly, who is now on the ACRS staff, is aware of that because Mike was the technical reviewer at the time.

MR. SNODDERLY: George, I am aware of two meetings with the French. The first took place here in Rockville, where we exchanged our regulatory analysis and position on the passive auto-catalytic recombiners.

And then another meeting took place with Gary Hollahan and his counterparts in France. The conclusion was made that they do not perform a cost-benefit study using the $2,000 per person-rem.

In fact, the French said at this time, they do not plan on using risk insights to reduce requirements for relaxed regulatory features but only to use them for possible enhancements, as was used in this case.

MEMBER APOSTOLAKIS: So they didn't do a risk assessment?

MR. SNODDERLY: They did a risk

assessment, but it was more of a looking at the phenomena, meaning conservative assumptions about hydrogen combustion and its effects on containment and the probability of failure; in other words, looking more to a fragility type of analysis. And from that, they made a determination that they wanted an additional mitigative feature for hydrogen control and required, then, the passive auto-catalytic recombiners.

MEMBER APOSTOLAKIS: But the elements that went into their analysis are also present in our analysis. There are no major differences. It's just the judgment at the end that was different.

MR. SNODDERLY: Yes. Well, first of all, as I said, they did not use a $2,000 per person-rem ratio.

MEMBER APOSTOLAKIS: Yes, I understand that.

MR. SNODDERLY: Their containment fragility numbers were slightly lower than the staff's. The staff used, I believe it was, the North Anna and Surrey type of containment designs. They also assumed some more conservative hydrogen loadings, combustion loadings that the staff didn't use.

I would say that they are comparable

results or they are very comparable in the sense that you can see what they assumed for hydrogen combustions and the loadings. You can see what the staff chose, and you can see the fragility curves. Although those results were slightly different, they came to different conclusions.

MR. DUDLEY: Okay. If I can continue, also I didn't add a bullet on this slide, but just to balance these negative comments, there were quite a few comments from numerous individuals, licensees, and others, including the ACRS, that this was a good rule and a step in the right direction towards efficient and effective regulation.

The next category of comments was related to equipment qualification and survivability. Mostly licensees requested clarification of the applicability of equipment qualification rules to monitoring systems and whether any new survivability requirements were going to be added by the proposed rule for combustible gas control equipment.

The NRC agrees that we needed to make some clarifications on the rule and the associated guidance. And in the final materials, we will make it clear that monitoring systems must perform in the environment that is anticipated in the severe accident

management guidance, but they do not need to meet 10 CFR 50.49 equipment qualification requirements.

Also, we will make it clear that the final rule will not bring about any changes to existing licensee analyses and the environment conditions that were used to establish the equipment qualification 50.49 compliance.

CHAIRMAN BONACA: Let's just expand on that. I mean, I am trying to understand you wanted to work in adverse environment. I believe that the 10 CFR 50.49, in fact, provided the requirements for demonstration of survivability into an adverse environment. What are they supposed to do now to demonstrate that they will work in --

MR. DUDLEY: The rule itself contains survivability requirements. The revised 50.44 provides reduced, but still requires that they survive during the severe accident conditions. But they're not as strict as 50.49 guidance, which is, I guess, for design basis accidents.

Next is the issue raised by the ACRS on putting the combustible gas source term for Mark III and PWR ice condenser containments in a regulatory guide and not incorporating it prescriptively in the rule itself.

The staff did not accept the ACRS' recommendation. There were a couple of reasons for that. If we required licensees to do an analysis to determine plant-specific hydrogen source terms, that would be a backfit. And we did not see any significant safety or cost benefits to impose that backfit.

In addition, the recent GSI 189 work that has been done on hydrogen source term right now shows about 65 percent metal water reaction for the source term plus or minus 23 percent, which still indicates to us that the current prescriptive value of 75 metal water reaction for the hydrogen source term is still reasonable for severe accident analysis.

MEMBER POWERS: I know of no severe accident analysis. I have never seen a severe accident analysis that does not go to 100 percent metal water reaction. In my entire career of looking at severe accidents, I have never seen them go less than 100 percent. In fact, usually they go to well over 100 percent because they include oxidations of steels and metals coming into the system from other sources.

MR. DUDLEY: I am not qualified to speak for the GSI 189 work. I don't see anybody from our

Office of Research. Bob, can you --

MR. PALLA: I am not with the Office of Research, but I think what this number is based on is the in-vessel phase. You may be speaking of the ex-vessel.

MEMBER POWERS: For just the in-vessel phase, it's a very reasonable number. In fact, it might be a little conservative for the in-vessel phase and quite an important number. But for the total severe accident analysis, I have never seen one be less than 100 percent. In-vessel phase is an excellent --

MR. DUDLEY: But that's what that came from.

MEMBER WALLIS: And that's what it's applicable to? You've got two numbers. You just want to complete your argument to show that using this number for the in-vessel phase is appropriate to the use to which you are putting it here.

MR. DUDLEY: 50.44 was always an in-vessel. It was always limited to that amount. And so that is why for this particular comparison, we used the in-vessel number, yes.

MEMBER WALLIS: That's all I needed to hear.

MR. DUDLEY: Thank you.

MEMBER KRESS: You mean that satisfied you?

MEMBER WALLIS: Well, I mean, he says so, and I know why. You didn't ask why?

MEMBER SHACK: In a risk-informed world, you worry about the risk.

MEMBER KRESS: Thank you.

MR. DUDLEY: Bob, do you want to discuss that or maybe you want to repeat the question.

MR. PALLA: I'm Bob Palla with the Probabilities Risk Assessment Branch in NRR. Is the question about why just constrain yourself to the in-vessel phase?

MEMBER KRESS: Yes.

MR. PALLA: Well, I guess one way of looking at it is that the rule, the original rule, was following the Three Mile Island accident. The types of accidents we tried to address there were degraded core, TMI-type accidents.

So I guess the mindset of the original rule is degraded core but not a full-blown core melt accident. You know, these accidents are arrested in-vessel.

An additional factor is that if one

actually designs a system that can handle the 75 percent metal water, that same system will cope with anything greater just as well. If the system is operable, it will cope with 100 percent.

MEMBER KRESS: That is a much more reasonable answer to me.

MEMBER POWERS: Also, seemingly dubious.

MEMBER KRESS: Yes, but the other answer I might have been looking for was the probability associated with going on to the full 100 percent or the frequency may be such that you don't have to go that far to meet whatever your risk criteria are.

MEMBER POWERS: It's no question that NUREG-1150 made it clear to us that a lot of similar accidents do get arrested before we progress.

MEMBER KRESS: That's right. So there is an associated probability.

MEMBER WALLIS: But we haven't seen it.

MEMBER KRESS: The argument was made. We haven't seen the backup to that.

MEMBER SHACK: But, I mean, if that's not the basis, this is a risk-informed rule, which means that you consider all sources of risk. I mean, you had better at least believe that argument.

MR. PALLA: Yes. I guess what I am saying

is that we did not develop arguments about in-vessel recovery and probabilities and derive 75 percent based on that. That's what I meant to say.

MEMBER KRESS: It gets back to the old argument of the 75 percent is part of the design basis accident concept. We're trying to reconcile design basis versus risk-informed, and that's where we always end up at this same impasse almost.

MEMBER WALLIS: You don't want to create a precedent where 75 percent now becomes okay for other kinds of severe accident analysis.

MEMBER SHACK: Well, it's not for future reactors.

MR. DUDLEY: For future reactors, we are going to require 100 percent.

MEMBER KRESS: It's just current reactors.

MEMBER POWERS: But, again, why 100 percent? I have never seen one limited at 100 percent.

MR. KELLY: We've also addressed that aspect.

MR. DUDLEY: The next category --

MEMBER SHACK: Can you tell us how?

MR. KELLY: We have been working on wording and looking. Dick is going to get into this

later, I believe, if you can hold onto it.

MR. DUDLEY: Yes. This slide, actually, we'll talk about it. The last category was a comment that we received on the applicability of the proposed rule. The rule was written to apply to all future reactors. And the commenter noted that the requirements that we had put forth in that rule were really based on current light-water reactor technology.

Now, the commenter's recommended fix was that we apply the paragraph (c) only to future light-water reactors and not issue rules for non-light-water reactors. We decided not to do that. Let me also let you know that this current position was arrived at after we provided you the materials that you have in your packets. So the material you have says that we are going to limit the applicability of the rule to future light-water reactors.

Subsequent to providing you the material, we decided to change our position on that. So right now we are adding a paragraph (d) to the rule that specifies requirements for future non-light-water reactors.

MEMBER POWERS: Do you have in your list of definitions what a credible severe accident is?

MR. DUDLEY: We do not.

MEMBER POWERS: Could you tell me what a credible severe accident is?

MR. DUDLEY: I can't tell you that.

MEMBER POWERS: Could you tell me what the --

MR. DUDLEY: In the reactor design and a lot of information, it is pretty clear that if we are going to specify requirements for all sorts of future non-light-water reactors, we don't necessarily know the coolants. We don't necessarily know the clads. It's pretty clear that we can't specify those rules with a lot of detail. And this rule that --

MEMBER KRESS: It's the "credible" word that I am worried about.

MR. DUDLEY: Do we have any --

MEMBER KRESS: I know you can't tell me what the scenario is without a design, but it's credible.

MR. DUDLEY: The meteorite striking the spent fuel pool is incredible.

MEMBER KRESS: It has something to do with the frequency.

MEMBER POWERS: We know what an incredible accident is.

MR. DUDLEY: Clearly, yes. I mean, there is a spectrum of severe accidents. And you just can't go out to everything. The distant that you go out in severe accident space is credible.

I mean, that is the only definition I can give you. I can't --

MEMBER KRESS: We have no limit on that frequency. We don't know where that line is drawn.

MEMBER APOSTOLAKIS: Where is the word "credible" here?

MEMBER KRESS: It's there in line --

MR. DUDLEY: You can't say "all severe accidents" because that would just not -- you know, you just can't.

MEMBER WALLIS: In a risk-based or risk-informed world, you really consider everything that is credible. You dismiss some things based on probabilities, but you consider everything, don't you? Isn't that the whole basis of it?

MR. DUDLEY: That is correct.

MEMBER POWERS: You would think you do, but, in fact, the reality is that we truncate and we exclude certain things. I agree I can identify things that are incredible, but I am struggling to understand what is credible.

MEMBER POWERS: I'm just curious why somebody used that word.

MEMBER KRESS: Yes.

MEMBER POWERS: I think you have explained it, but you just didn't --

MR. DUDLEY: Maybe we didn't use it in the term that you would define it.

MEMBER POWERS: You just want people to think that they had to include the meteorite strike?

MR. DUDLEY: Absolutely.

MEMBER POWERS: That is all you were trying to communicate there?

MR. DUDLEY: Pretty much, yes.

MEMBER POWERS: Is it going to get you in trouble in ways that you don't anticipate?

MR. DUDLEY: The use of the word "credible"?

MEMBER KRESS: I interpreted that differently. I interpreted it to mean the frequency of less than 10^{-6} is being excluded.

MR. GILLESPIE: Dr. Kress? Frank Gillespie for NRR. I am not sure if I am going to look at OGC because there was a Turkey Point hearing many years ago where the word "credible" was, in fact, brought up. And maybe it was one of our first

risk-informed hearings at the time, but, as I recall, something like 10^{-6} was related to the return frequency of the word "credible" at that hearing.

So if I fall back on case law, which you have to do because you are putting a word in regulation, so you have to go back into how that word has been previously interpreted in regulation, I believe right now 10^{-6} return frequency would be what we would likely associate with that word.

MEMBER POWERS: Then I can ask --

MR. GILLESPIE: That is how I remember it anyway.

MEMBER POWERS: I reiterate Dr. Wallis' question. 10^{-6} is assuredly a rare event, but if that rare event is associated with a 3 billion curie release, I might have pause on excluding that one.

MEMBER KRESS: Well, I think that 10^{-6} did come about originally by considering a source term which was representative of light-water reactors, severe accident source terms.

MR. GILLESPIE: Of about a 1,000-megawatt light-water reactor?

MEMBER KRESS: Yes, yes. So that is kind of implied in the numbers.

MR. GILLESPIE: It's kind of a package

because, actually, as I recall, it was the Turkey Point-specific hearing. Although it was a seismic hearing, I believe that that kind of got attached to that word.

MEMBER POWERS: I think you are right now what you mentioned the seismic that 10^{-6} came in, but the source term world is a dynamic world. And I can come up with scenarios that do have 10^{-6} return frequencies not involving seismic events and have formidable source terms.

Would not a better term be "risk-significant severe accident sites"?

MEMBER KRESS: I would just love to see terms like that in there.

MEMBER APOSTOLAKIS: You know, in the next session, one major item of discussion will be what is risk-significant. There is a disagreement between the staff and --

MEMBER KRESS: Oh, yes. That is the next question you ask, yes.

MEMBER APOSTOLAKIS: So it seems to me that there should be some consistency between what the staff puts in 1122 and what they put here because, first of all, it's not only the word "credible."

It's also the word "scenario." The word

"scenario" is not well-defined. I think that's what you implied now, that you can put things together and have one scenario. You can break them apart and have 15 different scenarios. So to put limits in terms of scenarios, you are really not achieving much.

The proposal from the start was to consider the sequence, whose aggregate frequency is 95 percent of the risk, which is much more meaningful. And this is something that has been a problem ever since Reg Farmer published his curves more than 35 years ago, where he talked about accidents. And then people realized that to you talk about accidents, you have to talk about the total frequency.

So maybe this should be coordinated with 1122 because that's a major issue.

MEMBER POWERS: It's an excellent point.

MEMBER KRESS: I think that is an excellent point.

MEMBER POWERS: And you have put your finger on where this particular wording will get you in trouble is that I can always split my scenarios up to guarantee that they fall below the 10^{-6} level.

MEMBER WALLIS: Well, to invoke something I hate to invoke, Davis Besse, when I heard about what happened at Davis-Besse, I said that is completely

incredible. I just didn't believe it. I couldn't. It was so incredible.

MEMBER APOSTOLAKIS: One of the reasons we got into the risk business is to avoid using words "credible," "incredible."

MEMBER WALLIS: Don't use those. Yes.

MEMBER APOSTOLAKIS: Right? And then the next step is that you can't really talk about individual scenarios because it is an ill-defined concept.

MR. KELLY: Right. And we understand that from the standpoint. And we're very sensitive to the fact. Depending on how you do your risk assessment, we don't want people to kind of cherry-pick and go and remove things on a basis of they have defined such a limited sequence that, "Okay. They can take that one out. Now, I am going to find another limited sequence, and I am going to take that one out." That is not what we want.

MEMBER APOSTOLAKIS: The point is that you have colleagues right now who are thinking about it. And they're fighting a battle. So you might as well take advantage of what their thoughts are and use the appropriate language.

MR. DUDLEY: We're not cast in stone with

any of these words. As you know, we have been working on this just in the last three or four weeks.

MEMBER POWERS: That's just one that I anticipate you getting in trouble with since it is directed at reactors that we really haven't seen right now. So we don't know what they're going to come in with.

MR. DUDLEY: We appreciate your comments and advice on this.

MEMBER ROSEN: I would observe that simply taking out the word "credible" and the word "scenarios" and making "accident" plural solves a problem.

MEMBER WALLIS: I don't know that there will be design basis accidents for these new designs either.

MEMBER KRESS: Yes, I think that is a problem, too.

MEMBER APOSTOLAKIS: That is another problem, yes.

MR. KELLY: Well, that's why we have indicated if you do both, if you talk about all severe accidents, you run into a problem of at what point do you draw the line. I mean, I could have an incredibly robust containment, but if you allow me to drop the

bottom of the vessel off instantaneously, it is going to cause a lot of problems about anybody's containment.

MEMBER ROSEN: Well, here's how I have in the past solved that problem, simply by inviting those who would wish to add a scenario which is 10^{-15} to the list. So now it shows up on the list, and at the bottom it has no impact on the summation.

It's there. One can look at it. But you can see right away it has no impact on the total risk because it's out in the ninth decimal place.

MEMBER APOSTOLAKIS: How about if you just say, "Information demonstrating that the risk impacts of combustible gases have been addressed"?

MEMBER KRESS: Or "acceptable."

MEMBER APOSTOLAKIS: "Have been addressed." Well, it's implied.

MEMBER KRESS: Okay.

MR. KELLY: We've thought about that and that wording. My concern is that if I merely say that it has been addressed, that means that somebody wrote something about it.

MEMBER APOSTOLAKIS: "Addressed to ensure adequate protection." I mean, the whole thing. I just stopped there because I didn't want to read the

rest of it. So "The risk impacts of combustible gases" and then you jump down to "have been addressed to ensure adequate protection of public health and safety from" --

MEMBER KRESS: But you need to put "risk" in there.

MEMBER APOSTOLAKIS: Yes.

MEMBER KRESS: "Adequate protection" does not cover it all.

MEMBER APOSTOLAKIS: "Risk impacts," yes. No?

MEMBER POWERS: Well, I think we can work with --

MEMBER KRESS: Yes, they can work with it.

MEMBER APOSTOLAKIS: Wordsmithing.

MR. DUDLEY: We are certainly open to suggestions. And we will go back and look very hard at this language. I think these suggestions are going to be useful.

MR. KELLY: And where this came from, in part, was we wanted to give consideration to the fact that there might be unique designs, liquid metal, fast breeder reactors, could be a salt reactor. I mean, that's possible.

MEMBER POWERS: That's not possible.

MR. KELLY: There might be plants that chose to come in with perhaps considerably more zirconium or they might be generating other types of combustible gases than the ones that we're currently considering in light-water reactors or I might have a plant that in certain ways, as long as I have a very low probability of failing the reactor itself or, let's say, I have a very high probability of mitigating that, but if I do, I also have a very high probability of mitigating it.

But if I don't mitigate it, I have a very high probability of failing the reactor, which, in turn, would fail the containment. That might not give us the kind of results that we would be happy with. So we try to give ourselves some flexibility here in our wording.

MEMBER WALLIS: I have a technical question for you. Maybe it's appropriate at this time. The rule says, I think, all containments must have a capability for ensuring a mixed atmosphere.

MR. KELLY: Yes.

MEMBER WALLIS: And if you read the reg guide, obviously it's going to be how you achieve that. It turns out that this can be achieved either with fans or by natural circulation or a combination

of all of those things and that then the licensee must provide an analysis of the effectiveness of this mixing.

I just wonder how good that analysis can be with the present state of the art, how good an analysis is the licensee capable of making to ensure that the atmosphere is mixed and how well mixed does it have to be and all of that sort of thing.

I think there are a lot of technical questions about this issue of mixed atmosphere.

MR. KELLY: That's a good question. We were just talking about that the other day, about exactly what does that mean to have a mixed atmosphere.

In particular, in this case, the definition at the beginning of the rule talks about, in essence, it's mixed. So if I were to have detonation, the detonation would be not severe enough to fail the containment.

I am not a containment expert. So I would have to go to somebody like Mike to get some comments about this.

MR. SNODDERLY: Graham, this is Mike Snodderly.

I think the precedent was set in the IPE

walkdowns that were done. For a system such as fans, the analysis would be as fairly well-understood. It's very well-understood.

For natural circulation, the goal was to assure that there were not closed passages where stratification would take place. Experts in PRA and in hydrogen did walkdowns of several containments to assure that --

MEMBER WALLIS: Have experts in flood mechanics as well as in PRA?

MR. SNODDERLY: Yes. Yes, Graham. And they did walkdowns to assure that there were not a lot of areas where stratification could take place, that there were vents.

MEMBER WALLIS: They walked around and said, "We don't think it will happen here."

MR. SNODDERLY: They were looking for --

MEMBER WALLIS: That's a typical analysis.

MR. SNODDERLY: You asked what was the level of detail or what is expected. I think it was to assure that in future designs or to meet this rule, that such a walkdown to support the PRA had been performed.

MEMBER WALLIS: Yes, I know they did that. They used to just look around and say, "Is it likely

to accumulate some combustible mixture here?" It would be more reassuring if we had a technical basis for analyzing these situations.

MEMBER POWERS: What I can tell you is that we have a variety of lump node codes in this world for analyzing containment response under accident conditions. And a variety of experiments had been done to look specifically at this question of how well do these codes calculate mixing.

Under forced circulation conditions, lump node codes do just fine. They identify those closed-in spaces Mike spoke of as the places where you get hydrogen concentration sufficient to support detonations on occasion.

When they have looked at natural circulation conditions, they have found that if you can hypothesize well what the natural circulation pattern is, they can nodalize the codes well enough to reproduce that.

If you have to predict a priori what they are, there is not good intuition on what it looks like, the code is not very good at that. They have had the God-given good sense not to even include the momentum equation so they don't run afoul of that problem.

MEMBER WALLIS: Which one of these? The MAPP code, was that?

MEMBER POWERS: MAPP is certainly one.

MEMBER WALLIS: It came before us a couple of years ago with some strange models for mixing and never came back.

MEMBER POWERS: This is not a static field. In the last international standard problem dealing with this issue that I attended, there were 46 submissions of analyses of a containment circulation kind of modeling, representing, I believe, 15 different computer codes. And MAPP was one of those.

The interesting result that came back was that the fairly coarse nodalization that these codes used was adequate for this particular test, which involved a situation where one could imagine --

MEMBER WALLIS: There is a real comparison with data, then?

MEMBER POWERS: Oh, yes. This is a data-code configuration. The interesting thing that you get is with the same code applied to the problem by different users, you get a disparity of results that can be dramatic.

MEMBER WALLIS: So then we have to ask, when the NRC sees one of these analyses submitted

using one of these codes, how do you assess whether or not it is acceptable? Do you have your own code for these situations?

MEMBER POWERS: They have two of them, as a matter of fact.

MEMBER KRESS: Contain and MELCOR.

MEMBER WALLIS: They use MELCOR? Do you have confidence in the predictions of your own code as sort of a comparison with whatever is submitted?

MR. KELLY: I'm not the expert on that. Mike or Bob, do you have any thoughts about it?

MEMBER POWERS: Well, I'll be glad to respond to the question. Well, I know something on this subject, at least a little bit. Let's be honest. I know a hell of a lot on this subject.

MEMBER WALLIS: What are your qualifications, Dr. Powers?

MEMBER POWERS: Limited, limited, very limited. I think it is safe to say that this is an area of continuing research, ongoing research. The mere fact that we are conducting international standard problems, we're comparing code predictions to experimental data right now is indicative. It's an evolving situation that as the codes are challenged by different experimental configurations, they get

continuously refined and developed and whatnot. They are reflective of our current state of the industry.

MEMBER KRESS: This looks like a good place where a CFD code might be useful.

MEMBER POWERS: Our experience is that is beyond the current state of the art, that for particular configurations -- and one of those configurations of great interest is the ice condenser beds. Here we are talking about more advanced reactors. Ice condenser beds is an area that poses a challenge to lump node codes.

You can for those kind of specialized environments do a CFD kind of calculation, but, remember, CFD calculations still struggle heroically when you have a phased condensing.

MEMBER KRESS: Oh, yes. Oh, yes.

MEMBER POWERS: So it represents a real challenge to CFD codes as well. In fact, in connection --

MEMBER KRESS: If one ignored condensing, wouldn't you get a conservative result?

MEMBER POWERS: No, I don't think so because why you get detonable concentrations is because you carry a hydrogen-steam mixture up into an environment. And you can condense out the steam. And

then, all of a sudden, you are in a detonable configuration.

What we have seen in comparisons is that there are real challenges modeling the turbulence with the CFD codes. In fact, if one asks only questions about gross quantities, like temperature, pressure, condensation rates, and things like that, and not microscopic questions, lymph node codes actually do better than the CFD codes.

MEMBER WALLIS: Well, I think with that in mind, there could be situations where you might want to install a fan or something. I don't know.

MEMBER POWERS: When it comes to the ice condenser, you will see that debate in spades.

MEMBER WALLIS: That is right.

MEMBER POWERS: Well, I speak to a variety of them, the FEMIS, AMED, CAVR, HFD. I mean, this is not a neglected area. And it's one that people have struggled with in many, many different ways, in many, many different approaches. And slowly the community evolves toward a consensus type of approach.

We have, for instance, in connection with the MAPP codes seen a tremendous evolution in the MAPP code from MAPP 4.0 to the current 5.3 or whatever it is and its approach to it; similarly, an evolution in

the codes that we have in this country, the codes that are used in Europe, and the codes that the Japanese are developing.

MEMBER WALLIS: I think that my concern was not whether Dr. Powers could analyze this but whether or not a typical licensee could do a good job and whether the NRC was capable of evaluating that job. Maybe this is something you should take note of.

MR. SNODDERLY: Graham, this is Mike Snodderly again.

I think the intent of the reg guide was to document that this issue had been considered as part of the IPE process but was not formally required to be documented and the resolution was based on the walkdowns that we previously discussed.

So the idea here was to somehow bring those walkdowns in that basis for addressing stratification in large dry containments or any containment that didn't have -- if they chose not to credit the fans *in toto* would be brought into the regulatory framework.

So that was the intent there and that was the level of detail that's expected, but it's to bring that in to the regulatory framework as being instead of remaining solely as part of the IPE process.

MEMBER KRESS: How does that deal with the top of the containment at issue? I mean, that seems to be a place where stratification is lacking. You know, you can't assure there are open passages there.

MR. SNODDERLY: But I think there they were crediting the spray systems. And what they were concerned about in the walkdown areas was to verify that there was not stratification in the rooms in the lower parts of the containments.

MEMBER POWERS: And the sprays typically don't go out to the dock.

MEMBER APOSTOLAKIS: Do you really need to say in "common defense and security" there? I mean, it sounds too pompous.

MR. DUDLEY: Just words from the Atomic Energy Act.

MEMBER APOSTOLAKIS: But we don't use those in routine. "Public health and safety," period. This is not an issue that affects the defense of the United States.

MR. DUDLEY: We'll discuss that with our general counsel.

MEMBER POWERS: Do you object to quoting from the Atomic Energy Act, George?

MEMBER APOSTOLAKIS: We never do that. We

never do.

MEMBER POWERS: Don't worry. We'll straighten him out after the meeting here. Heresy.

MEMBER APOSTOLAKIS: Now, to what extent are you relying in your assessments on the voluntary industry initiatives? I mean, it says here, "The commission continues to use severe accident guidelines as an important part of the severe accident closure process."

I mean, in your risk assessments, did you have any elements there that said, "But the industry is doing this voluntarily so it will affect the progression of the accident this way"?

To what extent are you relying on the voluntary initiative of the industry to reach your conclusion?

MR. KELLY: To what extent are we taking credit for saying --

MEMBER APOSTOLAKIS: Exactly. Yes, that's another way of putting it. Maybe you can put your marker on that.

MR. KELLY: Mike, I will have to ask you about that because you did those analyses.

MR. SNODDERLY: For containment venting in the long term, beyond 24 hours, the possibility.

MEMBER APOSTOLAKIS: That's the only, not the short-term? Okay.

MR. SNODDERLY: Not prior to 24.

MEMBER APOSTOLAKIS: How much credit? I mean, was that essential?

MR. SNODDERLY: Just that it's an acknowledged tool that should be available to decisionmakers in the technical support centers.

MEMBER APOSTOLAKIS: What happens if it is not available?

MR. SNODDERLY: Then eventually containment failure could possibly occur in the very long term, beyond 24 hours. So the decision would have to be made, co you want to control the release with a venting system or do you decide to have an uncontrolled release late, charge for late containment failure?

But that's the only place that I am aware of where voluntary actions were explicitly credited. And if you look at all of the major severe accident management guidelines for the owners' groups, it is included, the capability to vent the containment. But it is there as an option. It is not an exact step that one would take.

MEMBER APOSTOLAKIS: See, that is what I

am trying to understand. Did you use any probabilities that they will vent the containment there? Where did they come from?

MR. SNODDERLY: Scenarios were postulated where you can postulate containment late due to lack of decay heat removal and eventual pressurization or the possibility of radiolysis that could be to such a degree that would require possible venting or the possible of a hydrogen burn very late due to radiolysis.

MEMBER APOSTOLAKIS: What is the probability that they will actually vent it? It's voluntary. Is it one, that if there is a need, they will do it? The probability of not doing it is simply because somebody made a mistake someplace?

MR. SNODDERLY: No. It's linked to the likelihood of overpressurization due to hydrogen that would suppress radiolysis, but the quantification that I saw typically would have likelihoods of either .9 or .1, .9 that you would not need to vent containment. But there is the idea there that there is a small likelihood that you may need to vent containment late. And you should have that capability. And it's covered in the severe accident management --

MEMBER KRESS: But there's some criteria

in there, George, as to when you would vent. And if you meet those criteria, then the probability is pretty high. It's a pretty low probability you will meet those criteria.

So the conditional probability of that is pretty high. You will probalby never have --

MEMBER APOSTOLAKIS: I guess the question in my mind is there must be a spectrum of some metric where you decide that something is acceptable, it is done on a voluntary basis, and other things are not --

MEMBER KRESS: Yes. You're getting into the old question of this doesn't impact LERF and we don't have anything else in risk base which we ought to have. We really need some criteria on --

MEMBER APOSTOLAKIS: Why is this acceptable if I cannot take it to the extreme and say, "The only regulation we are going to have is to tell the industry to run the plant safely"? That's my only regulation.

MEMBER KRESS: Yes.

MEMBER APOSTOLAKIS: And then they will have all sorts of voluntary programs to achieve that? Where do you draw the line, which I believe comes close to what Mr. Williams told us about the English. They just issue generic statements, and then the

industry takes care of it. Right?

That is this additional thing that put on safety culture. And Commissioner McGaffigan said, "But we can't do that here."

MEMBER POWERS: I don't know that the English would agree with your characterization that there were 38 safety requirements.

MEMBER APOSTOLAKIS: Well, they are not as prescriptive as we are. That's what I understood from his presentation.

MEMBER POWERS: They might agree with that. I don't think they would agree with the statement of some generic things, and the industry just takes care of it.

MEMBER APOSTOLAKIS: Okay. Where do you draw the line when you say, "This is acceptable"? When it comes to the severe accident management guidelines, it can be a voluntary program, it's fine.

But when it comes to around the plant safety, no. We have to impose regulations, some of them there. There is something that says, "No, no, no, no, no. We have to have 50 points," such and such and such and such. That is probably not related to this, but I am just curious.

Mike, you wanted to say something?

MR. SNODDERLY: Yes. I think let's put it in perspective by looking at the containment event trees just very quickly. You would have to say, number one, that you do not have your hydrogen-mitigated system; for example, the igniters.

Then you would have to say that you do not have a decay heat removal system. And you had not been able to get that back for over 24 hours. Then you have to say that you have sufficient stratification that you create a detonable mixture. And then for certain designs, you also needed radiolysis to take place to give you enough oxygen to create a detonable mixture.

So now the rule has given you requirements that make this a very, very low-probability event because you have all of these mitigative features to prevent it. But if you don't, for defense-in-depth, there may be a possibility that all of those things don't work out the way you thought.

And so for defense-in-depth, you have your severe accident management guidelines that say, at your very last resort, you may want to have the option to vent the containment to preserve it. It's the only place for that very low likelihood sequence that you would have created a volunteer action.

So I would argue that it really has met our regulatory framework in the sense that for very low-likelihood defense-in-depth, you address that through something like the severe accident management guidelines, the voluntary initiative that has been well-documented and has received significant peer review as part of the --

MEMBER APOSTOLAKIS: No. That makes sense. I mean, it's just an extra defense-in-depth layer.

MEMBER KRESS: That's one reason the staff continues to require in this rule the hydrogen monitoring measurement systems. It's for that reason.

MEMBER APOSTOLAKIS: Okay. Fine.

MEMBER WALLIS: But you still haven't answered your question of what is the criterion for when you impose a rule and when you leave it up to industry.

MEMBER APOSTOLAKIS: I think Mike answered it.

MEMBER WALLIS: He is saying when it becomes very unlikely but still credible.

MR. SNODDERLY: You're right, Graham. I did forget to mention in the regulatory analysis that was done for this rule and it's determined using the

staff's regulatory analysis guidelines in the backfit rule to determine that the vents in the hydrogen recombiners were no longer cost-beneficial.

CHAIRMAN BONACA: Okay.

MR. DUDLEY: So if we make this addition, when we make this addition to the rule of paragraph (d), we will have to make some corresponding changes to the regulatory guide and the standard review plan and other things to make sure that those are all compatible.

That's the end of the presentation that we had planned for you this morning. Any more questions that you have we would be glad to try to answer.

MEMBER KRESS: Is industry happy with this rule pretty much, do you think?

MR. DUDLEY: Yes.

MEMBER WALLIS: You didn't your overwhelming cost-benefit analysis.

MEMBER APOSTOLAKIS: You presumed that we knew all the technical details, and you just talked about what other people said.

MEMBER POWERS: He knew that you had carefully scrutinized the documentation and had you had any questions, you would have raised them.

MEMBER APOSTOLAKIS: Voluntary commitment

on my part.

MEMBER WALLIS: Maybe you should say something about the criterion for judgment, which seemed to be a cost-benefit analysis.

MR. SNODDERLY: Graham, the committee looked at the regulatory analysis during its last letter-writing session on this issue. Jim Myers from ISL was saying Khatib Rabar performed the reg analysis. And they were here present.

MEMBER WALLIS: At least there should be some references since this is the final meeting on this. I think it would be useful to say in two sentences what the result of that was.

MEMBER KRESS: I recall a letter last time. We thought the cost-benefit analysis was very --

MEMBER WALLIS: It's overwhelming, really.

MEMBER KRESS: It was very well-done.

MR. DUDLEY: I'm sorry that I am not prepared to discuss that at this moment.

MEMBER SHACK: If there are no additional questions, then, Mr. Chairman, it is back to you.

CHAIRMAN BONACA: Thank you.

We have completed this presentation ahead of time.

(Whereupon, the foregoing matter went off the record at 9:37 a.m. and went back on the record at 10:02 a.m.)

CHAIRMAN BONACA: The meeting has come to order again. The next item on our agenda is the draft final regulatory guide, DG-1122, "Determining the Technical Adequacy of PRA Results for Risk-Informed Activities."

I believe we have two presentations in front of us today. Professor Apostolakis is going to walk us through this issue and presentation.

MEMBER APOSTOLAKIS: Okay. Thank you, Mr. Chairman.

3) DRAFT FINAL REGULATORY GUIDE, DG-1122, "DETERMINING THE TECHNICAL ADEQUACY OF PRA RESULTS FOR RISK-INFORMED ACTIVITIES"

3.1) REMARKS BY THE SUBCOMMITTEE CHAIRMAN

MEMBER APOSTOLAKIS: We wrote a letter last July regarding the revision 1 to regulatory guide 1.174, where we raised again the issue of quality of PRAs. We were told by the staff that they were in the process of developing a regulatory guide to address this issue.

What we have in front of us is the draft final regulatory guide that does this, DG-1122, which

has already undergone extensive public comments. I am sure the staff will talk about them.

My understanding is that most of them have been resolved except perhaps two or three. So today we will focus on the points of disagreement. This regulatory guide endorses the ASME standard and the NEI guidelines, with some exceptions. And these are the points of disagreement.

So I will turn the floor over to Ms. Drouin to lead us through the discussion.

MS. DROUIN: Thank you.

3.2) BRIEFING BY AND DISCUSSIONS WITH REPRESENTATIVES OF THE NRC STAFF REGARDING THE DRAFT FINAL VERSION OF DG-1122, INCLUDING RESOLUTION OF PUBLIC COMMENTS

MS. DROUIN: My name is Mary Drouin with the Office of Research. With me today also is Gareth Parry from NRR.

Just quickly, what we are going to try and go through today, of course, why we are here. We are not going to spend a whole lot of time on the background and history, but we did think that there are some key points that we need to just remind ourselves and what generated DG-1122 to revisit the commission position.

Then we are going to walk through at a very rather quick pace actually what is in DG-1122 and the SRP.

MEMBER APOSTOLAKIS: Excuse me, Mary. I forgot to do something.

MS. DROUIN: I'm sorry.

MEMBER APOSTOLAKIS: We received a letter dated April 8 and address to Dr. Bonaca, the Chairman of the ACRS, from Dr. Sidney Bernsen, who was the chairman of the ASME committee that drafted the standard.

Basically he says that there are two differences between the staff and the committee. One is a definition of significant sequences. And the other is describing the level of detail for the peer review.

I believe the members have copies of this letter. I don't know whether Mary is aware of the letter.

MS. DROUIN: Yes.

MEMBER APOSTOLAKIS: Oh, you are? Okay. So we are all aware of it.

MS. DROUIN: I was cc'd, yes.

MEMBER APOSTOLAKIS: Very good.

MS. DROUIN: And, as George noted a few

minutes ago, where we really want to spend the majority of the presentation and discussion is on the resolution of the public comments. We have received comments from several organizations. Most of the comments we have come to resolution. We are going to get more into that in the presentation.

I will disagree with Sid Bernsen. There are three areas where we have not come to a resolution, not two. We are going to spend some time on those three areas and then what our proposed schedule is.

We are here, of course, to brief the ACRS on DG-1122 and the SRP. We have gone out for public review and comment to provide the staff's resolution to these comments and how we would like to move forward. Ultimately we would like to obtain ACRS approval to allow us to issue this draft guide as a regulatory guide for trial for use.

MEMBER ROSEN: I'm not sure that we approve your doing that. I mean, we would comment on your course of action, but I am not sure "approval" is the right word, is it?

MS. DROUIN: My understanding is that we need a letter from the ACRS agreeing that this should be entered as a regulatory guide. That is one of the

checkmarks that we need. And that is the primary purpose of why we are here. We are requesting a letter, and we need a letter.

MEMBER ROSEN: Well, we'll write a letter to Dr. Travers or the commission, one or the other, and say we think it probably should be issued but certainly not approved in the regulatory guide.

MEMBER APOSTOLAKIS: If we say that it should be published, we approve it, right?

MEMBER ROSEN: It's a fine point.

MS. DROUIN: I have a little package, and it has in there a little checkmark that I get ACRS concurrence.

MEMBER POWERS: I will point out that --

MS. DROUIN: We can change that word to "concurrence" to be "concurrence/approval."

CHAIRMAN BONACA: That's fine. You will get a report from us.

MEMBER POWERS: We're not above bribery here.

MEMBER KRESS: That's right.

MS. DROUIN: As I said, I am not going to spend a lot of time on these but just to go back in history where we had the PRA policy statement encouraging our use. We had GAO criticizing us for a

lack of PRA standards. We had Dis-13 that said get on with professional societies and creating professional standards, specifically a PRA standard.

The next things are just a series of staff papers and SRMs that all deal with the PRA standards. And it all deals with this one issue of PRA quality. You hear this over and over again, a major issue concerned with the commission as we look at risk-informed activities.

MEMBER WALLIS: I have trouble with that expression because, in actual fact, you are addressing technical adequacy. All of these documents seem to address what the PRA tries to cover, the extent of the coverage of PRA. That says nothing to me about its quality.

There is a difference to me between what it tries to do and how well it does it. Yours seem to be addressing what it tries to do; whereas, I would like a measure of is it good or is it excellent or what is the quality of it. I think there is a different thing than the extent of the coverage of things.

MEMBER APOSTOLAKIS: Yes. This is a question that I was going to ask as well. Let me make it a bit more specific. Is the standard, the ASME

standard, and the staff's position the peer reviewers will decide this issue of whether the actual models are good?

Because on page 93 of the standard, it says -- we are going to have to do a lot of this back and forth. Sorry. Like under "Quantification," page 93, it says that "Level 1 quantification results are being reviewed" and then "The portion of Level 1 quantification process selected for review typically includes a symmetry sensitivity study, the recovery analysis," and so on.

So are we relying on the peer reviewers to actually say the models are good enough? Because then the peer review, of course, becomes even more important than what it is now.

MS. DROUIN: The peer review is certainly a very essential and critical aspect of it. I would not say that you are relying strictly on the peer review. If you were relying strictly on the peer review, then you would not need chapter 4 because you could just say, "Okay. I have got these peer reviewers, and I am going to rely on their opinion."

Chapter 4 sets the standards against which you are relying on the peer review to ascertain that those standards were met.

MEMBER APOSTOLAKIS: Well, in some instances, I think you are right, like when it comes to common cause failures, it says, "use," you know, either the alpha factor or basic factor, basic parameter model.

But in other instances, it just says, "Calculate realistic parameter estimates." It doesn't say, you know, "Using Basean updates." Unless this means the same thing to all of us, it is not clear they are going to do it correctly.

So in some instances, you are right. The model is specified. In other instances, it just says, "Do this." I guess the question is, then we will rely on the judgment of the --

MS. DROUIN: Now you are relying on the judgment of the peer review. And this is where the peer review becomes very critical. And this is when we get into the areas of disagreement, some of that is because from our perspective, you are putting a lot of reliance on this peer review.

MEMBER APOSTOLAKIS: Okay. But it is a correct understanding that peer reviewers will do this?

MS. DROUIN: Yes.

MEMBER APOSTOLAKIS: Just a clarification.

MEMBER ROSEN: A priori one shouldn't blanch at the idea that you are putting a lot of reliance on the peer review, do you?

MS. DROUIN: We certainly are not putting the reliance to the point where we are going to abdicate our responsibility. So what I mean is that the NRC would still not do a review. They would still do a review.

MEMBER ROSEN: Of course.

MS. DROUIN: But you would still rely a lot of the peer review to help us focus our review.

MEMBER ROSEN: What I come into this discussion with is a degree of comfort with the quality of the peer review at this time from the evidence that I have seen and personally experienced.

And I am asking the question about whether you think that is well-placed or should I not? To me, a peer review has been robust, at least in the instances that I have heard of and experienced.

MS. DROUIN: I am not understanding your question.

MEMBER ROSEN: The implication of your remarks to me at least could be interpreted to be that you can't rely on the peer review. And that is just the opposite.

MS. DROUIN: That is not what I said.

MEMBER ROSEN: Okay.

MS. DROUIN: I said you rely on the peer review to help our review but not to abdicate our review.

MR. PARRY: And I think this relates to some extent to one of the issues, the third issue of disagreement between us and ASME, which is that what we would like is for the peer reviewers to make value judgments about the assumptions and approximations that are a part of the PRA because that is valuable to us as reviewers because I think that is an essential part of peer review. Otherwise it becomes an audit. And I think we will come to that.

MS. DROUIN: We're going to come to that.

MEMBER APOSTOLAKIS: One last question on this subject. In a recent issue of *Inside NRC*, it says that the commission in two staff requirements memoranda said that, "A Level 2 internal and external initiating event or PRA which has been subjected to a peer review process and submitted to and endorsed by the NRC would be required." Is that any different? This "endorsed by the NRC," does that change anything?

MS. DROUIN: I don't think so. I am going to get to our next slide, which was getting to those

two SRMs that you are just referring to. The whole point of the previous slides on the background and history was to bring out this issue that the commission -- with every SRM when you go to the briefings, anything that has dealt with risk-informed activities, the commission keeps bringing up their concern of the issue with PRA quality.

We just were issued two SRMs, one on 50.69, one on 50.46. What I showed on the two slides -- now, I paraphrased their words, but on 50.69, the rule to be issued in parallel with the PRA standard and associated guidance; i.e., DG-1122, in the statements of consideration to ask whether or not we should require comprehensive high-quality PRA. Some of the words you just said pertain to the second one, the statements of consideration, for 50.69.

MEMBER APOSTOLAKIS: I guess the word that I was asking about is this "endorsed." In other words, if I look at 1122 and the PRA has gone through the peer review process meeting the standard and so on, then when you receive it, you are endorsing it or you have to do more to endorse, you have to do your own review?

MS. DROUIN: When we receive the PRA?

MEMBER APOSTOLAKIS: Yes, after it has

gone through the peer review process, the industry peer review process. Does this word "endorsed" by the NRC add anything or is it just another way of stating it?

MS. DROUIN: Again, probably to understand some of those statements, you have to go and look at the actual vote sheets. It is not, again, abdicating us to not do any review. The NRC would still do review of the PRAs.

CHAIRMAN BONACA: That's why you were saying that to you the importance of the type of review that you would like to see from the peer review, something that supports your judgment.

MR. PARRY: And I think, remember, the main purpose of this standard is to help us focus our review only in those areas that we really should be reviewing, which are probably the things where we don't meet where the PRA is known perhaps not to meet the standard.

So I am not actually clear what that statement means, and I don't think that we have -- I think we are probably still in the process of interpreting it is my guess. Tim Reed is here. He is involved with the option 2. And he would perhaps know a little bit more about that.

MEMBER ROSEN: But it clearly doesn't mean a wholesale submission of PRAs from everybody in the industry, does it?

MR. PARRY: I would hope not.

MEMBER ROSEN: I think you would find a lot of work in that --

MR. PARRY: A tremendous amount of it.

MEMBER POWERS: Could I come back to Mr. Rosen's question about the robustness of the peer review? Peer review, of course, is a hallowed institution of the scientific and engineering community. And it has been the subject of some academic study.

Have you looked at the conclusions of academic studies in the general area of peer review to see if they give you any insight into the reliability of peer reviews for your purposes?

MS. DROUIN: No in a quick answer. In a more long-winded answer, as someone who has participated in peer reviews, I think they are very valuable. And I think they can accomplish the intent to which we are looking for from them.

MEMBER POWERS: I think that is a general perception of the scientific and engineering community. It is not the conclusion that comes out of

some of the more notable studies of the peer review process. Words like "quixotic" appear in those. Peer review is an interesting institution on whether it is indeed a robust examination.

Now, it may well be, like democracy, the worst possible way of doing things except for everything else. It has not been found to be a panacea.

MS. DROUIN: I don't think that it is a panacea in that regard. And I think that if you are looking for the peer review to tell you where all of your awards are, that is not something to use the peer review for. A good peer review I think can tell you whether what you have is solid or whether it is going to fall apart.

MEMBER APOSTOLAKIS: I think it most likely will tell you whether it's consistent with the current state of the practice.

MS. DROUIN: Yes.

MEMBER APOSTOLAKIS: Unless you specifically ask the reviewers and select them in such a way that they are competent to do that, they will not give you statements like "We need to go beyond the state of the art in this particular issue because there are these uncertainties and so on" that would

just tell you yes. We use this model. That is what everybody else is using. And you used it correctly.

MS. DROUIN: Yes.

MEMBER ROSEN: Isn't the former too much? It certainly wasn't an expectation of the peer review process?

MEMBER APOSTOLAKIS: No, but what we are doing here is trying to understand the limits of peer review.

CHAIRMAN BONACA: Because we are trying to understand what the other role is, how much you depend on it and what kind of information you get in to make a judgment about the adequacy of your --

MEMBER APOSTOLAKIS: Exactly. There is a difference because the NRC staff has to worry about the public health and safety, not whether the analysis was done according to the existing models.

The peer reviewers look at, you know, this PRA, does it conform? Do you have a more difficult -- for example, I can see a peer review group not saying anything about model uncertainty because nobody does it.

But when you come in, you have to worry about it because your criteria are different. You worry about public health and safety. And if model

uncertainty can change the conclusions, then you have to worry about it.

MS. DROUIN: That's right.

MEMBER APOSTOLAKIS: So there is this distinction, I think.

MS. DROUIN: So there are things, you know, during the course of the development, I think, of the standard, particularly when you look at some of the list in there for the peer review, that were put in there from that perspective.

MEMBER APOSTOLAKIS: Yes, yes. I think we will come back to the peer review later because you were addressing the issue.

MS. DROUIN: Yes.

MEMBER WALLIS: Again, you've got this word "high-quality" PRA, but we don't have any criteria for high quality. I think most of your remarks are about acceptability or technical adequacy to me is a C. High quality may be an A. There is a difference.

MS. DROUIN: When we were writing DG-1122, we tried not to use the words "PRA quality" anywhere in there. I think we did that. I am now quoting you from the SRM.

MEMBER WALLIS: Yes.

MS. DROUIN: These were the commission's words in the SRM.

CHAIRMAN BONACA: You are talking about adequacy to support the conclusions.

MS. DROUIN: Yes.

MR. PARRY: Right. And, in fact, I think you will notice the position that -- I think that we state this position in SECY-00-162 -- what we talk about for quality, we talk about the quality of the PRA sufficient to support an application.

MEMBER WALLIS: I think you would accept a C level PRA because --

MR. PARRY: Right.

MEMBER WALLIS: You are not selecting for all PRAs to be A grade.

MR. PARRY: And I think the benefits you get from it are commensurate with the grade, if you like.

MEMBER APOSTOLAKIS: Are these comments, especially from Commissioner McGaffigan, changing now anything you are doing? I think your draft guide, you try to stay within the spirit of 1.174 that given a particular decision, you want to make sure that the PRA is done adequately and so on. And other parts of the PRA may not be done very well.

But now the commissioner comes in and says, "The fee for participating in the risk-informed activities is to have a Level 2 all modes high-quality PRA," which means now what, that you have to have a Category 3 PRA and that your effort here to accommodate people maybe is not consistent with the commissioner's view?

MS. DROUIN: In terms of Commissioner McGaffighan's statements, that does not change in terms of what we do in this draft guide, in this regulatory guide, because that is the implementation.

When I look at Appendix A endorsing the standard for a Level 1 full-power internal event, is there sufficient enough information or requirements in that standard such that if you fold it, it would yield you a quality PRA?

MEMBER APOSTOLAKIS: But if he requires high-quality, it seems to me you are going to Category 3.

MR. PARRY: I think his paradigm appears at first sight to be a little different from the one that we have been developing in reg guide 1.174 and in this document.

MEMBER APOSTOLAKIS: But you have not received a formal communication from the commission to

do that?

MS. DROUIN: One, I think that what is meant by high-quality, the staff still has to ascertain what is meant by that. Personally I disagree with you.

I don't think what is meant by Commissioner McGaffigan -- this is my personal view -- I want to make that clear -- that I am expressing here. I do not think he means a Category 3. I think what he means is a full-scope Level 1/Level 2 all contributors taken into account.

It is not just full power. It's low-power shutdown. It's external events. It's internal fire. I think when he talks about high-quality, he's meaning all of this. It's not that you come over and you have this Level 1/Level 2 LERF and then you just sort of do this side stuff and deal with your other contributors.

MEMBER APOSTOLAKIS: Well, that's part of it. You can't really --

MS. DROUIN: This is something that the staff is going to have to work out, what is meant by those words.

MEMBER APOSTOLAKIS: You can't call a Category 1 PRA high-quality, though.

MS. DROUIN: No, but I would call Category

2 high-quality. I would call Category 1 high-quality if you do it right.

MR. PARRY: Category 1 is high-quality.

MEMBER ROSEN: Sure, you can do Category 1 high-quality, but if that's all you need for the application you are asking for some sort of change based on. It always comes back to the question, is it good enough for the purposes intended? That's different for everything.

MEMBER APOSTOLAKIS: That's different from high-quality.

MEMBER ROSEN: That's different than what you might interpret, sufficient remarks --

MEMBER APOSTOLAKIS: Good enough for this application, but it's not the high-quality.

Are we going to come back to this category business? I have a question on the categories.

MS. DROUIN: No, we were not.

MEMBER APOSTOLAKIS: Okay. Let me raise my question. The way I understand the categories, as you move from 1 to 3, you become more realistic and more plant-specific.

MR. PARRY: And more detailed.

MS. DROUIN: And more detailed.

MEMBER APOSTOLAKIS: Right. But one

essential ingredient is this plant specificity, isn't it?

MS. DROUIN: Well, if you go to the standard and you go to Table --

MEMBER APOSTOLAKIS: Yes. It's the first one, isn't it?

MS. DROUIN: On page 3 of the standard.

MEMBER APOSTOLAKIS: Yes, page 3.

MS. DROUIN: I was one of the persons on the small group who helped put together this table.

What we felt is that if you are trying to define these categories of PRA, we felt there were three things that defined it. That was: The level of detail that you went into, how much plant-specific information you took into account, and how much realism you brought to your analyses.

So as you go from left to right, your left-hand one, which is your Category 1, your model is much at a higher level of detail. And you might be at the tray level. You're dealing with a more generic type of information. You're dealing with more conservative type analyses; whereas, when you move over to your far right, your Category 3, then you have gone to a much finer level of resolution detail. You're being very plant-specific, and you're being

realistic in your analyses.

MR. PARRY: It also has to be said that, even for Category 1, the models have to represent the systems as built and as operated.

MS. DROUIN: Oh, yes.

MEMBER APOSTOLAKIS: But you do state in the guide that the PRA model must represent the as-built and as-operated bond?

MS. DROUIN: Right.

MEMBER APOSTOLAKIS: And the event probabilities represent the actual operating history and experience of the plant and applicable generic experience is applicable? Right? You do say that, which it seems to me eliminates Category 1.

MS. DROUIN: No, no, because Category 1, you might keep your model, for example, at your fault tree level. You might keep it at the train level, system level. It starts to represent it. You're just not building it down to the component or subcomponent level.

You might keep your event trees at a higher level. They're still going to represent how that accident would progress, but it may not be down at this very detailed, fine cut where you have got 100 events in your event tree.

MEMBER APOSTOLAKIS: No, but the --

MS. DROUIN: So it's the level of detail.

MEMBER APOSTOLAKIS: But you cannot use generic data when you ask them to represent the actual operating history and experience of the plant.

MR. PARRY: Where are you looking, George?

MEMBER APOSTOLAKIS: Well, I'm trying to find it myself.

MR. PARRY: Okay.

MS. DROUIN: Well, in your Category 1, you aren't going to be able to do a Category 1 that is 100 percent generic data.

MEMBER APOSTOLAKIS: But if you ask them to have event probabilities that represent the actual operating history and experience and that the PRA model must represent the as-built and as-operated plant, it seems to me you have made it plant-specific.

MS. DROUIN: Where are you reading from?

MEMBER APOSTOLAKIS: I can't find it. I don't know why I can't find it.

MS. DROUIN: Then I would tend to say that is a mistake on ASME's part in characterizing it because that is not the intent. I don't want to speak for ASME because this is an ASME standard, not an NRC standard. I am just trying to share to you what I

think --

MR. PARRY: They're talking about the guide.

MS. DROUIN: Our guides? In our guide?

MR. PARRY: Yes, your guide.

MS. DROUIN: Then that would be our problem.

MR. PARRY: Yes, that would be our problem. That is what they are talking about.

MS. DROUIN: I didn't think we had a discussion on categories anywhere.

MEMBER APOSTOLAKIS: Okay. Page 19 of the draft guide.

MS. DROUIN: Okay.

MEMBER APOSTOLAKIS: Demonstration of technical adequacy of the PRA. In the middle paragraph, A, "The PRA model or those parts of the model required to support the application represent the as-built and as-operated plant." Okay? So that is the first part. "Current design and operating practices."

MR. PARRY: C is the point you are looking at. That just says "probabilities and frequencies consistent with the definitions of the events and the model." It will cover all categories.

MEMBER APOSTOLAKIS: There is another place where you actually say they should be using the actual experience. I mean, it's there. I just can't find it now.

If one is to make a decision regarding a particular plant, one has to have plant-specific information. Now, the correct way of putting it in my mind is that you may argue in some instances that the generic information does, in fact, represent the plant-specific information as well.

MR. PARRY: Or represents it adequately for the application --

MEMBER APOSTOLAKIS: So based on what I see in the guide, it seems to me you are eliminating capability Category 1 and, really, you're talking about capability 3 with some allowance for capability 2 in some places.

MR. PARRY: I hope not. And if you can find those and point them out to us, I think we need --

MEMBER APOSTOLAKIS: I just gave you one, right, the as-built and as-operated?

MR. PARRY: No. That's okey.

MEMBER KRESS: That's not plant-specific.

MR. PARRY: Yes, but that is the structure

of the logic models, the systems, the ones that you have. And the operator actions are the ones --

MEMBER APOSTOLAKIS: And I agree with that. It's the second one, the event probabilities, that is more --

MR. PARRY: That would be my worry.

MEMBER APOSTOLAKIS: Let's go on, and maybe I'll find it.

MS. DROUIN: You will see the statement right at the very beginning of the regulatory guide. I believe it shows up in the second paragraph, you know, "The purpose of the draft guide is to describe an acceptable approach for determining that the quality" -- unfortunately, this is one of the few places where we did use the word; we didn't feel we could get away from it here -- "of the PRA *in toto* or for those parts that are used to support an application are sufficient to provide confidence in the results since they can use regulatory decisionmaking," et cetera.

MEMBER APOSTOLAKIS: Which brings up another question. I think we have discussed it in the past, too, but let's make clear where we stand.

I can see when you're dealing, say, with the allowed outage time of a particular piece of

equipment not worrying about whether the fire analysis or something else has been done or the human reliability analysis has been done rigorously.

But if you go to regulatory guide 1.174, there is a requirement that you consider also the total CDF and the total LERF. So if one does the limited analysis using Category 1, what category should you be using for the total CDF and total LERF, also Category 1?

MR. PARRY: I think that in reg guide 1.174, the only time that absolute values of CDF and LERF are used, I think if you read it carefully, what it says is that if you have any indication that you're in excess of 10^{-4}, then you should be more careful with granting the application. I don't think --

MEMBER APOSTOLAKIS: How would you know that if you don't do a rigorous analysis?

MR. PARRY: I think if you don't do a rigorous analysis, if you do a Category 1, I suspect what you are going to end up with is, in fact, a higher CDF than you would do if you did a Category 2.

MEMBER APOSTOLAKIS: But isn't it an assumption on our part that, indeed, you will get a conservative CDF if you do Category 1?

MR. PARRY: In the sense that when you are

moving from Category 1 to 2 and that most of the supporting level requirements here I think for Category 1 tend to suggest that you should be using conservative analyses, then perhaps it is an assumption. But I think it is not a bad assumption. But it perhaps needs to be checked out.

MS. DROUIN: It certainly is an assumption, but I think as you go through and you look at the supporting requirements that are in the standard, I don't think it would be very difficult to show that it would yield a more conservative number.

MEMBER APOSTOLAKIS: Right, but if I look at pages 14 and 15 of the standard, where they give an example, -- and I think that is a good idea to give an example -- section 3.2.2, "Determination of Capability Categories," if you read the example, you get the impression that the values of CDF and LERF are sort of absolute.

So, for example, on page 14, they say they are looking at the surface water pump allowed outage time. Okay? And they say, "If the plant has a baseline CDF and LERF of such and such and it is expected that the changes in CDF can be shown to be small, then the parts of the PRA that are impacted by changes in SW pump availability due to maintenance of

determined to require PRA capability Category 2."

I am determining the capability category after I have a CDF and LERF. And I am confused now. If I have determined CDF and LERF using Category 1, I get a conservative result, which would probably be insensitive to a lot of the things I do because it is conservative.

Then I am not going to reach the conclusion that I should go to Category 2. I will stay to Category 1 because, no matter what I do, it will be insignificant with respect to the final result.

And then it goes on on the next page and says, "Continuing the above example, with a baseline core damage frequency of 10^{-4}" and so on, then again, they determine the capability category. And it seems to me the way these values are used, it implies that they are an external input.

And I am determining now the capability category for the application using that external input, where, in fact, in practice, what you are saying is, "No, it's not external. You have decided on the capability category, and you get the baseline CDF and LERF.

But then how can I use that as a criterion

whether I need to go to a higher category?

MR. PARRY: My interpretation of this is that, really, the way you would want to make sure that -- if you felt you had a conservative estimate of CDF, where you are really going to focus is on the evaluation of delta-CDF. Those things you need to do pretty well.

MEMBER APOSTOLAKIS: But if the original CDF is very conservative, how can I trust the delta-CDF? See, the CDF is not done independently of the baseline CDF.

MR. PARRY: No, it's done by the baseline CDF minus the modified CDF.

MEMBER APOSTOLAKIS: Right, but if I have already --

MR. PARRY: It is those elements that you are changing.

MEMBER APOSTOLAKIS: But if I have made already conservative assumptions because I decided to start with Category 1, then the delta-CDF I am going to have may be zero because I have been so conservative already that by changing the AOD by two weeks, my model is insensitive to that.

MR. PARRY: Then I think what this says is you look at those elements that go into the

calculation of that change and make sure that those now are Category 2. So it's almost like separating out part of the PRA.

MEMBER APOSTOLAKIS: But when it says, "If the plant has a baseline CDF," the plant doesn't have anything. You produce that. And the way it is presented here, it says, "Is that something that you Vic here gives me?" No. I do.

It's not external. I have made the decision to go with Category 1. And I produce a CDF. So the statement "If the plant has" is not meaningful.

MR. PARRY: Okay.

MS. DROUIN: But I think you can't say it quite that way.

MEMBER APOSTOLAKIS: Well, that's what it says.

MS. DROUIN: You don't have a CDF that's a Category 1 or a Category 2 or a Category 3.

MEMBER APOSTOLAKIS: That is my question. Do I?

MS. DROUIN: No, you don't.

MEMBER APOSTOLAKIS: So what do I have?

MS. DROUIN: It's a mixture of things. I mean, I would doubt that you would find a single PRA out there of the PRAs that are out there that when you

go down and you look at -- say you just take your vertical slides of Category 1 and you look at all the supporting requirements.

You aren't going to find one. You are going to see some places where it is Category 1, some places it's Category 2. And I think you would even find some places where it is Category 3.

MEMBER APOSTOLAKIS: No, but I think if --

MS. DROUIN: So it's the whole mixture.

MEMBER APOSTOLAKIS: But if a PRA is really Category 3, the parts they did using Category 1, there was a reason for that. They showed that if you do this conservative, it doesn't contribute much. You can't say it's Category 1. They just did a bounding analysis. But the baseline is Category 3. A lot of PRAs do that. That is how you screen sequences, right?

So I just don't see how the baseline CDF and LERF are produced. And it is used here as a criterion for deciding whether I need to do Category 2 for this particular application or something else.

It says, "Due to maintenance, a determined to require PRA capability Category 2; whereas, the remaining parts of the PRA needed to determine CDF or determined to require only PRA capability Category 1."

So what did the baseline CDF have in it, Category 1 or 2?

MR. PARRY: I think Mary is right that most PRAs will have some elements of the Category 1 and probably the majority that are 2. So all this says is what you are going to focus on is you are going to try and do a Category 2-type job on those things that you need to calculate the delta.

For what you need to calculate the balance, as long as you have reached one, then that is adequate. But in all likelihood, there will be more in Category 1. They will probably be Category 2.

MEMBER APOSTOLAKIS: So I start with a CDF Category 1?

MR. PARRY: No, It's not a Category 1 CDF. It's a calculated CDF from the model.

MS. DROUIN: It's a CDF, but you can't call it --

MEMBER APOSTOLAKIS: Can I do it using Category 1 approaches?

MS. DROUIN: What we keep saying is that --

MEMBER POWERS: I think that is the essential point, that regardless of what category it is, if whatever you have done is very conservative,

you end up with this zero delta-CDF because you are insensitive. That is the question.

MEMBER APOSTOLAKIS: That's my point.

MEMBER POWERS: And I think it is an excellent insight.

MR. PARRY: But I didn't necessarily think you do reach a --

MEMBER POWERS: We seem to get an awful lot of things coming to us that said we just did this, and it didn't make any difference.

MR. PARRY: The only way you could get a zero, I think, is if the elements that you were changing were not even in the model.

MEMBER POWERS: I don't think we mean zero in absolutely zero. I think we mean they are always very small.

MR. PARRY: Well, they might be small, but they might genuinely be small.

MEMBER POWERS: They might be a product of the conservatism.

MR. PARRY: Just by looking at them.

MEMBER APOSTOLAKIS: They might not.

MR. PARRY: But the only way you have to be concerned is where the conservatisms that you have put into the model have made it impossible for you to

calculate the delta. That is where I would be concerned. And if there are the elements in the model that you can represent the change with, then you can calculate a delta.

I mean, the result of the model is a sum of cuff sets. So you take a large sum and a small bit that you're changing. When you take the difference, that large bit cancels out.

CHAIRMAN BONACA: Would a reviewer at the NRC be able to see how this kind of dullness of the model is making some effects? I think it would.

MR. PARRY: And I think that that is one of the requirements in reg guide 1.174, that you do sensitivity studies to see whether there are changes out --

CHAIRMAN BONACA: To see how the assumption is made in the inputs in the data that you have been using plus --

MEMBER APOSTOLAKIS: But isn't this again part of the spirit, consistent with that approach that we want to accommodate licensees who don't have good PRAs and so on? I find this kind of guidance here to be inconsistent with the statement from the commission of high-quality PRA.

MEMBER KRESS: Let me add a little

question to this. Suppose I wanted to use the PRA to determine some importance measures.

MEMBER APOSTOLAKIS: No. That doesn't apply.

MEMBER KRESS: Well, you know, eventually when we are risk-informed, we might get there. If I'm using a very conservative PRA, I get a conservative CDF, say, a large CDF, what that tends to do is make the importance measure with respect to that CDF smaller, which goes against having this fixed value of an importance measure, saying that's when it's risk-significant. I worry about things like that when we use conservative PRAs. I am worried about the further use of PRAs using this quality guide.

MR. PARRY: But if you look at -- I'm trying to think. I think it is Appendix A in reg guide 1.174, that issue is discussed that you can obscure importance measures by having conservative elements and also having non-conservative elements.

So we recognize that. And I think you will find that in, for example, 50.69, it is the whole PRA that needs to be of an adequate quality because of the fact that you are using --

MEMBER KRESS: You would have to use the Category 3.

MR. PARRY: Two I think is what people seem to be holding out.

MS. DROUIN: I think at this point, what we need to do is go back and re-look at this, re-look at it a little bit more carefully, and just determine if we need to add any clarification in DG-1122.

MEMBER APOSTOLAKIS: Yes, I think the issue of whether the baseline CDF and LERF can be Category 1 is really a serious one because, I mean, I haven't thought of all of the implications, but to do the baseline CDF on Category 1 and then the situation-specific analysis Category 2 or 3, that just doesn't make sense to me.

By the way, I found the sentence that we are looking for, page 7.

MEMBER ROSEN: Seven of which?

MEMBER APOSTOLAKIS: Of the guide.

MEMBER ROSEN: Of the guide.

MEMBER APOSTOLAKIS: No, no. Of the DG-1122.

MEMBER ROSEN: Page 7?

MEMBER APOSTOLAKIS: Yes, "Parameter Estimation." Okay? "Parameter Estimation Analysis." The last sentence, "and represents the actual operating history and experience of the plant and

applicable generic experience as applicable." "Applicable generic experience as applicable." That's nice.

It seems to me that the guide -- and I agree with that -- asks for a plant-specific PRA which is of reasonable quality. And my question is, why don't we just say that up front? I think if I do what you are asking them to do, I will end up with at least Category 2.

You are eliminating Category 1 implicitly. And the question is, why don't you want to do it explicitly?

MS. DROUIN: Let me come back and answer this because we are going to now get into this part of the guide.

MEMBER APOSTOLAKIS: Okay. Fine. I mean, you are asking them to be plant-specific, the models. You are asking them to include actual operating experience. I mean, that is what PRAs do. I mean, if you look at South Texas, you look at Seabrook, all of these --

MS. DROUIN: I think you are misreading. I think you are misreading this. I am going to get back to this point.

MEMBER APOSTOLAKIS: Okay. Now, where are

we?

MS. DROUIN: We talked about what we are not trying to do with this reg guide. One, we are not trying to address how the PRA results are used in the decisionmaking process. That is not part of the scope of this document.

The guidance on how PRA results are used is in the application-specific guide. So you would go, for example, for tech specs. I think it is 1177, ISI 178. Go to 174. So how you actually use the PRA results in your application, you go to that application-specific regulatory guide.

This is strictly dealing with the issue of determining the technical acceptability of the PRA for the application. It has a very specific focus.

MEMBER WALLIS: I guess it is possible to do that. I am not quite sure. It seems to me that what is acceptable technically can hardly be divorced from what you are going to do with it.

MR. PARRY: That is what we are saying, isn't it?

MEMBER WALLIS: But it does not address how they use it. Since they use it for decisionmaking, I don't know how you can divorce technical acceptability from the use.

MR. PARRY: No, but what --

MEMBER WALLIS: It is a nice thing to say, but I am not sure how you can do it.

MR. PARRY: All this is saying is that where we talk about technical acceptability, it is in relation to those elements of the PRA that are used in the decisionmaking process.

This guide does not address how you identify those elements. That is dealt with elsewhere because this guide is meant to support a lot of other regulatory guides.

MS. DROUIN: So based on that scope, how do you --

MEMBER WALLIS: It seems very strange to me. The whole idea of engineering is the technical acceptability of the engineering analysis is based on what it is used for, isn't it, always? You can't divorce the two.

MS. DROUIN: How somebody is going to, for example, use the fact that station blackout has this CDF and these contributors and how they are going to use that in some decisionmaking process, we are not addressing.

But given that they are going to use that information, we are trying to say that that

information is technically acceptable. I mean, it was performed --

CHAIRMAN BONACA: So what you're going to do, you are going to show that this is adequate support, any one of those activities that then are described so far as the evaluation portion in different guides?

MS. DROUIN: Right.

MR. PARRY: I think another way of looking at it is that this guide will give our position on the ASME standard, which if you applied all of the --

MS. DROUIN: And PRA standards.

MR. PARRY: And other PRA standards.

MS. DROUIN: If you apply all of the supporting level requirements, then you would have a PRA that does what a PRA does. It calculates CDF. It calculates LERF. It identifies all the contributors.

I think all we are saying by this statement is that we are not telling people how to make decisions here. All we are doing is commenting on the quality of the elements of the PRA.

MEMBER WALLIS: But it seems to me your PRA has to be adequate for the most difficult decision that uses the most sophisticated PRA.

MR. PARRY: But that I think is the way

the ASME standard is written. It is written to incorporate all of the elements that you would need to do exactly what I just said.

MEMBER APOSTOLAKIS: The regulatory guides, though, do not specify categories.

MR. PARRY: No, they don't.

MEMBER APOSTOLAKIS: Should they? Who makes that determination? Let's say I want to -- again, the AODs. I would go to the regulatory guide that says, "tech spec changes." Right? That is a regulatory guide.

MR. PARRY: Right.

MEMBER APOSTOLAKIS: Now, it doesn't tell me there what kind of capability category I need.

MR. PARRY: Right, right.

MEMBER APOSTOLAKIS: So the individual reviewer will have to make that determination or is it going to evolve from long practice?

MR. PARRY: No, I don't understand.

MEMBER APOSTOLAKIS: I pick up the regulatory guide that deals with tech spec.

MR. PARRY: That's right.

MEMBER APOSTOLAKIS: And I want to change my AODs. I look at the guide. It makes no reference to categories. There is a lady and gentleman here

writing regulatory guide 1122, DG-1122, saying, "Look, we are not getting involved in what category, what quality of PRA you need. We are just going to describe various attributes of the various categories because the regulatory guides that deal with specific regulatory decisions deal with that," but they don't. So there is a gap there.

If I want to extend the AOD, somehow I have to make a judgment because if I look at the guide, it doesn't tell me what category to use. And I go to DG-1122. It talks about categories. Somehow I have to decide that Category 1 is good enough.

MS. DROUIN: But again, you're never deciding it at that high level that your PRA is Category 1. You are deciding it on a requirement by --

MEMBER APOSTOLAKIS: At a local level.

MS. DROUIN: Yes.

MEMBER APOSTOLAKIS: Okay. But there is no guidance how to do that, even at the local level.

CHAIRMAN BONACA: Okay. As you looked at this quality and this implementation -- and the ASME people have done, too -- they have made a judgment that if you meet these requirements, you can support all regulatory applications we know of right now.

MEMBER APOSTOLAKIS: No.

CHAIRMAN BONACA: Now, that is how it has to be because we are talking about adequacy of standards to support regulatory applications.

MEMBER APOSTOLAKIS: But they are not telling you which applications.

CHAIRMAN BONACA: They are not telling which applications.

MEMBER APOSTOLAKIS: Because it is a graded approach.

CHAIRMAN BONACA: And there may be a gap. I'm saying that --

MEMBER APOSTOLAKIS: There is a graded approach.

CHAIRMAN BONACA: -- I can live without putting a burden right now on the standard and the reg guide, recognizing that there may be some additional steps to be done for specific applications. Actually, there is.

MEMBER APOSTOLAKIS: In fact, an earlier draft of the ASME standard tried to do that. And the staff and we objected.

MS. DROUIN: Excuse me?

MEMBER APOSTOLAKIS: A very early draft of the standard tried to put up front and give examples

of applications where --

CHAIRMAN BONACA: But that wasn't done --

MEMBER APOSTOLAKIS: We all objected.

CHAIRMAN BONACA: But there was no technical basis for it.

MEMBER APOSTOLAKIS: We didn't want to specify.

MEMBER ROSEN: I think there's a burden of proof issue here. And that is that the applicant who wants to get some sort of regulatory approval to make a change has the burden of proof to say, "For this change that I want, my PRA is acceptable. And it's of the correct category because."

Most of the because is in the delta-CDF argument, as Gareth would argue. It is not something that is in either of the guides, either the one side of the sandwich or the other. I mean, it's not --

MEMBER APOSTOLAKIS: It's not. It's not.

MEMBER ROSEN: It's not as you suggest.

MEMBER APOSTOLAKIS: It's a statement of fact.

MEMBER ROSEN: But the outcome of that discussion between the applicant, the licensee, and the staff is going to be presumably some sort of change or some sort of denial of a request for a

change.

The burden of proof, it seems to me, is on the licensee to say that his PRA can support this change he has requested. And I don't know how you would write it ahead of time. I'm not sure you would even want to try.

MR. PARRY: And I think chapter 3 of the ASME guide, in fact, tells the applicant to do that.

MEMBER APOSTOLAKIS: All of these things would go away if everybody had the level of a Category 3 PRA.

MS. DROUIN: I don't know that they had a Level 3.

MEMBER APOSTOLAKIS: Category, category.

MS. DROUIN: If you certainly had a single category. I mean, going into multiple categories added a whole level of complexity that we are now having to deal with. I am not going to argue that.

MEMBER APOSTOLAKIS: And that's what Commissioner McGaffigan is referring to by saying "Band-Aids" and "Band-Aids."

MEMBER ROSEN: Well, that's not fair.

MEMBER APOSTOLAKIS: That's what he says.

MEMBER ROSEN: Maybe he did, but I don't think it's fair. I think that people have developed

this tool. And some places want to use it broadly, and they have to have a better one. And some places want to use it in a minimal sense. And the wisdom of the ASME and the staff in thinking about what the ASME has done has said, "Yes, that's okay."

MEMBER APOSTOLAKIS: So can you give me an example, to close this, of an application where Category 1 would be sufficient?

MS. DROUIN: I guess I would come back and say that is not really a fair question because I don't know of anyone who has a Category 1 PRA. You keep saying, but no one has done a PRA that has just been done to those requirements at that level. Such a beast does not exist.

MEMBER APOSTOLAKIS: So it's a mixture?

MS. DROUIN: It's a mixture.

MEMBER APOSTOLAKIS: For everybody?

MS. DROUIN: For everybody, absolutely.

CHAIRMAN BONACA: But this bullet there, 3 and 4 particularly, they state that these are the -- "sufficient technical quality," which means every regulatory application can be supported by this PRA now.

I see the point that George is making. That is, some applications may need a level of quality

which is higher or lower than some other. And so are you seeing a standard here that it is closer to mostly the PRA or --

MS. DROUIN: But when we say "level of quality," those words bother me because whether you're Category 1, you're Category 2, or you're Category 3, you have quality in all of them. Whatever the requirements are, you have to do it right.

CHAIRMAN BONACA: Well, let me use the word, then, "sufficient technical adequacy."

MS. DROUIN: No because that is adequacy also. It's depending on if you are in Category 1, do you need that level of detail? Do you need that level of plant-specific information? Do you need that level of realism? I mean, that is what we are talking about between the different categories. So it's not a difference between technical adequacy or quality.

CHAIRMAN BONACA: The problem I am having is that you start, the NRC starts, with an application, right? Say it's an application for reg guide 1.174. It comes in as a model and with a problem that is being resolved.

So the problem that actually is being addressed is the first thing that the NRC is confronted with. And then you are saying, "Okay.

This is the problem I am trying to resolve. And this is the evaluation I am using. Now, what kind of PRA do I have behind that to support it?"

You make a judgment on the PRA based on the problem that you have to solve. There is a correlation between the two. And you are making a statement of sufficient technical adequacy.

Now, that doesn't mean that you have set this model of sufficient technical adequacy to address any other problem. You are only focusing on the adequacy for that problem. Is that correct?

MR. PARRY: I have a slightly different --

CHAIRMAN BONACA: Unless people are going to docket a PRA that is good for any regulatory application.

MEMBER ROSEN: I would say yes to that right away. Go ahead, Gareth.

MR. PARRY: I have a slightly different take on this, and I am not sure that everybody would agree with it. I think that you could use a Category 1 PRA to even do Option 2 in 50.69.

MS. DROUIN: I would agree with that.

MR. PARRY: What it means, though, is that you would have more components in your high safety significance category than you would if you had a

Category 2 PRA.

So I think because a Category 1 PRA is a PRA model that has all the right PRA elements, it hangs together as a model, it deals with dependencies, it has the right operator actions in there, it has some conservative --

MEMBER KRESS: It gives you a conservative CDF.

MR. PARRY: That's right.

MEMBER KRESS: That's in the denominator for the importance factors for option 2.

MR. PARRY: It's true, but also if you look at the guidance for doing option 2, you have to perform certain sensitivity studies to see whether by changing parameters --

MEMBER KRESS: Yes, but those sensitivity studies are divorced from the actual CDF.

MR. PARRY: Well, not necessarily. I mean, if one of the things that you had done was to put very conservative common cause failure values in your model, then take them out. See what new results you get. And construct your set of high and low safety significance SSEs on that basis together with other things that you could put in.

MEMBER KRESS: In that sense, you are

right. You're right. You're right.

MR. PARRY: You have to jump through more hoops.

MEMBER KRESS: Yes.

MR. PARRY: But you can still come to a solution. You will get an answer. It's just that I think that the answer that you will get will not be as beneficial if you have got a Category 1 as if you had a Category 2. I think that is the flavor that we have to get with these categories. It's somewhat --

MEMBER KRESS: Let me give you a scenario and see what you think of this. I'm a plant. I'm a licensee. And I have a PRA. It's been through the peer review process. And they deemed this PRA to be Category 2 just without any application at all, just Category 2.

Now they have submitted it to you to see if you agree and along with some requested application of it. Now, the application, they will use it in their application.

They will calculate a CDF and a LERF. And they will also calculate. They will look at that CDF and LERF and say, "Oh, in 1.174 space, this allows me a delta of so much. And I know by my category that I don't have to go to Category 3 because I am

conservative on both these CDFs and LERFs. So I can use them, and I can allow this delta CDF."

So then I use the same thing, but I go in and specify where my application is going to affect the PRA and calculate a delta, which is probably more precise than the CDF, and I come up with a delta calculation that fits my 1.174 guideline, I am okay. And I am going to submit all of this to you, along with some potential uncertainties in all of these.

Now, the question I have is, where does uncertainty fit into that? Is that left over to the decisionmaking process? Is that part of your saying, "We ought to tell them how to make the decision" or --

MR. PARRY: Yes, that's included. That would be included in the reg guide 1.174 application, where it tells you to consider all of the uncertainties.

That is not to say that the standard in DG-1122 is silent in that sense. It's not. It mentions it. But I think where they're used because I think, again, what reg guide 1.174 says is to focus on those uncertainties that you know can change the position.

MEMBER KRESS: But when they ask for uncertainties in the guide, I will have to refresh my

memory. Does it ask for uncertainties on the delta also?

MR. PARRY: It doesn't.

MEMBER KRESS: That could be much smaller than the uncertainties on the actual CDF.

MS. DROUIN: I mean, the guide does not ask for certainties on the delta because the guide is not producing a delta.

MEMBER KRESS: I see.

MS. DROUIN: It is producing a CDF.

MEMBER KRESS: But does it say you have to have uncertainties on the delta?

MR. PARRY: It doesn't mention delta anywhere.

MEMBER KRESS: Okay.

MS. DROUIN: The guide does not tell you how to calculate a delta. So, therefore, it doesn't ask for uncertainties. It does ask for you to do uncertainties on your CDF. I mean, there is quite a bit in here on certainty analysis.

MEMBER KRESS: But you leave it up to the decisionmaker on that?

MS. DROUIN: Yes.

CHAIRMAN BONACA: We need to have some progress on this presentation, I guess.

MEMBER APOSTOLAKIS: Why are you guys silent on bounding analysis? You say on page 4 that "Guidance and such alternative methods are not provided in this guide" at the very top of page 4 of DG.

MR. PARRY: Because this guide is specifically designed to address the ASME standard and NEI-00-02.

MEMBER APOSTOLAKIS: How is a bounding analysis different from a Category 1? Isn't Category 1 supposed to be conservative; therefore, bound?

MR. PARRY: No.

MS. DROUIN: Category 1 is still a PRA.

MR. PARRY: Yes, yes.

MEMBER APOSTOLAKIS: And bounding analysis is not? What is it?

MR. PARRY: I don't think it is. It is not an analytical PRA.

MEMBER APOSTOLAKIS: What kind of bounding analysis are we talking about? Are we talking about, for example, the five methodology from EPRI? Is that the bounding analysis?

MS. DROUIN: To me, that would be a bounding analysis. That is not your PRA. This is where you don't have a PRA and you are doing some

other type of analysis to bound the problem.

MR. PARRY: And the type of analyses that were done for many of the external hazards, for example.

MEMBER APOSTOLAKIS: So what is the all of bounding analysis? I mean, it says, "Guidance is not provided. We acknowledge that some of them sometimes are used."

MR. PARRY: Where are you looking?

MEMBER APOSTOLAKIS: Page 4.

MEMBER ROSEN: The bottom of 3 and the top of 4.

MS. DROUIN: You have got to start with the bottom of 3 and then go on to 4.

MR. PARRY: I think that is just trying to say what this guide is doing and not doing.

MEMBER APOSTOLAKIS: Is there another place where we can find some guidance?

MR. PARRY: No, probably not. Probably not.

MEMBER APOSTOLAKIS: I think the committee objected to the bounding analysis being included in the ANS external event guide. We didn't see that it was proper to put them there.

MR. PARRY: What did you mean by the

"bounding analyses"?

MEMBER APOSTOLAKIS: I don't know. BIDE is a bounding analysis. The seismic margins approach is a bounding analysis.

MR. PARRY: Well, that's not a PRA, though.

MEMBER APOSTOLAKIS: It appears in a PRA standard.

MR. PARRY: Yes, I know.

MEMBER APOSTOLAKIS: Now, is there a place in the internal event analysis where so-called bounding analyses are used or is it only external events?

MS. DROUIN: I don't know that anyone in the sense of how we use the term "bounding analysis" will use it for a Level 1 PRA because everyone has a Level 1 PRA.

MEMBER APOSTOLAKIS: So what is the difference between a bounding analysis and a conservative --

MR. PARRY: Maybe we can reasonably put this in there. This reg guide eventually will have additional appendices to address all of the other PRA analysis, like external hazards, low-power shutdown. I guess that's it.

What this is saying is that what we are looking at here is specifically PRA elements and not the bounding types of analysis that we could do for, say, high winds and --

MEMBER APOSTOLAKIS: So in the internal event part, you don't see any --

MR. PARRY: I don't see any myself, no.

MS. DROUIN: No.

MR. PARRY: I can't think of any.

MEMBER KRESS: Now, the CDF is supposed to include all of those things, internal and external, and low-power shutdown. I can see if you had a Level 1 that didn't have those in it, then it wouldn't meet your Category 2?

MS. DROUIN: If, for example, in their Level 1 PRA, for some reason, they didn't include LOCAs, that was not part of the analysis, this guide does not give the technical attributes for an acceptable analysis, if you want to call it a bounding analysis, that you could do in replacement of going back and doing your LOCA analysis, as you would do it in your PRA.

MEMBER KRESS: I could imagine someone not having a fire in their PRA or not having low-power shutdown risk in their PRA and coming up with some

sort of bounding effect on the CDF for those things and saying, "Now, our calculated CDF by our PRA we have is this much. And we are going to multiply it by a factor to include these bounding analyses." Would that be an acceptable bounding analysis?

MR. PARRY: I don't know if it's acceptable or not, but this is not addressed in here.

MEMBER KRESS: I know, but George is asking where would a potential bounding analysis likely be.

MR. PARRY: I think that would have to be addressed in the application-specific reg guide and review, I think. It's not addressed here.

MEMBER KRESS: I guess the question is how would the staff deal with that if it had no guidance on how to deal with bounding analyses.

MEMBER APOSTOLAKIS: I mean, shouldn't there be some guidance as to what a bounding analysis is.

MS. DROUIN: I'm sure there should be. It's just not part of the scope of this document is all we are saying. I mean, we are giving the basic requirements, common guidance for the basic requirements, of the PRA.

To get back to your question, would there

be such a case on Level 1, I quickly started thinking about the PRAs we saw in the IPEs. I can say, yes, I saw quite a few.

If you go back to the insights report, there were quite a few initiating events that were your support initiators that were not modeled that should have been modeled that are contributors and should have been included in that.

Now, what this says is that if you want to include them, we are going to give you guidance on how to do them in your customary -- I am trying to use the right word here in creating your initiating event model, your event tree model, et cetera.

If you don't want to do it that way and you want to do it through this other some bounding way, you are going to have to go to another document -- whether or not it exists is a good question -- for what would be acceptable.

MR. PARRY: See, we are commenting on the ASME standard in NEI-00-02.

MEMBER APOSTOLAKIS: No. You are doing more than that.

MR. PARRY: And they don't address --

MEMBER APOSTOLAKIS: But you are doing more than that, aren't you?

MEMBER POWERS: George, are we interrogating the speakers about not including that which we beat on the seismic standard for including?

MEMBER APOSTOLAKIS: No. The question is, shouldn't there be some guidance as to what is --

MEMBER POWERS: It just strikes me as this is maybe a diversion from the main thrust.

CHAIRMAN BONACA: I would like to just say I have a concern about the timing available here because we have a full presentation yet. And then the second presentation is some issues for resolution.

I am just wondering if we should have a subcommittee meeting on this if we want because there may be significant issues on DG-1122 deserving more time.

MEMBER APOSTOLAKIS: If the committee finds that they will not have sufficient information to issue a letter, maybe we should do it.

CHAIRMAN BONACA: I understand.

MEMBER APOSTOLAKIS: Because on page 5, for example, it says that "The risk calculation, CDF and LERF, should account for all plant operating states and initiating events, either quantitatively or qualitatively." Now, what does it mean to characterize risk qualitatively? It's about the

middle of the page.

MS. DROUIN: Right. That sentence, that little paragraph was inserted because, again, what we wanted to say is that when you get to an application, you do have to consider all of your contributors to risk. You don't necessarily have to do it through a formal quantitative PRA analysis approach.

MEMBER APOSTOLAKIS: How can it be qualitative? Do you mean you are bounding it? You're deciding it's not significant? That's quantitative. A judgment like we were saying earlier this morning, credible versus incredible, a judgment that this does not contribute significantly is based on my estimate that it has a 10^{-6} frequency. It's never qualitative, even though you don't do anything about it afterwards because you dismiss it. But qualitative --

MS. DROUIN: Then that's just a poor choice of words on our part because all that paragraph is trying to say is that we were just trying to acknowledge that while you have to address all of your risk contributors, you don't necessarily have to do it through this.

MEMBER APOSTOLAKIS: Through a formal PRA.

MS. DROUIN: Through a formal PRA approach.

MEMBER APOSTOLAKIS: Fine.

MEMBER KRESS: Well, let me ask you another question.

MS. DROUIN: That is all that paragraph is trying to acknowledge.

MEMBER APOSTOLAKIS: So why don't we take out the words "either quantitatively or qualitatively" because the whole thing is structured that way, I mean, Category 1, 2, 3, do this, do that --

MS. DROUIN: I would prefer to clarify it because that paragraph was added based on comments because people kept thinking, "Well, you know, we are going to make you do a PRA on everything."

And we are saying, "No, that is not the intent here." We are just going to say for a full-scope PRA, here is what we think a technically acceptable full-scope PRA is. That doesn't mean you necessarily have to have it for every application.

MEMBER APOSTOLAKIS: Yes, but that is not qualitative.

MS. DROUIN: That is a poor choice of words. We can clarify that.

MEMBER KRESS: While we're on this page, let me ask you another question. The two paragraphs above that one we were just dealing with say, "The CDF

is a surrogate for latent fatalities risk."

Now, I have never seen the technical justification. It could be. It could be. There could be. You know, I think you mean the 10^{-4} CDF is probably, but I have never seen the technical justification for that where we ask you to show that if you only have 10^{-4}, that you meet the latent safety goal, latent risk safety goal.

I have never seen that anywhere. Have you? Actually, has it been done somewhere?

MS. DROUIN: Yes, it has.

MEMBER KRESS: And 10^{-4} actually will meet that --

MS. DROUIN: Yes.

MEMBER KRESS: -- for basically all plant sites?

MS. DROUIN: Yes, and if we can as part of the option 3 -- I'm told never to use the words "Option 3." As part of risk-informing Part 50, one of the things we were asked to do was to show that relationship and that justification. We would be more than willing to give you that in an appendix.

MEMBER KRESS: I would like to see that, yes.

MS. DROUIN: It goes through and shows how

the LERF, the $1E^{-5}$ and $1E^{-4}$, how those will meet the QHOs.

MEMBER KRESS: Was that based on the Level 3 analysis at every site? It had to be somehow.

MS. DROUIN: It was based on insights from 1150.

MEMBER KRESS: Could be coming from that, yes.

MEMBER APOSTOLAKIS: Now, LERF, of course, includes CDF. So it does affect --

MEMBER KRESS: I'm assuming what they did is take 10^{-4} CDF, call that a LERF, associated it somehow with a source term and for every site, calculated and showed that that meets the latent safety goal. I don't know that that is why. I have never seen that.

MS. DROUIN: We'll be more than willing to give you a copy of that document.

MEMBER WALLIS: I think there is something like 15 percent through your slides.

MEMBER APOSTOLAKIS: She's not going through all of --

MEMBER WALLIS: I was going to ask you. Are you going to go through all of the slides?

MEMBER APOSTOLAKIS: No.

MR. SNODDERLY: Chairman Bonaca --

MS. DROUIN: No, no. I was going to jump. I was going to do a major leap.

MR. SNODDERLY: Chair Bonaca, this is Mike Snodderly. If I could make a suggestion? I think to help focus these discussions, we should remember that I think what we are being asked to write a letter on is whether this draft guidance is sufficient for trial for use relative to the guidance that we have now, which is nothing.

So I think we ought to consider what are the differences between the staff and ASME and the staff and industry. And we're going to hear from industry in a 20-minute presentation. Perhaps it would be a good time to go and try to understand the differences between the staff and ASME and the issues that were discussed in the Bernsen letter concerning the quantitative definitions of risk-significant and dominant.

MEMBER APOSTOLAKIS: Sure, but we are concurring on the issuance of the guide. So we have to make comments. And there are not very many more. Then we will go to your stuff.

One of the things that you are asking repeatedly here is "Calculations are performed by

personnel who are qualified to perform the types of analysis of interest and are well-trained in the use of the codes."

Now, why do you need that? Do you mean in other places, you don't need qualified people? And how are you going to check that? I mean, I don't understand that. It is a sentence that is gratuitous. Page 6, "Success Criteria Analysis."

MEMBER WALLIS: I thought it was a rather useful sentence.

MEMBER POWERS: Yes. I will comment that one of the things we had talked earlier about were these containment codes. We find that the users who have not been explicitly trained in the use of the code tend to get worse answers in the sense that they agree less with experimental data than those who have gone through an explicit training --

MEMBER APOSTOLAKIS: But this applies to the full PRA. I mean, if you have a guy who is not experienced with accident sequence development, he may produce things that are wrong or unrealistic. I mean, the use of qualified personnel to perform analysis is a universal requirement, it seems to me, first. And, second, it's not enforceable.

Did you use qualified people? Fine.

MEMBER POWERS: I believe they --

MEMBER APOSTOLAKIS: Yes, I do.

MEMBER POWERS: I believe the qualifications of the individuals doing analysis are part of the submissions I have seen. There's a section that says, "Here is the guy who did it, and here is what his background is."

MEMBER APOSTOLAKIS: But that applies to the other part of the PRA.

MEMBER ROSEN: I would argue that you are on target, George. I think there are standards for the selection, training, and qualification of engineering support personnel. They are INPO standards, and they are met. It's a very rigorous kind of business in the utility.

I don't have the document with me, but I think I could put my finger on the right set of words in those documents and then ask whether or not, in fact, the utilities are complying with that and is INPO accrediting the fact that they're complying with that. I think you can go through that --

MEMBER APOSTOLAKIS: All I'm saying is singling it out for success criteria and LERF calculations seems kind of odd.

MEMBER ROSEN: Yes. Because of the broad

scope of the selection, training, and qualification requirements for engineering and support personnel which are imposed, I think it is odd that you would pick this one out.

MEMBER APOSTOLAKIS: Okay.

MEMBER WALLIS: It's because there is a problem with the integration of phenomenological stuff in the codes with PRA.

MEMBER APOSTOLAKIS: But if you ask the guys who develop the accident sequences, they will tell you the same thing, that if you don't have a guy who really understands the plant and how to do that, you are not going to get the results. So that's --

MEMBER KRESS: But this is probably because the PRA severe accident codes are not the ones they use to calculate success criteria. It's another set of codes or hand calculations. They're different from the PRA, and it's an input to the PRA. And it's determined a different way.

So I could see how one might to single that out and say, "Hey, you'd better be sure you do this right or have the right people doing it."

MEMBER WALLIS: Let's leave it in, George. Leave it in.

MEMBER APOSTOLAKIS: Which implies that

other things you don't have to make sure you heard them right.

MEMBER LEITCH: But it's inherent in the task qualification and everything that we do. Whether it's operating, maintenance, sweeping the floor, the individual has to be qualified for the task that he is doing.

MEMBER KRESS: But my point is the people who develop these success criteria are probably somebody other than the PRA person.

MEMBER APOSTOLAKIS: Sure.

MEMBER KRESS: So he's going to have different qualifications than a PRA.

MEMBER APOSTOLAKIS: Sure, but that doesn't say different -- I mean, it just says they should be qualified and well-trained. I mean, I can take a --

MEMBER KRESS: Intelligent and --

MEMBER WALLIS: Experienced.

MEMBER KRESS: Good physical condition.

MEMBER WALLIS: I think we ought to move on.

CHAIRMAN BONACA: I don't think there is any other field of engineering right now where you have such a mix of experiences in the team that

develops and supports the PRA. That's a difference that I see there than if you have -- so that statement doesn't bother me.

MEMBER APOSTOLAKIS: Now, one last comment. And then we will go to your issues. The sensitivity analysis, there is I think confusion out there as to what the sensitivity analysis is supposed to do.

A lot of people follow the old engineering approach that says, you know, you do a best estimate of point calculation. And then you do sensitivities to account for uncertainties.

In a risk-informed environment, sensitivity analysis has a very specific role in my opinion. It identifies the major drivers to the result. And then you do an uncertainty analysis on all of these. It's not a replacement for uncertainty analysis.

Given this confusion, it seems to me you ought to give a little better because you say on page 8, "The sensitivity of the model results to model boundary conditions and other key assumptions is evaluated using sensitivity analysis to look at key assumptions, both individually and in logical combinations." And then what? Okay. I found the

sensitivity. Now what do I do?

MR. PARRY: Remember, I think all of this is saying is that this is how you interpret the results of a PRA. This guide doesn't really specifically tell you very much about that. In fact, neither does the ASME standard, I don't believe.

Where we focus on sensitivity studies I think is in places like reg guide 1.174. The purpose is to determine whether the sources of uncertainty that you have identified can alter the decision you are trying to make.

So I think it is the usage of it in there that we should be concerned about.

MEMBER APOSTOLAKIS: Let's go to page 84 of the ASME guide. It deals with LERF. So that's as good as any. I haven't heard Dr. Kress complain about your allowance for a limited-scope LERF calculation. Do you agree with that or is that a separate issue?

MEMBER KRESS: I don't know how I feel about that.

MEMBER APOSTOLAKIS: I'll tell you what it is if you want to think about it. Anyway, if we go to this page 84, the top table, it says, "Provide uncertainty analysis which identifies the key sources of uncertainty and includes sensitivity studies for

dominant contributors to LERF."

The message is clear: sensitivity studies, the uncertainty analysis. I don't know what it means, actually. I wouldn't know what to do here. If I had this to comply with, I wouldn't know what to do with it.

The uncertainty analysis will identify the key sources of uncertainty.

MR. PARRY: Right.

MEMBER APOSTOLAKIS: And then it will include sensitivity studies for dominant contributors. The uncertainty analysis does not identify anything. It just propagates uncertainties. The sensitivity analysis identifies sensitivities.

MR. PARRY: Okay. Maybe that should be "provide an analysis of uncertainties," which would mean identification of sources and interpretation of their impact on the results, which is what I think is what this uncertainty analysis means.

MEMBER APOSTOLAKIS: Exactly. And to identify the impact, you have to have some idea of how likely those changes are.

MR. PARRY: Not necessarily. I mean, you can look at them just in terms of their consequences.

MEMBER APOSTOLAKIS: Not necessarily but

in general.

MR. PARRY: Then I think when you make a decision, that is when you need to understand the likelihood of those --

MEMBER ROSEN: There's a definition of uncertainty analysis in the standard. It says, "the process of identifying and characterizing the sources of uncertainty in the analysis and evaluating their impact on the PRA results and developing a quantitative measure to the extent practicable."

MR. PARRY: That's fine. There you go. So, actually, that fits that definition.

MEMBER ROSEN: Yes.

MR. PARRY: Thank you.

MEMBER APOSTOLAKIS: Well, all I know is that all of the NEI documents that have come to us propose sensitivity analysis, not uncertainty analysis. The latest one was -- what was it? -- 00-04 or something.

MR. PARRY: But they're in the context of making decisions.

MEMBER APOSTOLAKIS: Yes. Why would I do an uncertainty analysis otherwise? In the context of making a decision, especially when we calculate delta-CDF; whereas, we know the variance of the

difference of two random variables. This is the sum of the variances, right? The uncertainty goes up.

MR. PARRY: Yes.

MEMBER APOSTOLAKIS: And, yet, we are completely ignoring that.

Look, there is a part of the agency that does this very rigorously. And that is the repositories. Okay? They do a lot of our statistical analysis. We don't do much about it, but at least we should clarify the concepts that the sensitivity analysis is not a substitute for uncertainty analysis.

I mean, we have already violated theories by calling unavailability something that most people don't call unavailability. Now we are going to redefine uncertainty and sensitivity?

Anyway, there is another letter that we are writing that maybe the committee will have an opportunity to discuss these things.

MR. PARRY: I think the sensitivity analysis --

MEMBER APOSTOLAKIS: A lot of people, by the way, who have nothing to do with this say, "informed," like my colleague Professor Wallis likes to say, "informed laymen." They say, "Well, we hear that PRA is so uncertain, orders of magnitude."

And then you guys are telling us that you are risk-informing the regulations based on delta-CDF that is less than 10^{-5} or ^{4}. Do you really trust this result? It seems to me we are doing everything on the basis of point estimates.

Tom, Page 5.

MEMBER KRESS: Page 5 on what?

MEMBER APOSTOLAKIS: Of the DG.

MEMBER KRESS: DG. Okay. I've got that.

MEMBER APOSTOLAKIS: "Scope of PRA."

MEMBER KRESS: Okay.

MEMBER APOSTOLAKIS: Under the bullets, the last sentence of the paragraph under the bullets, "A limited Level 2 PRA is needed to address." Do you agree with that?

MEMBER KRESS: I'm still trying to find where you are readying.

MR. PARRY: This paragraph right here.

MEMBER APOSTOLAKIS: The first paragraph under the bullets.

MR. PARRY: All that means is that you don't have to have all the bells and whistles to allow you to --

MEMBER KRESS: All it says is you don't need to count fission products.

MS. DROUIN: That you're just not doing a full-scope Level 2. That's all that states.

MEMBER KRESS: Yes.

MEMBER APOSTOLAKIS: Well, we can move on to the disagreements, then. I don't think you can --

MEMBER KRESS: I think that is all right.

MEMBER APOSTOLAKIS: -- you need to do anything else.

MEMBER WALLIS: We're going to move back to Mary's schedule here.

MEMBER APOSTOLAKIS: Well, to the disagreements with the ASME people. Go to significant and dominant. Tell her what "significant" means.

MEMBER POWERS: George, you're denying the rest of us the benefit of all of this material she has prepared.

MEMBER APOSTOLAKIS: Well, if she goes back to the full presentation, we'll never get --

MS. DROUIN: What I was going to propose is jumping to --

MEMBER POWERS: Well, you're jumping to.

MS. DROUIN: If you don't want me to jump here, I will back up.

MEMBER WALLIS: Are we going to miss something significant or dominant?

MS. DROUIN: No. We had not planned on giving a detailed presentation of the bulk of the content of DG-1122 because the bulk of what is in DG-1122 was taken from SECY 162 and we had had numerous exchanges in the past with this committee.

So we didn't feel the need to come back and go back through all of this because we had had those discussions in the past and there was nothing new that we had added. We had literally looked at that information. So, really, we were going to skip through all of those slides very, very quickly.

This is where we had hoped to spend the bulk of the presentation, of where we are in discord, where we still have objections in the appendices in DG-1122. We went out for review and comment.

MEMBER WALLIS: You're skipping forward. You're skipping forward about eight pages. You don't have page numbers on your slides.

MEMBER APOSTOLAKIS: You don't have page numbers.

MS. DROUIN: I apologize for that. I meant to do it and --

MEMBER APOSTOLAKIS: So where is it now?

MEMBER WALLIS: This is a Level 1 presentation, Category 1.

MS. DROUIN: I really do apologize for that.

MEMBER POWERS: But I will point out that it survived peer review.

MEMBER ROSEN: Not completely.

MS. DROUIN: Actually, I had to take the --

MEMBER ROSEN: We're part of them here.

MS. DROUIN: I had printed this out. And I said, "Oh, I've got to remember to page-number it." And then I forgot. Now, peer review might have caught that, Dana.

MEMBER ROSEN: That's right.

MEMBER WALLIS: So you're going to give us an important message now, Mary.

MS. DROUIN: Are we all on the same page?

MEMBER WALLIS: The bottom line is the bottom line on this slide, isn't it?

MS. DROUIN: That is a very good observation. The bottom line is that among all of the public review we have had is to move forward and publish this for trial for use and to go for some pilots. But in the interim, I think there are some interesting things to note before we get into where we still have not come to total resolution.

We received very few comments on the main body of the reg guide. We received absolutely no comments on the SRP. The majority of the comments were on Appendix A; very few comments -- they were mostly editorial in nature, which surprised us -- on Appendix B.

MEMBER APOSTOLAKIS: In other words, they agree with what you said about Appendix B.

MS. DROUIN: That is our position. If they did not object to our objections, then the fact that there are no comments tells me that they agree with our objections of what we have as we documented, then, in Appendix B. We received no public comments otherwise.

MEMBER WALLIS: You did a very good job of detailing all of your comments. I'm just saying I thought you did a very good job of detailing all of your comments.

MS. DROUIN: Oh, thank you.

MEMBER APOSTOLAKIS: Mary has difficulty appreciating and accepting.

MS. DROUIN: They are so seldom I can't believe them when I get them.

MEMBER APOSTOLAKIS: She's stunned for five seconds and says, "Okay."

MR. PARRY: However, I think that our comments in Appendix B would have to change if the ASME standard changed.

MEMBER WALLIS: Possibly.

MR. PARRY: At least we would have to revisit them.

MS. DROUIN: Yes. Okay. I am missing a viewgraph.

MR. PARRY: No, you're not.

MS. DROUIN: They're just not in order.

MEMBER WALLIS: It's not significant.

MS. DROUIN: Okay.

MEMBER APOSTOLAKIS: The next one is several objections to ASME standard, right?

MS. DROUIN: Right. We have had a lot of discourse in conversation with ASME. We have come to a resolution, I think, for the bulk. Unlike Sid, who said in his letter two, we feel there are three areas where we haven't come to resolution.

The first one, which he mentions in this letter, is the definition of the terms "dominant, important, key, and significant"; the second one, the peer review to assess the validity of the key assumptions and uncertainties, which I believe is the one that was not in his letter. Is that his letter

there?

MR. PARRY: Yes. Yes, that wasn't in there.

MS. DROUIN: And then the third one, the minimum list of topics required by the peer review team.

So if we go to the first one, when you go through the standard, you do have a definition provided for the word "dominant." You will see that up in chapter 2. It's very subjective, very open-ended. My personal feeling is if you've got ten different people reading it, you would see ten different definitions.

Certainly I go back to the insights that we gleaned from the IPE program and looking at the PRAs, the term "dominant, significant" was used all over the place by all the different people there. In some cases, that may be okay, but they are used interchangeably in the standard to mean the same thing. And in some places, they are used interchangeably to mean different things.

These words are used in the standard to determine whether a requirement is imposed. So it is also used to distinguish between your capability categories. And because of that, you need a more

solid, robust definition. It certainly would increase the staff review time. That's in a quick nutshell going very fast where our problems are in terms of these definitions.

There has been a lot of discussion, I said, on this. There is agreement between the NRC and industry that there is a problem. Everybody agrees there is a problem. They agree that the standard contains ambiguities and inconsistencies. Where we are not in agreement is how to resolve the difference.

We have proposed a definition. Some places it's okay. In other places, it's not okay. And we are in disagreement of how we should resolve it. There is some feeling that it should be resolved via the pilot. Some leave it to the peer review. These are just two examples of some of the views of how this should be reviewed.

CHAIRMAN BONACA: Looking at this, there has been quite a bit of experienced in the reg guide 1.174 applications. I mean, the staff has reviewed a lot of those already. Do you have a sense that the pilot would help resolve this issue?

MS. DROUIN: I think the pilot could help resolve it if you come in with a position. I think to come in without a position and have the pilot dictate

the position I don't think is a very effective or efficient way to move forward.

MEMBER APOSTOLAKIS: By the way, how do you do a pilot on this, for pilot applications, right? What does that mean?

MS. DROUIN: Well, right now you would come in with an actual application where you --

MEMBER APOSTOLAKIS: Oh, and there you will go through DG to see whether --

MS. DROUIN: Right.

MR. PARRY: Yes.

MEMBER APOSTOLAKIS: Okay.

MR. PARRY: Yes. I think one of the problems with any issue that relates to inconsistency unless you have a number of pilots, then you are really not going to resolve the issue.

MEMBER APOSTOLAKIS: Okay. So what do you report?

MS. DROUIN: So the staff is proposing a more robust definition. I used the word "robust" in quotes because I was struggling late last night with the right word to put there. It should provide self-consistency and uniformity in the usage of the term.

We think the definition should be

consistent with good industry practice. For your capability Category 2, you should consider the definition in the context where you are going to use the entire PRA to truly test.

We don't think the peer review is an appropriate place to leave it because the peer review would just look at that PRA and in the way they define it, that they defined it correctly. That is broader than what the standard is trying to do because it is trying to cut across.

Again, we don't think the definition should be developed as part of the pilot. It should test it and refine it as necessary.

MEMBER LEITCH: Now, we received a document that had like 17 pages of changes to address this issue. Is that correct? I mean, is that what we are talking about? I mean, it was a --

MS. DROUIN: That's our Table 5, what you received. We had a public meeting back in January. And we offered to go through the standard every single place that term was used.

I mean, we had just pointed out the problem initially in DG-1122, and we took exception to the definition. Then at the public meeting we had in January, we said, "We will go back. And we will look

at every place and try and point out exactly where the inconsistencies are and offer a solution."

MEMBER LEITCH: Now, does the difference of opinion relate to the facts of the matter or is it really a matter of the timing? In other words, I guess what I understand the staff's position to be is you ought to go make these changes and industry say, "Well, that is going to seriously delay the whole thing. Why not just get it out the way it is for pilot use, rather than subsequent delay?"

MEMBER APOSTOLAKIS: What's the rush? Why do we need to --

MEMBER LEITCH: That's what I am trying to understand. Is that the issue? It's not so much the substance of these things, is it? It's whether it's better to get it right initially or --

MS. DROUIN: There are two problems. One problem is the inconsistency where words are used interchangeably. It is my understanding that ASME has agreed to fix the inconsistency problem. And in that regard, I think we have resolution.

The other problem is now what is the definition of these words.

MEMBER APOSTOLAKIS: So are you saying "important" and "significant" should not be used

interchangeably?

MS. DROUIN: I think that if you mean something by the word "important," then use that word. Don't come in one place and use the word "important," someplace use "significant," and someplace --

MEMBER APOSTOLAKIS: Okay. Fine.

MS. DROUIN: You know, that's what you mean.

MEMBER APOSTOLAKIS: So let's define one, and let's go get it.

MS. DROUIN: Let's define it if that's what you mean now. If you mean something different by the word "important," if you mean "significant," --

MEMBER APOSTOLAKIS: Then you should say that.

MS. DROUIN: -- then you should say that. And don't use them interchangeably, then.

MEMBER APOSTOLAKIS: Okay.

MS. DROUIN: We all agree on that, in part. It is my understanding that ASME is going to fix that part in the addendum.

MEMBER APOSTOLAKIS: Right.

MS. DROUIN: But now where the difference is now what do you mean by those words?

MR. PARRY: And I think Mary will point

out that one of the things that we are trying to do is come up with a quantitative definition of what these terms mean. The industry I think is leaning towards saying we don't need a quantitative decision, we can do it qualitatively, which I think opens up more subjectivity, which is I think what we are concerned about.

MEMBER APOSTOLAKIS: But you see, then if that definition of Category 1 relies on the word "dominant," all of them, actually, you have to find the dominant --

MR. PARRY: No. We've changed that. I mean, we are suggesting -- sorry -- that that should be changed.

MEMBER APOSTOLAKIS: So they should delete the word "dominant"?

MR. PARRY: That it should be replaced in some way, which is what is included in Table 5.

MEMBER APOSTOLAKIS: Coming back to the question that Dr. Leitch asked, is there an urgency to publish this? Why not take a few weeks and resolve the issue?

Why is the industry insisting that it is going to be delayed? And if it is delayed, so what? Has anybody now submitted a risk-informed application

request that is back because of lack of guidance?

Maybe we should ask them when they come.

MS. DROUIN: I don't want to speak for ASME, but I think what their concern is or their view, we want to publish this as a regulatory guide for trial for use.

Now, what our position is going to be can only be on what is formally out there. I think from ASME's perspective, they would like to see as few objections in our guide as possible.

MEMBER APOSTOLAKIS: So it's not the timing of the release. It's just that they don't like objections.

MR. PARRY: But that is related to timing of release since we want to get this out before when, the end of the year.

MEMBER APOSTOLAKIS: Why?

MS. DROUIN: Our schedule is we are trying to get this out for trial for use early this summer.

MEMBER APOSTOLAKIS: Yes, but why? I am asking why. What is the urgency. I mean, why don't we take a few more weeks to do it right?

MS. DROUIN: I think if you are talking about a few more weeks, that is within that schedule.

MEMBER APOSTOLAKIS: Now, as you said,

from day one of PRA technology, people have been using the words "dominant" and "significant." And now 25-30 years later, we're saying there is going to be a major delay because we all have to agree what they mean.

MR. PARRY: I think part of that, we have been using the words "dominant" and "significant." We have been using them very sloppily.

MS. DROUIN: Yes.

MR. PARRY: We know that.

MEMBER APOSTOLAKIS: Come on. Maybe it was not the 95 percent, but, you know --

MR. PARRY: I think we individually knew what we meant by the terms, but --

MEMBER APOSTOLAKIS: And as a community, too.

MS. DROUIN: George, I --

MEMBER APOSTOLAKIS: Let's not do the definitions because this has no relevance.

CHAIRMAN BONACA: I can see the need of the NRC is somewhat different from the ones because, I mean, they are reviewing, assuming the spectrum of applications. And then they have to cope with these differences in definition and reconcile somewhat and be like an arbiter of --

MS. DROUIN: Needs more review.

CHAIRMAN BONACA: I can see how it creates some different challenge for you than for individual applicants.

MS. DROUIN: If one of our goals is to make the staff review more effective and efficient, that is what these all come down to.

MEMBER APOSTOLAKIS: That is right.

MS. DROUIN: Are we trying to minimize the list of REIs? Are we trying to make this --

MEMBER APOSTOLAKIS: I will tell you why I --

MS. DROUIN: These are issues that would help go a long way in doing that.

MEMBER APOSTOLAKIS: I guess the reason why I am a little disturbed by this apparent urgency is that it happens all of the time, not just here. If you do this, it will delay the least. And we all say, "My God. It will?" Why? Let it delay. If we have to do it, we have to do it.

MEMBER WALLIS: My experience with thermal hydraulic guides is it takes forever to get them out. You have to struggle to not delay them.

MEMBER APOSTOLAKIS: Shall we see the definitions at some point?

MS. DROUIN: I'm getting ready to go to it

in the next slide.

I just wanted to point out when we went through very systematically and looked at every place the terms "significant," "important," "dominant," "key" were used. There were some interesting observations that we came across.

First of all, the biggest one is probably on the second bullet. The meaning of the term is dependent on the object. What we meant by that -- and this is why we felt you could get rid of the word "dominant" is because it really wasn't so much a difference between dominant and significant.

It was whether you were applying it to a sequence versus to an initiating event versus to a basic event because when you stand back and think about it and think and if you try to define the word "dominant," for example, a dominant basic event is going to have a different definition than a dominant sequence.

MEMBER WALLIS: There may not be any dominant sequence. And there may not be any important sequence. But everything may be significant, it seems to me.

MS. DROUIN: Right.

MR. PARRY: And you are using the word

"dominant" in the way that the dictionary defines it. I think PRA people have tended to use it not quite enough.

MS. DROUIN: And the other thing that we came across was the use of the word "sequence" was coming across the same problem, inconsistent and unclear. In some cases, they truly meant a sequence class versus a functional sequence. That is something, then, when you were talking about the definition of significant and dominant. Anyway --

MEMBER APOSTOLAKIS: We had that problem this morning as the committee members.

MS. DROUIN: So our position that we have taken in DG-1122, first of all, it is strictly in the context of the requirement as it is used in the standard.

MEMBER APOSTOLAKIS: But you have a different definition in this document.

MS. DROUIN: What we have here is what we proposed. Okay. I apologize.

MEMBER APOSTOLAKIS: Significant sequence. Those sequences comprise 95 percent of the core damage frequency. Is that what you mean there?

MS. DROUIN: The definition that is currently in DG-22, we have revised that. This is our

current staff position.

MR. PARRY: You are looking at Table 5, aren't you?

MEMBER APOSTOLAKIS: It is from Table 5. It is actually --

MS. DROUIN: You are looking at Table 5.

MEMBER APOSTOLAKIS: A memo from Mr. Singh dated February 25th to Allen Ruben through Mary Drouin.

MS. DROUIN: Yes. Did I not type something right?

MR. PARRY: Yes, that's right.

MEMBER APOSTOLAKIS: Well, explain what this "95 percent provide confidence in CDF," I don't understand. What is the definition?

MS. DROUIN: I was trying to get to Table 5.

MEMBER APOSTOLAKIS: Okay.

MS. DROUIN: I was paraphrasing for the slide. The actual definition is what you have on Table 5.

MEMBER APOSTOLAKIS: Well, it is actually distracted, I guess. It says, "New definitions."

MS. DROUIN: Why can't I find Table 5?

MEMBER APOSTOLAKIS: It is no longer

operative.

MS. DROUIN: Here it is. Sorry. Here it is.

MEMBER APOSTOLAKIS: It is no longer operative. Okay.

MS. DROUIN: Again, it's done in the context of whether you mean sequence, basic event, initiating event.

MEMBER APOSTOLAKIS: No. What is sequence? Let's look at --

MS. DROUIN: Significant sequence is one of the set of sequences defined at the function or systemic level that when ranked comprised 95 percent of the core damage frequency or that individually contribute more than one percent to the CDF.

MEMBER APOSTOLAKIS: That's what it says. "Those sequences when ranked comprised 95 percent of the core damage frequency or that individually," more or less the same. Now, when ranked, you mean and then the frequencies --

MS. DROUIN: Yes.

MEMBER APOSTOLAKIS: I am having difficulty with an individual contributing more than one percent because I can see that they are cumulative, which makes sense, but because the notion

of a sequence is ill-defined, I do not -- why do you need that, the one percent? I mean, if you say those when ranked comprise 95 percent, I am happy with that.

MS. DROUIN: Well, the problem with just doing the 95th percent --

MEMBER APOSTOLAKIS: Or 99, whatever.

MS. DROUIN: Or 99, whatever, whether it is 90 percent, any of those --

MEMBER APOSTOLAKIS: Right.

MS. DROUIN: And these situations do exist where you have a risk profile where you might have something that is 9 percent, 11 percent, 10 percent.

MEMBER APOSTOLAKIS: And?

MS. DROUIN: Do you cut something up? Say that you are using a --

MEMBER APOSTOLAKIS: If all of them are ten percent, then I can use the ten sequences, right?

MS. DROUIN: So which one do you throw away?

MEMBER APOSTOLAKIS: None.

MS. DROUIN: But you only have to capture 90 percent. But let me tell you, you put that definition out. And one of those sequences that is a ten percent will get thrown out.

MEMBER APOSTOLAKIS: No.

MS. DROUIN: Oh, yes.

MEMBER APOSTOLAKIS: It is ten percent of the total.

MR. PARRY: It won't get thrown out. It might be treated in the definition.

MEMBER APOSTOLAKIS: How can it be thrown out if I include it in my dominant sequences 95 percent?

MEMBER KRESS: Especially if you ranked them.

MS. DROUIN: I'm saying if --

MEMBER APOSTOLAKIS: Yes. That's what I say. You rank them, and you are.

MS. DROUIN: At 95 percent.

MEMBER APOSTOLAKIS: Right. So ten percent is more than five percent.

MS. DROUIN: I was using the case where you use 90 percent. You can come up with something equal.

MEMBER APOSTOLAKIS: Then we are arguing you should not use 90 percent. That's what you're saying. See, the problem is that -- and, again, we have had this this morning. I can have a sequence and break it up into ten sequences.

So I applied the one percent to what, to

the aggregate, to one?

MR. PARRY: No, but that's why it says in this one it's the functional or systemic level. That's actually put in there because --

MEMBER APOSTOLAKIS: That puts a limit to it. I agree.

MR. PARRY: That puts a limit to the level of decomposition.

MEMBER APOSTOLAKIS: The question then is, do you really care about that if you have a 95 percent? Do you mean that there is another sequence that is 5 percent and you are really ignoring it because it is outside the night depository?

MR. PARRY: 4.9 percent maybe.

MEMBER WALLIS: After they had been ranked.

MR. PARRY: You say you ranked them.

MEMBER WALLIS: You ranked them first.

MEMBER APOSTOLAKIS: I think these things are much more meaningful if you do them on a cumulative basis because the other one I don't know. I mean, maybe you can put a qualitative statement and look at the rest and if something happens, do something.

MR. PARRY: Let's take a hypothetical

example. You could have 100 sequences. That is not unusual. I mean, that wouldn't be an unusual circumstance for a Category 1 PRA.

MEMBER APOSTOLAKIS: And all of them are one percent?

MR. PARRY: All of them are one percent.

MEMBER WALLIS: Nothing is dominant or important, but they are all significant.

MEMBER APOSTOLAKIS: Why should they --

MS. DROUIN: Let me rephrase that. You shouldn't.

MEMBER APOSTOLAKIS: You shouldn't.

MS. DROUIN: You shouldn't. But I'm telling you I have seen people do it because you have only had to do it to the 95.

MR. PARRY: Ninety-four of them might be 1.0. The others might be .099 percent. It would drop.

MEMBER APOSTOLAKIS: Well, if you can find the way around this one percent. I mean, I see what you are saying. Maybe some qualitative statement that you should look at. Usually we call them pathological situations, where you have everything having one percent or something, then you do something else. But most of the time this works.

MS. DROUIN: I do agree that I think you could address that one percent with some explanation. And you wouldn't have to put the hard one percent in there.

MEMBER APOSTOLAKIS: Exactly.

MS. DROUIN: I agree with that.

MEMBER APOSTOLAKIS: That would make me much happier because essentially I think you are right. I mean, this is a good definition. It's just that we don't want to get -- again, these are pathological situations where in 100 sequences, each one has one percent.

MEMBER WALLIS: George, isn't this much better than what we had before?

MEMBER APOSTOLAKIS: Oh, no, no. That argument drives me crazy. This would be good enough, too, --

MS. DROUIN: Again, you have to go --

MEMBER APOSTOLAKIS: -- especially coming from you, Professor Wallis. It has to be good enough.

MEMBER WALLIS: Yes, good enough, much better than we had before. That's also very important criteria.

MEMBER APOSTOLAKIS: Oh, yes, yes.

CHAIRMAN BONACA: I think it is wonderful,

the idea of subdividing until nothing is significant. That seems the ultimate bureaucratic goal.

MS. DROUIN: Okay. Move on.

MEMBER APOSTOLAKIS: Wait.

MS. DROUIN: I am trying to be efficient and effective here, George.

MEMBER APOSTOLAKIS: No, but you have more stuff there.

MS. DROUIN: Sorry.

MEMBER APOSTOLAKIS: We talk about the components now, the events.

MS. DROUIN: Yes, sorry, sorry.

MEMBER APOSTOLAKIS: Now, we make a big deal out of consistency here, but, as we have all agreed in the past, the role in fossil vessel criteria are not necessarily consistent with risk criteria. I think Dr. Parry has written that in one of his early papers, when he was young and more aggressive.

MS. DROUIN: I think this is a very good example of why we felt you did not have to use the word "dominant" in the standard. Again, you have to go back to the actual context and where these words are used. So saying a dominant sequence, say, for example, the word "dominant" then takes on this definition of 95 percent. Now, if you apply the word

"dominant" to a basic event, you never would want to live with that definition.

MEMBER APOSTOLAKIS: First of all, the numbers 2 and 005 I guess now have become law because they have been used so long, right?

MR. PARRY: It's folk law.

MEMBER APOSTOLAKIS: Now, in the text, you saw you are also allowing burn bond? I don't see any criteria for burn bond.

MS. DROUIN: Where did we say that in the text?

MEMBER APOSTOLAKIS: Yes, you do. Yes, you do.

MR. PARRY: It's probably in section 2, right?

MEMBER WALLIS: I don't want to get into too many details, George. We'll never get there.

CHAIRMAN BONACA: Twenty minutes left for this presentation.

MEMBER APOSTOLAKIS: Number 7, page --

MR. PARRY: Forget that. This is in the context of Appendix A.

MEMBER APOSTOLAKIS: All right.

CHAIRMAN BONACA: There are about 20 minutes left for this presentation. Make sure that --

MEMBER APOSTOLAKIS: So what do we do?

CHAIRMAN BONACA: They have a coordinated presentation here with many slides. I would like to hear the other points that they have to make. I am just saying that we need to stay, just make sure that they tell us about the issues that they are presenting.

MEMBER APOSTOLAKIS: So we shouldn't question?

CHAIRMAN BONACA: I don't think we should disrupt the presentation. That's all, George.

MEMBER WALLIS: Mary, can you move on?

MS. DROUIN: Are we ready to go to the next one?

MEMBER APOSTOLAKIS: Yes.

MS. DROUIN: The next one is -- and we think this one is very critical -- the peer review team to assess the key assumptions and uncertainties. The standard does not require the peer review team to assess the key assumptions and uncertainties. They do not pass a value judgment on whether those assumptions are appropriate or not, and that's the key point.

MEMBER POWERS: Let me ask you a question, Mary. I've looked ahead at your viewgraphs, and I know you are going to say more on this. But I just

wondered in the course of your career, when asked to peer review something, have you ever not been asked to address the key assumptions and uncertainties?

MR. PARRY: I'm not sure that you were ever asked to do it. You just do it naturally.

MS. DROUIN: You just do it.

MEMBER POWERS: Gee, it seems for every journal I review, it's line number 1.

MR. PARRY: Review the assumptions.

MEMBER WALLIS: That may be for journals, but for things like thermal hydraulic codes, it seems that very often, this is the part that is passed over.

MEMBER KRESS: The industry apparently doesn't want to do it, according to your next slide.

MR. PARRY: Part of this, though, part of their action may be, too, that we have been discussing what we mean by key uncertainties and key assumptions. I think there was a fair that by just saying, "Review the assumptions," you could be reviewing a tremendous number of things that probably are not important.

I think Table 5, which I will go back to briefly, we have had a public meeting on that March 11th. And we got some very helpful comments, primarily from Doug True, where some of the suggestions we made were perhaps too far-reaching.

They had ramifications that we hadn't thought of.

We are still in the process of looking at that, but I think that may be one of the -- I can't speak for sure, but I think that may be one of the reactions to this that there is a fear that we might be asking too much.

MEMBER APOSTOLAKIS: Are the peer reviewers usually industry people?

MR. PARRY: Usually, yes.

MS. DROUIN: Usually.

MEMBER APOSTOLAKIS: Do they ever question NEI documents?

MS. DROUIN: Do they ever question the --

MEMBER APOSTOLAKIS: Yes.

MS. DROUIN: I would hope so, but you're not asking the right person.

MEMBER WALLIS: It seems to me very good to include this. Even though, Dr. Powers, that any component review team is going to do it, there is no harm in stating the obvious because it is an important aspect of the review.

MS. DROUIN: We have clarified with ASME that we are not asking them to pass judgment on every single assumption. So we have had that. And the feedback that we have still gotten is that they

disagree with this. Our feeling is that there are certain key assumptions that a value judgment does need to be looked at.

MEMBER APOSTOLAKIS: So if everyone uses, say, the EPRI human reliability model and everyone is an industry reviewer, nobody will say, "Gee, is there another model that would give different results?" That is what you are trying to avoid here?

I mean, they will all accept this because this is an industry-sponsored model without questioning it; whereas, if Gareth is on the panel or Mary, they might raise some questions. What is the issue here?

Key assumptions. I mean, here is an area where major assumptions are made in order to get some results, right?

MR. PARRY: Yes. And I think where we had an agreed-upon industry position on some particular modeling aspect, we wouldn't need to address this issue, like, for example, if we get agreement on CLOCA models, for example, if everybody uses the agreed-upon CLOCA model, that no longer becomes --

MEMBER APOSTOLAKIS: Is there a --

MR. PARRY: I don't know. But yes, what we are trying to avoid is that it's just accepted

because we need -- fortunately, we are in a position where I think there are differences in most of the key models.

MEMBER APOSTOLAKIS: But I do agree with my colleagues here. I mean, this is done, really, by reviewers, maybe not in a systematic way, but it is done. If somebody sees something that she thinks is not proper, she will raise the issue.

MEMBER ROSEN: I don't think there is any harm in stating the obvious.

MEMBER APOSTOLAKIS: No, there is no harm in stating it.

MEMBER WALLIS: So let's move on.

MS. DROUIN: Okay. The third one is the minimum list of topics required by the peer review team. There is no minimum requirement in the standard for the peer review team.

If you look at the second bullet, the standard states specific suggestions for the peer review team to consider. These suggestions are not intended to be a minimum or comprehensive list of requirements.

We disagree. We think that there ought to be a minimum list of topics. We are not asking for ASME to be prescriptive. We agree you shouldn't be

prescriptive but to provide a minimum list of topics that you know so that at least when you go from each PRA, that those have been covered and addressed, the level of detail they go into, the scope they can go into each one. We agree that should be left up to the peer review team, but there ought to be at least a minimum list of topics for each of the elements that ought to be in the standard.

So I have kind of summarized our three slides in those two sentences. That is our position.

MEMBER WALLIS: I think that will be useful thinking. I don't know anything about the PRA, but in, say, thermal hydraulic codes, if you require that they evaluate the basic equations and the assumptions, then it becomes true at the end that at a later review, you find some defects there. You can go back and say, "How did this ever happen since the peer review team was required to meet this minimum requirement of reviewing that aspect?" It would be useful.

MEMBER APOSTOLAKIS: Okay. Now, since ASME is not here, maybe we can spend a couple of minutes discussing the objections. At this point, the level of detail, Mr. Bernsen says, "A significant number of committee members disagreed with this

proposed change, believing that it goes beyond the intent of the peer review. That is, it is more like a checklist audit and is too prescriptive an instruction to be mandated for use by a competent team of reviewers, that it would be counterproductive. By forcing the peer review team to exam, recommend items that they know through experience are reasonable."

Are you asking them to do that? If they know from experience that they are reasonable and they look at it, then they are passing judgment. They are passing judgment. So this is not extra burden.

But the first point that this becomes a checklist audit, I don't know what you guys have to say.

MS. DROUIN: I would disagree with that comment.

MR. PARRY: Actually, I think that's why we do want peer reviewers to make value judgments and assess the assumptions and approximations because if not, it could become a checklist.

MEMBER APOSTOLAKIS: Regarding the definition of significance, are the majority of the members opposed because of the technical complexity of implementation in the scope of documentation needed to demonstrate compliance. Compliance with what? With

a dominant?

And others are disagreeing because of the degree of precision that is implied in setting boundaries for determining whether to use realistic or conservative values or where to switch from precise modeling to approximations.

MEMBER POWERS: I don't understand it.

MEMBER APOSTOLAKIS: I don't understand what that means. Okay. Are you don't?

CHAIRMAN BONACA: On that other issue, going back a moment on this issue here of prescribing a number of topics, how would they expect that this staff could be satisfied of a peer review if the staff doesn't even know that the certain basic number of topics had been covered? Right? I mean, on a peer review, it's a standard judgment.

MEMBER POWERS: Has the staff received the peer review? Do they have access to it?

MR. PARRY: Oh, sure.

MS. DROUIN: My understanding is they have access I thought to the F&O's.

MR. PARRY: Well, I'm not really sure, but I think that typically what has been submitted, if anything, it would be yes, probably the summary. That's an observation, rather than the complete

report. Whether we would have access, I am sure under an RAI, we would have access to it.

MEMBER ROSEN: A resident inspector can go look at it any time he wants.

MR. PARRY: Presumably, yes.

MEMBER ROSEN: Nothing is secret.

MEMBER APOSTOLAKIS: Are there any other questions for the staff?

MEMBER WALLIS: We seem to be supporting the staff on this one, too, generally speaking.

MS. DROUIN: And then just our last one, you know, we are asking for your concurrence -- we don't like the word "approval" -- for us to publish this regulatory guide for trial for use. I apologize I didn't put the words "for trial for use" there.

MEMBER APOSTOLAKIS: Why do you always go to the CRGR last?

MS. DROUIN: I don't think that we go to them last. It's just when we can get on people's calendars.

MEMBER APOSTOLAKIS: You do.

MS. DROUIN: It wasn't intent that we went to them last.

MEMBER APOSTOLAKIS: Not just you, the staff in general goes to the CRGR last.

MS. DROUIN: Well, I can't --

MEMBER APOSTOLAKIS: And sometimes there are changes to the document we approve here.

MS. DROUIN: I can just comment. This was the date available for us to come and when the CRGR is available for us to speak to them. It just ended up in this order for this particular program.

MEMBER APOSTOLAKIS: So what happens now to the detail? Maybe we can discuss this afternoon what we want to do.

MEMBER ROSEN: I would like two sentences about what a pilot would be. What are you really talking about, a pilot?

MS. DROUIN: What are we talking about? South Texas, for example, has volunteered to be a pilot. Their application is a tech spec. There are going to be issues of PRA quality. How those issues are addressed will be through this DG-1122, the use of how South Texas is using that, how we are using the SRP to deal with that issue.

MEMBER APOSTOLAKIS: Has any other utility with a PRA or less quality than the South Texas volunteered to be a pilot?

MS. DROUIN: No one has yet. Someone else has volunteered? Formally? I was going to say there

has been a lot of discussion, and I am aware of people. But I would hate to volunteer --

MEMBER APOSTOLAKIS: The problem is you don't learn much from binding these things to a very good PRA.

MS. DROUIN: South Texas is the only utility that has formally let us know. We have had a lot of discussion with other utilities, who have indicated very serious interest.

MEMBER APOSTOLAKIS: Okay. Because I don't think you are going to learn much from South Texas PRA. I think they are --

MS. DROUIN: I don't disagree.

MR. SNODDERLY: Excuse me, George. My understanding is that NEI will address this as part of their presentation.

MEMBER APOSTOLAKIS: Fine, if we ever get to it.

MS. DROUIN: Okay.

MEMBER APOSTOLAKIS: Are you done?

MS. DROUIN: I am done. The only thing I would add, I am not going to go through them, but there were some other -- I thought maybe of interest if we had time and there really were backup slides that are some other types of general comments that we

received.

MEMBER ROSEN: But we can read them.

MS. DROUIN: They are there for your information.

MEMBER APOSTOLAKIS: And enjoyment.

MEMBER POWERS: Since most of your comments I am going to have to read anyway, we will read those as well.

MS. DROUIN: Thank you.

MEMBER APOSTOLAKIS: Okay. Thank you very much, Mary and Gareth.

MS. DROUIN: Thank you.

MEMBER APOSTOLAKIS: Biff Bradley from NEI is walking towards the microphone. Do we have a copy of your slides?

MR. BRADLEY: Yes.

MEMBER APOSTOLAKIS: All right.

MR. BRADLEY: I am Biff Bradley of NEI and appreciate the opportunity to provide the industry perspective on the DG-1122. It has been a long effort to get to this point and a lot of hard work on all sides by NRC staff as well as industry and the ASME and CNRM.

Before I get into our specific comments on the reg guide, I wanted to provide a little bit of

context to some of the discussion that has taken place already. I think a lot of what, at least in our discussions with the staff in the context of the standard, a lot of what drives their perceptions tends to be results of the IPE reviews, which actually took place about 14 years ago. There have been substantial improvements to all PRAs since that era.

Back a couple of years ago, we took the initiative as an industry to try to provide updated information to try to capture the improvements to the models, the new risk metrics, the new dominant/significant sequences, what have you. Unfortunately, due to world events, we were unable to go forward with that initiative.

It's unfortunate that we don't have the benefit of the staff's better understanding of the current state of the models in the discussions we have had in developing the standard and the need for, the perceived need for prescription in some of the areas we have talked about.

Also, in the area of peer review, at this point we have completed 101, actually, peer reviews. There are only two left. That is Susquehanna and San Onofre, both of which will be complete. San Onofre is scheduled for June and Susquehanna for this fall.

That will be the final, the initial round, at least, of peer reviews for the industry.

A final thing, I just wanted to mention that the standard -- there are other checks and balances on PRA capability outside of the standard. As you know, NRC has developed their own models, the SPAR models. The plants involved in the MSPI program, the risk-based performance indicators have spent a lot of time and effort with the staff addressing the SPAR models. And we are seeing convergence of the SPAR models with the plant models to the point that those plants in that project have seen the CDFs pretty good convergence, the point here being that there are other methods NRC has to check and balance on PRA adequacy beyond just the standard.

Let me get back to the standard now. This has been a long effort, five years of effort on the part of the ASME to write the standard. It has been a good team of industry and NRC as well as other experts involved.

We did issue a final standard in February of last year. There was tremendous consideration of all of the points that have been discussed today: the need for qualitative versus quantitative definitions of key terms, the extent to which the peer review

process could be relied on to make informed judgments with regard to issues of this nature. And the standard came out the way it did following five years of deliberation of those topics.

I do believe that NRC's current position that a quantitative definition of significant needs to be applied is a significant and fundamental change to the standard as proposed or actually finalized by ASME. I would like to spend a little bit of time talking about why in developing the standard, we chose not to put a quantitative terminology for that term in.

Another concern I think primarily in the area of documentation, the standard requires documentation of how you meet those requirements as they pertain to these specific sequences of interest.

I think it is safe to say that no existing PRA in the industry would meet the standard with regard to documenting how all the requirements that pertain were met for 95 percent for those sequences comprising 95 percent of the CDF.

And I am not complaining. I am just noting here that there would have to be a fairly substantial effort on the part of all plants to provide that documentation.

MEMBER APOSTOLAKIS: So when the staff proposes to define dominant sequences using some percentage, say, then there is a requirement that you do certain things to those.

MR. BRADLEY: Correct.

MEMBER APOSTOLAKIS: And that is where your objection is, that that is an unnecessary burden that we will have to go back and look at the sequence. We may have missed two, for example.

MR. BRADLEY: It is more than just a burden issue. I think that under-characterizes. I think there are issues with how the models are done. I would like to get into that a little bit. We can come back to that.

The general issues we have are the capability of an expert peer review team to make an informed judgment relative to what is significant or dominant with regard to a plant model, as opposed to the need to explicitly define that in the standard. There is also a concern that when we wrote the standard, dominant and significant were intended to really have two different meanings.

The word "dominant" was used less extensively. The word "significant" was used throughout the standard in many connotations, some of

which could be implied to be quantitative. Others we were just using the word "significant" like you tend to use the word "significant" in day-to-day conversation.

The real issue we have is with the proposed quantitative definition of the term "significant." And the reason we didn't put it in the standard to start with was because there are variabilities in a number of areas that impact the capability to do that. We believe the right way to do that is to have the expert peer review team make that judgment of what is dominant or significant or a certain requirement.

Some of the things that vary, BWRs versus PWRs. BWRs tend to have lower CDFs and with a wider distribution of risk because of the numerous ways you can get water in a core in a BWR.

The modeling approach I will talk about in a minute. We basically have four platforms we are using in the industry for modeling. This definition doesn't necessarily fit all of those platforms. It fits some of them.

Plants that have dominant contributors that chew up a whole bunch of their CDF and a handful of contributors are much more capable of using a

definition like that than a plant that has the risk profile spread out and doesn't really have single contributors chewing up most of their CDF or LERF.

The final concern we have is in going through this exercise and imposing to pose a quantitative definition for certain terms and actually eliminating the word "significant" where it was used qualitatively in many cases, this is going to be a reg guide. This is going to be imposed into regulatory space used by resident inspectors, the regions, et cetera.

And our experience has been that having these types of rigid definitions without some type of qualifier can be a problem, a practical problem, relative to implementation.

MEMBER WALLIS: What's the basis of the decision? If the word "dominant" implies that you treat something differently on the basis of making decisions, someone has to decide.

MR. BRADLEY: Correct.

MEMBER WALLIS: If you had a common definition that everyone agreed on, it would help the decisionmaking.

MR. BRADLEY: Yes. And I think we can get to that here to talk about.

MEMBER WALLIS: If it's all up to the guesswork of some peer review team, then I don't see how you get that consistency.

MR. BRADLEY: Well, I think I wouldn't characterize it as "guesswork." These are expert peer reviewers.

MEMBER WALLIS: Judgment. Let's call it judgment.

MR. BRADLEY: Right. And let me talk about why we felt it was necessary to leave that up to the peer review team. I don't really want to talk about the one percent. Let's talk about the 95 percent.

As I mentioned, we have four different platforms we are using in the industry for PRAs, PRAs base on functional sequences. And both of those types tend to have a fairly small number of sequences, which this definition would probably work for those plants in all cases.

When you get into other types of models, such as the linked event tree, which is the risk-manned model, or the single fault tree, which is a type of model used by plants with safety monitors, which is capable of being solved more rapidly than the other types of plants' models, the top two here,

neither of those last two really define sequences per se.

The way you would have to interpret this standard, those plants would have for the risk-manned 10 to 20 thousand sequences that have fallen to the definition of the standard. And for the single fault tree, you could actually have over a million sequences that would fall under that definition.

MEMBER APOSTOLAKIS: Because these are minimal --

MR. BRADLEY: Correct.

MEMBER APOSTOLAKIS: You go down to detail.

MR. BRADLEY: Right, and I would like to say that maybe given enough time and effort, we could go back into the standard and really address how to do this specifically for the individual requirements, for each of these types of platforms.

MEMBER APOSTOLAKIS: Would the compromise be to use the 95th percentile definition and limit it to functional and systemic sequences?

MS. DROUIN: That is our definition, our proposed definition.

MR. BRADLEY: But the problem is --

MEMBER APOSTOLAKIS: Because in PRAs,

really, without any definitions, when people say "dominant sequences," they really mean the top two. Nobody in his right mind will go to the minimal.

MS. DROUIN: It's there on his slide, our definition, "function or systemic."

MEMBER APOSTOLAKIS: Is that what it says?

MR. BRADLEY: Right. But the problem is that the plants that don't have functional or systemic sequences --

MEMBER APOSTOLAKIS: What do they do?

MR. BRADLEY: -- in order to comply with the standard would have to somehow generate those from what they have, which tends to be down here.

MEMBER APOSTOLAKIS: But Biff, aren't we missing some useful insights from the PRAs for those plants if we don't know what the dominant or functional sequences are?

MR. BRADLEY: I'm not suggesting that that may be --

MEMBER APOSTOLAKIS: Maybe they should do it, in other words.

MR. BRADLEY: Yes. I'm just saying that right now the way the standard is set up, there is a hole there. To go forward and issue it now into a regulatory environment with this 95 percent leaves a

large number of plants hanging out in terms of how they would do that.

And there are no definitions in the standard currently as to how you would go about grouping these other groups of cut sets into these types of definitions. That's missing from the standard right now because --

MR. PARRY: Can I make a comment here that the single fault tree approach is going to have many more difficulties with the standard than this one because they don't have accident sequences. There is a whole number of things that they are going to have trouble with.

Now, there were accident sequences that were developed to develop the single fault tree model. But if they are not maintained, they are going to have other difficulties in the standard --

MEMBER APOSTOLAKIS: That's what I meant. And part of it is that you are really missing out on the value of PRA if you don't end up with some high-level sequences and you say, "These dominate."

MEMBER ROSEN: Now I know why South Texas volunteered, I think, because they have a very nice set of accident sequence analyses that are high-level.

MEMBER APOSTOLAKIS: You are contributing

to their ulterior motives.

MEMBER ROSEN: I didn't even know they volunteered.

MEMBER APOSTOLAKIS: They volunteered because they are noble people.

MEMBER ROSEN: They did it because they had high-level functional systemic sequences. It's well-documented. So I am making a point here about why would you pick them because you will get an answer presumably, "We can do it. Here it is."

MEMBER APOSTOLAKIS: That's why they are looking for --

MEMBER ROSEN: Yes. You needed some volunteers who were of the kind that you are alluding to. We would have difficulty because otherwise we won't get any data.

MEMBER APOSTOLAKIS: With any PRA, a major insight is the dominant function of all systemic sequences. If you don't reduce that independently of what Biff is telling us here, if you have a single fault tree approach that doesn't reduce that, you are missing something.

MR. BRADLEY: I don't disagree.

MEMBER WALLIS: You are not giving information to the decisionmakers.

MR. BRADLEY: That is why we put the term "dominant' into the standard as a separate entity from "significant."

This is just an example of one of the requirements and one of many in the standard. This is what the original standard said, "Provide a detailed description of dominant accidents sequences or functional failure groups." And the NRC's proposal is to change that word to "significant." Again, depending on how your model is set up, how your risk contributors are laid out, you could end up having to document, generate thousands of pages of documentation.

Whether that is appropriate or not, maybe it is, but it certainly is a fairly large step from what we have now for most models.

MEMBER WALLIS: Well, the changing the words isn't changing anything unless you have changed the definition of those words.

MEMBER POWERS: I think we agreed to that.

MR. BRADLEY: And they did. That is what they are proposing to do. I wanted to say there has been some progress. All of the proposed tables of definitions that NRC talked about today have come out since the public notice, the public comment notice,

for the standard.

These have all actually been informally shared with us. So what you see published in the *Federal Register* didn't include the 95 percent or any of what was talked about today. We have had some progress in going through these things.

Really, what is needed to resolve this is to go through line by line every requirement in the standard and see, "Does that definition work? Can you really fit a 95 in there or does that really make sense in that context?"

In some cases, the staff agreed that it was better to use importance measures for some of the basic events dealing with HRA. Those are good changes that move it toward a practical definition.

The other thing having to do with having to document how you dealt with thousands or tens of thousands of cut sets has to lend itself to some type of sampling approach. The staff has recognized that as well.

So we have had some progress since the FRN came out in a series of meetings. And I think we are working and converging in some areas here and the staff has recognized that some of these requirements need to be rethought.

Relative to the discussion on key assumptions and uncertainties, I wanted to clarify that. The industry's position was not that that was a burdensome thing to do. The industry's position was that given that prior to recently that had never been nebulously defined or not defined at all, as Gareth indicated, we would prefer to do that in the context of an application, where it would be easier to identify for a specific application what were the key uncertainties or assumptions.

Now, subsequently NRC has provided some definitions in Table 5 of key uncertainties and key assumptions that I think do focus that better. That is a significant improvement over what led us to make the original comment responsive to the FRN notice, where you just had an unbounded requirement to address key uncertainties and assumptions and no one knew what that meant.

So I think these are all areas where we have made progress. I hope we can continue to make progress to resolve this and come up with a standard to resolve this that serves NRC's needs as well as practically implementable.

MEMBER APOSTOLAKIS: Now, when? Are you proposing they issue what they have now and then you

continue?

MR. BRADLEY: I'm going to get to that. Just to mention, with regard to the peer review section, the minimal set of requirements, our concern there was when we wrote that. In addition to that, I think Sid's concerns, which I think were correct in some degree that once you set out a minimal set of regulatory requirements, that tends to drive the team to focus on those, perhaps inordinately so and to the loss of being able to really function as a peer review team and use their expertise to hone in on those areas that are most important.

In addition to that, when we wrote the section, section 6.3 of the standard, we put a very extensive list in there based on the peer reviews we have done already, but it was never intended when we wrote that list that all of those would always be done for every peer review.

There are specific requirements in there that simply are not -- there are specific ones that we need to go in and visit one at a time before we can agree that those could be a minimal set of requirements because some of them would require a level of effort that goes way beyond what you can do in a one-week peer review.

I think, again, that is probably something where we can converge, but we need to revisit that list but rather than just imposing the existing suggestive list as a minimal list.

Also, some issues with the LERF section that remain to be worked out, mainly due to the fact that it was written a little bit differently than the other sections and still while working on that.

There was another issue where in many, many instances, the word "significant" had been used. And if NRC couldn't determine that it was used in a quantitative sense, they just eliminated it.

There are many examples in their table where they just eliminated the term and basically left an unbounded requirement. It could be inferred in regulatory space to have any number of meanings.

We are concerned there that in the zeal to get "significant" out where it didn't have a quantitative meaning, we got a little carried away. We need to go back and revisit those requirements with the knowledge that this is going to be a reg guide and it's going to be out there being used in the regulated environment.

Finally, in terms of where we think this should go, we did spend five years as an industry and

as ASME developing this. We do believe it places the appropriate emphasis on the peer review versus prescription. That's the way the consensus standard came out. We would like to try the consensus standard.

And I would also like to recognize that a lot of the review and modifications NRC proposed were constructive and have been implemented or are in the process of being implemented into a near-term revision to the standard absent the ones that we talked about today that are still controversial.

Given that and given that we can implement those, we would like to be able to try using the consensus standard and see how that works before we jump off the cliff into quantitative definitions and imposing significant new concepts into the standard that really weren't there when we wrote it.

The San Onofre peer review, which is coming up in June assuming they continue to be capable of meeting that date looking at all of the issues in this standard, would provide an opportunity to do that.

They actually want to perform that peer review to the subelements of the standard. So, instead of using the existing criteria that are in

NEI-00-02, they are going to take the ASME standard supporting requirements and apply those through the peer review process.

MEMBER WALLIS: Why not have two reviews in parallel, one using your framework and one using NRC framework, see which one works out better?

MR. BRADLEY: That's a thought. We could explore that. It is an issue for the licensee and the resources involved. Certainly the --

MEMBER APOSTOLAKIS: The peer review that San Onofre would go through, that is part of the NEI-sponsored peer review, right?

MR. BRADLEY: It is.

MEMBER APOSTOLAKIS: So it's not ASME?

MR. BRADLEY: Well, no. It's different because they are one of the last two plants that has come along for this. And now we actually have a final ASME standard out that they can use.

MEMBER APOSTOLAKIS: So you are going to use also the ASME standard?

MR. BRADLEY: Yes. So they are actually going to do that part of it to judge how well they meet the ASME standard. We believe that would provide an excellent opportunity for all parties, including NRC, to see how this standard works. And then

following that, we can maybe have a better position to determine if we need to move forward.

San Onofre is actually one of those plants that uses the single fault tree. So it would be interesting to see how we could try to apply the standard there.

MEMBER APOSTOLAKIS: But they developed that because they wanted the monitor. They had the PRA before the monitor.

MR. BRADLEY: They may have had one before, but that is not what they have now.

MEMBER APOSTOLAKIS: By the way, there was a statement by someone there from NEI that you believe that Category 2 means more or less the same as Grade 3 of the NEI review process, as I remember.

MR. BRADLEY: Well, in developing Appendix B and assuming that the shoulds were shalls and a few other things, we generally made that inference. Actually, NRC reviewed that on a requirement by requirement basis to see if they agreed with that.

MEMBER APOSTOLAKIS: So what you are doing really makes more explicit what Mary told us earlier, that no PRA is really Category 1 or Category 2 or Category 3. You come in and say yes, we agree. In fact, this element is Category 1, this element is

Category 2.

MR. BRADLEY: I guess personally I wouldn't call a PRA Category 1 or Category 2.

MEMBER APOSTOLAKIS: Well, that is what they said, too.

MR. BRADLEY: They only really apply to the elements. And the same in the peer review, you don't have a Grade 1 or a Grade 3 PRA. All of those grades are applied on the individual elements.

MEMBER APOSTOLAKIS: Yes.

MR. BRADLEY: I know there was a lot of discussion of that this morning, but the way we view that is in the context of an application. Now, we didn't have these categories before. So obviously if you go back and look at reg guide 1.177 or something, it is not going to have anything in there. But going forward, we would expect regulatory guidance or guidance from some source on what capability levels you need for the various elements of a PRA for an application.

Actually, we have developed that for Option 2 to some degree already, where NRC looked at all of the subelements of the peer review process and looked at those versus the Option 2 categorization process and gave us review guidance on how to do that.

So there is an example where they go line by line through there and look at those categories. But I think going forward, we would need to do that.

The last thing, I had attached this slide. This was just a backup slide. At the risk of going into a five-hour discussion, which hopefully lunch will preclude, the other issue and one of the reasons the authors of the standard did not impose that 95 percent definition is that, really, the question comes up, "Ninety-five percent of what? Is it 95 percent of your fully converged solution? Is it 95 percent of the truncation value you chose?"

That leads into a whole other can of worms, which, really, you have to go back and look at how you truncated and how you converged a specific model to determine where the 95 percent would apply.

In this case, if one assumed -- and I don't think this is really the intent, but if one assumed that the 95 percent was applying to the fully converged solution, you are looking at about half a million cut sets that the requirements of the standard would conceivably apply to for this one specific model.

MEMBER WALLIS: How do you know what 100 percent is? Don't you need to have an infinite number

of cut sets?

MR. BRADLEY: You iterate. You basically iterate. You take it up. You can generally see --

MEMBER WALLIS: Where it is going.

MR. BRADLEY: -- where it will converge, yes.

MEMBER WALLIS: If you ever get there.

MR. BRADLEY: I don't want to open up a huge can of worms here. I am just saying that if we are really going to impose a 95 percent criterion into the standard, there is a lot more work that needs to be done in terms of different model types. What do you really mean by 95 percent?

These things weren't envisioned when we wrote the standard. I think you can't just stick a 95 percent in where there wasn't that intent before without a significant amount of additional work.

I don't want to say the industry objects to the use of a quantitative definition, period, but I do think we are concerned that you just take the existing standard and put this one size fits all 95 percent in there and issue this thing out as regulatory guidance. We may create a difficult situation and --

MEMBER ROSEN: It's regulatory guidance

for trial for use, right?

MR. BRADLEY: Right.

MEMBER ROSEN: Not regulatory guidance quite.

MR. BRADLEY: Yes, whatever that means. I guess --

MEMBER APOSTOLAKIS: I don't know what is trial for use. How is trial for use different from issuing a guide and then revising?

CHAIRMAN BONACA: First of all, when is it going to be issued? I mean, this is not a final.

MEMBER APOSTOLAKIS: The end of the year.

CHAIRMAN BONACA: So we are reviewing it now, but there may be changes in it before you issue it.

MS. DROUIN: The changes that were are going to make are the ones based on the public comments.

MEMBER WALLIS: Will you make any changes based on our comments?

MS. DROUIN: We may make some based on comments we have received from the ACRS. That is entirely possible, yes.

MEMBER APOSTOLAKIS: It's less likely. We are not in the dominant set.

MS. DROUIN: We may make comments also based on CRGR.

CHAIRMAN BONACA: Are we going to make comments based on a document which is not final yet? I mean, I would be reluctant to do that?

MEMBER APOSTOLAKIS: Is there still dollop between you and the industry? Now it's do or die?

MS. DROUIN: What our schedule is is we have a position right now. We are going to have a public meeting to share. We have had a lot of dialogue. I was just down in Florida at the ASME meeting. The most recent Table 5 that you have, we haven't sent it to ASME yet, but it reflects a lot of the discussions that were held in Florida. We are going to have a public meeting, present this.

Our final position will be dependent on when ASME issues the addenda. If ASME comes in and says, for example, they can issue the addenda in July, I would make a strong recommendation to my management that we hold off and have our position based on the addenda.

If ASME comes in and says the addenda is going to take a year, no. We don't want to wait a year. We want to get this thing out there.

MEMBER APOSTOLAKIS: So the best we can do

is write an entering letter.

CHAIRMAN BONACA: Well, we'll discuss that later on.

MEMBER SIEBER: Let me ask a question to Mr. Bradley. If you had your druthers, would you like to see or not like to see an interim reg guide for trial for use or the alternative is resolve all of these issues before you issue the guide?

MR. BRADLEY: I think that is really a function of what trial for use means. It is not something we do routinely in the industry where you issue a reg guide for trial for use. And to the extent that it is not case in concrete and if we issue it for trial for use and find out that we can still make what could be substantive changes to it, maybe make it go back to more of what the standard was is my opinion where we would end up. That would be okay.

It is probably more a question for OGC or someone who could help better explain what the function of a trial reg guide is. I think certainly we would like the opportunity to -- we are concerned that there are substantial iterations in progress.

And we haven't even had time to use the standard for a single peer review or a single pilot application yet. It is a moving target. And we need

to resolve that through some regulatory mechanism. I am not sure what that is.

MEMBER KRESS: Does it have to be issued to have a trial for use?

MR. BRADLEY: Yes.

MEMBER ROSEN: Of course not. It seems to me they could take the draft guide however --

MEMBER KRESS: Let's check that out and see.

MEMBER ROSEN: If Mary wants to correct it and run the Xerox machine and hand it to Biff, that will be the end of it.

MR. BRADLEY: As I understand it, there are two sets of -- there is one addenda to the standard that is going to come out in the near term to pick up those areas that the CNRM did agree NRC had made changes that were accepted. I think that is going to come out this summer sometime.

I think any further changes involving these definitions will be delayed until the 2004 addendum of the standard.

MEMBER APOSTOLAKIS: But the point is, though --

MS. DROUIN: That has not been decided by ASME yet.

MEMBER APOSTOLAKIS: But the point is I think what Mr. Rosen just said, the pilots will be volunteers. Let's just use what we have, see whether the 95 percent works or not but without having a formal regulatory guide issued because then the changes I think would be much easier to effect.

MR. BRADLEY: We have already explored this.

MS. DROUIN: That's why we want to issue it for trial for use.

MR. BRADLEY: Unfortunately, all --

MEMBER APOSTOLAKIS: There is a legal standing for trial for use because Biff doesn't seem to be sure what that means.

MR. BRADLEY: We have two Option 2 pilots. And we have the South Texas tech spec initiative 4B pilot. And then we have the San Onofre peer review, I think, at least in the case of South Texas and at least one of the Option 2 pilots, these are plants that can use the 95 percent type definition because they have relatively small numbers of "significant sequences." It's fairly practical for them to apply it.

San Onofre is a different case. I don't know about the other Option 2 plant, but it would be

good to try this out on all of the permutations.

MEMBER APOSTOLAKIS: When this is issued, Mary, is it going to still be DG-1122 or it will be RG something?

MS. DROUIN: It goes out as an RG, but it goes with the title "Trial for Use." I mean, this is very typical. We have done this many times. For example, 1.178 has been out there trial for use.

MEMBER APOSTOLAKIS: And?

MS. DROUIN: And now it is going to be issued as a regulatory guide and the terms "trial for use" will be removed.

MEMBER APOSTOLAKIS: It has been modified and --

MS. DROUIN: Being modified, et cetera.

MEMBER APOSTOLAKIS: Mr. Dinsmore?

MR. DINSMORE: Steve Dinsmore from the staff.

I don't know generically what it means, but for 178, it meant the reg guide didn't establish regulatory positions, which meant you could later change it easier than if you released it as a final reg guide.

MEMBER APOSTOLAKIS: So the words "for trial for use" allow you to do that?

MR. DINSMORE: That is correct.

MS. DROUIN: It makes the process --

MR. DINSMORE: It also means that you don't have to backfit analysis if you want to increase the requirements.

MEMBER APOSTOLAKIS: So it is a legal term, then. I mean, it is not just we invented it. It means something, the OGC.

MR. DINSMORE: Yes. But that's what it meant for the ISI.

MEMBER APOSTOLAKIS: Yes.

MS. DROUIN: It's the weight --

MEMBER APOSTOLAKIS: Okay. Any other questions?

(No response.)

CHAIRMAN BONACA: Okay. Let's go to lunch.

(Whereupon, at 12:45 p.m., the foregoing matter was recessed for lunch, to reconvene at 1:45 p.m. the same day.)

CHAIRMAN BONACA: This meeting is called to order again, and we are going to move on to the next item on the agenda. That is Control Room Habitability, and Dr. Powers is going to lead us through this presentation. I understand there are two

presentations, and --

MEMBER POWERS: We've got this table over here -- to the left of us, we've got reg guides, generic letters, guidance. We've got everything.

CHAIRMAN BONACA: We are lucky.

MEMBER POWERS: We're in tremendous shape.

CHAIRMAN BONACA: All right.

MEMBER POWERS: I think most of the members are generally familiar with the revelation that measured inleakage to the control room envelope for several plants was found to exceed, often by a dramatic amount, the unfiltered inleakage that was assumed in the plant safety analysis, and that, of course, this could have profound consequences on the kinds of doses that you would anticipate operators might receive in the course of design basis accidents.

The challenge that seemed to arise is that differential pressure surveillances that are done in many plants to assure that their control room envelope is maintaining its function is just not adequate as a measure of inleakage. This issue has been before the committee before. We have written letters on it.

Our letter has addressed primarily guidance that has been prepared by NEI as they work with the staff, and there has obviously been a

tremendous amount of work on this. And today we're going to hear what the status of that work is and to look at some materials the staff has had out for public comment and is now ready to issue in final form.

Now, since I have been on this committee, we have always done things by having the staff present followed by a presentation by the industry. So I'm starting a new trend here. We're going to reverse that, and we're going to begin with a presentation from the industry.

And I think, Steve Schultz, are you going to --

MR. SCHULTZ: Yes.

MEMBER POWERS: Wherever he is. There he is. You hide from me all the time, Steve.

Steve is going to begin and give us what's been going on with NEI 9903 since we last heard about it, which is, what, about 18 months ago. Is that right?

MR. SCHULTZ: November of 2000.

MEMBER POWERS: Oh, okay. Time flies when you're having fun.

Okay. Steve, your show. And if you're going to stand up there, you've got to be wired, dude.

MR. SCHULTZ: Yes. Good afternoon. I'm Steve Schultz. I'm with Duke Energy, and I'm going to make the industry presentation on behalf of the NEI Control Room Habitability Task Force on the work that we've done since our last ACRS meeting with you.

And I'm going to start just with, by way of introduction, the NEI leads on this are Jim Riley, who is sitting at the table here; Alex Marion, who Jim reports to; and the subgroup chairs are all here. Bob Campbell is from TVA and has been providing leadership in the testing and systems area. John Duffy from PSEG has been providing leadership on licensing basis. And I've had the subgroup on analysis and assessment.

The purpose of our discussion today is the following. We want to describe the industry work that has led up to the revision of the NEI document which you saw a draft of prior to the last meeting in 2000. We published it in June, and so we want to present what we have provided in the latest revision of that document published just last month, identify the key elements associated with that revised guidance.

We want to discuss also what recent industry experience has been in control room habitability testing and assessment, talk about our positions regarding the revised document and the reg

guides, and describe our future plans.

MEMBER POWERS: Steve, if I might interject that we did have an excellent session at the last ANS meeting in this precise area.

MR. SCHULTZ: We have. That's one of the ways in which we've been communicating with the industry as well as with the NRC, and that session was actually led by the NRC. And we intend to do that again coming up at the June ANS meeting.

I'm going to run through three slides here on history pretty rapidly, but, again, this slide leads up to the NRC -- ACRS meeting in December of 2000. The issue came up several years ago -- '98 -- and NRC brought the issue to the industry's attention, a task force was formed, and a first draft of the industry document was prepared in 1999.

But I guess I would call that an early risk-informed approach, which did not contain all of the elements of a risk-informed approach, and the staff did not find it adequate. Industry sat with the staff, talked about it, and decided it was not the way to do business. And so we initiated with the task force a restructuring of the document to prepare a real guidance document for the industry in this area.

There was a unique approach taken there.

We met monthly with the NRC to address particular issues associated with this topic. And through that process we worked through the year of 2000, created a draft of the document, gave it to the NRC for their review, and that was the draft copy that you had.

At that time, we had five issues that we had gotten to with the staff and had not reached resolution on. And it was decided at that point that rather than sit at tables and discuss those issues, going forward industry was going to complete the NEI 99-03 document.

In June of 2000, it was completed and published, and at the same time NRC was going to proceed to create the regulatory guides, the draft guides which were published in 2001/2002, and then commented on. You now have the final documents of those guides.

Following publication of the guides, industry commented heavily on them, and provided those comments to the NRC. And while that was going on, a new idea came up in terms -- in order to get additional input from industry, and that was to hold regional meetings held last summer where industry and the public were invited to meetings to discuss the regulatory guides, the generic letter, contents, and

all of this issue -- very open meetings.

I know Mark is going to discuss these in his presentation. They were very open meetings, gathered a lot of new information. There was a lot of dialogue between industry and the NRC, and we came to further closure on issues regarding this topic.

And at the last meeting, the task force met before the meeting, the regional meeting, and decided and proposed at that meeting that we would revise the document we had published in June 2001 and develop even better guidance based on the content and discussions of the meetings last summer and provide that as a better guidance document to the industry.

We met with the NRC to discuss that last September. Part of that discussion had to do with how we would proceed with respect to the draft guides. Draft Guide 1111 and 1113 had to do with meteorology and analysis. We had almost identical information in NEI 99-03 Rev 0. We did not want to have duplicate documents, one being developed by the NRC, one being developed by the industry.

And it was determined -- suggested by the staff that the NRC's -- those documents should be within NRC's purview. We agreed with that. I, for one, as the analysis lead reluctantly took all of that

information out of the industry document. We wanted to have it in one place.

We had commented substantially on those draft guides. NRC agreed to hold another public meeting where we sat with them, made certain that they understood our comments in a level of detail so that we could go forward -- they could go forward with them to revise the draft guides into the final regulatory guidance.

Then, we moved on fast --

MEMBER WALLIS: Could you remind me about where this all started?

MR. SCHULTZ: Yes.

MEMBER WALLIS: It all started because there was -- in the tech specs or something there was a number of 10 CFM, or some number which was very small, for inleakage. Was that actually a regulation?

MEMBER POWERS: Well, a technical specification.

MEMBER WALLIS: Was it a regulation? Was it actually written in law that there should be this --

MEMBER POWERS: No. The law is basically -- GDC 19?

MR. SCHULTZ: GDC 19 is the --

MEMBER POWERS: Yes. Which says you've got to protect your control room.

MEMBER WALLIS: Yes. But the number that people were shooting for, which they all missed except for maybe one or two, was this very low inleakage number of so many CFM.

MEMBER POWERS: That's the number they select.

MEMBER WALLIS: Which seems to be sort of desirable as a simple criteria. You measure it. If you've got it, you pass. If you don't, you don't. Now you've got this enormous amount of stuff that's got to be calculated in order to decide whether you pass or not. And I just wonder what's being achieved by making such a complicated structure, instead of something very simple like pass if you have a certain amount of CFM, and you don't if you have more than that.

MEMBER POWERS: What you're really doing is calculating what is the dose to your operator under an accident condition.

MEMBER WALLIS: That's the ultimate objective, yes.

MEMBER POWERS: That's what you're doing. Part of that calculation is to say, how much

unfiltered inleakage do I have into the control room? When you select a number for that, that's part of your FSAR. It becomes part of your plant license. Okay? The complication is still the same in doing that dose calculation.

MEMBER WALLIS: And every plant has a different number? It just seems so simple to have a number which is pretty good, and we understood that it's about right, and --

MEMBER POWERS: If we all had the same control room, then you could do that. But since the control room boundary is -- I don't know whether there are any two plants that are the same. I mean, it's all different. And more importantly, or just as importantly --

MEMBER WALLIS: We have a speed limit for all cars, and they're all different. But it's --

MEMBER POWERS: I mean, these things have come in as we got smarter about plants. And not only is the control room envelope different, but what's around that that will affect the inleakage is all different.

MEMBER WALLIS: Yes. I don't want to pursue this very far. It just seems to me replacing something which looked very nice and simple in the old

days with something which now has five reg guides and all that kind of stuff --

MEMBER POWERS: But all the stuff you're seeing in there always existed.

MEMBER WALLIS: Okay. Okay.

MEMBER POWERS: Okay? The simple number is one part of an involved analysis.

MEMBER WALLIS: Okay. Thank you.

MR. SCHULTZ: The general assumption in the old days was that there would be very little inleakage, and that CFM was really to account for opening and closing of the control room door during an event.

The finding back in the late '90s was that -- or mid to late '90s was that that assumption was wrong. And, in fact, with the variety of different control room designs, there's a large variety of inleakage numbers that are now being measured at different plants.

With respect to the four guides, one was very -- one is meteorology. That's generic, and it can be applied to any control room evaluation and analysis. One is an analysis guide, which, again, is general. The two that we're really talking about here are 1114 and 1115, which are the testing and

applications guide. That's what we have in our document, too, and that's what we want to focus on here.

So the intent here, again, was to move very rapidly to create a better industry document. We have provided that to the NRC. They provided us good review comments on it. We've addressed those comments in the final version that we published in March.

Just to describe what that's all about, Rev 0, which we published in 2001, we think is an excellent reference document for its time. We had gathered together a lot of information on testing, assessment particularly. We had the analysis meteorology information in there, and the intent was to assure that guidance was available for industry to use.

Following last summer when we came to better agreement with the NRC about how we should approach this issue programmatically, we determined that Rev 1 would provide specific actions that a licensee should take to address the issues in the Generic Letter, and that those actions should be very specific to address the items that were still on the table to resolve.

So the major focus of the document, and

the changes that come following 99 Rev 0 is to focus on key issues. Where the -- these are the five issues, which I'm sure you're familiar with -- in analysis phase, hazardous control, control and testing of unfiltered inleakage, and the issue related to how we would implement this in a controlled program -- that is, the technical specifications. So I want to walk through each of those.

Now, the document then is organized so that Chapter 2 lays out those issues, describes them for licensees, and in Chapter 3 identifies what a licensee needs to do to address the issues. And here we go through that.

With respect to the analysis approach, the licensee has basically three options. They can stay with the current licensing basis, maintain that, and provide -- but the document states that a control room dose, different from what has been done in the past, most licensees, FSARs, they need to provide a control room dose evaluation for all control -- current licensing basis DBAs, everything that's in the FSAR.

They cannot use the information and techniques, the revised analysis methods and limits in Draft Guide 1113 if they choose to maintain their current licensing basis. They can use Draft Guide

material on meteorology. That was assumed to be applicable in any case to control room dose analysis.

If they determine they want to take advantage of Draft Guide 1113, they have to take that as a whole document and need to assess all of the design basis accidents that are listed in that document, even if they are not part of the current licensing basis. And, of course, everyone has the option to use alternative source term as an analysis approach.

With respect to hazardous chemical evaluation, the mission is to assess and evaluate control room habitability -- respect to the measured inleakage, which we'll get to later -- to make sure that hazardous chemical control is appropriate for that measured inleakage, and also in the assessment process the licensee needs to look at current hazardous chemical sources, both onsite and offsite, on a periodic basis.

MEMBER POWERS: Steve, let me ask you a question here. It comes up a couple of times in your document. It says, "Assess and evaluate control room habitability with respect to measured inleakage." And in your document there is a statement, if I can find it, that says the measured inleakage has to be less

than -- measured inleakage values are less than or equal to the analysis input, but you're talking about a measured quantity.

Then, there's some uncertainty associated with it, and you don't provide in this document much that I can identify on how to treat those uncertainties. Don't you mean actually when you say "measured" the measured value plus some standard deviation?

MR. SCHULTZ: We brought this -- we've had a good discussion on this with the tracer gas -- with the testers that do the testing of the unfiltered inleakage. And their position has been that what they provide has a value, once they complete the testing, is a nominal value with uncertainty. But their direction/opinion is that the nominal value is what ought to be used in an analysis.

Now, we've talked about this with the staff and discussed it. Now, the reason they say that is the uncertainty is a result of the test, and I know what that uncertainty is, and I know why that uncertainty happens. It happens because when I'm measuring flow in a ventilation system there's uncertainty associated with that, and that's going to affect my final result.

And so our position has been as long as we understand the sources of uncertainty -- and that means if we understand it that they are reasonable, that they're apt to be low, then a nominal value can be used.

Now --

MEMBER POWERS: I think there's -- another uncertainty exists in this. You make a measurement under conditions that are reasonably controlled and close to normal operating conditions. You're applying this for an accident condition which is different -- different environment for the control room envelope, range of meteorologies, that being the ambient pressures and things like that, ambient gas densities.

You'll get a different inleakage, then, and that uncertainty is not understood -- I mean, you understand it, but it's not quantified here. Don't you need to conclude that sort of thing?

MR. SCHULTZ: The approach in performing the test, just to clarify one item of what you mentioned, the process in performing the test is to put the configuration in the accident alignment and mode of operation.

MEMBER POWERS: Yes.

MR. SCHULTZ: So that part is done. But

you're right -- the environment conditions can vary, and that is -- that's not directly captured in the measurement of this particular variable. So in that regard, in fact, what we are depending upon is the application of conservatisms in other areas of the overall analysis to the control room --

MEMBER POWERS: Okay.

MR. SCHULTZ: -- of which there are still many in terms of --

MEMBER POWERS: There are a ton of them.

MR. SCHULTZ: Right.

MEMBER POWERS: Yes.

MR. SCHULTZ: So that's where we rely upon that. Most --

MEMBER WALLIS: That will depend on whether the wind is blowing. If you have a 60 mile an hour wind blowing, presumably that's likely to affect the inleakage.

MR. SCHULTZ: And that's --

MEMBER WALLIS: Considerable, isn't it?

MR. SCHULTZ: Well, the meteorology assumption is that we utilize the 95th percentile value of the calculated evaluation for chi over q. We use the 95th percentile data to capture that.

MEMBER WALLIS: This isn't for dispersion.

This is from the actual leakage into the control room itself?

MR. SCHULTZ: For the calculated dispersion from the point of location of a release.

MEMBER WALLIS: No, not --

MR. SCHULTZ: For the release portion of it.

MEMBER WALLIS: The inleakage itself depends on wind blowing, not the -- I know that the dispersion does as well, but --

MR. SCHULTZ: It can. Bob, can you speak to the impact of the environment outside the control room to measurements inside?

MR. CAMPBELL: This one?

MR. SCHULTZ: Yes.

MR. CAMPBELL: Yes. This is Robert Campbell with TVA. In answering your questions about, for example, wind, the wind does impact -- I mean, it will change the pressures across walls and other things. But for the most part, we do ask that people take into account, whenever they set up these tests, those conditions.

And the analysis is typically done for a still wind condition, less than five miles an hour, and that usually maximizes your source term from the

chi over q's. If you get winds pretty much up above 30 miles an hour, or the higher it goes the stuff goes away. And so you may increase your inleakage, but at the same time you're also decreasing your source.

So we're trying to say -- maybe not correctly say it, but try to standardize how you do this stuff.

There was another question that you had asked about the different environmental conditions and the lineups. In the document we --

MEMBER POWERS: It's not the lineup.

MR. CAMPBELL: Well, it comes into accident conditions, and those are the lineups. So there's a lot of other systems that are adjacent to the buildings, and other buildings that can either pressurize adjacent spaces or non-pressurize them. And we require that when you're doing these tests that you take into account all of those conditions and pick the worst case.

For example, if I have a building that is going to be at a higher pressure, and it's adjacent to the control room, I would want to make sure that I account for that when I measure my inleakage, so that even though my accident analysis says that system is not running, if the worst case is for it to be running

that may be counterintuitive. But we put that guidance in our document, and that's --

MEMBER POWERS: Okay. I struggled to find that guidance. It may be in here, but I have a hard time putting my finger on it.

MR. CAMPBELL: Okay.

MEMBER POWERS: Okay? So maybe you can give me some help on finding exactly where I'm looking.

Steve, please.

MEMBER ROSEN: Yes. Could I ask you to go back to Slide H, the one before. I'm kind of puzzled by something on that slide -- I still am -- and that is that there must be a rationale for what's under Bullet 2. To use DG 1113, you must assess listed deviation, even if they're not part of your current licensing basis. Why in the world would anyone want to assess a DBA that wasn't part of their licensing basis?

MR. SCHULTZ: Of their current licensing basis?

MEMBER ROSEN: Yes.

MR. SCHULTZ: In order to use the advantages of Draft Guide 1113, which have improved analysis methods and a revised limit for the success

of the analysis result.

MEMBER ROSEN: Huh? I don't get it.

MR. SCHULTZ: The draft guidance -- the new guidance in the Reg Guide provides relief from some conservative analysis assumptions that have routinely been made, moves more toward the guidance in Reg Guide 1.183.

MEMBER ROSEN: So in the --

MR. SCHULTZ: Provides a new limit.

MEMBER ROSEN: -- payout for using more realistic assumptions in the calculation, you have to use more unrealistic assumptions in terms of what you assess.

MR. SCHULTZ: You need to --

MEMBER ROSEN: Is that the deal?

MR. SCHULTZ: You need to expand the events that you have evaluated in your licensing basis. You may have to. It depends on the licensing --

MEMBER ROSEN: Aren't you embarrassed standing there and saying that? I mean --

MEMBER KRESS: That's the nature of DBAs. They're always supposed to be -- have those conservatisms built into them. And if that's your current licensing basis, and you're going to something

else, then you don't want to throw away your conservatisms.

MEMBER ROSEN: No, it says that it must assess the list of DBAs. And there must be a list that I didn't find, but presumably there's a list -- and if one of those DBAs doesn't apply to this plant that presumably wants to use this option, nevertheless he has to analyze a design basis accident that's not part of his licensing basis. Am I correct?

MR. SCHULTZ: That's the intent of the regulatory guidance.

MEMBER ROSEN: I'm trying to be polite, you know? But it's absurd.

MEMBER POWERS: Well, it might be something we interrogate the staff about, because it's their requirement.

MEMBER ROSEN: Okay.

MR. SCHULTZ: I lost a slide.

MEMBER WALLIS: Would you say it was preposterous?

MEMBER ROSEN: Better, but --

MEMBER WALLIS: Since we've got quiet here, we --

MR. SCHULTZ: Excuse me, Dr. Powers, did we address your comment from --

MEMBER POWERS: Well, I --

MR. SCHULTZ: -- with respect to --

MEMBER POWERS: -- mean, I think I understand what you're doing. And either I need to read this thing more carefully or you need to give me some help, because the kinds of detail that you provide on -- the constraints you put on the testing, I just don't see it here. I may be overlooking it. Okay?

Because it is that -- it's not the uncertainty in your measurement of the flow that bothers me so much. I mean, I'm sure you get that, and I'm sure you do something with it. It is this testing on Sunday afternoon when everybody knows that all reactor accidents occur at 1:00 in the morning and -- 4:00 in the morning -- I'm sorry, Steve. Well, that's on east coast time. In New Mexico, they only occur at 1:00. Okay?

MEMBER ROSEN: TMI was there.

MEMBER POWERS: And that the -- try as you might to reproduce the conditions that exist in the environment around the control room envelope, in your testing you're just not going to do it, because sometimes you can't -- you can't change the density of the gas appropriately or the temperature, and things

like that. It's that uncertainty that I don't see how it figures in here.

Now, what you're telling me is -- and I think you're probably right -- is that uncertainty pales in comparison to the conservatisms that are put on all the rest of the analysis.

MR. SCHULTZ: We find that's true.

MEMBER POWERS: I'm sure you're right about that, because there are some --

MR. SCHULTZ: The approach we've taken for control room analysis are similar to in terms of application of conservatism to offsite dose analysis.

MEMBER LEITCH: Can I clarify some things? I guess most plants have positive pressure control rooms, and they have tech specs that basically require that one must demonstrate that you can maintain the control room at a positive pressure with respect to the area outside --

MR. SCHULTZ: That's correct.

MEMBER LEITCH: -- the control room. And you can infer from that what the inleakage is. But yet when you try to duplicate that with tracer gas tests, you get many times -- typically, you get many times the inleakage. Is that a correct understanding?

MR. SCHULTZ: Well, the assumption has

been -- and it's stated in some technical specification bases -- that because of the pressurization of the system there is no inleakage into the control room because of the pressure differential.

And what has been found is that's not true, that there are differences in pressure, sometimes ductwork is positive to the pressure in the control room, sometimes there are cracks, holes, unidentified sources of inleakage or paths for inleakage into the control room. So even in a pressurized control room situation, inleakage can occur.

MEMBER LEITCH: So you really can't look at the situation macroscopically, if you will. You have to --

MR. SCHULTZ: That's correct.

MEMBER LEITCH: -- think about the individual --

MR. SCHULTZ: And that's why we're here and why --

MEMBER LEITCH: -- situations.

MR. SCHULTZ: -- we've been talking about moving the issue forward by doing the testing and performing new analyses.

MEMBER SIEBER: You can actually have inleakage and out-leakage through the same envelope.

MR. SCHULTZ: That's correct.

MEMBER LEITCH: Now, when you are speaking about the ability to manage accidents, are we including also the remote shutdown panel?

MR. SCHULTZ: Yes.

MEMBER LEITCH: And in some plants, that remote shutdown panel is in the control room envelope, and in other cases it is not, correct?

MR. SCHULTZ: That's correct.

MEMBER LEITCH: Yes.

MR. SCHULTZ: But when I responded and said we're considering the remote shutdown panel, we're considering that particularly for the next topic for the smoke events.

MEMBER LEITCH: The smoke -- yes, that's what I -- yes, okay.

MR. SCHULTZ: But with respect to a dose to an operator, if it's not within the control room envelope, then it's not considered with respect to this particular issue.

MEMBER LEITCH: Okay.

MR. SCHULTZ: With respect to the smoke assessment, it has really turned into a qualitative

and fairly simple statement at least that the intent is to assure reactor control from either the control room or an alternate shutdown panel, and that's for both internal and external smoke events, internal and external to the control room.

MEMBER POWERS: Before you pass again on the hazardous chemical, in your smoke guidance, but I think also with respect to chemical hazard, you have verified that initial and continued training is performed to ensure familiarity with a success path credit and licensee's response to smoke event.

When we have visited simulators and asked, "Do you ever test with SCUBA gear on or with protective breathing apparatus on?" I've never had anybody say yes. They sometimes test whether they can go operate the remote shutdown panel, but never can they operate in this equipment. Why is that?

MR. SCHULTZ: It has been done more recently.

MEMBER POWERS: Ah, okay.

MR. SCHULTZ: And it has been done in response to some of the things that we have found out here.

MEMBER POWERS: Okay.

MR. SCHULTZ: John, do you recall any

information related to that? I know that it was done at ANO, and there have been discussions with the staff as to when that should be done, given the particular situation at a plant, especially when we got into the discussion of compensatory measures, which are in Appendix B of the document.

MEMBER POWERS: Right.

MR. SCHULTZ: And in that there is some guidance as to when one would need to do a -- work with the simulator or demonstrate shift turnovers and that type of thing related to use of --

MEMBER POWERS: Yes. It would be interesting to see some data on that, because it comes up every once in a while in the analysis of these events. And, you know, how much is the degradation and performance? We know there must be some.

And the fact is, I don't have any data on the subject. We might be able to get some from the Marines, but --

MR. SCHULTZ: There has been work done in the area of just protective clothing for other plant --

MEMBER POWERS: Yes. Yes. But I was wondering particularly about the control room operations.

MEMBER SIEBER: There actually have been studies for the teddy doses for basically maintenance work, as to whether it slows workers down, gives them more -- a whole body dose or impedes communication and things like that. So there are studies out there, but I don't -- I'm not aware of any that specifically deal with the control room.

MEMBER POWERS: Well, you know, I think we ask every control room we visit -- or simulator that we visit, do they ever test especially for the chemical hazard evaluation. You know, they usually have the gas masks and what not that they -- they are in the control rooms, but not in the simulator and they don't ever test --

MR. SCHULTZ: It's not pervasive, but I know that at least one licensee has gone through the process of doing this.

MEMBER POWERS: It would be interesting to see.

MEMBER LEITCH: Yes. We did test it from time to time, I think both in the simulator and in the control room, as I recall. I forget the periodicity of the testing, but --

MEMBER POWERS: But you're required to do it in the control room every once in a while.

MEMBER LEITCH: Right, yes.

MEMBER POWERS: But I have not had any control -- any simulator say, "Oh, yes, we do that every 15th evolution," or something like that.

MEMBER LEITCH: Yes. I don't remember the periodicity, but I know we did do it. And as you suggest, the operators were very uncomfortable at the prospect of having to do significant operations in SCUBA gear.

MEMBER POWERS: Well, in light of that limited experiential base, how does one go about doing this verification that you call for?

MR. SCHULTZ: Verification --

MEMBER POWERS: Yes, verify that continuing training is performed to ensure familiarity with the success path credit and licensee's response to smoke event. And prior to that, there's a long discussion of SCUBA.

MR. SCHULTZ: Okay. John, did you have a comment related to that? It's in the discussion related to the smoke event.

MEMBER POWERS: Your response to the smoke event consists of a whole bunch of verify, verify, verify. I picked this one because I had --

MR. SCHULTZ: Right.

MEMBER POWERS: -- some familiarity. But there are a bunch of verifies that I'm not sure I know how one goes -- I mean, a few of them I know how to do, but this one I'm perplexed. How do I -- you know, how do I verify it?

MR. SCHULTZ: I guess we could say we're leaving it to the licensee, but --

(Laughter.)

-- we ought to provide more guidance. And I'll simplify that by saying we still will be having further discussion with the licensee about how this is actually implemented. One of the things that is absent here is the detail aspect of what the control room habitability program is.

That is, onsite the licensee is required to develop that program, and we have perhaps -- well, this is what we have stated in the guidance that the licensee needs to do. Have we run through and put together exactly how that turns into an appropriate program and what we meant by "verify"? The answer is no. And perhaps "verify" was an easy word to repeat in each of those bullets, and we should have selected wording more carefully.

MEMBER POWERS: That's okay. I just wanted to --

MR. SCHULTZ: But the intent is to -- for the licensee to be thinking about each of those items and issues. We want to do work especially with the smoke events and say, "These are the things you need to be thinking about when you're preparing to react to internal or external events."

MEMBER POWERS: That seems to be a characteristic of 99-03 is, "Here are things you should be thinking about." I mean, almost every entry is like that. Almost nowhere do you say, "Do exactly this."

MR. SCHULTZ: There are areas where we do, and I would counter by saying compared to 99-03 Rev 0, it's quite an improvement in that area, because 99-03 Rev 0 was specifically written to provide what I would call generic guidance for the industry, without being specific about -- to provide alternatives to the licensees.

And programmatically here we are laying out requirements associated with, for example, a licensee performing analyses for control room for each of their design basis events. That is not the case today for licensees. We are prescribing the testing program that I'm getting into next, and so that is something that licensees are to do.

So on the big picture issues, we have said, "This is how you do it." But our expectation is that, as the licensee responds to the Generic Letter and defines the plant-specific program, that's when they're going to get into the specifics of what they need to do.

And one clear reason for that is every control room is different, and the ventilation systems associated with control rooms that aren't different are different. So it is -- we believe we're providing direction here sufficient for licensees to put together the program that's appropriate for them --

MEMBER POWERS: Yes, but it's --

MR. SCHULTZ: -- and meet the Generic Letter.

MEMBER POWERS: -- an extensive list of things to think about, I'll admit that.

MR. SCHULTZ: It is.

The next issue is associated with testing, and the approaches here in the document came out of discussions we had with the NRC in the meetings last summer. The ASTM 741 test or the tracer gas testing approach is acceptable. That can be used for all plants, all plant designs.

We had a discussion with you in 2000 about

the integrated component test method. There's been a lot of development on that method, and the determination there is that that method would be acceptable. If the conditions for that test are met -- "conditions" is the wrong word.

If a licensee reviews the expectations for that test and determines it's suitable for their control room, and if that result is correlated to the tracer gas test results at the licensee's plant -- and by "correlation" we mean that the results of the integrated component test cover or correspond to 95 percent of the measured value from the tracer gas test, at least that.

Now, if the integrated component test method is not correlated at that licensee's plant -- this bullet means that if you test twice, once with tracer gas and once with component testing, you can then apply component testing later.

If you want to use component testing and you haven't done tracer gas testing in your plant, if you can benchmark your control room to another plant that has done a correlation, then your benchmarking demonstrates that your control room is the same, your procedures are the same, and your assessment of that -- of your control room and the assessment of that

control room prior to the test matches up, then you can make the argument that you can do integrated component test at your site.

MEMBER POWERS: It's the question of what a similar control room is. I mean, we've discussed here at length that every control room is different. There's a counter example -- two sister plants on the same site. There are very likely to be quite --

MR. SCHULTZ: Palo Verde is a good case.

MEMBER POWERS: Yes.

MR. SCHULTZ: They are --

MEMBER POWERS: Is that what you're thinking of when you say this -- you put this one in?

MR. SCHULTZ: That's one example. The STARS plants are another example. They believe that, as they've done their assessments at each of the control rooms, the assessments and the assessment team have concluded that certain plants have similarities --

MEMBER POWERS: Okay.

MR. SCHULTZ: -- within that group. So it would be a very tight comparison.

And then, the last bullet here indicates that alternative test methods -- other test methods could be acceptable, correlated to the tracer gas test

results, and justified for NRC review. So if we come up with a new methodology, that's how one would proceed.

MEMBER POWERS: We saw this methodology that Brookhaven had come up with, and I think you're testing it at Duke, aren't you?

MR. SCHULTZ: Dr. Dietz has prescribed a method. We're talking to Brookhaven and to Dr. Dietz about making a comparison study at the McGuire Station.

MEMBER POWERS: I found that just very impressive as a methodology. In comparison to the kind of information you get out of the tracer gas, that was -- that seemed like a very powerful test.

MR. SCHULTZ: This is the PFT methodology, which allows one to put sources and receptors at various locations. And through that, as compared to tracer gas, you'd be able to identify more information about where the sources of inleakage are as well as the measured value. It has been done at Calvert Cliffs.

MR. CAMPBELL: It's been done at Calvert. Again, Robert Campbell, TVA. It's been done at Calvert Cliffs, and essentially they got exactly the same results that they did with what we will call a

traditional tracer gas test. And it's being also considered at other sites. Steve mentioned his.

And I do know that when the ASTM committee meets that governs E-741, they're going to bring it up to see if they can include Dr. Dietz's method into the E-741. But that may not happen for a while.

MEMBER POWERS: It also looked like it was conducive to subsequent testing fairly easily.

MR. SCHULTZ: That's correct.

MEMBER POWERS: And much less expensive than the tracer gas.

MR. CAMPBELL: Yes. It's a very simple method, and it uses very easily dispersed sampling tubes. So --

MR. SCHULTZ: The one thing that needs to be done for pressurized control room is to assure that -- is to develop a new matrix transformation to analyze the data and also determine where you would put the sources and the receptors.

MEMBER POWERS: Yes, it's a little while down the line, but it looks like new technology is coming along. And I am gratified that you include other methods, because you don't want to preclude new technologies like this, especially if they are substantially less expensive.

And I note that in that -- some of the comments that we've seen on this, the number of vendors willing to do leak testing is small.

MR. SCHULTZ: That's correct. There are two vendors that are doing tracer gas testing.

The program -- I mention on the last slide that we also have definitive guidance on how one performs an assessment. Those are the two elements of a program going forward for the industry that -- this is the way it will proceed.

Licensee would perform or have performed a baseline test. Three years following a successful baseline test, they would perform an assessment. And if that assessment is successful, then you'd proceed right straight across and conduct a periodic retest three years later, and then perform an assessment and run through that loop.

The baseline test is one which includes assessment. Preconditioning can be done prior to a baseline test. That's the approach that is being taken. The periodic test would be an as-found test, except for routine maintenance that would normally be done either before --

MEMBER POWERS: Things like --

MR. SCHULTZ: -- or during an outage, and

that kind of thing. Yes.

Down below, if you don't pass an assessment, what the industry has done is indicated there are likely -- if it's a procedural discrepancy or a minor deficiency associated with inleakage, one can determine that. Then it goes into the overall corrective action program.

But if it is major, if there's a hole someplace that you don't think it should be, or you feel you've got an extensive programmatic deficiency, then you need to retest. And if you need to retest, or if you don't pass a retest in the process, you don't go back to an assessment loop -- process in the loop, but you would retest three years later.

MEMBER POWERS: Now, you have three-year testing. Do I understand correctly that the staff has two-year retesting? You're still three years. Where did I read two years?

MR. SCHULTZ: It was in the -- I think it was in the draft guide.

MEMBER POWERS: Okay.

MR. SCHULTZ: Before we met last summer.

MEMBER POWERS: Oh, okay. Okay.

Now, in something I read -- I'm beginning to doubt what I've read now.

(Laughter.)

You guys are scaring me. I have seen what I thought was 1114 tables that said endorse, partially endorse, don't endorse, 99-03. How are you reacting to that?

MR. SCHULTZ: Well, we have two reactions. One is we feel that what we -- we haven't seen the regulatory guide coming from those draft guides, so we have reviewed and commented on the draft guides. Our position, based on our document and what we have in the reg guides is that there is much more detailed and useful information in 99-03 Rev 1 than there is in 1114 and 1115.

We're concerned that there are two documents that proceed forward, and we're also concerned that the regulatory guides that are coming out will refer to 99-03 Rev 0 versus this document Rev 1.

And the concern there is, although one might not think it would be the right thing to do, when licensees are responding to a Generic Letter, and the Generic Letter refers to regulatory guides, many licensees will follow it rote and will not deviate to use industry guidance, even it's a better document --

MEMBER POWERS: Sure.

MR. SCHULTZ: -- if the licensing description focuses on 99-03 Rev 0. And we would rather not see that happen. That is to say, we'd rather not see licensees take that route or have to feel they need to go in that direction.

With respect to control of the process here, the guidance indicates that all licensees would adopt a licensee control program to periodically retest, to go through the diagram that I just described. With respect to technical specifications -- we have already discussed this -- some plants have inconsistencies between -- in this area between their bases, their surveillance requirements, licensing and design basis.

They need to look at that. They need to make sure that there are not inconsistencies and need to correct those. And one opportunity we have created to do that is to adopt the tech spec being developed by the tech spec task force, which provides a new tech spec in the ventilation system area and refers to this program that will be created by the licensee.

There is an option, we believe, that a licensee could correct the bases of the tech spec and not go through the process of adopting TSTF. We believe there's actually two problems with that,

although we think it's a viable option from a licensing basis.

The two problems are that the staff has not found this agreeable as an approach and --

MEMBER POWERS: They get a vote.

(Laughter.)

MR. SCHULTZ: And they do get a vote, and there are real advantages in the tech spec that's being created by the TSTF in terms of providing greater license -- greater duration in terms of the ventilation system LCOs and response to those, any problems that one might have there.

MEMBER POWERS: Let me come back to retesting and things like that. Elsewhere within the regulatory system we've seen fit to develop performance-based retesting schedules. Why have you eschewed that concept here?

MR. SCHULTZ: We haven't. There's a small paragraph in the document that indicates when we gather experience that it would be appropriate to adjust what's hard-wired into that diagram, make adjustments, and we also feel that that could go both ways. If a particular plant design experience shows that it's having problems, perhaps they should test more frequently.

But if the testing is coming out satisfactory, I would expect licensees and the industry to come up with approaches to do different testing. If the PFT test works, that could be a very simple way to resolve the problem in any case and do periodic testing every three years without much expense and just reassurance that the system is operating as expected in the licensing analysis.

MEMBER POWERS: One of the suggestions that has appeared somewhere -- and it may -- and you guys are really scaring me on what I think I've read.

(Laughter.)

-- was that you do a test, and then you go ahead and do your delta P surveillance between the time you've done your test and the time you do your retest, on the theory that that may not be -- the delta P test may be no good for monitoring inleakage, but it sure would tell you something about degradation over the interval between that. Is that being pursued, or is that --

MR. CAMPBELL: Steve?

MR. SCHULTZ: Yes.

MR. CAMPBELL: Yes. The task force has reviewed the proposed tech spec change, and it's our position on the task force that we need to keep those

particular surveillances, because the systems were designed to fulfill certain functions and perform certain acts, and those surveillances assure that. If anything, I would say the tech spec is being added to to account for the unfiltered inleakage.

MR. SCHULTZ: Did that speak to the question?

MEMBER POWERS: Sure. Yes.

MR. SCHULTZ: I wanted to discuss what has been happening in the industry outside of the fact that we haven't gotten the Generic Letter and Reg Guide. Approximately 35 percent of sites have now performed inleakage testing, and what I wanted to state here is that what we are finding is that the tracer gas testing is improving with that experience, that in this regard, both in terms of sources of unfiltered inleakage -- in other words, we have a much better understanding of where the inleakage is coming from, although the tracer gas test does not tell you that when a test is performed.

We're still getting a better feel for where it comes from, and it -- and coupled with the testing that has been done, there's been a lot of sealing work, a lot of repair work that's been done on control rooms to lower inleakage.

The most likely source of inleakage has been in ductwork. Sealing of ductwork has really helped some plants lower the unfiltered inleakage values or sealing around filtration units.

MEMBER POWERS: This experience, I mean, you know, I've certainly attended discussions where people described their experiences there. But by and large, it seems to be the great oral tradition. I mean, I don't see a document coming out and saying, "Okay. Out of 13 plants that have found it necessary to better seal their envelope, 45 of them found it was in ductwork, and 55 percent of them found that it was door seals and things like that."

I mean, it's all oral tradition. Isn't there a move to document these experiences, so the other 60 plants that need to do this have an easier time?

MR. SCHULTZ: There has been. And the best forum for that is the Nuclear HVAC Utility Group, NHUG.

MEMBER POWERS: Oh, okay.

MR. SCHULTZ: And they have not only presented papers at their last few meetings -- they meet semi-annually -- on those issues, but they have also now formed a subcommittee to get lessons learned

from testing. And I presume you're also looking at the results of that testing and the results and impact on the sites.

MR. CAMPBELL: And we're passing that on to the targeted audience, which is the HVAC system engineers at the various plants.

MEMBER POWERS: I found that a couple of presentations we've had at the ANS on these experiences, and the photographs they provided, and things like that, was really conducive to understanding what the problem is.

MR. CAMPBELL: And that comes from, again, that utility group that Steve mentioned. A lot of that -- and much more extensive than what you've seen at the ANS conferences has been done.

MR. SCHULTZ: The other experience has been with respect to correlation testing between or on behalf of the integrated component test method. There have been three sites that have done the integrated component test and tracer gas testing. Palo Verde is one, Comanche is another, and Catawba is a third.

All of those units are pressurized, clearly, and are -- is one criteria for performing the integrated test, and in each case the inleakage is relatively low. But the results, in comparison, have

been good, have been very good.

MEMBER WALLIS: Are these tests where you put a tracer in, and then you watch it dilute with time?

MR. SCHULTZ: You're using -- in the tracer gas test, you are inputting --

MEMBER WALLIS: Of course, it could die down with time.

MR. SCHULTZ: That's one technique that's used to measure what the inleakage is into the system. It's basically a -- there's a couple ways that are used, but both are aimed at determining what goes in and what goes out of the control room and what the difference is and applying that to inleakage.

Now, it's inleakage that's measured in the tracer gas test, not necessarily unfiltered --

MEMBER POWERS: Oh, don't say that. Don't say that. Your own comments say no, no, no, you don't measure it; you only infer it.

MR. SCHULTZ: No. I said you do measure the inleakage. You --

MEMBER WALLIS: You derive it from the test.

MEMBER POWERS: We will point to you some comments that you afflicted the staff with.

MR. SCHULTZ: All right.

(Laughter.)

MEMBER WALLIS: Do you measure it two different ways and see if they agree? We had a presentation two years ago or something about it, all the hazards and difficulties and inaccuracies, and they are pretty big in these tests. Do you measure it two different ways? I assume you --

MR. SCHULTZ: They're getting better. But generally, there's not -- it's not done two different ways. Generally, for a control room in a particular system, there's one approach that's preferable.

Bob, can you speak to that in terms of the different -- the two different tracer gas testing methodologies?

MR. CAMPBELL: Yes, I will. Again, it's Robert Campbell with TVA for the recording. But preferably, I would like to have somebody like a Pete Leggoss in here or some other Ph.D.

MEMBER POWERS: He's been here.

(Laughter.)

MR. CAMPBELL: But it depends on the control -- type of control room. If I have a neutral pressure control room, I believe that a concentration to K method, where I stabilize a certain concentration

in the control room, and then watch it decay -- whereas if I have a pressurized control room I will have a constant injection of material, and then I will watch the concentration in the control room change is -- when I'm pumping in.

So now I have a qualitative value of what I'm pumping in and how it's changing over time in the control room. And then, from that, yes, we can infer what the inleakage is. So it depends on the type of control room, and those are the methods that I believe are being used.

But any one of the three methods that are given in the ASTM standard can be used, but they're used with different constraints. For example -- and I can go into that. But one of the things would be control room volume. What's the net free volume?

And I think the constant injection method, you do not have to worry about control room volume, whereas the K method you would.

MEMBER WALLIS: Well, I guess that I'm trying to get at -- and I don't know how much time we've got here --is you've only got 35 percent of the sites. There's no real check about how good the test is, because there's nothing else it's compared with -- just to get some idea of how good these tests turned

out to be. That's all I'm trying to get at.

MEMBER POWERS: Well, I think --

MR. SCHULTZ: In my experience with the test, if there's a problem with the test -- and this can be shown analytically -- you get a conservative result. So, I mean, that's one thing that makes one feel comfortable about the results that we're getting.

MEMBER POWERS: I mean, the --

MR. SCHULTZ: I think you --

MEMBER WALLIS: There weren't anomalies. And you expect an exponential decay; you get an exponential decay. It's all straightforward and fine, or is it --

MR. SCHULTZ: Well, I would comment that with respect to that, with respect to the testing, there's been a lot of better understanding coming from the testing process itself, the importance of mixing, for example, the importance of knowing where to inject and where to measure the tracer gas to get a flow measurement, for example.

MEMBER WALLIS: You're still in the learning process?

MR. SCHULTZ: There has been a lot of learning that's happened in the last three years, and the test results are -- the testing is getting better

as a result.

MR. CAMPBELL: Let me interject here. I think we do have some correlations that the techniques for the tracer gas testing do work, because we have three plants that have done component testings concurrent with their tracer gas test. Those are three.

Plus, we've done another plant that has done a PFT test, and that correlates with the tracer gas test. And I do know of two plants that used tracer gas testing over periods of time. Crystal River and Millstone Unit 2 have done repeated tests and have gotten consistent results.

So I -- maybe that helps answer the question.

MEMBER POWERS: I think there's a vast amount of information coming from -- not from the nuclear industry, but just from the HVAC industries and things like that that say, "This is a reasonable way to go about measuring things." There are -- clearly there are technique -- you have to be an experienced experimenter, but I don't know of any test where that's not the case.

MEMBER ROSEN: A couple of quick questions. What is the tracer gas that's used?

MR. CAMPBELL: SF6.

MEMBER ROSEN: Okay. What does PFT stand for?

MR. CAMPBELL: Perfluorocarbon.

MEMBER ROSEN: Perfluorocarbon.

MR. CAMPBELL: Perfluorocarbon test. That's a tracer test. It's a perfluorocarbon tracer test.

MEMBER POWERS: And what they do, Steve, is they have a bunch of perfluoros, a bunch of different ones, and they --

MEMBER ROSEN: So that's different than the SF6.

MEMBER POWERS: Oh, yes. Yes.

MR. SCHULTZ: It's more the type of test that you -- it's also used for dispersion testing. In fact, that's what it's used for mostly is having lots of sources and receptors. And you can actually do -- some licensees are considering --

MEMBER ROSEN: I apologize for asking easy questions.

MEMBER POWERS: You'll have to forgive me, I did not provide the committee the ASTM test in their package. So they may not be 100 percent familiar with the test itself. We gave them enough to read.

MR. SCHULTZ: And the last comment on the slide here is that licensees are also in the process of applying alternative source term methodologies and using methods that are consistent with those already in the Draft Guide 1111 and making submittals accordingly.

MEMBER WALLIS: Well, I guess the reason I asked all this, if Peter Leggoss was here and he gave us a good exposition on all this testing, it seemed to be that you had to do it pretty carefully. You had to know how to do it.

All I'm trying to establish is that the industry has got a mature enough understanding of this that these things can be done routinely and correctly in the future. That's all I'm trying to establish. We've talked about very few plants so far that have done these tests with any degree of thoroughness.

MR. SCHULTZ: Some of the plants have tested more than once.

MEMBER WALLIS: Yes, that's --

MR. SCHULTZ: And I think that's good and bad news, because the reason they've tested more than once is that the first test didn't work very well, and it needed to be revisited or the sealing had to be done in between.

MEMBER POWERS: Steve, is it true that when you say the plants have tested that really what they're using is a vendor?

MR. SCHULTZ: They are using a vendor, yes.

MEMBER POWERS: Okay.

MR. SCHULTZ: The testing that has been done to date has been done either by Leggoss Associates or by NUCOM. Those are the two vendors that have been used for tracer gas testing.

We've talked about the first two elements of the industry's position. That is, the guidance provided here we think is very robust. With respect to the draft guides, that's all we've seen. We have not seen the final regulatory guides. But our concern is that they reference 99-03 Rev 0, and we think at least they ought to be updated expeditiously to reflect endorsement of Rev 1.

That endorsement would be very helpful as part of transmittal of the Generic Letter response -- again, to focus licensees toward using Rev 1 as the document to use as an approach versus Rev 0.

And the last comment, 1111 and 1113, as revised through our public comment process, should provide really improved guidance to licensees in the

-- both the analysis and the meteorology areas.

Our future plans -- and we've discussed about this a little bit -- of course, the task force is going to provide support to the industry in reviewing the final regulatory guides when they're published. And in moving forward with that review, and with the response to the Generic Letter, we've determined that an industry workshop would be very useful in this area, and we're projecting that it could happen.

We're still working with the NRC to make sure we've got the right schedule there -- the third week in June. If everything else is marching forward properly, then that should be a good time, focusing on, again, the reg guides and the generic letter response.

And getting into some of these issues that you've raised, Dr. Powers, as well, we would want to make sure that we have thorough discussion on that. We're thinking of a two-day workshop. We're thinking of having it in the Washington area. And if ACRS members -- I don't know if you have a meeting that week. But if ACRS members would like to attend, that would be useful as well.

MEMBER POWERS: Well, I mean, the

subcommittee might have an interest in this, just to see what you're doing.

MR. SCHULTZ: Right. I mentioned NHUG's activities, and there are other activities. They've had a control room habitability subgroup within NHUG now for several years as well. And also, the industry is considering ways to look at next steps to events, the lessons learned in radiological analysis.

Although we pulled that from our guidance document, many of our comments -- several of our comments associated with Reg Guide or Draft Guide 1113 we noted would apply to Reg Guide 1.183, alternative source terms. That's been out now for almost three years, and we think that there are other improvements that could be made in that document, and there's probably source term issues that need to be addressed there, too.

Other questions?

MEMBER POWERS: We'll see how you do with ruthenium tetroxide as the -- and your source term issues.

Any other questions you have of Steve?

MEMBER RANSOM: Mine is kind of a general question. But is there equal attention given to internal control room equipment failure and fires and

failure of the fire suppression equipment, that type of thing?

MEMBER POWERS: Inside the control room?

MEMBER RANSOM: Inside the control room, right.

MEMBER POWERS: All of Appendix R.

MR. SCHULTZ: Right.

MEMBER RANSOM: Okay.

MEMBER POWERS: It's a major part of it.

MEMBER RANSOM: All right.

MEMBER POWERS: Control room fires are the worst fires that you can possibly have, and so there's a great deal of attention given to that. Yes, we agonize over those a little bit, because that's the one place everything comes together.

MR. SCHULTZ: And we've deferred to Appendix R in our document.

MEMBER POWERS: Well, there's a future there, too.

If there are no other questions, we'll move on to the staff's presentation, and they can tell us what they want from us.

MR. SCHULTZ: Thank you.

MEMBER POWERS: Thanks, Steve.

MR. REINHART: Good afternoon.

MEMBER POWERS: All yours. We've got a team here, another -- better introduce the whole team here.

MR. REINHART: I'm going to do that.

MEMBER POWERS: A couple of them we know real well, but --

MR. REINHART: I'm Mark Reinhart, Chief of the Licensing Section of the Probabilistic Safety Assessment Branch, which has the dose assessment team which is responsible for this work. So that's why I'm here.

The team consists -- the team leader was Jack Hayes. Steve LaVie was our licensing lead for that area. Mark Blumberg was the analysis lead for that area.

At the table over here is Harold Walker, who was the systems lead for the assessment, and Leta Brown is our Dose Assessment Team Branch and NRC single meteorologist who has helped considerably on this effort.

MEMBER POWERS: Mark, before you get into history --

MR. REINHART: Okay.

MEMBER POWERS: -- tell us what you want from us.

MR. REINHART: What we want is to just bring you up to date on where we are in the project. We talked to you also in November 2000.

MEMBER POWERS: Right.

MR. REINHART: We are going through the process of issuing our documents. We don't necessarily need a letter. We wouldn't argue with a letter, but this is an informational update.

MEMBER POWERS: What I think is feasible, Mark, is a letter on the Generic Letter.

MR. REINHART: That's fair.

MEMBER POWERS: I think you ask us too much on the reg guides. There are new things in there, and we need a little more study on them to understand. We see more than we know. That's put it that way.

Now, one of the challenges that I think we confront in the reg guides is that we see new technology being introduced in some of them, and we see discussions of that in which deliberate conservatisms are being introduced. And we don't see a comparison with experimental data, with phenomenology, to understand why people think these are necessary and sufficient conservatisms.

And I'll come back to one of the questions

we posed to the -- to Steve Schultz when he was up here was, why is it adequate, as implied to your document, to take the result of this test and say, "Done under conditions that they're attempting to simulate the design basis accident conditions," but clearly don't. Why is that adequately conservative, to take that result and proceed with the analysis?

And those are the things that we need a little more time looking at them for the reg guides. But the Generic Letter I think is -- it's a pretty straightforward document, as far as I can tell.

MEMBER WALLIS: Is that the one thing we don't have in our package?

MEMBER POWERS: Probably.

MEMBER WALLIS: It says it's here, but it isn't. But H isn't there.

MEMBER ROSEN: I think listening to you carefully, which I always do, I think what you just said is my one big question, which was, why must you assess the list of DBAs, even if they're not part of the current licensing basis? And DG 1113 is subsumed, because we're not into that. We're not going to comment on the reg guides, the draft guides.

I would still like an answer to the question, but --

MR. REINHART: We intend to answer that question.

MEMBER ROSEN: But I guess it's not ripe yet.

MEMBER POWERS: No, no. I think we -- during this presentation, we should interrogate him and learn as much as we can about the reg guide. I was just saying that to prepare a letter, I think for -- a letter for the Generic Letter is feasible for us to do. I don't think we can learn enough in the time we have with you to comment intelligently on the reg guides.

MR. REINHART: When the day is done, though, we need to issue the reg guides.

MEMBER POWERS: I understand.

MR. REINHART: Okay.

MEMBER POWERS: Yet.

MR. REINHART: Yes, okay.

MEMBER POWERS: Okay. But I'm not sure we can add value to the --

MR. REINHART: Okay.

MEMBER POWERS: -- by writing a letter on the reg guides, because there's -- like I say, there's more in them than you can digest easily. We may give you some comments that you may want to act on in the

course of the presentation here, and what not, but I think that's all you're going to get from us on the reg guides.

MR. REINHART: Okay. Okay.

MEMBER POWERS: I just don't think we can do it --

MR. REINHART: Fair enough.

MEMBER POWERS: -- intelligently and usefully.

MR. REINHART: Appreciate that.

The history was covered, obviously. At the time we started to get involved, it was 30 percent of the industry had run the unfiltered inleakage tests, and of that 30 percent all but one plant did not satisfy its unfiltered inleakage design assumption.

The one that did did not consider uncertainty. If they had considered the uncertainty, they wouldn't have. So that's the history in a nutshell.

Where we went from there in developing our guidance -- we have the four reg guides that are new, the draft guides, but there are two existing draft guides there also and a generic letter. And the next slide I'm going to show how these fit together.

But the 1114 is on the overall control room habitability, 1115 is the testing, and then there's an existing AST analysis, and the developed TID analysis reg guide.

The hazardous chemical release was existing, and the meteorology 1111 was developed. It was developed primarily on what we were already doing with the industry in their submittals, and we wanted to get that information out to them. In fact, we did put it out publicly, but then incorporated it into the draft guide.

MEMBER POWERS: Before you go too much farther on this, you say you're anxious to publish these reg guides. I'll comment to you that especially in 1111 there seemed to be a lot of typographical errors. I'll just pick a page here, which is page 20, and just kind of --

MR. REINHART: Okay.

MEMBER POWERS: -- because there are a couple of them here. You know, it says, "Using equations 11, 12, and 14," there is no equation 14.

It comes down here and it says, "The density -- affluent density from expansion" -- it's calling out a density. Well, it doesn't have the units of density. It probably should, but it doesn't.

Similarly, the density of error is kilogram meter cubed. That's, I'm pretty sure, not what you meant. You might want to scrutinize these things for typographical errors, especially 1111.

MR. REINHART: Okay. Appreciate that.

The way we're approaching -- and this is captured in the Generic Letter -- really, the Generic Letter is saying industry, based on experience, we have -- believe that probably statistically, given that we have this large sample and nearly all of it failed, the probability is the next test is going to be a failure, so we need some information.

So what we've done is in the Generic Letter asked for that information. Please provide us what your unfiltered inleakage is, what's your basis for that, and how that satisfies your analyses, where it's an input.

MEMBER POWERS: To be clear, the quantity that's of interest is what you said -- the unfiltered inleakage. The quantity that you derive from this ASTM test is actually inleakage.

MR. REINHART: The derived value -- one of the derived values is the unfiltered inleakage.

MEMBER POWERS: Okay. You subtract out what you know to be the filtered flow.

MR. REINHART: Yes.

MEMBER POWERS: Okay. But not inadvertently filtered.

MR. REINHART: Right.

MEMBER POWERS: Explicitly filtered.

MR. REINHART: Right.

MEMBER POWERS: I understand.

MEMBER LEITCH: Mark, are we saying that we have fairly high confidence that most of the plants out there are not satisfying one of the general design criteria?

MEMBER POWERS: To be blunt, yes.

(Laughter.)

MR. REINHART: Put it this way -- we have confidence that one of their design inputs is not as assumed. We are giving them credit for compensatory measures that would put them below the GDC limits of the dose to the operator.

MEMBER LEITCH: These compensatory limits being SCUBA gear?

MR. REINHART: Potassium iodide and SCBA on a temporary basis, yes.

MEMBER LEITCH: Okay.

MR. REINHART: So what the Generic Letter offers is if there's a problem when you, licensee,

look at your unfiltered inleakage, we're providing an option. Here is one way to fix it, and these are the regulatory guides we're talking about that describe that option.

The licensee could say, "No, I'm going to stay with the status quo." And what we've said to industry -- to date we have not shut plants down. We've cleared that up through our Deputy EDO level. We're not intending to shut any plants down, but we will start asking questions, particularly if we have a license amendment that would come in and hit upon that particular value -- they want to take a relaxation, but unfiltered inleakage is part of the analysis.

We need to understand why that's a correct number, and we can't proceed without it. Or following the Generic Letter we're going to proceed with some audits, inspections, some sort of followup, and a plant that says, "Hey, I'm fine. I think that's there now. They've responded." And so they are subject to some followup, and the follow might be the same line -- help us understand why you think this is the correct number.

MEMBER POWERS: One thing you don't have on your slide is how NEI 99-03 fits into this

integrated overview.

Now, I have come away from Schultz's presentation with a little different feeling than I went into it with. I went into it saying, okay, we've got dueling guidances here. Now I see there is -- with Rev 1, there is some sort of meshing of these two. Can you give us some insight on that meshing?

MR. REINHART: I think that we're not dueling also. I believe we're coming together very well. These guides, to the extent that we could, reference NEI 99-03 Rev 0. Our hope was that Rev 1 would have been out in time that we could have addressed it. We got it on March 17th. So we're not there yet, but I'm going to explain how we're going to switch over.

MEMBER POWERS: Okay.

MR. REINHART: But that is definitely an integral part of this.

MEMBER POWERS: Okay. So you have endorsements, you have a table in there that says, yes, do this, we'll do this one with exceptions, and don't do this.

MR. REINHART: Yes.

MEMBER POWERS: A lot of them would say, well, just -- the guidance just -- 99-03 just don't

address this issue. I mean, there's a surprising number of --

MR. REINHART: Yes. And we've tried to use the places we can and provide guidance where we don't think we can.

MEMBER POWERS: Okay.

MR. REINHART: And we're acknowledging the industry's concern, and we're trying to say this is guidance. You know, it's one way -- this is a way the staff will accept. You can provide other options, too, and we'll look at those.

It was mentioned -- we've had a lot of interaction before this and since this.

MEMBER WALLIS: Could you go back? I don't understand the purpose of the Generic Letter. It seems to be simply asking them to go back and confirm that they meet these various GDC requirements.

MR. REINHART: We're asking them to provide the basis for their understanding of why they meet their design input.

MEMBER WALLIS: They've never done that before?

MR. REINHART: We've not asked them before, other than initial licensing, to give us that value. And many licensees proposed values of down to

CFM.

MEMBER WALLIS: So they just guessed from somewhere, which was not really a technical analysis?

MR. REINHART: Jack, can you answer exactly how the original numbers were derived?

MEMBER WALLIS: I don't think it matters, really.

MR. HAYES: They have provided confirmation in their original licensing basis --

MEMBER WALLIS: Right.

MR. HAYES: -- that they did meet GDC 19. What we're asking them to do with respect to the Generic Letter is say, "Hey, based on the evidence to date that we have found from testing these various facilities, do you still believe that you meet your licensing basis requirements?"

MEMBER WALLIS: I thought you already knew that only one did out of 30 plants, whatever.

MR. HAYES: But we're asking people to confirm it. You know, we can't -- you know, it's not up to us to conclude what the other 70 percent or 65 percent are doing. You know, it's up to them to provide the basis.

MEMBER WALLIS: So it has taken you all this time to ask them to justify what they did when

you knew that most plants weren't meeting the numbers which they had proclaimed that they were designing to?

MR. REINHART: It has taken us all this time to develop the guidance, get public comments, interact with the stakeholders, and try to come up with a way that is reasonable from each side. We don't know that plant X, Y, or Z doesn't meet anything.

MEMBER WALLIS: So you're expecting that they will do tests and report the results of the tests and show that their system -- with the assumptions they made long ago, about meeting GDC requirements?

MR. REINHART: We're asking them to tell us what the number is and why they feel that's the correct number. Testing is one way they could do that. This type of testing is one way they could do that.

MEMBER POWERS: The historical number -- I mean, the number that appears in the FSAR and the like, it is my perception that that was the number that was chosen as a design constraint.

MR. REINHART: Yes.

MEMBER POWERS: They said, okay, I'm going to build my -- my control room envelope so that it has 10 cubic feet per minute --

MR. REINHART: I think most of them assumed it was airtight.

MEMBER POWERS: Right.

MR. REINHART: And they assumed that inleakage because of opening and shutting the door as people came in and went out.

MEMBER POWERS: And the truth of the matter is --

MR. REINHART: It wasn't airtight.

MEMBER POWERS: Well, it's not airtight. But more important than that is that just about everything that you have subsequently done to the control room has probably contributed a little bit to the non-airtightness.

MR. REINHART: Probably. Yes, exactly.

In the public interface, we had five meetings, four at regional cities. We had one also in concert with an NHUG meeting in Columbus, Ohio. And through that time we -- what we tried to do is review the history, where we were, what's the guidance we're discussing, what are the key issues.

We discussed all stakeholder perspectives, and I will say that was, as Steve Schultz mentioned, it was a very open, animated, almost always respectful discussion that focused on these various issues. And

we made a lot of progress.

MEMBER ROSEN: You mean nobody called your reg guide preposterous.

MR. REINHART: No. No. They might have said other things.

MEMBER POWERS: Well, I almost introduced this session by saying that we've got quarrelsome relations here, looking at some of the comments. I mean, when you get down to arguing over whether you're measuring something or inferring something, I mean, that's getting kind of picky, isn't it?

I mean, it's a legitimate philosophical debate. But left more to the -- I shouldn't say academics right now, but --

(Laughter.)

MEMBER ROSEN: I'm not just --

MR. REINHART: Actually, the comments we've gotten on 1113 were very complimentary.

MEMBER ROSEN: I'm not just saying that because, you know, I want to refer to the earlier comments, the scurrilous comments I made. I'm asking you because I want to know if anybody cares about what seems to be such an extraordinary position. If nobody cares, then I'll drop it, too.

MR. REINHART: I think people care. Could

I -- I'm going to get there in a couple minutes. I do think people care. And I think if we were going to draw a line, we could probably get people on both sides of this line. Definitely.

And as was mentioned in Steve Schultz's slide, we've had ongoing discussions since August in looking at the draft Rev 1, in looking at the public comments to our guidance.

Again, just commenting on the workshop itself, we had excellent communication, good dialogues, good discussions. We ended up in close alignment, not perfect but close, and we had, surprisingly to us, very few comments on the Generic Letter. Most of the workshop was focused on the reg guides.

The milestones that we used during the last year, in the spring we issued the draft guides and the Generic Letter for public comment. During the summer and fall, we had those five workshops, two ANS sessions, which were also very lively -- one in June, one in November.

And we extended the public comment period to October 7th, so that once all of this discussion occurred there was plenty of time for people to put their comments together and get them into the staff,

so that there was no -- this has been going on for 20 years. It seemed that a couple months was reasonable to get the cards on the table.

There is a discrepancy. Sometimes you'll see September 6th. That was the original date. But when it came out in the Federal Register, it said October 7th. The industry called us and asked us, and we said, "It's October 7th."

MEMBER WALLIS: So what has happened is for 20 years these plants have not been meeting their tech specs, but now at least you've got them to explain to you if and why they're meeting their tech specs. That's what you intend to achieve with the Generic Letter.

MR. REINHART: Right.

MEMBER WALLIS: That's quite remarkable.

MR. REINHART: The tech spec is one part of the issue, but the real issue is that unfiltered inleakage.

MR. HAYES: Mark, I think we have to clarify and say they are meeting their tech specs, because they don't have the technical --

MR. REINHART: Yes.

MR. HAYES: -- specification on unfiltered inleakage.

MR. REINHART: The tech specs didn't answer the question the tech specs were designed to do, but they satisfied the tech spec surveillance requirement. Everybody passed it. They probably passed it today.

MEMBER WALLIS: Although the leakage was far more than specified.

MR. REINHART: The tech specs do not specify a number for unfiltered inleakage.

MEMBER POWERS: If you have a pressurized control room, the tech specs on the delta P measurement. That just proved not to be indicative of what the unfiltered inleakage is. Okay. We learned something. Okay?

MR. REINHART: Our plan -- our alignment plan, if you would, was to come up with guidance that addressed the comments, public and otherwise, that we got. And we feel we've done that. And to conform NEI 99-03.

What we tried to work with industry -- and they tried to work with us -- was to let's put all the documents, so that we're all focusing in the same place, and we were hoping to get a revised NEI 99-03 by the end of the comment period, or shortly thereafter, and then revise our reg guides, Generic

Letter, accordingly. For various reasons, we didn't meet that schedule.

So let me go to the four issues, and then I'll follow up with where we're going to finish up on our schedule. The four issues that we've addressed before the ACRS that we've worked with industry all year on are testing, the technical specification surveillance requirement, what we call integrated implementation, which is -- it's the Draft Guide 1113 -- and smoke and other toxic gases.

The issue here -- when plants were originally licensed, there were a number of agreements reached where certain plants would have an underconservative factor. But the reviewer said, "Well, this is underconservative, but this other factor is overconservative." So that was approved.

MEMBER WALLIS: This is a new idea. I thought things were conservative or not. Now they can be under or over?

MR. REINHART: The combination of the factors were determined by the reviewer to be overall satisfactory.

MEMBER WALLIS: Does underconservative mean not conservative?

MR. REINHART: Yes.

MEMBER WALLIS: Okay. Thank you.

MR. REINHART: So the problem there, though, was each licensee had a different arrangement. There was no standard set of overconservatisms and underconservatisms. There were a lot of tradeoffs.

So what we said in this area, the analysis area -- we're going to go through and take out all of the analytical overconservatisms that exist to try to be reasonable. At the same time, we identified some underconservatisms that were in there, and we relaxed the criteria based on what we learned from the AST work from 30 rem thyroid to 50 rem thyroid.

And we said to the industry this is a package. We don't want people going through and taking out just the overconservatisms and saying, oh, all this other stuff is part of our licensing basis. We're going to keep -- we're going to reduce these numbers but keep these numbers. We're looking for a level playing field.

Part of that is that some licensees didn't analyze for all of the DBAs. Apparently, some of the unanalyzed DBAs could be more limiting. So we're saying if you take this option, we want you to look at the whole package to give us a reasonable, balanced answer.

Some licensees have come back and said, you know what? We didn't analyze for this, and we can't because of that, and that's all documented in our original submittals. And we're saying we'll abide by that, we'll certainly consider that.

What we're really trying to avoid, and trying to be as reasonable as possible, is somebody coming through and using -- if I could use the term cherrypick -- just take all of the goodies and end up in an underconservative end point. That's really what this issue is about.

MEMBER ROSEN: What I understood that bullet to be in Steve Schultz's presentation that you must assess the listed DBAs, even if they're not part of your current licensing basis. I took that to mean even if the DBAs -- those design basis accidents might not apply to your plant, like a steam generator tube rupture in a BWR.

MR. REINHART: No.

(Laughter.)

MR. REINHART: No, no, no. We're really trying to be as reasonable as possible.

MEMBER ROSEN: What you're saying is that just those DBAs that could have occurred at that plant but were not part of the original license, the

original and current licensing basis for whatever reasons.

MR. REINHART: Exactly. And particularly if the omitted DBA is more limiting than the one assumed.

MEMBER ROSEN: Thank you. I understand.

MR. REINHART: Okay. Thank you.

MEMBER POWERS: And by the way, that is one of the items in the reg guide that most impressed me was the recognition that the large break LOCA need not be the most limiting case. And it actually surprised me, but I was gratified to see that you found that.

MR. BLUMBERG: Right. One of the things that happened in the plant design, there was a belief early in the industry that because the source term was so huge the large break LOCA -- it, by definition, was the limiting accident. As a result, the control rooms were all designed to handle that event.

Okay. The ventilation systems were designed for loss of coolant accident. Okay? Some plants the control room isolates on a containment isolation signal, which is no good for steam generator tube ruptures, which is no good for main steam line breaks, fuel handling accidents.

So what's happened is is what we've found through looking at license amendments is some of the other sequences actually can be more limiting than local.

MEMBER POWERS: And, once again, we see what the ultimate failure of the design basis accident concept is.

MR. BLUMBERG: You know, for BWRs, there's other considerations. At most of the BWR plants the release point -- there's an elevated release point that goes to a standby gas treatment system. The main steam line break, which is a ground-level release, can be far more limiting.

MEMBER ROSEN: Just as you say, Dr. Powers.

MEMBER POWERS: And we should abandon that for future reactors.

MEMBER ROSEN: Absolutely. Future reactors should not have design basis --

MEMBER POWERS: We're playing with ourselves here. Go ahead, Mark.

MR. REINHART: When we look at the testing issue, I want to call your attention to my highlighted bullet here. Throughout the summer, you know, surprisingly there was some emotion to this issue.

But as the summer progressed, either the industry's ability to explain what they really meant, or our ability to understand what they really meant, or both, improved.

So by the end of the summer, I think we all understood each other and were a lot more comfortable.

MEMBER ROSEN: It's also possible that people got to take their vacations and they all felt better about everything.

MR. REINHART: That could --

MEMBER POWERS: Well, I have to admit my perception coming in and having listened to you and Steve has helped me enormously, because I thought there were much bigger differences here than I think there really are.

MR. REINHART: Good. Good. What the industry proposed is the first thing they're going to do is a self-assessment of their control room, comprehensive, very thorough is our understanding. They're going to look at the design. They're going to walk it down.

They're going to make sure they've identified any false walls or any traps, make sure they've identified all of the penetrations, they

understand where their envelope is, and then they're going to say, "What do we need to do to fix it?" And they're going to make an effort to do that. And that's up front, and we agree with that.

Then, they'll test it. Three categories of testing -- the ASTM 741, we're saying that's to date -- and I'll get to Dr. Dietz in a minute, because he's probably going to overcome this. But that's to date the preferred and most prevalent.

The correlation to ASTM 741, what the industry is calling their integrated component test would be the next preference, but a correlation. And then, whatever other convincing baseline test came about, particularly Dr. Dietz's method, and apparently that is or could be an ASTM 741 type test.

MEMBER POWERS: Does it have to be an ASTM test to satisfy you? Or what you're saying here is a convincing test is adequate?

MR. REINHART: Down here?

MEMBER POWERS: Yes.

MR. REINHART: A convincing test. I mean, this is the standard -- the folks that wanted to find out really how tight boundaries were came up with this standard, so that's why we're -- but people learn, people grow, and --

MEMBER WALLIS: It's been around for some time that test.

MR. REINHART: Yes.

MEMBER WALLIS: So after all this work, you've agreed to adopt the only test which existed in the first place.

MR. REINHART: We've agreed to do that all along.

MEMBER WALLIS: Okay. So there wasn't really any debate about that.

MR. REINHART: Not that we would agree to that.

MEMBER POWERS: The innovation that has occurred is there's now an alternative up here that is cheaper, faster, easier, lots of things.

MEMBER WALLIS: I don't understand why all of this wasn't done on day one.

MEMBER POWERS: I think the answer is the same answer that Sol Levy once gave me about -- when I was badgering him about some deficiency of the Mark I containment design that he had designed. And he put up with me about as long as he was going to, and then he looked at me and he said, "We just weren't very smart in those days."

(Laughter.)

MR. REINHART: Good point. I do want to point out a comment came up. It's our believe that Millstone did do their own 741 test. They wrote the procedures, did it themselves.

This was discussed. We believe this is a performance-based method, with the provision of, as we learned, we can make modifications. It was discussed, so I wasn't going to talk about it again.

MEMBER POWERS: Yes. But the important thing is that you're thinking about a performance-based test here.

MR. REINHART: Yes. Very much so.

MEMBER WALLIS: If the test failed, you'd think they'd fix something rather than wait for another three years to do another test.

MR. REINHART: They do. If the test fails, they fix it, retest.

MR. BLUMBERG: But the next three-year test is intended to catch -- if this was a degrading trend, that maybe we aren't valid, we're waiting for six years for the next test. So that if they fail a test, we're going to require a retest in three years -- once again, performance based.

MR. REINHART: The tech spec -- this is where we really left it last summer. The issue with

the tech spec is the surveillance requirement intended to verify the unfiltered inleakage was satisfactory, i.e. integrity of the control room, the delta P test. While the delta P was adequate, it was brought up the source of the pressurizing air could be contaminated, and, therefore, wasn't really telling us factually if they were meeting that unfiltered inleakage assumption.

So what we're proposing is that the surveillance requirement point to a Section 5 administrative control program that describes the expectations and details of that program.

For two years, we've tried to interface with the tech spec task force, the TSTF, to get a proposal. We got one recently. We're not 100 percent happy with it. We're not 100 percent unhappy with it either. But we're not ready to say that's it. So in the Draft Guide 1114 is an example tech spec, and it basically says you can use this, you can propose what you want to propose. But when that TSTF is approved, it's going to replace whatever is in Draft Guide 1114.

My understanding from the industry TSTF is they're not really working really hard on this, and so the message back to industry is, if that's in fact true, and they speed things up, this will be a done

deal.

MR. RILEY: Hey, Mark, can I address that right now?

MR. REINHART: Please.

MR. RILEY: This is Jim Riley, NEI. I was talking to the TSTF people yesterday, and they confirmed that they are actively working on that with the Tech Spec Branch. They expect to have comments shortly and a final TSTF out by the middle of May. Now, of course, that depends on the comments, of course, but at least that's the schedule they're currently working towards.

MR. REINHART: That would be great. We look forward to that.

A couple points I want to make on tech specs -- my belief, having worked a number of years in Tech Spec Branch, is that the surveillance requirement that was intended to verify the control room integrity, as described in the basis, is what needs to get fixed. It's not sufficient just to change the basis to say that it does something else.

There has to be some surveillance pointing to some reasonable method to verify that integrity, and I think we can work toward that goal.

The next issue -- smoke and toxic gas. I

believe we're in agreement here. We're saying we have to be able -- we, the licensee, has to be able to control the reactor from either the shutdown panel or the control room.

And finally, where are we going from here? Our schedule is to issue our Generic Letter and draft guides in May, in final -- final guides, draft guides and final -- final guides. Yes, okay. It would have been nice to have had NEI 99-03 Rev 1 earlier. We do have a redline strikeout comparison between the previous version and this version. We see a number of changes. We don't see it perfect in our eyes, so we want to take some time to look at it.

At the same time, we're going to learn from implementation. So what we're proposing is to take what we learn from implementation, what we learn from reviewing Rev 1, with the complete intention of going back and issuing a Rev 1 to whatever draft guide, or then final guide, that needs to be revised to incorporate that.

We understand that a reg guide is one way the staff is proposing. If the industry, in looking at Rev 1 of NEI 99-03 and the positions in our draft guide comes in and says, "We're meeting Rev 1 with these caveats," we're going to be more than willing to

work with industry to accept that approach.

So that's where we are. We think we've made a lot of progress. We think the industry has made a lot of progress, and we hope to go forward.

Thank you.

MEMBER POWERS: Do members have any other questions to pose to Mark and his team here? Mark, I found this extremely useful, both your presentation and Mr. Schultz's presentation. I learned a lot. And I would hope that once you've gotten the responses to the Generic Letter, and had a chance to digest them and what not, that you'd come back and give us another informational briefing on this subject, get us back up to speed, what not. Maybe by that time we'll know exactly where we stand on 99-03 Rev 1 and things like that.

MR. REINHART: We'll be happy to do that.

MEMBER POWERS: I think that would be useful, to do it, because it's -- this is a very important issue here. And I'd like to see how it progresses.

With that, I'll turn it over to you, Mr. --

MEMBER WALLIS: I think the really interesting thing will be whether or not these plants

are meeting these design criteria.

MEMBER POWERS: They won't.

(Laughter.)

MEMBER WALLIS: If they won't, you still won't have fixed the problem.

MEMBER SIEBER: Let me ask just one question before everybody leaves on their break.

MR. REINHART: Okay.

MEMBER SIEBER: I'm thinking about the control rooms where the alternate shutdown panel is in the control room envelope. And generally, the design is -- let's say it's a pressurized envelope. The design is such that there is no real seal, nor is there testing to assure that a fire that generates smoke in the control room envelope, but outside the shutdown panel area, doesn't get in there. How do you deal with that?

MR. REINHART: Our understanding of what industry is agreeing to do here is they're saying they're going to analyze to make sure that they can control the plant from one of those two places regardless of the source of the fire.

MEMBER SIEBER: Yes, I read the Generic Letter. That's what you're asking them to do. I'm just wondering how they're going to do it.

MR. REINHART: I don't have the answer to that. I will be interested to see how they do that.

MEMBER SIEBER: So will I.

MEMBER POWERS: Any other comments?

MR. RILEY: I'd like to make a couple statements. This is Jim Riley, NEI. Just a couple of observations. You've probably heard these already, but I'd like to reemphasize them. I guess one thing we'd like to point out is that we do have a confusing situation I think out in front of the industry, or we will when the Generic Letter and the reg guides get out there, because, as Mark indicated, there's reasons why.

But the bottom line is the Generic Letter and the reg guides reference Rev 0. And as I think you heard everybody state, our Rev 1 of 99-03 has moved a long way towards bridging the differences between the staff and the industry.

And what we're going to have out for the industry is a Rev 1 with our recommendations from the NEI task force that this be something they use, and reg guides that reference Rev 0 and point out differences.

And we're concerned that we're leaving the industry in a position that might be confusing, so

we'd like to encourage that we take action sooner rather than later to try and provide some guidance on how we might deal with that confusion, whether that be some kind of a notice of enforcement discretion to keep inspectors from getting too carried away on differences right now.

If it's a risk -- we in the industry are putting together this workshop that we -- that Steve mentioned already. And one of the purposes of the workshop was to try and help clarify the situation for the licensees.

And we're asking that the NRC staff, Mark and his folks, ACRS, if you guys would like to come to this, to come to it so that we can -- we've got a number of things we want to address, but one of them is, how do we bridge the gap? How do we understand the big picture of what's out there, so we don't leave people with two different ways of doing things and no good -- maybe no good approximation of how all of this all fits together.

And I think this rolls right into the tech spec issue, too. As Mark pointed out, there is a sample tech spec in one of the draft guides. There is a TSTF out there. There's a possible situation where we may have a TSTF approved with another tech spec and

a draft reg guide that's different

And, Mark, I know you said that if the TSTF is approved that would take the precedent. But at least there's another possibility there of ending up with a confusing situation. So it's a situation that I think we need to help folks understand, all of us on both sides. We'll certainly do our share, and I'm sure Mark and his folks will do theirs, too.

Another thought I'd like to put out there is that there will be some time that it will be necessary by the licensees, in order to get this baseline testing done. There's a lot of things that are involved in testing control rooms, not the least of which is coming up with the resources needed to test, because there's a limited number of folks out there that can do this kind of stuff.

So you're going to have a Generic Letter that's going to be asking for actions by a certain period of time. But from a realistic standpoint, there's a lot of things that need to happen. And it's just something everybody ought to be aware of going in, that it's going to take a while before plants are going to be able to get themselves ready to do these tests and get the test results completed.

Thank you.

MR. REINHART: Could I just address -- I think Jim raised three good points. One, we also don't want any confusion. I mentioned that we're going to have some sort of followup. One of the things we're contemplating is what you call an audit instruction.

So our staff would participate prior to inspections in an audit to try and get some feedback from what's going on, and certainly be able to clarify and be involved in those initial implementations.

The draft guide specifically points to the TSTF when approved. So if that TSTF is approved, it will automatically replace the sample in the draft guide.

And I think we're giving 180 days to respond to this, unless a licensee feels they can't, and then they get 60 days to tell us why. Okay. So I think we're giving some time there.

MEMBER POWERS: Peter Leggoss gave us an estimate that it might take 480 days to respond. And what you're saying is that's fine as long as they tell you the -- within the 60-day period that that's what it's going to take.

MR. REINHART: Sure. Yes.

MR. CAMPBELL: Robert Campbell with TVA.

In the experience I've seen with the test, just with the response time of 180 days, it takes roughly two weeks to pull off the test that we're talking about per plant. And if you look at two weeks per plant with two vendors, and assuming that people aren't going to start testing until after they've done all of the preliminaries, I think you're going to be able to only test 13 to 20 plants in the 180 days' response.

So that leaves, out of 66 sites in this country, that leaves you somewhere 40 plus sites that may not be able to test in the 180 days' time.

MEMBER POWERS: But my understanding is that's okay.

MR. CAMPBELL: Yes.

MEMBER POWERS: As long as they say, "Gee, I'm not going to be able to test until such-and-such a time, because I can't schedule it." Is that right?

MR. CAMPBELL: Yes. There's an allowable --

MEMBER ROSEN: What's your view about testing individual units at sites? Do you have to test both units or just one?

MR. LaVIE: It depends upon how similar they are. If you're talking about Palo Verde --

MR. REINHART: I think the question is

they have to test them. Whether like Palo Verde, three control rooms, they can benchmark the correlation for one to the other two, we're agreeing that they can do that, but they have to test all three control rooms.

MEMBER ROSEN: Well, I think -- I mean, one control room could have degraded seals and the other -- even though they're identical, they're --

MR. REINHART: That's right. Exactly.

MEMBER ROSEN: -- they're not. So it seems to me you have to do -- you have to at least address both control rooms in some way.

MR. REINHART: Yes. Absolutely. And also, we don't -- we understand the industry wants to correlate. We are looking for similarity in design. The fact that X number of licensees get together in a cooperative manner doesn't mean their designs are conducive to the benchmarking. That's -- the burden is on them to show that that's accurate.

MR. RILEY: Thank you. Jim Riley again, NEI.

Mark, this is a request for you guys, I guess. We're trying to put this workshop together, as we mentioned. And one of the points of the workshop is to try to help people understand how to respond to

the Generic Letter.

We find ourselves in a bit of a box timing-wise because of the 60-day response. If it's at all possible to allow licensees 90 days to give us more of an opportunity to get together with you guys and have this workshop, clear up some of these issues and help people respond, it would -- I think it would be a big help for the licensees and they would appreciate it.

MR. REINHART: Let us look at the calendar, see when we can schedule things. And, again, we've been working at it 20 years. We want to do what's right to get it fixed.

MEMBER WALLIS: Well, I'm puzzled here -- 480 days, you're going to find that half these plants don't meet their requirements. Is that what you're going to -- you just -- what's the expectation, that they're going to meet the requirement?

MR. REINHART: My expectation is, remember they said they're going to do that assessment and repair of their envelope. I'm expecting licensees to really get out there --

MEMBER WALLIS: Keep fixing it until they meet the requirements.

MR. REINHART: Yes.

MEMBER WALLIS: And the other thing, I don't see why Peter Leggoss can't duplicate himself. Why can't he -- within a year and a half, can't he train somebody else to do what he does?

MR. REINHART: Well, in addition to Mr. Leggoss, I believe there's two other vendors doing those tests. And I know in addition to what the industry mentioned, I know of at least four other units that are contemplating using Dr. Dietz's method. So a lot of folks are out there, and we'll see. I think there's a reasonable chance of getting reasonable tests in a reasonable period of time.

MR. BLUMBERG: I'd like to point out that the Millstone units have a periodic requirement that they self-imposed where they've done a tracer -- they've done I think three tracer gas tests themselves using their own site procedures and site personnel. It can be done by people onsite.

MEMBER POWERS: Any other comments? I'm going to give it back to you before there is, Mario.

MR. REINHART: Thank you very much.

CHAIRMAN BONACA: With that, we'll take a recess until five after 4:00.

(Whereupon, at 3:50 p.m., the proceedings in the foregoing matter went off the record.)