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.)

CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

Name of Proceeding: Advisory Committee on Reactor Safeguards 501st Meeting

Docket Number: n/a

Location: Rockville, MD

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

Matt Needham

Matt Needham
Official Reporter
Neal R. Gross & Co., Inc.

Reg Guide on PRA Technical Adequacy

ACRS

April 10, 2003

NEI

PRA Technical Adequacy

- Applications have driven substantial model improvements since IPE era
  - 2001 industry effort to provide public updated risk information was terminated by NRC due to security issues
- 100 industry peer reviews are complete, final 2 scheduled
- NRC SPAR internal events models achieving convergence with industry models (factor of ~2 agreement in CDF)

NEI

ASME Standard

- Complete after 5 year effort
- Reflects consensus of PRA experts
- DG-1122 (as modified by additional staff proposals since its issuance) proposes fundamental change to approach through standardized quantitative definition of term "significant"
- Existing PRAs would not meet DG-1122 as modified by proposed definitions

NEI

Issues

- Reliance on peer review team judgment (ASME) versus prescription (NRC)
- "Dominant" and "Significant" have different meanings in Standard. NRC proposes single term
- Variability in plant types (BWR/PWR), modeling approach, risk contributors distribution make "one size fits all" definition impractical
- Regulatory treatment of rigid definitions

NEI

Example – Significant Sequences

- NRC definition of "Significant Sequence":
  - Functional or systemic level sequences that comprise 95% OR individually contribute >1%
- Typically, the 95% Criterion Is Controlling
- Typical:

PRA Based On	# of Seq. Included
Functional Seq.	10-20
Systemic Seq.	100-200
Linked ET	10,000-20,000
Single Fault Tree	2,000 – >1,000,000

NEI

Example – QU F2

- ASME: Provide a detailed description of *dominant* accident sequences or functional failure groups
- NRC: Provide a detailed description of *significant* accident sequences or functional failure groups
- Issue: Could result in substantial additional documentation without commensurate benefit

NEI

Status

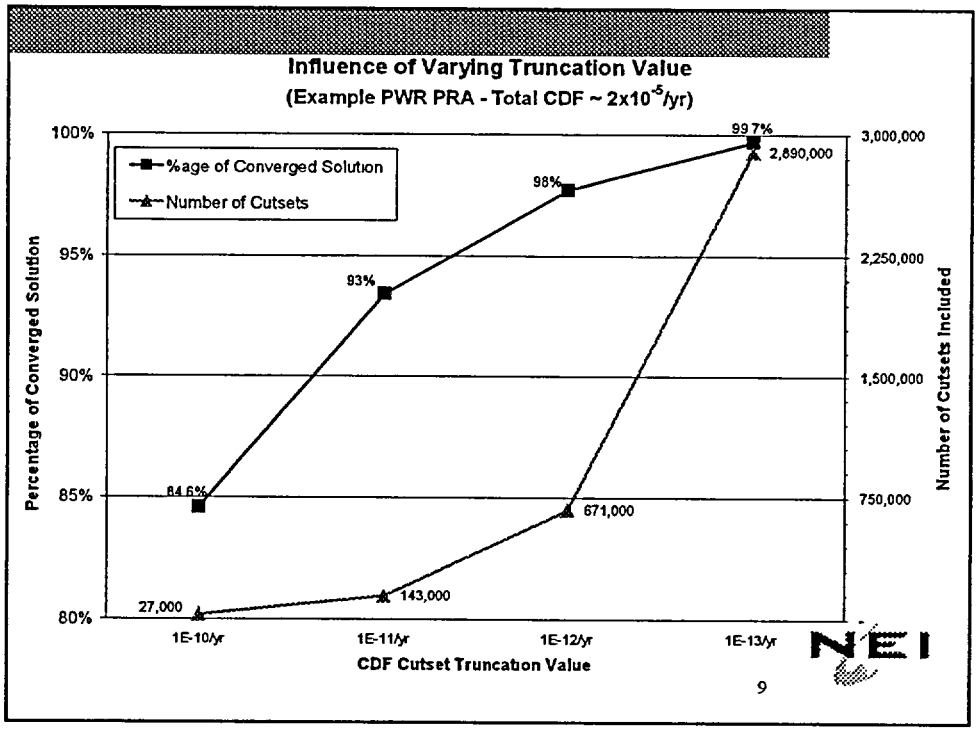
- Some progress in recent discussions with staff
  - Sampling approach
  - Use of risk importance measures for certain requirements
  - Proposed clarifications of "key uncertainties, assumptions"
- Concerns remain
  - Peer review section, LERF, unbounded requirements

NEI

Resolution

- Issuance of DG-1122 for trial use, maintaining qualitative definitions used by ASME standard, is recommended
- Would provide opportunity to apply DG-1122 with NRC observation before contemplating additional fundamental changes
- Upcoming peer review provides opportunity
  - NRC staff invited

NEI


Influence of Varying Truncation Value
(Example PWR PRA - Total CDF ~ 2x10-5/yr)
%age of Converged Solution
Number of Cutsets
Percentage of Converged Solution
Number of Cutsets Included
100%
95%
90%
85%
80%
3,000,000
2,250,000
1,500,000
750,000
84.6%
93%
98%
99.7%
27,000
143,000
671,000
2,890,000
1E-10/yr
1E-11/yr
1E-12/yr
1E-13/yr
CDF Cutset Truncation Value
NEI

United States
Nuclear Regulatory Commission

RISK-INFORMED 10 CFR 50.44 COMBUSTIBLE GAS IN CONTAINMENT

ACRS COMMITTEE

APRIL 10, 2003

Richard F. Dudley
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
US Nuclear Regulatory Commission

BRIEFING OBJECTIVES

- Discuss the draft final rule for risk-informing 10 CFR 50.44 and associated guidance documents
- Discuss staff evaluation of significant public comments on proposed rule
- Receive ACRS feedback on current staff plans for proceeding with final rule

BACKGROUND

- Staff met with ACRS on December 6, 2001 to discuss the proposed risk-informed modifications to 10 CFR 50.44, the draft regulatory analysis, draft regulatory guide, and draft technical specifications

- ACRS letter dated December 12, 2001
  - concluded that the proposed rule would result in more efficient and effective regulations to deal with combustible gases
  - recommended that the proposed hydrogen source term for BWR Mark III and PWR ice condenser containments be included in the regulatory guide and not in the rule

- SECY-02-0080 (May 13, 2002) transmitted the proposed rule to the Commission; Commission SRM, dated June 27, 2002, directed staff to publish the proposed rule

- Rule published on August 2, 2002; 75 day comment period ended October 16, 2002.

- Staff has analyzed comments and prepared the final rule and associated guidance

PUBLIC COMMENTS

- 15 commenters (7 licensees, 2 industry groups, 2 vendors, 2 private citizens, 1 citizen's group, and ACRS)

- Comment categories:
  (1) general concerns about reducing requirements on nuclear safety

  (2) questions/clarifications about the equipment qualification, survivability, and adequacy of remaining combustible gas control equipment

  (3) concern over the prescriptive requirement for hydrogen source term for Mark III and ice condenser plants

  (4) concerns about the applicability of the proposed rule to future plants; particularly non-LWRs

GENERAL CONCERNS ABOUT REDUCING REQUIREMENTS

- doubts that NRC had an adequate technical basis for concluding that public safety was maintained (voids, improper rebar in concrete containments, concern about adequacy of hydrogen generation studies and risk analysis)
- concern that reductions only provided financial benefits to licensees
- need to complete NRC evaluations of GSI 191(sump debris) and GSI 189 (power to igniters during SBO) before reducing combustible gas requirements
- concern over allowing 90 minutes (instead of 30) to initiate hydrogen monitoring
- concern that venting the RCS would increase the possibility of containment failure
- concern that passive auto-catalytic recombiners are being required in France, but not in the United States
- need for performance criteria for atmospheric mixing systems

EQUIPMENT QUALIFICATION/SURVIVABILITY

- Licensees requested clarification of applicability of EQ (10 CFR 50.49) to monitoring systems and whether any other new survivability requirements were being imposed for combustible gas control equipment

- NRC agrees on the need for clarification; the final rule will make it clear that:

  - monitoring systems must perform in the environment anticipated in the severe accident management guidance, but need not meet 10 CFR 50.49 equipment qualification requirements; and

  - existing licensee analyses and environmental conditions used to establish 10 CFR 50.49 compliance are unchanged.

HYDROGEN GAS SOURCE TERM

- ACRS December 12, 2001 letter:

  The proposed specification for the combustible gas source term for BWR Mark III and PWR ice condenser containments should be included in the regulatory guide instead of being incorporated directly in the rule.

- NRC staff did not accept ACRS recommendation

  (1) Requiring licensees to do analyses to determine plant-specific hydrogen source terms would be a backfit without any safety or cost benefits

  (2) Recent GSI-189 results show 65% (+/-23%) metal water reaction, indicating that current 75% value is still reasonable for severe accident analyses

APPLICABILITY TO FUTURE DESIGNS

- Commenter noted that the proposed requirements for all future reactors were based on current LWR technology and recommended that they apply only to future LWRs

- NRC agrees with the commenter that the proposed §50.44(c) might not apply to future non-LWR designs; plans to add a new paragraph (d) for non-LWRs:

  (d) *Requirements for future non-light water reactors applicants and licensees.* Applications for design approvals, design certifications, construction permits, operating licenses, manufacturing licenses, and combined licenses filed after [EFFECTIVE DATE] must include:
  (1) Information addressing whether accidents involving combustible gases are technically relevant for their design, and
  (2) if accidents involving combustible gases are found to be technically relevant, information demonstrating that the safety impacts of combustible gases during design-basis accidents and credible severe accident scenarios have been addressed to ensure adequate protection of public health and safety and common defense and security.

- Corresponding changes will be made to the Reg Guide and SRP

"An Approach for Determining the Technical Adequacy of PRA Results for Risk-Informed Activities"

[DG 1122 (and associated SRP)]

Advisory Committee on Reactor Safeguards

Presented by:
Mary Drouin
Gareth Parry

April 10, 2003

OUTLINE

- ❒ Purpose of Meeting
- ❒ Background and History
- ❒ Commission Position
- ❒ DG-1122 & SRP
- ❒ Resolution of Public Comments
- ❒ Schedule

PURPOSE AND OBJECTIVE OF MEETING

- ❒ Brief ACRS on DG-1122 and associated SRP
- ❒ Provide staff resolution to public comments
- ❒ Obtain ACRS approval to issue as Regulatory Guide for Trial Use

BACKGROUND/HISTORY

- PRA Policy Statement
  - Encourages staff use of PRA in all regulatory matters
- GAO
  - Indicated need to "develop standards on the scope and detail of risk assessments..."
- DSI-13
  - *"...where there are needs for new codes, standards, and guides and recommendations for areas of emphasis. The NRC's initial activities .... should include development in Probabilistic Risk Assessment (PRA)..."*
- January 1998
  - ASME initiated writing of PRA standard (Level 1, 2, full-power, internal events)
- April 18, 2000, SRM
  - Indicated that the staff "should provide its recommendations to the Commission for addressing the issue of PRA quality..."
- SECY-00-0162
  - Identified the scope of the PRA and the minimal technical functional attributes of a PRA
- October 27, 2000 SRM
  - Indicated that "the timely resolution of PRA quality requirements is necessary to support existing and developing risk-informed regulation..."

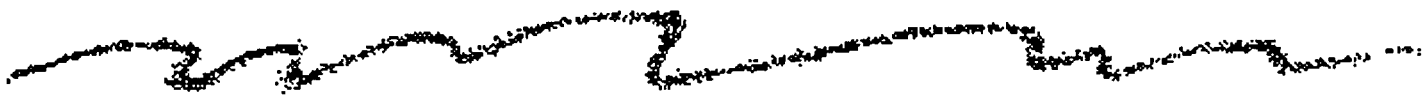
BACKGROUND/HISTORY

- SECY-02-0070
  - Indicated staff plan "to develop a new RG and SRP chapter that would provide guidance to licensees and the staff, respectively, on how to use the standards and other industry programs in evaluating the technical appropriateness of PRA results for risk-informed applications"
- April 5, 2002
  - ASME published "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications" (ASME RA-S-2002)
- DG-1122 and associated SRP
  - issued November 28, 2002 for 60 day public review and comment period with comments due February 28, 2003
- Numerous public meetings throughout process

COMMISSION POSITION

For Example:
Staff Requirements Memorandums on 50.69 and 50.46

- PRA quality a key issue
- 50.69
  - Rule issued in parallel with PRA standard and associated guidance
  - Statements of consideration: require a comprehensive high-quality PRA
- 50.46
  - Include need for a high quality PRA in the rule



PURPOSE OF DG & SRP

- DG-1122:
  - To describe an acceptable approach for determining that the quality of the PRA, *in toto* or for those parts that are used to support an application, are sufficient to provide confidence in the results such that they can be used in regulatory decision making for light water reactors

- SRP Chapter 19.1:
  - To provide guidance to the staff on how to determine that the PRA providing the results being used in the decision is technically adequate

SCOPE OF RG & SRP

- Does ***not*** address how PRA results are used in a decision-making process
- The guidance on how PRA results are used in a risk-informed activity is addressed in the application specific regulatory guides
- This DG (and associated SRP) solely address the issue of determining the technical acceptability of the PRA for an application

ORGANIZATION OF DG

- DG 1122: provides regulatory positions on the issue of "PRA Quality" to support risk-informed regulatory activities
  (1) A minimal set of functional requirements of a technically acceptable PRA
  (2) NRC position on consensus PRA standards and industry PRA program documents
  (3) Demonstration that the PRA (*in toto* or specific parts) used in regulatory applications is of sufficient technical adequacy
  (4) Documentation that the PRA (*in toto* or specific parts) used in regulatory applications is of sufficient technical adequacy
- Appendices: provide regulatory position on specific PRA standards or industry programs

DG 1122: REGULATORY POSITION 1

— Functional Requirements of a Technically Acceptable PRA —

- Guidance provided in three areas
  - Scope defining the PRA
  - Elements of a PRA
  - Technical attributes and characteristics for a full-scope PRA

DG-1122: REGULATORY POSITION 2

— Consensus PRA Standards and Industry PRA Programs —

- To demonstrate conformance with Regulatory Position 1, acceptable approaches include:
  - an industry consensus PRA standard
  - an industry-developed peer review program
- Consensus PRA standard
  - Based on a set of principles and objectives
- Peer Review Program
  - used to identify the strengths and weaknesses in the PRA and their importance to the confidence in the PRA results
  - An acceptable program is one performed by qualified personnel, according to an established process, and documents the results showing both the strengths and weaknesses
  - Characteristics and attributes provided

DG 1122: REGULATORY POSITION 3

— Demonstrating the Technical Adequacy of a PRA Used to Support a Regulatory Application —

- Guidance provide in three areas
- Identification of parts of a PRA used to support the application
- Scope of risk contributors addressed by the PRA model
- Demonstration of technical adequacy of the PRA
  - Assessment that the PRA model is technically correct
  - Assessment of assumptions and approximations

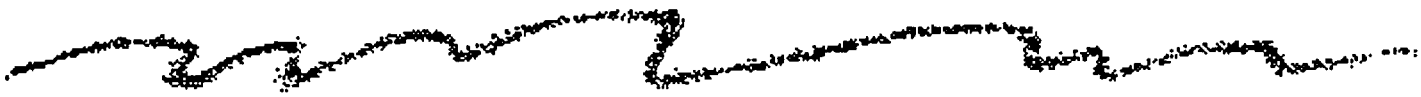
DG 1122: REGULATORY POSITION 4

— Documentation and Submittal —

- ***Archival documentation*** should be sufficient to demonstrate that the scope of review of the base PRA is sufficient to support the application
- ***Licensee submittal documenation*** to demonstrate that the technical adequacy of the PRA used is of sufficient quality

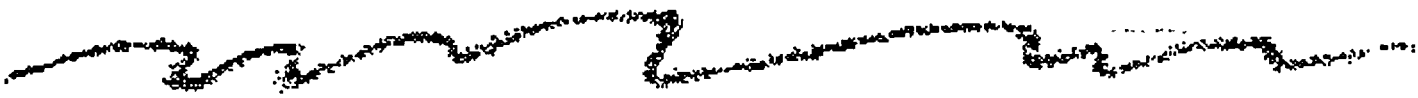
SRP CHAPTER 19.1 — SCOPE AND PURPOSE

- Concerns any licensee request submitted for NRC review and approval for which PRA can play a role
- Used to support application-specific SRP chapters; e.g., changes:
  - To a plant's licensing basis
  - In plant-specific technical specifications
  - In inservice test program
  - In inservice inspection program
  - 50.69
- Gives the staff guidance on the scope of the review to assess the adequacy of the base PRA
  - Does not give guidance on assessing the analysis of the impact of the change on the PRA results
  - Intended to be used in conjunction with an application-specific SRP chapter



SRP CHAPTER 19.1 — ORGANIZATION

- ❒ Areas of Review
- ❒ Acceptance Criteria
- ❒ Review Guidance and Procedures
  - ▸ Scope of review
  - ▸ Assessment of the PRA
- ❒ Evaluation of Findings
  - ▸ Assessment of PRA against industry good practice
  - ▸ Significant assumptions and approximations assessed
- ❒ Implementation



APPENDIX A: STAFF POSITION ON ASME STANDARD

- Staff position provided on each requirement, stated as:
  - No objection: the staff has no objection to the requirement
  - No objection with clarification: the staff has no objection to the requirement; however, certain requirements, as written, are either unclear or ambiguous and therefore, the staff has provided its understanding of these requirements
  - No objection subject to the following qualification: the staff has a technical concern with the requirement and has provided a qualification to resolve the concern
- Discussion of staff concern (issue) provided
- Staff resolution to clarifications and qualifications
  - Necessary additions (shown in **bolded** text) and necessary deletions (shown as ~~strikeout~~ text) provided for the staff to have no objection

APPENDIX B: STAFF POSITION ON NEI PEER REVIEW AND SELF-ASSESMENT

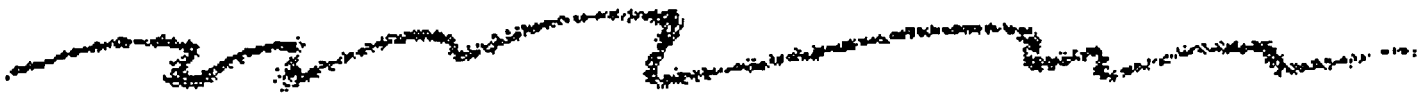
- Staff position provided on each requirement, stated as:
  - No objection: the staff has no objection to the requirement
  - No objection with clarification: the staff has no objection to the requirement; however, certain requirements, as written, are either unclear or ambiguous and therefore, the staff has provided its understanding of these requirements
  - No objection subject to the following qualification: the staff has a technical concern with the requirement and has provided a qualification to resolve the concern
- Staff review included:
  - NEI 00-02, "Probabilistic Risk Assessment Peer Review Process Guidance"
  - Self-Assessment Process
  - Self-Assessment Actions
- Discussion of staff concern (issue) and resolution provided

BASES FOR STAFF POSITIONS

- Staff position based on information provided in Regulatory Positions 1-4, where applicable
  - Characteristics and attributes for each technical element of a technically acceptable PRA
  - Principles and objectives of a standard
  - Characteristics and attributes of a peer review

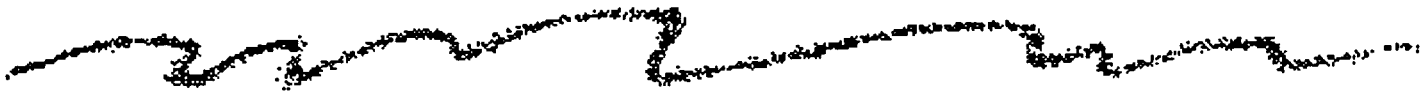
PUBLIC COMMENTS

- Comments received from six different organizations
- Very few comments on main body of draft guide
- No comments received on SRP
- Majority of comments on Appendix A (staff position on ASME standard)
  - Resolution arrived at the majority of staff objections
  - Staff understanding that ASME intends to issue an Addendum incorporating the resolutions
  - Staff objections in three major areas
- Few to no comments on Appendix B (NEI-00-02 and Industry Self Assessment)
- Consensus to move forward to publish Regulatory Guide for Trial Use via pilot(s)



STAFF OBJECTIONS TO ASME STANDARD

- Definition of terms dominant, important, key and significant
- Peer review to assess validity of key assumptions and uncertainties
- Minimum list of topics required by the peer review team



Definition of terms dominant, important, key and significant

STAFF CONCERN

- Definition provided is extremely subjective and only provided for "dominant"
- Terms are used in places interchangeably with the same meaning, but in other places, do not have similar meaning
- Term is used to determine whether a requirement in the standard is imposed
- Term is used to distinguish between capability categories
- Without a better definition, the review time by the staff would increase

Definition of terms dominant, important, key and significant (cont'd)

INDUSTRY POSITION

- Agreement that it is a problem and that the standard contains ambiguities and inconsistencies
- No agreement on how to resolve the definition
  - Split on whether this can be and should be resolved via a pilot
  - Leave to peer review to resolve
- Appears to be a consensus to correct, at least, the inconsistencies

Definition of terms dominant, important, key and significant (cont'd)

STAFF POSITION

- A "robust" definition with a clear minimum requirement is needed
- Provide self-consistency and uniformity in the usage of the terms
- Definitions be consistent with good industry practice
- For capability category II, considered the definitions in the context of an application where the entire PRA would be used (e.g., 50.69)
- Peer review not appropriate resolution: peer review determines if what was implemented makes sense, therefore, different licensees could use different definitions in a reasonable manner and the peer review would not find this discrepancy
- Definition should not be developed as part of the pilot
- Pilot should test the definition and refine as necessary

Definition of terms dominant, important, key and significant (cont'd)

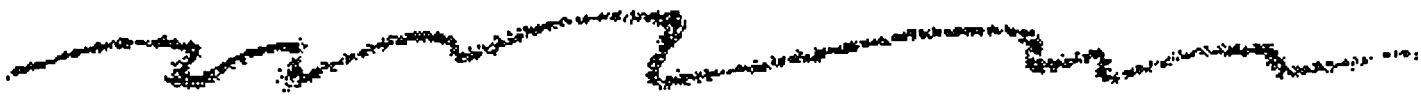
STAFF OBSERVATIONS ON USAGE OF THE TERMS

- Terms used interchangeably for similar meaning
  - Important actions, significant actions
- Meaning of term dependent on the object
  - Sequence, initiating event, basic event
- Use of term "sequence" inconsistent and unclear
  - Definition of sequence too vague
  - Term used to mean
    - Sequence "class," "functional" sequence, "systemic" sequence, etc.
- For simplification, consistency and clarity, use of the term dominant observed to be unnecessary

Definition of terms dominant, important, key and significant (cont'd)

STAFF POSITION

- Definition developed strictly in the context of the requirements in the standard
- Definition written for "functional" and "systemic" type sequences
- Selection of quantitative values (i.e., 95% and 1%):
  - 95% — provide confidence in CDF/LERF estimates
  - 1% — capture sequences, for example, of similar contribution with uniform CDF/LERF profile
- Selection of quantitative values (i.e., use of RAW/FV):
  - RAW>2 — consistent with existing applications
  - FV>0.005— consistent with existing applications



Peer review to assess validity of key assumptions and uncertainties

STAFF CONCERN

- ❒Standard does not require the peer review team to assess the key assumptions and uncertainties
- ❒Standard does require the PRA owner to identify and document the key assumptions and uncertainties
- ❒The key assumptions and uncertainties directly impact the confidence of the results and insights
- ❒While models and techniques may be correctly implemented, if the assumptions and uncertainties are "invalid," then it can become irrelevant that the models and techniques are good, the results and insights can still be invalid
- ❒Without this requirement in the standard, the review time by the staff would increase

Peer review to assess validity of key assumptions and uncertainties (cont'd)

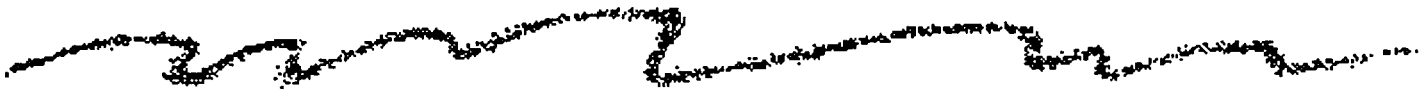
INDUSTRY POSITION

- Too burdensome of a task
- Belief that it is not necessary because "the peer review shall assess the PRA to the extent necessary to determine if the methodology and its implementation meet the requirements of the standard"

Peer review to assess validity of key assumptions and uncertainties (cont'd)

STAFF POSITION

- A key objective of the peer review is to assess the strengths and weaknesses of the PRA, to accomplish this objective, the peer review must assess the key assumptions and uncertainties
- Determining if the methodology and its implementation meet the requirements is not the same, the assumptions can cause risk profile and contributors to be very different
- Require peer review team to assess the key assumptions and uncertainties
  - Provide an example list to assist in defining what is meant by "key"



Minimum list of topics required by the peer review team

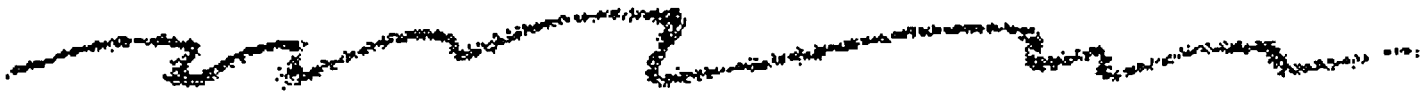
STAFF CONCERN

- There is no minimum requirement for the peer review team
- Standards states: "....specific suggestions for the review team to consider during the review....these suggestions are not intended to be a minimum or comprehensive list of requirements."
- No consistency or uniformity among the review at any level
- Without a minimum list, no knowledge of what the peer review, at a minimum (high level) reviewed and the staff review time would increase

Minimum list of topics required by the peer review team (cont'd)

INDUSTRY POSITION

- Peer review teams "must be allowed to select the scope and level of detail for the review and not be bound by prescriptive requirements. A peer review is not an Audit."
- Counterproductive, forces team to document items they know through experience are reasonable
- Almost all the plants have been peer reviewed, the self assessment evaluates the gap between the standard and NEI-00-02, can be deferred



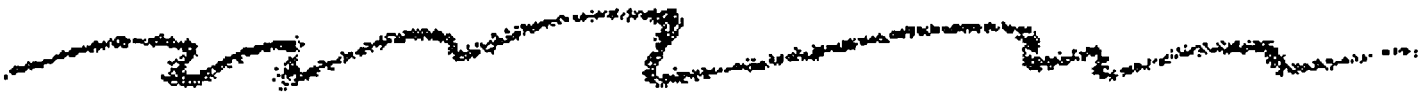
Minimum list of topics required by the peer review team (cont'd)

STAFF POSITION

- A minimum list of "topics" needs to be in the standard
- List of "topics" is not prescriptive, it allows the team to determine the scope and level of detail of the review
- A standard needs to provide consistency and uniformity
- To be addressed under the self-assessment process, there must be a difference. With no minimum requirement, there is no difference for the self-assessment proces to evaluate

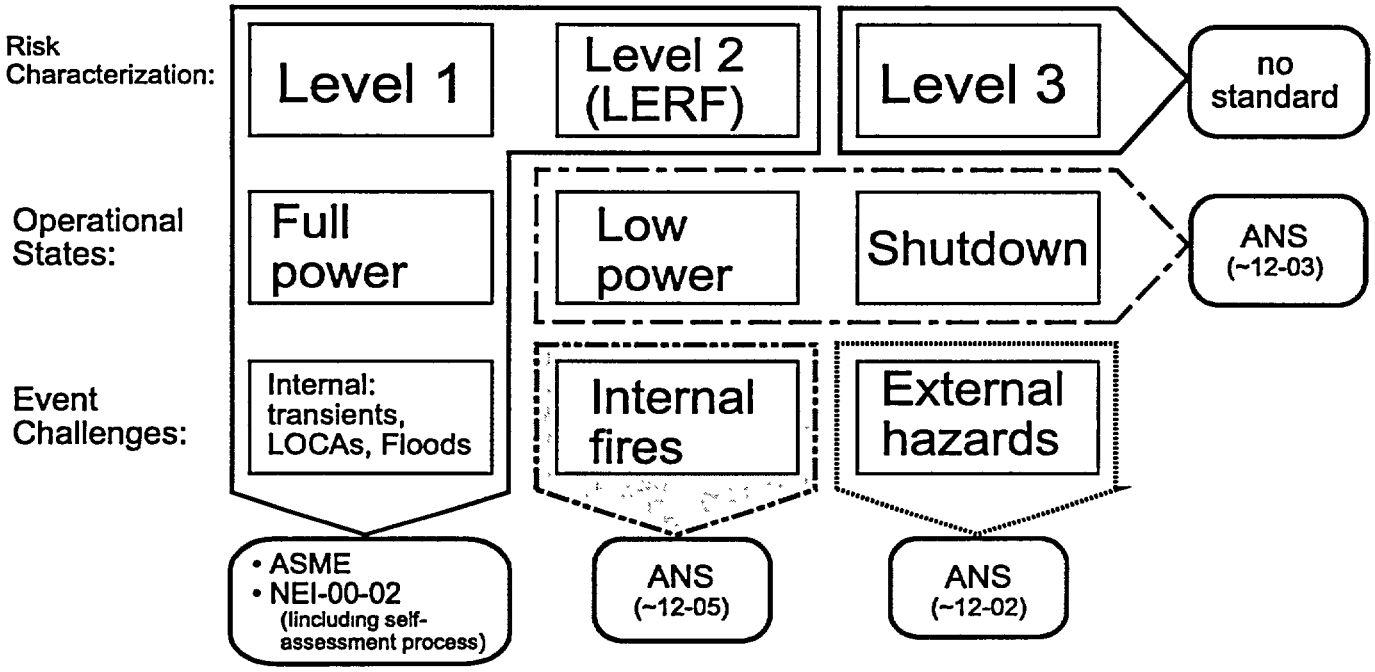
NEXT STEPS ....

- ❒ Receive ACRS letter with approval for publication
- ❒ Brief CRGR and obtain approval for publication
- ❒ Update DG and SRP taking into account public comments (as noted) and issue as Regulatory Guide Trial for Use
- ❒ Initiate pilot(s)
- ❒ Continue to update as appropriate



MORE TO COME .....

Full-Scope PRA



ADDITIONAL PUBLIC COMMENTS

OVERALL OBSERVATIONS

- The impact use of the Regulatory Guide in its current form on industry efforts to support risk informed applications could be considerable. This additional effort would be simply due to a new demonstration of PRA technical adequacy. This additional burden does not appear to be justified in the context of a risk-informed process in which the PRA information serves a supporting role to engineering or deterministic arguments.
  - The staff does not agree that implementation of this regulatory guide is viewed as "a new demonstration of PRA technical adequacy."
  - PRA quality has been an issue continually raised by the Commission and noted in RG 1.174.
  - The intent of DG-1122 is to minimize the staff review in addressing the issue of the technical adequacy of the PRA information used in an application.
  - The extent to which PRA information is used in a licensing activity is dependent on the licensee's submittal; that is, the extent of the technical basis supported by PRA information.

General Comments on Section C. Regulatory Position 1: Functional Requirements of a Technically Acceptable PRA

- Scope and elements of a PRA: the detail of what constitutes a "technically acceptable" PRA is a fundamental departure from the concept of "PRA quality commensurate with the application," and the DG implies that any PRA not containing all of the elements of a full scope PRA is somehow deficient for applications.
  - The staff disagrees with the comments. Throughout the guide there are statements such as:
    - "....describe one acceptable approach for determining that the quality of the PRA, in toto or for those parts that are used to support an application,..."
    - "... it is also recognized that, in some applications and decision, methods other than PRA (such as bounding analyses) can be used to address risk issues; guidance on such alternative methods is not provided in this guide..."
    - ".... The level of detail required of the PRA model is determined ultimately by the application. ...."
  - The staff will review the guide for areas to provide additional clarity on this issue.

General Comments on Section C. Regulatory Position 1: Functional Requirements of a Technically Acceptable PRA (cont'd)

- Main body provides discussion of external events but the appendices place detailed emphasis on internal events, nbalanced emphasis on details of internal events modeling.
- Regulatory process should address the elements of integrated decision-making process in a balanced fashion.
- DG-1122 has been written to encompass future standards and PRA scope causing an incongruity between what is expected in the future
  - The staff disagrees with the comment.
  - Commission has consistently stated that the risk needs to address all contributors (i.e., full-power, low power and shutdown, internal and external events).
  - Guide is consistent with Commission expectation and provides guidance for the attributes and characteristics of a technically acceptable PRA addressing all the contributors.
  - Guide also states that use of an industry consensus PRA standard or an industry-developed peer review are both acceptable approaches to demonstrate conformance, where applicable, with the characteristics and attributes of a technically acceptable PRA. The guide recognizes that some of these contributors can presently be met via standards or industry programs and provides for that flexibility, where available.

Control Room Habitability

Probabilistic Safety Assessment Branch, NRR/DSSA

Dose Assessment Team

Mark Reinhart, Section Chief

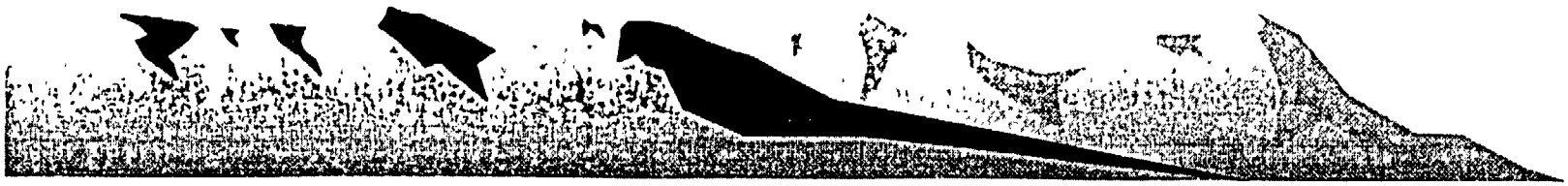
Jack Hayes, Project Lead

Mark Blumberg, Analyses Lead

Steve LaVie, Licensing Lead

History

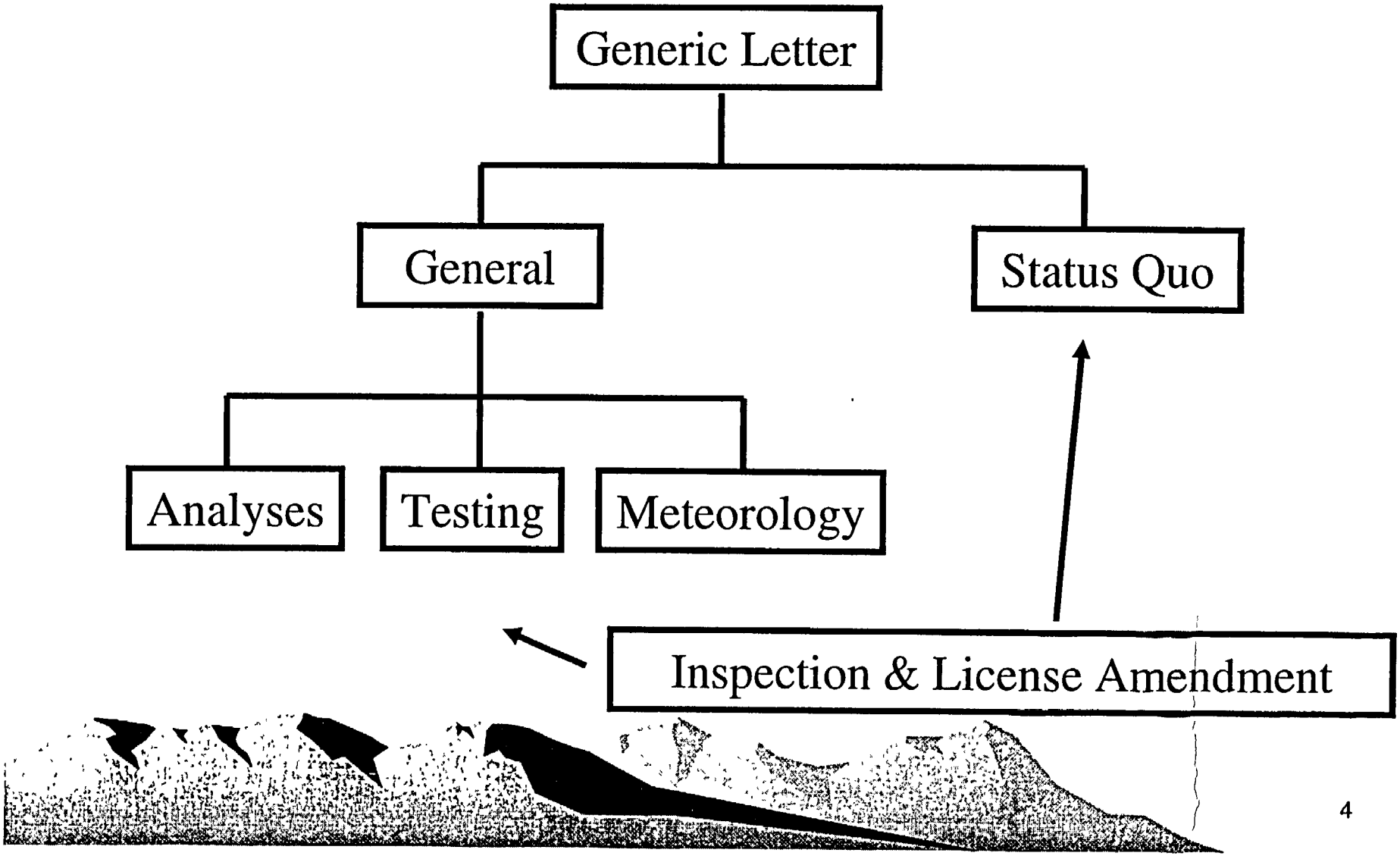
- 30% Control Rooms Tested
  - Unfiltered In-Leakage (Design Basis Input)
- All but one did not meet
- One did meet
  - Not accounting for uncertainties



Guidance

- NRC Generic Letter
- NRC Regulatory Guides
  - Control Room Habitability [DG - 1114]
  - Testing [DG - 1115]
  - Analyses (AST) [Existing]
  - Analyses (TID) [DG - 1113]
  - Hazardous Chemical Release [Existing]
  - Meteorology [DG - 1111]

Integrated Overview

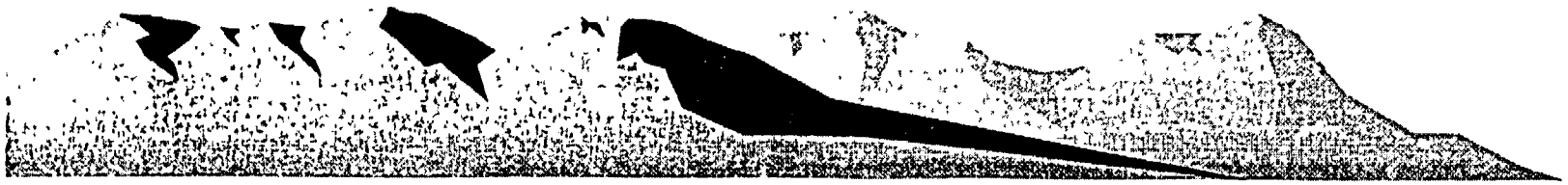


Public Stakeholder Interface

- One Day Workshop, Regional Office Cities
  - July 11, 2002 Region I
  - July 16, 2002 Region II
  - July 18, 2002 Region IV
  - July 23, 2002 Exelon
  - August 6, 2002 Region III & NHUG (Columbus, Ohio)
- Reviewed History, Guidance, Key Issues
- Discussed Stakeholder Perspectives
- Ongoing Since August

Workshop Accomplishments

- Good communication among stakeholders
  - Many Constructive Comments
  - Excellent Dialogue
  - Discussed issues
  - Focused: Common Ground & Success
- Close Alignment
- Few Comments on Generic Letter



Milestones

- **Spring 2002: Issued Draft GL & DGs for Public Comment**
- **Summer & Fall 2002: 5 Workshops & 2 ANS Sessions**
- **Extended Comment Period: Oct 7, 2002**

Alignment Plan

- Conform Regulatory Guides
- Conform NEI 99-03
  - Before end of comment period (Sep 6, 2002)
  - Subsequently Revise Regulatory Guides and Generic Letter Accordingly

Key Issues

- Testing
- Technical Specifications Surveillance
- Integrated Implementation
  - Removed Over Conservatism
  - Removed Under Conservatism
  - Relaxed Criteria
- Smoke and other Toxic Gases

Testing

- **Control Room Envelope Self Assessment**
  - *Comprehensive, Very Thorough*
  - Identify & Repair Sources Unfiltered Inleakage
- **Test**
  - ASTM 741 (Preferred and Most Prevalent)
  - Correlation to ASTM 741 (Next Preference)
  - Other *Convincing* Baseline Test
- **Progressive Alignment of Views**

Testing Frequency

- **Test**
  - Baseline
  - 6 Years After Previous Successful Test
- **Assessment**
  - 3 Years After Previous Successful Test
- **Ongoing Maintenance Program**
- **Performance Based**
  - If Test Fails, Next 3 Year Assessment Must be Test
  - If 3 Year Test Passes, Frequency Returns to 6 Years

Technical Specifications

- Section 5.0, Administrative Controls
  - Program
  - Describe Expectations
  - Program Content Details

Smoke and Toxic Gas

- GDC-19: Control reactor from either
  - Control Room
  - Alternate Shutdown Panel

Schedule

- Generic Letter & Regulatory Guides
  - Issue Final, May 2003
- Gain Experience from Implementations
- Revise Regulatory Guides Accordingly and reference NEI 99-03, Rev. 1

NEI Progress on Control Room Habitability Guidance NEI 99-03 Rev. 1

NEI Leads
Jim Riley
Alex Marion

NEI Control Room Habitability Task Force
Subgroup Chairs
Robert Campbell (TVA) Testing / Systems
John Duffy (PSEG) Licensing Basis
Stephen Schultz (Duke) Analysis

NEI

Purpose

- Describe Industry and NRC work leading to revision of NEI 99-03 guidance
- Identify key elements of revised industry guidance
- Discuss industry control room testing and assessment progress to date
- Provide industry positions regarding NEI 99-03, Rev 1 and the regulatory guides
- Describe future plans

NEI

Early History

- NRC CRH concerns (May 1998)
- NRC/NEI/NHUG CRH Workshop (July 1998)
- NEI forms CRH Task Force (Summer 1998)
- First draft of NEI 99-03 (1999)
  - NRC found it did not adequately address issues
- CRH TF initiates restructure of NEI 99-03 (November 1999)
  - Monthly TF/NRC meetings (2000)
- CRH TF submitted revised NEI 99-03 Draft (October 2000)
- NRC letter on remaining issues and regulatory plan (November 2000)
- ACRS meeting and letter providing recommendations & observations (December 2000)

NEI

3

Recent History

- Issued NEI 99-03 Rev 0 (June 2001)
- NEI industry workshop w/NRC (August 2001)
- NRC continues with program to issue RGs and GL (October 2001)
  - Draft RGs and GL issued for public comment (December 2001 – April 2002)
  - Public comments provided to NRC on draft RGs and GL (March – September 2002)
- Four NRC regional meetings (July to August 2002)
  - Led to progress on resolution of remaining issues
- NEI letter proposing NEI 99-03 redraft (August 2002)
  - Follow-up to the August 6, 2002 Region III meeting
- CRH TF/NRC staff meeting to discuss revised NEI 99-03 (September 10, 2002)

NEI

4

Current History

- September 2002 – NRC public meeting to discuss public comments on DG-1111 and DG-1113
- October – NEI 99-03 revised and distributed for industry review
- November – NEI 99-03, Rev 1 Draft submitted to NRC for review
- January 2003 – CRH TF/ NRC meeting to respond to and disposition comprehensive NRC comments
- February – Revised the document to address NRC comments
- March – Final NEI 99-03, Rev 1 published with disposition of NRC comments

NEI

5

Major Changes: General Approach

- Revision 0 was an excellent resource document
- Revision 1 provides the specific actions that a licensee needs to take to address the CRH issues
- Revision 1 explicitly defines the CRH Program as consisting of:
  - Assessment
  - Testing
  - Subsequent Actions
- Revision 1 defines the essential elements of the CRH Program

NEI

6

Major Changes : Focus on Key Issues

- Licensing/design basis and operator dose analyses
- Design basis accident analyses
- Hazardous chemical evaluation
- Control room unfiltered inleakage
- Impact of smoke events on reactor control
- Control room emergency filtration system technical specifications

NEI

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Revised NEI 99-03

- Analysis approach
  - Current licensing basis (CLB) maintained
    - CR dose evaluated for all CLB DBAs
    - DG-1113 (revised analysis methods) may not be used
    - DG-1111 (meteorology) may be used
  - To use DG-1113 (TID Source Term)
    - Must assess listed DBAs even if not part of CLB
    - DG-1111 may be used
  - Use of RG 1.183 (Alternative Source Term)
    - DG-1111 may be used

NEI

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Revised NEI 99-03

- Hazardous chemical evaluation
  - Assess and evaluate CRH with respect to measured inleakage and current hazardous chemical sources
- Smoke assessment
  - Assure reactor control from either control room or an alternate shutdown panel
  - Internal and external smoke events

NEI

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Revised NEI 99-03

- Inleakage test methodology
  - ASTM E741 acceptable
  - Integrated component test method acceptable if correlated to ASTM E741 test results at licensee's plant
    - Definitive criteria provided for correlation
  - Integrated component test method not correlated to ASTM E741 test results at licensee's plant must benchmark to similar CR where a correlation has been successful
  - Alternate test method acceptable if correlated to ASTM E741 test results at licensee's plant and justified for NRC review
- Clear guidance for periodic assessments

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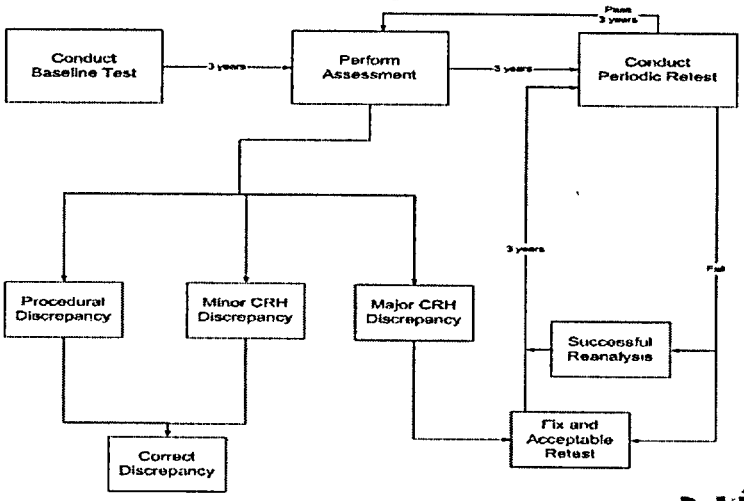
Figure 1
CRH Program



NEI

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Revised NEI 99-03

- Everyone adopt licensee controlled program to periodically retest
- Technical Specification (TS)
  - Plants must ensure their TS surveillance requirements, TS Bases, and licensing and design basis are consistent
    - Plants need to correct inconsistencies
      - Adopt new TS being developed by TSTF- 448 or
      - Correct Bases as necessary

NEI

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Industry Testing and Assessment Experience Update

- Approximately 35% of sites have now performed CR inleakage testing
- ASTM E741 testing has improved with experience
  - Sources of unfiltered inleakage and reasons for test inaccuracy and uncertainty are better understood
- Correlation testing has been performed successfully for the Integrated Component Test Method
- Licensees have applied the Alternative Source Term methodology and are using methods consistent with those in DG-1111

NEI

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Industry Positions

- NEI 99-03 Rev 1 provides substantially more guidance on development and execution of a CRH Program than did DG-1114 and DG-1115
- DG-1114 and DG-1115 reference NEI 99-03, Rev 0
  - These should be updated expeditiously to reflect endorsement of Rev 1
- NRC should endorse NEI 99-03, Rev 1 as a suitable approach for licensees to reference in their Generic Letter response
- DG-1111 and DG-1113, as revised through the public comment process, provide improved guidance to licensees

NEI

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Future Industry Plans

- NEI Control Room Habitability Task Force will provide support to industry in review and evaluation of the Regulatory Guides when published
- CRH TF will support an industry workshop in June to provide guidance on
  - Generic Letter response
  - Use of the new RGs and NEI 99-03, Rev 1
- NHUG has established programs to monitor and distribute lessons learned from control room testing
- Industry is considering next steps to advance lessons learned in radiological analysis applications

NEI

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