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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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528TH MEETING

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THURSDAY,

DECEMBER 8, 2005

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The Committee met in Room T-2B3 of the U.S. Nuclear Regulatory Commission, Two White Flint North, 11545 Rockville Pike, Rockville, Maryland, at 8:30 a.m., Graham B. Wallis, Chairman, presiding.

PRESENT:

GRAHAM B. WALLIS, ACRS Chairman

WILLIAM J. SHACK, ACRS Vice Chairman

JOHN E. SIEBER, ACRS Member-at-Large

GEORGE E. APOSTOLAKIS, ACRS Member

MARIO V. BONACA, ACRS Member

RICHARD S. DENNING, ACRS Member

THOMAS S. KRESS, ACRS Member

DANA A. POWERS, ACRS Member

VICTOR H. RANSOM, ACRS Member

I-N-D-E-X

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8:32 a.m.

CHAIRMAN WALLIS: Good morning. The meeting will now come to order. This is the second day of the 528th meeting of Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following: Early Site Permit Application for the Grand Gulf Nuclear Station and the Associated Final Safety Evaluation Report; Draft Final Generic Letter, "Impact of Potentially Degraded Hemyc/MT Fire Barrier Materials on Compliance with Fire Protection Regulation;" Proposed Program Plan and Advanced Notice of Proposed Rulemaking for Risk-Informing 10 CFR Part 50; and the Preparation of ACRS Reports. In addition, we will meet with the NRC Commissioners between 1:00 p.m. and 3:00 p.m. in the Commissioners' Conference Room, One White Flint North, to discuss items of mutual interest.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Mr. Sam Duraiswamy is the Designated Federal Official for the initial portion of the meeting. We have received no written comments nor requests for time to make oral statements from members of the public regarding today's sessions. A

transcript of a portion of the meeting is being kept and it is requested that the speakers use one of the microphones, identify themselves and speak with sufficient clarity and volume so that they can be readily heard.

I would now like to proceed with our business and the first item on our agenda is being introduced first by my colleague, Dana Powers. Dana, please continue.

MEMBER POWERS: Okay. We're going to discuss the Early Site Permit of Grand Gulf. This is that we're trying to finalize this review of the early site permit and the Staff's SER on this early site permit. We have written an interim letter.

You will recall in that interim letter we discussed a variety of items but three we raised questions about. We raised questions about a more explicit discussion of hazardous material transport on the Mississippi River and any threat that might pose to the proposed new site.

We discussed the issue of the applicability of past weather data to prognosticate the future. Since that time, we have had some weather events in the general Mississippi area that would be of interest to know how they impacted things.

Also since that time, we have been able to do some of our own research on whether cycles in the Gulf of Mexico and what I can report to you is indeed there are cycles; that we do see cycles in hurricane frequency in the area. The issue then becomes whether you get cycles of very intense hurricanes or not in the area. If hurricane activity goes up, you also get increased frequency of very intense hurricanes and what I can tell you is the historical record does not provide enough information to resolve that issue. There are two theories on the subject. So on average, it's about as postulated in the early site permit.

The third area that we had questions about was the treatment of maximum winter precipitation and its relationship to the maximum snow load and whether that was a rational burden to transfer to the COL as a site characteristic or not.

Those are the questions that we had posed in the past and we'll turn to the speakers now to remind us of the nature of the proposed Grand Gulf site and the resolution of the issues that were outstanding at the time of our interim meeting. I think we're going to be led off with a presentation by George Zinke.

MR. ZINKE: Yes.

MEMBER POWERS: It's all yours, George.

MR. ZINKE: I'm going to let Kenneth Hughey start with some introductions.

MR. HUGHEY: Good morning. My name is Kenneth Hughey. I'm the Senior Manager for Business Development in Entergy Nuclear. Randy Hutchinson, our Vice President, was hoping to be here today to kick this off but other things came up and he wasn't able to attend.

So before I get started, I would like to just introduce the team members that we brought today. George Zinke is our Licensing Manager for early site permit. He primarily will lead the discussion today. To his right is Guy Cesare with Enercon Services, one of the principal investigators for the early site permit. Al Schneider with Enercon Services in the back. We have Bill Lettis with William Lettis and Associates is our seismic expert in this area. Garry Young, a recent addition to our team members. The reason for Garry Young is he will be following up as our project manager for our COL project that we've announced at our Riverbend site. Kathryn Sutton with Morgan Lewis who also has assisted us in early site permit. Then in the back, Mike Bourgeois who is also a member from Entergy on our early site permit.

Let me say that we're happy to be here today. We think this is a very important milestone in early site permit. We very much look forward to the discussions today, hopefully addressing your questions. We would like to compliment the Staff on their work today to get us to this point and we very much look forward to working ourselves through this process efficiently and effectively and hopefully very soon having an early site permit that Entergy looks forward to using at Grand Gulf with our plans for COL coming in the future. With that unless there are any questions for me, I'll turn it over to George and we'll get right into it.

MR. ZINKE: Okay. The presentation today, we'll just real briefly go over some general information that you've seen before and at the last time we were SER was in draft and there were some open items and since we last met there have been changes to that status. So we'll briefly go over that and then we'll move into the three subject areas that you just talked about.

The next slides are just as a background where the Grand Gulf site as you know is in Mississippi and some of the characteristics are listed on slide four. I didn't plan on discussing this since

this is again a repeat but just to bring it together. The map on page five again shows the location of Grand Gulf site on the Mississippi River in Mississippi.

Slide six is the early site permit application, some of the details. We do have a single unit on the site currently and that the permit was to evaluate the characteristics of the site for additional units. The current operator of the current unit is Entergy Operations. Entergy is a company that has multiple subsidiaries and that's why we have a number of the subsidiaries.

MEMBER POWERS: We've noticed.

MR. ZINKE: Right. So unless there are any questions on the background, let's move into slide seven. The DSER as issued in April of 2005. In that there were some open items. Our primary response was in June and then we provided some supplemental information later in June through September. The final SER was issued in October.

On slide eight, depending upon how you want to count the action items, you have a handout that looks like this that outlines the individual items and depending on how you want to count them. We count them with items and sub-items to be 31. You get different counts because on some of the items there

were ABCs. So we just counted them. In general, most of the items we provided some additional information to the Staff and they were either closed or some of the issues were left to become either permit conditions or action items.

Raj in the NRC presentation will go over with you the difference in the criteria for what's the difference between permit conditions and action items. In basic, the action items capture things about the site that we and the Staff agree are issues are better resolved in the context of a COL application where you marry the site with the design rather than resolving it with just the information solely about the site in looking at a plant envelope without more specifics of the design that would be put on that site.

In the area, the items that were associated with emergency preparedness or a characterization of the open items was a little bit different. Going into the process, we had expectations and ideas on what major features were and what they would accomplish in the early review in the new Part 52 licensing process and we had lots of lessons learned in that process. But basically at the end with the open items, we determined that the open issues were going to have to be addressed again with

the COL application due to their nature and that it was more beneficial to us to not continue to provide more information and resolve the details of emergency planning in the context of a COL application rather than in this thing called "Major Features for the Early Site Permit."

Ultimately, the Staff looked at the information that we had and within their process, they granted most of the major features that we had requested and that one of the major features given the level of information that we had provided, they did not grant one of the major features. But either way, the way we viewed it is that the full and integrated emergence plan that gets provided that we would provide in the COL application is the mechanism for really resolving those.

MEMBER POWERS: I think the way you've properly characterized it is that this term "Major Features" is a major lesson learned that we need to refine that a little bit and say exactly what we mean there just to facilitate the process for future people. Sorry you suffered but it's a good lesson learned and we'll look for your insights on how to make that better in the future. But I think you put your finger on the pulse there.

MR. ZINKE: Okay.

MEMBER POWERS: It just needs some specificity and I think everybody agrees to that.

MR. ZINKE: And it was very valuable for us to go through because we learned a lot that will be very beneficial as we prepare the COL application.

MEMBER POWERS: Good.

MR. ZINKE: At this point, I just want to ask if you have any questions on specific open items other than there's a few that cross over into the areas of your questions on the flooding and the hazards that we'll get to in a little bit. But other than those, I didn't know you had any specific questions on anything.

MEMBER POWERS: No, I don't have any specific ones on the items other than the three areas that I mentioned.

MR. ZINKE: Okay.

MEMBER POWERS: I don't know if any other members have questions in other areas. Why don't you just go ahead, George? I have never seen the Committee shy about asking questions out of context.

MR. ZINKE: That would be fine. We can come back if you think of things.

MEMBER POWERS: Good.

MR. ZINKE: The next area we want to spend some time on was that as you noted in our last ACRS there was a lot of discussion about weather and global warming and the predictability of weather patterns and since we last met and obviously since we submitted the early site permit application, there's been weather experience in the States of Mississippi and Louisiana.

MEMBER POWERS: Gosh, has there.

MR. ZINKE: And so we wanted to talk a little bit about the process first before we actually talk with you about what that experience has shown us. The early site permit application was submitted in October of 2003. Since that time, we've had discussions with the staff about the finality of various information that gets put into a permit and in the context of what happens with an early site permit once you use it in the context of COL application.

One of the letters the Staff put out dealt only with environmental finality and provided the industry some guidance on dealing with new significant information and the kind of processes an applicant would have in evaluating to see if changes affect what was previously said. In the safety area, although this letter does not cover the safety, some of the concepts are similar in the sense that if new

information happens the applicant has to deal with it and make some judgments and needs to have some processes that would reasonably determine if there's new information and the significance.

However, in the safety area, there certainly are different thresholds. With the early site permit, it establishes some site characteristics. So if we ever became aware through new information that those site characteristics were no longer valid, then we would have to deal with that. Likewise, when we use the early site permit in the context of a COL application, we would be making judgments on all of those sites characteristics and any new information that we're aware of at that time that has happened since we submitted and then putting them in the context of a selected design and looking at margins. Some of the requirements for that really come out of 52.79 and some of it is just logical that you have to do that in order to prepare an application.

So since that time, we've had the hurricane experience. What I'm going to be presenting to you has not been submitted to the staff and does not form part of the basis for the early site permit. And I make that emphasis because some of the ways we've looked at the data at this point would be

different than the analysis that we would do in the context of a licensing application. For example, I'm going to show you some data, then some comparisons, that we looked at versus in an application we're going to follow the methods and the standards that are provided for how you determine site characteristics.

On slide ten, we've looked at relative to weather experience what are the kinds of characteristics and parameters that become important with regard to hurricanes and it's things like the maximum wind gusts in miles per hour, the maximum precipitation rates and PMP site flooding which end up being site characteristics in the context of the early site permit. But it also then becomes important as to what is the structural design of the facility you would be selecting and the parameters so you can determine what your margins are in order to figure out whether this new information is significant or not.

CHAIRMAN WALLIS: What does very heavy rain do to the slope down to the river? Does it produce an erosion or land movement?

MR. ZINKE: As we talked a few months ago for Grand Gulf because we're on flat ground, a lot of rain can flood the immediate area around the plant pretty quickly and that's why the current Grand Gulf

has a flood plan, ditches, drainage paths. So the amount of rainfall and the prediction of that and the margins we'd have becomes important.

CHAIRMAN WALLIS: But if it did overload your drains and flood over the bank, then presumably you might produce a new canyon or something down below.

MR. ZINKE: Yes. That's why for the existing Grand Gulf we have things like flood protection on the doors. So it's something your design just has to consider.

On slide 11, in our general ESP methodology, we collected the regional data based upon the industry standards. What that means is that the site characteristics are not directly where you just take direct readings from what was at the site. Here in fact are industry standards that gather information in the region over time and go through statistical analysis and out of that pops out numbers that then become part of your basis.

Some of those standards have changed since we submitted the application and we expect they will continue to change as data is gathered. That's why we would again use the early site permit and the COL. We need to relook at those and see from a standards have

things changed that would change what the site characteristic is and likewise the calculation methods are established in standards.

For the early site permit that we submitted, what we submitted was the max three second wind gust for Grand Gulf was established at 96 miles per hour and max one hour precipitation 19.2 inches. Those become important as we go through our experience so you have at least some idea of what kind of numbers did we see relative to what our site characteristic is. And then how do those numbers compare to the kind of thing that you see in design and structure analysis, the number that the designs are actually designed to.

On slide 12, one of the things we looked at for this presentation which is beyond what the standards would have us do is trying to judge the hurricanes did not come through Grand Gulf. They came through other parts of Mississippi and Louisiana. So we looked at what kinds of things can we learn from that given it really didn't come over Grand Gulf. So we looked at least for the wind and looked along the same latitude and tried to gather data that is available to give us some idea of that hurricane.

MEMBER POWERS: This is good because in

your application, you did a similar thing for Camille but it hinges very much on Camille. So to the extent that you can add to that database, I think you enforce that. That was one of the things that was really bothersome about the application is that it hinged very much on what Camille did. Now you have some extra data.

MR. ZINKE: Right.

MEMBER APOSTOLAKIS: Let me just ask something of you. Is there any physical reason why these hurricanes missed the site or is it a pure real random event? In other words, the next one might actually hit the site.

MR. ZINKE: The steering forces on the hurricane are independent. Generally, it's meteorological conditions in the Gulf of Mexico. If you look at the historical record and plot all of them, they're all over the street.

MEMBER APOSTOLAKIS: So what you're saying is that it's really a random event. It could hit the site.

MR. ZINKE: Yes.

MR. CESARE: Totally. Just like it could hit anything on the coast and then inland from that point on.

MEMBER APOSTOLAKIS: Okay. So if it hits the site and you have as you say there 160 miles per hour, what happens?

MR. CESARE: The wind gust was at landfall. So that's -

MEMBER POWERS: This is the contention that's made in the application is that if the hurricanes slowed down as they go over the land and the question they're asking is suppose that this hurricane did come right over the site. What kind of attenuation do I get having traveled that distance over land?

MR. ZINKE: Exactly.

MEMBER POWERS: And in the application itself, they drew that information out of Camille and now we're going to look and say what additional information do we get out of Rita and Katrina. For that question in the past, you didn't have a lot of data points. Now you suddenly have two more data points and they seem to be supporting the general contention that you had in Camille which adds potency to the argument here it seems to me.

MR. CESARE: If I might add, Dr. Powers, to what you're saying, Hurricane Camille was described in the application prior to these events and it was

described in the body of historical weather information. However, the site characteristics are developed on industry standards.

MEMBER POWERS: Yes, I understand.

MR. CESARE: And ASCE studies and then incorporates that with all other weather information for max wind gusts and then comes up with a family of curves.

MEMBER POWERS: Yes. You did a responsible job in putting together the information and because if you'd not written about Camille, I would have said what about Camille.

MR. CESARE: Right.

MR. ZINKE: And course, Camille even forms part of the license basis for the current unit. But with regard to your question about the randomness, there are some aspects of the hurricane that would be random. There are still physical features but as far as where they will hit landfall. But once they hit landfall, then there are some physical things that are predictable about no longer is there a water source for them to pick up water. Now you can predict they are going to become less in strength.

MR. CESARE: And energy from the water.

MR. ZINKE: And energy. And then again,

there is some randomness in the difference in the hurricanes. Camille was an extremely strong hurricane but compact. So when you look at the damage and how it actuated, that's different than the Katrina which was less strong but bigger, broader. And then you look at the hurricanes, there are certain aspects of the hurricane like the strength of the wind that's close to the eye.

But then there's the aspect of the hurricane that deals with the water which is now going to be more on the edges and associated with where it's picking up the water. So that's why at least for this presentation we looked at different aspects of that just to draw some comparisons. If we look at wind speed and the water, we figured some of that, we wanted to at least look at what happens along the same latitude relative to the strength, the decrease of the hurricane. There are at least some conclusions that you might draw.

CHAIRMAN WALLIS: This is very good but then you have three data points and there has to be some logic which says now we're going to assess what's the probability of the wind being more than so much. I'm not quite sure how you do that.

MEMBER POWERS: That's where they go to

the end of these three standards. I mean that's hard.

CHAIRMAN WALLIS: That's right. Industry standard helps you with that. That's right.

MEMBER POWERS: The heart of their application is really the industry standards on this. This is more anecdotal information that substantiates the contention and the problem in the past was that they had one data point and now we have more.

CHAIRMAN WALLIS: As long as it substantiates it, it's good.

MEMBER POWERS: Right.

MR. ZINKE: And that's why I made the point at the beginning. Relative to a licensing application, I'm going to stick with the standards. But for what I'm presenting here isn't from that source. It's more of this is kind of the information. That's why when we get to COL application and we actually have our documented counts and things, it will be based in a different way than what we're presenting here.

MEMBER POWERS: This is information that's going to be absolutely crucial for your public meeting on this.

MR. ZINKE: Yes.

MEMBER POWERS: You know you're going to

have public interest in this particular question. Many are interested. Please continue.

MR. ZINKE: Okay.

MEMBER BONACA: Just a question of clarity. The previous slide that you didn't show but seems to show a lesser attenuation for Katrina than for Camille. Is there a relationship between the width of the hurricanes? You were saying that Camille was a narrower with a strong punch. Is there a relationship between attenuation and the radius of the storm?

MR. ZINKE: There ends up to be a lot of things that can affect how the strength decreases. So it's not any one or two or three things.

MEMBER BONACA: You don't have the specifics.

MR. ZINKE: Right. And at least, I'm not aware of any modeling that you can factor in all of those things.

MEMBER BONACA: Okay. I was just curious.

MR. ZINKE: So in comparing the three hurricanes, Katrina was in August of 2005. At landfall, the gusts were 160 compared to Rita at landfall 150. Camille in `69 was 170 which just says that the wind at landfall were similar but Camille was

stronger. Katrina passed about 90 miles, this is the eye, east of the site and at the same latitude where Grand Gulf or close to that same latitude, the gusts were around less than 92 miles per hour. For that hurricane, the max Grand Gulf wind was 21 miles per hour. You can see that's because the hurricane was east of Grand Gulf.

MR. CESARE: That is not an instantaneous gust though.

MR. ZINKE: That's right.

MR. CESARE: Our data, that's the peak hourly average at 4:00 p.m. that afternoon.

MR. ZINKE: So some of that's a little bit apples to oranges.

CHAIRMAN WALLIS: The instantaneous gusts are a little bit bigger.

MR. CESARE: Just to give you a framework.

MR. ZINKE: For Rita, the wind gust landfall 150. It passed 160 miles west of Grand Gulf. Gusts at that same latitude around 63 miles per hour. Again, in loose comparison for that, the hourly average was 14 miles per hour at the Grand Gulf site which would expected just because of where the hurricane was.

In comparison with Camille, it came much

closer to Grand Gulf. It was ten miles east of Jackson. From your map, Jackson is slightly north east the track of Grand Gulf.

MR. CESARE: But 60 to 70 miles east of Grand Gulf slightly but Grand Gulf didn't exist then, that site.

MR. ZINKE: Of course, Camille was a stronger hurricane but more compact and as it passed ten miles east of Jackson, it saw gusts in that area of 67 miles per hour at the airport.

VICE CHAIRMAN SHACK: Is there any significance to the one that's less than 92 and the others that are approximately 63?

MR. CESARE: We're being faithful to the National Hurricane Center reports that they issue and in one case, for Katrina one month earlier, they characterized it as less than and in this case, they said approximately. So we had to stay true to it.

MR. ZINKE: And again, that's part of the reason when we would actually do official kinds of calcs in source of the data we had to be real careful of that. But for this in trying to get a general characterization, we're just trying to be faithful to sources of data.

CHAIRMAN WALLIS: There are probably

categories that are less than 92 and less than 80 and less than so on. Isn't there or something? So it's between that category and the next one.

MR. ZINKE: Yes. But these are actual numbers not categories.

MR. CESARE: But these are actual numbers not categories in the stations that have measured and this is how they reported it. I think it's actually wind measured over five seconds.

MR. ZINKE: Figure 13 shows the general path of what Katrina did and then Figure 14 shows the general path of Rita.

MR. CESARE: What didn't mean to infer any difference between the two in the representation. This is the best available graphic of the paths. They go for color coded to wind velocities.

MR. ZINKE: And then in looking in -- Guy, I'm going to let you go do the summary comparison on 15.

MR. CESARE: Very good. What we then wanted to do is trying to say had these two storms passed exactly over the plant how would their max velocity wind gusts compare with site characteristics that have been established in the application and reviewed and accepted by the staff. For structural

design, maximum wind gusts, that value based on the industry standard that's 100 year return wind is 96 miles an hour. That equivalent, you've seen the numbers before. Now it's just tabulated. Compares close to Katrina, four miles an hour difference greater than Rita.

The maximum one hour precipitation likewise is based on an industry standard, an HMR standard, which we may talk about in more detail later to the degree we talk about local intense flooding. But that establishes the maximum precipitation for one hour 19.2 inches.

Now rainfall is a little bit difficult to characterize. We certainly measure it but whether or not the rainfall is greater or lesser at 32, two issues. One is generally speaking on the eastern side of the hurricane counter clockwise, it drops more of its rain early rather than on the west side. So what side you measure it on is important.

The other thing is what's happening in upper atmospheres farther up in the northerly track. I believe Camille, Katrina had a lot more rain over an eight hour period in Virginia I believe because of the mountains and the way it accumulates.

However at 32° north latitude, we did get

some data just to show you a frame of reference to the site characteristic. Newton, Mississippi is on Interstate 20 which is roughly that latitude. That's the National Weather Service and so we show for Katrina at Newton which is to the east of the site 1.4 inches as the maximum rainfall.

For Rita, we actually had data at Grand Gulf. Since Rita was to the west of the site, we used Grand Gulf data as being the maximum number. It was 2.15.

I think at the site for Katrina we had 0.3 inches. Again, you can't take comfort in that because it could drop more rain north of that.

Overall, we would conclude that maximum wind gusts for these two data points are less than ESP characteristics and the measured hourly precipitation at that latitude was less than PMP, well below it.

MEMBER BONACA: But Katrina came quite close.

MR. CESARE: Katrina came, it gets to what you were initially talking about cycles and there is some information in the literature saying that the cyclone experience is a 60 year cycle and we are in that phase where it would be more maximum. So you will see storms that are close to the 100 year return

maxs. So it's not inconsistent to have that high a number for this region at this time.

MEMBER BONACA: Although I mean it's very important somewhat the point that Dr. Powers has made several times that things are changing and --

MEMBER POWERS: The situation, it seems that the cyclical nature hurricanes is pretty well established. If we were dealing on the Atlantic coast, we could probably say things about how the intensity varies within those cycles. The problem is the historical record for Gulf of Mexico storms which do seem to be different than Atlantic storms just doesn't sustain enough information. So you rely on modeling.

The modeling in this area is like the modeling in most weather areas. If I find a model that predicts one thing, I guarantee you there's some professor someplace with a model that predicts exactly the orthogonal thing. So what they've done is probably the only thing you can do which is you take these industry standard things and you say this is what I'm going to go with because I'm not expert in weather modeling and I don't intend to become one. What we're looking for is some context to put this in and you're giving us exactly what we're looking for.

MR. CESARE: Then what is the process that applies apart from the science of the modeling? What is process that we would use and that's what we have intended to briefly discuss here. The process is we would at COL look at significant changes in events information that might influence our site characteristics.

We would look at industry standards if we have based it on that industry standard and that standard has been updated. That is to say a site characteristic was based on the industry standard that is specifically charged with looking at storm history whether it's named hurricanes or other changes in other event information. That standard would be established and we would look at that.

We would evaluate them as required. If we felt like it was appropriate, we would discuss those changes in our application, the COLA's FSER. The fundamental step then would be compare the site characteristic with the parameter values that have been established or assumed for analyses in the selected reactor vendors at DCD and we would confirm that the DCD is bounding and we would evaluate the margins if they were close. That's a typical process that we expect to follow at COL.

In summary, the way we see this is we establish the site values based on industry standards. The recent hurricane experience looking specifically at wind gusts and precipitation appear to be bounded at this point by our established site values, we believe there's a sound process at COL that would lead us to evaluate new and significant information and then we would consider the reactor design and margins for the selected design for this site.

MR. ZINKE: And in fact for the Grand Gulf site, we are now in that process of having picked up the technology that we're looking at.

MEMBER POWERS: What did you pick?

MR. ZINKE: I'm sorry.

MEMBER POWERS: What did you pick?

MR. ZINKE: The GE ESBWR and at this point decided that have not finished looking at what the margins might be and obviously then that comes back into your question of if the margins are real small and then you get into the how sure are we that it might not change over the future. Then we would deal with that. If the margins are real large, that conceivably that our design margin rather big, then it becomes not as significant of an issue. But even then if it's something that we've looked at, the standards

that are developed where you would pick the site characteristics, they are updated routinely. I think there's been at least one update since we've submitted. ASCE is now `05. I think it's within the last month or two and we haven't evaluated it. We would prefer not to compare it with current ESBWR three second wind gust because that DCD is under current review and we haven't really studied it to understand what those numbers mean. It looks like there's a great deal of margin but we can't say that in truth.

MEMBER POWERS: Sure. And wouldn't expect you to. To my mind, what you've provided here is exactly what I was looking for, just some context to put the numbers and the anecdotal information to supplement what you had there in there and they are important to me. It stood out to be honest with you in the application that we really only had the Camille thing. Now you have the Katrina and the Rita. I think that satisfied what I was looking for exactly.

MR. CESARE: Okay.

MEMBER POWERS: Do other members have questions? I'd like to just ask for a little clarification on one aspect of the transportation up the Mississippi. As I understood, you considered a

bounding explosive event involving 5,000 tons of TNT.

MR. CESARE: Yes. That's established in Reg Guide 191.

MEMBER POWERS: And this produces a blast wave where you took some attenuation from the bluff.

MR. CESARE: The process was we began with the Grand Gulf Unit 1 FSER which basically established separation distance and other topography aspects that would give sufficient protection. The Unit 1 is 1.3 miles. The proposed site is 1.1. So we basically said there is sufficient margin in there already that the slight close proximity of the ESP site would still, the separation distance and the topography, the bluff itself provides adequate protection. The staff did additional evaluations and probably should refer to them for their calculations.

MEMBER POWERS: We will.

MR. CESARE: We did, in response to discussions with the Staff in RAIs, look at a delay detonation where we actually did calculations on the liquefied natural gas barge accident which is in the application.

MEMBER POWERS: And you concluded that that was bounded by the 5,000 ton.

MR. CESARE: That's a different source

term but we concluded its probability was very low and that it should not be considered as a design basis event.

MEMBER RANSOM: Along that line, does ammonium nitrate shipped up and down the Mississippi?

MR. CESARE: I would assume it is.

MEMBER POWERS: You can count on it.

MEMBER RANSOM: There have been some catastrophic experience with that in Houston years ago.

MR. CESARE: You're talking about one turn of the century, early 1900s.

MEMBER RANSOM: The World War II timeframe back in there. They had a ship that blew up in the harbor.

MEMBER POWERS: The 5,000 ton TNT was an attempt to bound that.

MEMBER RANSOM: It would?

MEMBER POWERS: Oh, yes. 5,000 tons of TNT is a small nuclear warhead.

CHAIRMAN WALLIS: Five kilotons.

MEMBER KRESS: For the reactor you have on the site now, do you have a PRA for it?

MR. ZINKE: Yes.

MEMBER KRESS: Had you ever exercised it

at a level three mode for that site?

MR. HUGHEY: Level three meaning consequence to the public?

MEMBER KRESS: Yes.

MR. HUGHEY: Yes, we have. For certain events, we do have Level three events, consequences to the public. Yes.

MEMBER POWERS: Grand Gulf is a NUREG 1150 site.

MR. HUGHEY: It's a NUREG 1150.

MEMBER KRESS: I know that. It doesn't use their PRA though.

MR. HUGHEY: No, we took NUREG 1150 as a starting basis when we developed our PRA and refined and modified it over the years to improve it. But, yes, we started with NUREG 1150.

MEMBER POWERS: Grand Gulf was extremely cooperative with NUREG 1150 and generous in sharing their site information and developing that PR.

MEMBER APOSTOLAKIS: And it does meet the quantitative health objectives I think as I remember.

MEMBER KRESS: That was my follow-up question.

MEMBER POWERS: It does not. There is no calculation done in 1150 that's comparable to the

requirements for the quantitative health objectives. Quantitative health objectives refer to all accidents and all initiators and all modes of operation and that hasn't been evaluated.

MEMBER KRESS: That's why I asked if they exercised their own PRA because that would be the way you would doodle it rather than looking at NUREG 1150 results. I was just curious as to how close you meet these QHOs although they're not a requirement or anything. They are some sort of a gauge on site suitability in my mind. But you haven't done this I gather.

MR. HUGHEY: I'm not sure exactly what you're asking for.

MEMBER POWERS: He's fishing. He's fishing for another debate.

MEMBER KRESS: They know me too well.

MEMBER-AT-LARGE SIEBER: He's actually working on another part of this.

MEMBER APOSTOLAKIS: The question though does make sense. I don't understand why it was dismissed.

MEMBER KRESS: The question is relevant.

MEMBER APOSTOLAKIS: It's very relevant.

MEMBER KRESS: To early site permits. And

I'm just curious why we don't do a Level three and compare the results to the QHOs and then if you're going to put another plant on there --

(Several speaking at once.)

MEMBER POWERS: We do not currently have the technology to do a calculation that's comparable to the QHOs.

MEMBER KRESS: If you properly evaluate the uncertainties, you might be able to.

MEMBER APOSTOLAKIS: I don't think that's the reason, Dana. I think the reason is that the regulations do not require it.

MEMBER POWERS: Of course not. He's asking why we don't do the calculation.

MEMBER APOSTOLAKIS: The Grand Gulf PRA as I remember includes internal events up-power plus external events up-power. What it does not have is a shutdown mode, right, unless you did it after?

MR. HUGHEY: We did it after. We did have the ability through special models and a PRA to do shutdown mode.

MEMBER APOSTOLAKIS: Okay.

MR. HUGHEY: Because we were a follow-up to NUREG 1150 and we were one of the first plants to do a full shutdown mode PRA.

MEMBER APOSTOLAKIS: So if you take all of these results and put them together, do you remember if you meet the goals, the 10 to the minus whatever?

MR. HUGHEY: Yes, we meet all the current safety goals. We've always met those. I can't say though that again it would be what type of events. For example, we don't have seismic in our PRA.

MEMBER APOSTOLAKIS: You don't?

MEMBER DENNING: What about fire?

MEMBER APOSTOLAKIS: Fire, they do.

MR. HUGHEY: We do.

MEMBER DENNING: You have a fire PRA?

MR. HUGHEY: I think on fire we did screenings.

MEMBER DENNING: You did screenings.

MR. HUGHEY: I think we did screenings on them. It's been many years since I've looked at our PRA because I'm not in the operations division any longer. So I guess I would probably have to say that I can't answer every question directly on that.

MEMBER DENNING: If you look at the internal events analysis, that shows significant margin to the QHOs but I think Tom's question and Dana's question relate to the question that's not a complete characterization of all of the contributors.

So until you have done a fire PRA and a seismic PRA and include a shutdown PRA, then you haven't really totally addressed whether you meet the QHO.

MEMBER KRESS: I would settle for an internal events comparison if you really want to know.

MEMBER DENNING: Well, that you can --

MEMBER POWERS: I'd still like to stick to early site permit. Do we have any early site permit questions for the speakers?

MEMBER KRESS: How far is it to New Orleans and Memphis?

MR. HUGHEY: From Grand Gulf?

MEMBER KRESS: Yes.

MR. HUGHEY: Two hundred miles.

MEMBER KRESS: A good distance.

MR. HUGHEY: Yes. Memphis is probably 225 or so and New Orleans is right at 200.

MEMBER KRESS: St. Louis?

MR. HUGHEY: St. Louis.

MEMBER AT LARGE SIEBER: That would be a bit further.

MEMBER POWERS: Gentlemen, thank you very much. Turn to the staff. Laura, did you want to introduce?

MS. DUDS: Sure. In the interest of

efficiency and effectiveness as we turn towards fiscal year 2008 and we're going to be looking at eight to ten of these reviews, we'll do the intro while the Staff is setting up. My name is Laura Duds. I'm the Branch Chief for the New Reactor Licensing Branch.

Before I start, I did want to take a moment to express our gratitude and our appreciation for Med. Yesterday Jerry Wilson was expressing to me that Med has been with New Reactors group through three, four design certification projects and we really wanted to say thank you and wish you all the best.

In addition, this is going to get sad actually after awhile when we continue to say goodbye to these people. Sitting behind me, Kaz Campe has provided the site hazards analysis for the ESPs as one of several thousand activities and safety conclusions that he's done for the Staff. So we wanted to thank him for his help and we appreciate working and learning from both of you.

PARTICIPANT (MED): Thank you, Laura.

MS. DUDS: You're welcome, Med. With that, we're here today to present our final safety evaluation for the Grand Gulf ESP application. The Staff has completed our review for this application in

accordance with the existing regulations and the current guidance that the Staff is working to. I do want to make the point that due to some late changes in the Dominion North Anna early site permit application Grand Gulf is now our lead early site permit plant which means they will be the first plant to go through the mandatory hearing. With respect to the changes in North Anna, we expect to see the extent of those changes in early January and we will work with your staff to see if additional interactions are needed.

With that, I'm going to introduce Raj Anand who is the Project Manager for the Grand Gulf early site permit. Also Nitin Patel sitting beside him is new to our Staff working on early site permits and I seem to have to introduce new people every time we're here.

MEMBER POWERS: If you wouldn't drive them away, you're going to have to bring in new people.

MS. DUDS: I know. And here I got honorable mention in trying to hire Med yesterday but our staff is continuing to grow and we're turning forward. So with that, Raj.

MR. ANAND: Thank you, Laura. Good morning. My name is Raj Anand and I'm the Safety

Project Manager for the Grand Gulf early site permit application. I have with me Nitin Patel. Nitin will help me in flipping the slides. So let me get started on slide no. two please.

The purpose of today's meeting is to provide the ACRS committee members an overview of the conclusions reached by the Staff in Grand Gulf early site permit safety review and discuss the permit conditions recommended by the Staff and the COL action item listed in the final safety evaluation report.

This is today's agenda for my presentation. My presentation will be less than 25 minutes.

MEMBER POWERS: If I don't interrupt.

MR. ANAND: You can ask the question. Thank you. The final safety evaluation report documents the Staff's technical review of the site safety analysis report and the emergency planning information submitted by the Applicant for the Grand Gulf early site permit site.

The Applicant, the SERI, requested that their ESP site be approved for a total nuclear generating capacity of up to 8,600 megawatts thermal with a maximum 4,300 megawatts thermal per unit. The Applicant declined to submit a specific design at this

stage but the Applicant has submitted plan design parameters that are representative and the intent to be the bounding for those reactor designs such as advanced boiling water reactor, Westinghouse AB-1000, GE Economic Simplified Boiling Water Reactor, IRIS Pebble Bed Modular Reactor.

The Staff has reviewed the Applicant's plan parameters from the standpoint of whether they are reasonable. It is then Applicant's burden to make sure that they pick up parameters such that when they come in for the combined license application with the actual design that it fits within those parameters.

I just wanted to mention that NRC Staff was benefitted from a number of experts' input to the safety evaluation report. In hydrology, we have had the support from Pacific Northwest Lab. In some cases, the lab did the independent evaluation of Applicant's evaluation and conclusions. PNL also supported the site hazard review. In the geology and seismic area, the Staff was benefitted from the support from the United States Geological Survey and Brookhaven National Lab. In emergency planning, the Staff consulted extensively with the Federal Emergency Management Agency (FEMA). So we had a large team involved in reviewing the Grand Gulf ESP application.

The review conducted by the Staff confirmed that SERI application complies with the requirement of Subpart A of 10 CFR Part 52 which governs the early site permit and the Part 52 references the Subpart B of 10 CFR Part 100 which contains the citing criteria. The Staff determined that the Applicant's exclusion area is acceptable and meets the requirement of Part 100 subject to the limitation and conditions identified in the final safety evaluation report.

Permit Condition 1 which I will discuss later in my presentation provides a reasonable assurance that the ESP provides for the control of the exclusion area. The Staff independently verified the adequacy of Applicant's dose consequences calculation from normal operations and concluded that the proposed site is acceptable for constructing a plant falling within the planned parameters with respect of the radiological effluent dose release consequences from normal operation.

The Staff reviewed the Applicant's aircraft analysis and independently verified the assessment of the aircraft hazards at the site. The Staff concluded with respect to the aircraft hazards that the proposed site is acceptable for constructing

the plant that fall within the PPE.

MEMBER-AT-LARGE SIEBER: What would make the site unacceptable from the aircraft hazard standpoint?

MR. ANAND: We have contacted FAA and we have also discussed with them if there is any big airport coming near to the site later on and also we looked at the topography for any local airports near to the site as well as the major international airport which is Jackson, Mississippi which is located is 65 miles northeast. We also looked at the frequencies of the aircrafts that travel in and around the Grand Gulf site.

MEMBER-AT-LARGE SIEBER: Okay.

MR. SCOTT: Jack, could I add a comment? Mike Scott, ACRS Staff. The infallible Early Site Permit Review Standard also contains acceptance criteria for when you need to do further work in that area when the flight densities are too great or the airports are too close or whatever.

MEMBER-AT-LARGE SIEBER: But there are current plants that are within the control zones of major airports already existing and do they meet the regulations?

MR. SCOTT: The Early Site Permit Review

Standard of course is not a regulation. It's guidance.

MEMBER-AT-LARGE SIEBER: Right. But the mere fact that the site may be within the control zone of an airport probably would not exclude that site from consideration for an ESP. Is that true or not true?

MR. SCOTT: I believe we can get Kaz Campe to speak to that since that's his area.

MR. CAMPE: Kaz Campe, NLR. The question of what it would take in terms of aircraft hazards in order for it to be not acceptable if I understand the question, first of all, the aircraft hazards when they're evaluated are evaluated in a cumulative fashion without picking out particular features such as airports or airways, training routes, what have you. All of those things are looked at and in the end, all of them are aggregated into a single overall likelihood or probably of an aircraft crash on site.

And the determination is then whether or not it is within the acceptance criteria as spelled out in the standard review plan. So if the air frequency of an aircraft crash on site exceeds that criterion, then you do not have an acceptance at that point and then you have to go back and have another

look.

That other look can take several different forms. You can refine the analyses looking at the conservatisms. Ultimately this is all done with the assumption that there's no protection. So ultimately you can go into taking into account the structures and their physical features doing structural analysis and so on, consequence analysis. So those are the things that can be examined. But the main criterion is one of whether or not it meets the frequency that's considered an acceptance level.

MEMBER-AT-LARGE SIEBER: Okay. Thank you.

MR. ANAND: With their evacuation time estimates, the Applicant has shown that no physical character stakes unique to the proposed ESP site would propose a significant impediment to the development of the emergency plans. The Staff concluded that the Applicant's proposed major features of the emergency plans are acceptable and meets the NRC requirements.

The Staff had not approved the Major Feature H which deals with the emergency facilities and related equipment. The Applicant has not provided the sufficient information concerning emergency facilities and equipment at this time. Therefore, the Major Feature H is not approved in the final safety

evaluation report.

The Staff has concluded that the Applicant provided an acceptable description of the current and projected population densities in and around the site and properly specified the low population zone and population center distance.

With respect to the Committee's comments on the potential accidents associated with the nearby river transportation, the Staff has updated the discussion of the assessments of the explosions, fire and toxic chemical released in the final safety evaluation report.

With respect to the release of the toxic gases from the chemical such as anhydrous ammonia and chlorine in a potential river barge accident, the Staff has analyzed the accident for the Grand Gulf operating reactors and have estimated that the toxicity level in the control room is acceptably low. Since the design of the new reactor, the control room is not known at this time. The Staff will evaluate such accidents at the COL application stage.

The Staff has identified this as a COL action item in the final safety evaluation report. So based on its review, the Staff has concluded that the potential hazard associated by the nearby

transportation routes, industrial and military facilities, pose no undue risk to the proposed ESP site.

MEMBER POWERS: Your analyses of the transportation accident include examinations of a 5,000 ton blast.

MR. ANAND: Right.

MEMBER POWERS: In that analyses, you conclude that a separation of 2.1 miles would be needed. But then you argue that there is an attenuation of that shock wave due to the bluff and you appeal to a preceding citation that I unfortunately have not been able to retrieve and examine. Can you explain to us why that particular citation is deemed authoritative?

MR. ANAND: May I request?

MR. CAMPE: Kaz Campe. If you could possibly just repeat the last part. I didn't quite catch the last part of your question.

MEMBER POWERS: In essence, I want to understand why that blast attenuates a shock wave so that the separation that goes from two miles down to it says 1.3. I think it's actually 1.1 and the basis for what appears to be a proceedings citation for blast dynamic analyses. The title of it is something

like "Why We Should Use Blast Dynamics In Safety Assessments." I have not been able to retrieve or examine that citation. But for some reason, it's deemed authoritative and that does not smack of an authoritative document to me. So I'm trying to understand why is that authoritative. Why can that be the basis for a substantial reduction in the required separation?

MR. CAMPE: I'm not sure if I was emphasizing the authoritative aspects of it. I was citing a reference of an Arthur D. Little study that was made. That is not to say that that is the only thing I've looked at. That is one of the more complete coverages of the topic and so I thought it would be appropriate to list it.

In my studying this aspect, I have looked at several sources that all seem to have a general indication of the types of reduction factors that one can get from obstacles that are in the way of an incident over pressure wave that said to me that we may not have it precisely perhaps but it's certainly factors of the type that I found in this study by Arthur D. Little and that's what was used as a basis for concluding that it's a reasonable thing to expect.

I have found other calculations in

reference to architectural studies with intentional threats being the focus where deliberate obstacles were being introduced as part of an architectural design in order to reduce the magnitude of an incident blast that seemed to be also in agreement with what this study did.

So in essence what I'm saying is I wasn't focusing or picking out a singular reference and hanging it all on that but actually looked across the board and saw general agreement and just simply picked this one as a representative one. I'd be happy to supply the copies of this if that would help.

MEMBER POWERS: I'm struggling with trying to understand the configuration that was analyzed. If I look at the line of sight between the center of the transportation corridor, actually the bank of the transportation corridor, at the bluff, do I see the top of the facility? I think I do. So now do I get the attenuation from the bluff over the entire height of the facility?

MR. CAMPE: At the very least, the direct line of sight would only be applicable to the incident over pressure wave front when in fact conservatively one includes the reflective wave which is additive and that would be traveling along the topographical

surface and that would be subject to this attenuation by the existence of the bluff. The incident wave is one-half of the total over pressure that one sees on the floor surface facility.

MEMBER POWERS: If my facility is exposed to the incident, it's going to get the reflective. It's going to reflect off the building. You're going to get the impulse from both of them if there's a line of sight. What I'm concerned about is I think the sighting study looked at barriers to completely obscure the facility and it's not clear to me that this facility is completely obscured by the bluff. Maybe I'm wrong. I just don't understand what you're analyzed.

MR. CAMPE: I at the same time am not clear how a direct line of sight without taking into account existence of bluff would necessarily still involve a reflective over pressure wave. I'm hearing what you're saying and I don't quite see it that way. But I would have to look at that.

MEMBER POWERS: I think it can be safe to say I don't understand this analysis.

MR. CAMPE: All I can say is I can try to provide further clarification on this particular aspect.

MEMBER POWERS: Good. Please continue.

MR. ANAND: Thank you. The Applicant has discussed with you the climate and methodology used to determine the severity of the weather phenomena. The Staff has also concluded that Applicant's proposed site characteristics related to climatology and the methodology used to determine the severity of the weather phenomena reflected in the site characteristics are acceptable and contends sufficient margin for the limited accuracy, quantity and the period of time in which the data has been accumulated in accordance with GDC-2 of Appendix A to 10 CFR Part 50.

The Staff also acknowledges that the long-term climate change resulting from human or natural causes may introduce changes into the most serious natural phenomena reported for the site. However, no conclusive evidence or consensus of opinion is available on the repetitivity or natural such changes.

If in the future the ESP site is no longer in compliance with the terms and conditions of the ESP, for example, if new information shows that the climate has changed and the climate and site characteristics no longer represents the same weather conditions, the Staff may seek to modify the ESP or impose

requirements from the site in accordance with the provisions of 10 CFR 5239 "Finality of Early Site Permit Determination" if necessary to bring the site into compliance with the Commission's requirements to assure adequate protection of the public health and safety.

The Staff also concluded that the Applicant's proposed site characteristics related to the hydrology are acceptable with the noted permit condition and COL action items which are discussed later in my presentation. In addition, the Staff independently verified that the flood in the Mississippi River is not a threat to the ESP site. The Staff also consulted with the Corps of Engineers and the Staff independently verified that the ESP site is safe from flooding. The Staff concluded that the proposed ESP site is acceptable from the geology and seismic standpoint and meets the requirement of 10 CFR Part 100.23, "The Geologic and Seismic Criteria."

As we all know, the proposed Grand Gulf ESP site is located in a relatively low seismic region. The Applicant has identified no active seismic faults within the 90 mile radius from the location of the ESP site and no earthquake recorded within a 25 mile radius since 1777.

The Grand Gulf site is a deep soil site. The Applicant has used the regulatory guide 1.165 for identification and characterization of seismic sources and determination of safe shutdown earthquake ground motion. The Regulatory Guide 1.165 describes method acceptable to NRC Staff for the determination of SSE. Therefore, the Staff concludes that the ESP site meets the requirement of Part 100. Finally, the Staff concluded that the Applicant provided appropriate quality assurance measures equal to those required by the 10 CFR Part 50, Appendix B.

The Staff review included all the different area lists in the Slides 8 and 9. The bolded text referred to in the two slides refers to the area that contains open items in the draft safety evaluation report. There were a total of 23 open items in the draft safety evaluation report as indicated on Slides 8 and 9. All those open items have been resolved in the final safety evaluation report. The Applicant has addressed in a matrix form the key open items in their presentation. So I will not go more into details on these open items.

During the North Anna early site permit review, the Staff with the assistance from the Office of General Counsel developed criteria for proper

characterization of permit conditions and site characteristics and COL action items in the final safety evaluation report. We applied the same criteria to develop permit conditions and COL action items in the Grand Gulf final safety evaluation report.

The Staff has proposed three permit conditions in the final safety evaluation report. There were ten permit conditions in the draft safety evaluation report. In addition, the Staff has identified 26 COL action items in the final safety evaluation report which includes the remaining seven permit conditions identified in the DSER. I will discuss the COL action items later in my presentation.

Here are the three proposed permit conditions in the Grand Gulf final safety evaluation report. The Staff proposes to include a condition in the early site permit that might be issued in connection with the application to go under exclusion area control before construction begins under a construction permit or COL referencing the ESP. The Applicant must obtain and execute an agreement providing for shared control of the Grand Gulf ESP exclusion area including Staff's approval.

Permit Condition 2 requires the new unit

radwaste system to be designed with a feature to preclude any and all accidental releases of radionuclides into the potential liquid pathway. The reason we propose this permit condition is that the Applicant has not made the decision as to what a specific design might ultimately be built at the ESP site. Therefore, the exact location of the radwaste storage facilities and the accidental release points of liquid effluent in the ground and surface water is not known at this time.

Since the soil properties such as the absorption and retention coefficient cannot be determined from the location of the potential radionuclides release on the ground, the Staff concluded that the issue could be best resolved if there is no release of radionuclides for the ground water. Accordingly, the Staff proposed this permit condition and the Applicant is okay with this permit condition.

The Permit Condition No. 3 states that the early site permit holder or an applicant referencing the ESP must perform a geologic mapping of the future excavation for safety-related facilities.

I discussed earlier that there are 26 COL action items identified in the final safety evaluation

report. The purpose of the COL action items are to ensure that the Applicant issues and tracks and considers these issues in the COL phase. COL action item identify and highlight what is needed at the COL stage. This is similar to the established concept in the design certification. The list of the COL action items in the SER is by no means all inclusive. They are all listed in Appendix A to the final safety evaluation report.

The following are the major milestones for the project. I would like to highlight the following. The Staff received the Grand Gulf application in October 2003 and the Staff issued the final safety evaluation report on October 21, 2005. The future or the remaining milestones are that the Staff requests that the Committee provides a letter to the EDO by December 22, 2005 giving their recommendations.

The Staff will then issue a NUREG by January 28, 2006 which will include the ACRS letter concerning the Grand Gulf early site permit application and the Associate's and the Staff's final safety evaluation report.

There are mandatory hearings for the early site permit applications. These mandatory hearings will begin in 2006. There are not contentions

admitted in the SSE application. The uncontested hearing will begin upon the completion of the Staff's final involvement of impact statement which is due to be published on April 14, 2006. The ESLP decision is due in December 2006. Commission decision for the Grand Gulf early site permit is expected in January 2007.

In summary, the Staff issued the Grand Gulf early site permit final safety evaluation report on the schedule. The Grand Gulf early site characteristics with the limitation and condition proposed by the Staff comply with the Part 100 requirements.

Reactors having characteristics that fall within the parameters identified in the ESP and which meets the terms and conditions proposed in the final safety evaluation report can be constructed and operated without undue risk to the health and safety of the public.

Staff review concludes that the issuance of the Grand Gulf ESP will not be harmful to the common defense and security or to the health and safety of the public. We believe that the Staff has done an outstanding job in preparing this final safety evaluation report and we appreciate the Committee's

efforts for the issuance of a letter so that we can issue the NUREG by January 28, 2006. This concludes my presentation. I'll be happy to address any questions if you have. Thank you.

MEMBER POWERS: Members have any questions for the speaker? Thank you very much. Mr. Chairman.

CHAIRMAN WALLIS: Ms. Duds has a statement to make.

MS. DUDS: No, I don't want to be a glutton for punishment on this bluff issue regarding the erosion but I just wanted to clarify and see if the Applicant had anything to add regarding the Staff's looking at the topography and identifying a certain attenuation and accepting some credit for that bluff. I wasn't sure that we could provide more information at this time.

MR. ZINKE: We really can't because this was an issue or a subject we took different approaches on and that's why I really can't add anything to that.

MS. DUDS: Okay. Thank you, George.

CHAIRMAN WALLIS: So we now are finished. Anyone wish to anything more on this matter? I think we're really to take a break and we can not start again until our next item on the agenda which is at 10:30 a.m. So we are lucky because of the great job

done by the presenters that we're ahead of time and we'll take a break until 10:30 a.m. Thank you. Off the record.

(Whereupon, the foregoing matter went off the record at 10:02 a.m. and went back on the record at 10:33 a.m.)

CHAIRMAN WALLIS: On the record. Please come back into session. The next topic on the agenda concerns potentially degraded fire barrier materials. I'll turn to my colleague, Rich Denning, to lead us through this one. Rich, go ahead.

MEMBER DENNING: Okay. Thank you. In March and April of this year as you're all aware, the NRC undertook some preliminary testing and demonstrated the hazards of conformity research and that is that you might find out that things aren't the way that you thought they were. So what we're going to hear about today is a little explanation of what actually was observed in these tests on the Hemyc/MT fire barriers and then what we're really here for is to consider the generic letter to be issued to the industry to understand exactly where these materials are being used and to identify plans for how we're going to do corrective actions to the extent that those are required. Sunil Weerakkody will make the

introductory statements.

MR. WEERAKKODY: I'm Sunil Weerakkody. I'm the Chief of Fire Protection Branch in the Division of Risk Assessment. The reason we are here today in front of the ACRS is to personally draft a generic letter that we have put together entitled "Impact of Potentially Degraded Hemyc/MT Fire Barrier Materials on Compliance with Fire Protection Program." The objective of today's presentation is to obtain the ACRS endorsement on the proposed generic letter.

I do want to before I go to the two bullets there introduce the three people who will be in front of you making presentations and answering your questions. First, Mark Salley who is the Team Leader for Fire Research from the Office of Research. Mark led the effort to run the Hemyc testing and gave us the results that we used to engage the industry and ask them to take the appropriate actions.

And Angie Lavretta joined the Fire Protection section about a year ago. In fact, our work load increased because of the Hemyc issues and she's been the lead for the generic letter on Hemyc and she'll be making the presentation on the regulatory actions on the generic letter. She will follow Mark who will provide the presentation on the

research test results.

Then Dan Frumkin used to be a Fire Protection engineer. He's been with NRR for the last ten years. So he's cognizant of all regulatory and risk kind of aspects of Hemyc and other fire barriers for NRR.

Getting back to these slides, as I said the generic letter that we plan to issue for which we are going to ask your endorsement is going to request that each of the licensees who receive the generic letter identify whether they rely on Hemyc and MT and other material for the separation of fire barriers at their plants to comply with the regulations. Then the same letter is going to request the effected licensees to provide a description of the installation, discuss whether the installation is in compliance in light of the new information that we will be disseminating with the generic letter and tell us what kind of compensatory actions they have taken and also tell us if they conclude that they're not in compliance how they plan to establish compliance with the regulations.

CHAIRMAN WALLIS: I guess we'll get into this when we go into the details but I had a lot of trouble understanding how your tests helped the

licensees understand how their particular configurations would be in compliance or not. Maybe we'll get into that in the details.

MR. WEERAKKODY: We would towards the end.

CHAIRMAN WALLIS: You should have done some limited tests and there ask a sweeping review of everything they have to see if it's in compliance. I wasn't sure you were giving them enough information to figure that out. Perhaps we'll get into that.

MR. WEERAKKODY: I could answer that now or I could wait until the end of the presentation.

CHAIRMAN WALLIS: Well, if you have a quick answer.

MR. WEERAKKODY: Okay. I have a quick answer. We gave enough information to question whether they are in compliance and some licensees like for example Vermont Yankee, they concluded that it was sufficient for them to go out and renew and replace their material. Then you have other licensees who basically said to us and in fact are performing additional testing to see whether this applies to them.

CHAIRMAN WALLIS: So they have to do additional testing.

MR. WEERAKKODY: Some licensees are doing additional testing. Dan, did you want to say something?

MR. FRUMKIN: Yes. This is Dan Frumkin of the Staff. Just one more thing, the configurations that we developed for our testing were developed based on input from the industry. They reviewed our test report. We incorporated many of their comments. So with the amount of resources we had to do the tests, this was as representative as possible of the licensee's testing or installations.

MR. WEERAKKODY: Unless you have questions, I would like Mark to provide the RES presentation.

MR. SALLEY: I'm Mark Salley from the NRC Office of Research. I have Roy Woods with me in the audience. Roy was the Program Manager for this. So we should be able to cover everything for you. This presentation is pared down. We could talk all morning about the testing and we have ten minutes to do that. So that's about right. But I would like to give you the quick, verbal presentation and then we have some photos at the end that we'll show that hopefully what I talk about will draw it all together.

Hemyc is a fire barrier material. This

goes back to 1980 timeframe with protecting the same trains within the same fire area, the same problem that the Thermo-Lag was used for. You all remember back from `92 era the Thermo-Lag. This is another material that was used to do that.

It's a very simple fire barrier and I'll pass a piece around for you all to look at here. What it basically is is a high temperature fabric. You'll hear this referred as sag "welding cloth" or you'll hear the brand names, Refrasil or Siltemp is a very common one back in the `80s. Siltemp was probably the biggest manufacturer of it and you basically take the Kaowool which we've looked at before, a ceramic fiber material and you sew it into blankets or pillows or mats. You then go and install this around the raceway and that is the fire barrier system.

While I have this in front of me and I'll pass it around, you'll notice a difference which we'll discuss and that's the color. This is brand new Refrasil material. You'll see that it's a tan color. This is an actual color that was wrapped around where two joints came together. If you picture it, this was wrapped around. It's an actual color that came out of the fire test. You know the color has changed and that will be important later. But the cloth reacts

thermally to the flux from the furnace and it does some interesting things. So it's a very simple fire barrier system. I'll pass it around. George.

Hemyc, it's interesting too when you work these problems. What does Hemyc mean? We've thrown the word around for years. It's interesting that back in the 1980s when Appendix R was first put into play people were wondering how do we solve the problem and a Spanish insulation firm by the name of Hemyc came up with one solution. This is the company that developed it if you will in Spain. Their company name is Hemyc and that's what this barrier system has been referred to.

There's nothing proprietary or anything special about it. Like I said, it's commercial grade Kaowool, two inches of Kaowool, wrapped with a commercial grade, high temperature welding cloth. So it's not like the Thermo-Lag where you had this secret proprietary mix type kind of thing. You could make these up in your garage and Jack could be installing them in Beaver Valley if we were 40 years ago. So it's nothing special, but that's where the name Hemyc comes from. It's the name of the company.

There's also another variety. Hemyc is what we refer to as the one hour barrier. There was

also a three hour version and the three hour version of the material was called MT. It's very similar to the Hemyc. As a matter of fact, when you look at the installation procedures, the first layers that go on are basically the one hour Hemyc configuration. They then put a second layer on where they put some packets of some material in there to absorb the energy. So the two designs are similar both one and three hour. One hour is predominant. I think there's only one or two plants that use the three hour.

VICE CHAIRMAN SHACK: Do these packets absorb energy by a phase transition or something?

MR. SALLEY: I'm trying to remember. Roy, do you remember what the chemical was in the packets? It was noncombustible.

MR. FRUMKIN: Yes. It was hydrate. It's a saturated salt substance with water and as it heats, the water boils off.

MR. SALLEY: Theoretically when the packet is broke, it looked like sand running out. But that was the design.

Testing, it was straight up testing, full scale testing. It was done to NFPA 251 which is the same as ASTME 119 as far as standard time/temperature curve. As far as the amount of instrumentation, how

the configurations were done, we used Generic Letter 8610 Supplement 1. So the testing was standardized. It's the same standardized testing we've done since the mid `90s.

Just to review quickly, we had some options in here. Graham, you would alluding to how we tested to represent industry. Let me answer that now or at least take a stab at it. When we did the installations, we followed the vendor manual pretty much to the letter and we had the original vendor Promatec. So we used their people.

We had continuity as the craftsmen who did the original work. We had as close to that as we could get. We followed the vendor manual to the letter. Where they said a minimum six inch collar, we had them cut a minimum six inch collar and that's how we set the testing up.

The standard says to test empty which will give us our worst case configuration. We did that. We also had room inside the test deck because the lessons we had learned from Thermo-Lag was that if you have a heavier thermal mass you have more thermal inertia. It takes longer to heat up. The temperatures tend to run cooler.

Based on that experience in the spare

areas in the deck, we put the same configurations but we fully loaded the conduits. And before we lit the furnace, what we fully expected to see if we did see failures was that the empty ones being lighter would fail first and we'd see progressively as the heavy conduits would last longer in the furnace. That's what we were looking for when we started the testing.

Again, the criteria, it's the average temperature rise of the raceway being less than 250° for acceptance with no single point exceeding 325° Fahrenheit above the ambient start of the test. There would also be a hose stream test. Again we were using the same hose stream we used in Thermo-Lag and it's often used for pen seals and that's the fog nozzle test.

The first test was conducted in March of 2005. In here we put an array of conduits. We had two one inch, two inch and a half and two four inch, one being empty, the other being fully loaded. Again we were trying to look for the difference that the cable mass gives us. We also had one, if you will, typical sized junction box in the assembly and one thing we noticed about the vendor manual, again lessons learned from Thermo-Lag, was they only required the structural steel to be protected three

inches away from the barrier.

Now other vendors have used as much as 18 inches and the physics being the same, if you heat up the tube steel or the Unistrut you know it's going to conduct heat energy into the barrier system. We thought three was awful short and we didn't want to biased the tests just because of this thermal short we would lose the data on the raceways. So we separated the supports from the raceways. The raceways hung supported outside the test assembly and we had separate instrumented supports so that we could gather the data to see the heat transfer back through the material.

What we saw when we did the testing was that the raceways from the one to the four inch that failures occurred between 33 and 43 minutes. The other thing was that it was random in the failures. We didn't see the empty one inch fail first and the loaded four inch fail last as we had expected.

CHAIRMAN WALLIS: What does failure mean in a test like this?

MR. SALLEY: Failure means that you exceeded the delta T max so that 325° single point --

CHAIRMAN WALLIS: Which doesn't mean they all fell apart or something?

MR. SALLEY: No. It means thermally you did not keep the interior of the conduit cool enough to insure the functionality of the cable. Again, our results were mixed. We didn't see them failing in the order we expected them and when we looked at the assembly what we had discovered really for the first time was a phenomena of thermal shrinkage.

If you see the piece of Hemyc that's being passed around, you'll notice that the color has changed. It's changed from a tan to a white. What happens here is when the material is going through this change it actually shrinks and during the shrinking process what we now saw was breaches in the barrier. So at the point where it shrunk inside the testing, we now had a breach which exposed the conduit to the furnace which you could see the thermal couples peg right up. And that failure was random throughout the assembly.

CHAIRMAN WALLIS: Someone is going to ask this sometime I'm sure. Now we had Thermo-Lag and it failed tests and we had Kaowool which failed and this stuff which has been installed for some time is now failing. One would think that all these tests would have been done ahead of time so that you don't put stuff out there and then have to take it off again and

find something better. It seems to have happened three times now. What's going on here?

MR. SALLEY: There's a number of reasons for that, Graham. I'll answer part of that and I'll let Dan answer the regulatory part. If you go back to Brown's Ferry `75.

CHAIRMAN WALLIS: A long time ago.

MR. SALLEY: I remember, but I guess I'm getting old. There was no test for penetration seals before Brown's Ferry and after that, all of a sudden we need this test method for penetration seals. This is important. Then ASTM and UL and all the factory and everybody developed test standards. When this was installed in the `80s, again follow E-119. E-119 is for building materials and follow the section on partition walls.

Well, that criteria is very subjective and open. The NRC solved that problem by issuing Generic Letter 8610 Supplement 1 in the mid `90s as part of the outfall of Thermo-Lag and it's interesting that the testing bodies, the people who do this for a living, ASTM, in `95, they issued their first standard. So I think what you're seeing on this is when you standardize the test method and then you go back and look at these things, then you start to

really see what happens.

Testing was performed on Hemyc in Spain. There were some small scale tests. Dan knows a lot about them. He can add to it. But that's what the original approvals were based on. Anything you want to add, Dan?

MR. FRUMKIN: Yes. Just that the testing in Spain was similar, large furnace, 10 feet by six feet kind of scale of furnace with the standard temperature in a typical configuration. But we were unaware or at least probably the analysts or the reviewers in the early `80s weren't considering thermal mass. They weren't considering different kinds of configurations and so forth in their analysis. So their review and this was reviewed in the early `80s by the NRC Staff didn't take into consideration a lot of the different factors that we learned from Thermo-Lag.

CHAIRMAN WALLIS: It was a shrinkage phenomena or something that you think would be discovered in these earlier tests.

MR. FRUMKIN: It was a smaller scale test. So the shrinkage is per foot. But one of the points on the smaller scale test is like on building materials if they have a ten feet of this conduit we

put thermal couples every six inches. They put thermal couples at one location on the ten feet. So if the shrinkage did not occur if they didn't put it at a seam, they might not have noticed a temperature rise. We got smarter. But the -- Okay.

MR. SALLEY: Dan is absolutely right. Standard E-119 test, you would use as few as ten thermal couples. When you look at the tests we run here, we use hundreds of thermal couples because we're measuring so far along.

The structural steel, again to touch on your question, Graham. The vendor manual had two methods of installing the material. You could either put the two sections together and put a collar over it. That piece you see passing around, this is an actual collar, a six inch collar. Or you could do an overlap joint if you picture a bell and spigot in old case iron plumbing. So when we say we tested what industry did if they followed the vendor manual, here are the two joints. We tested both types of joints.

The third thing you could do that we saw from a lot of the installations in the field was people had stitched it together, if you picture a baseball stitched together. So we did the junction box in that manner where we stitched the junction box

tight like a baseball and that one gave us some real problems in the first testing because --

CHAIRMAN WALLIS: They should supply them with zips or something.

MR. SALLEY: Yes, zippers would have been good. They hand-stitched it with a noncombustible thread. The shrinkage really caught us off guard with the junction box because when the shrinkage occurred, now we had the seams open and when the seam is open, the thread broke. When the thread broke, the fire barrier fell off. So that was clearly the weakest link was the stitched design.

Structural steel. It's good that we tested it separate. Again, if the physics hold up here, we can see the Unistrut. It conducted heat in at the three inch point at 22 to 32 minutes on average and the larger tube steel again, you have a larger cross section to heat up. So it conducts heat better. It failed as early as 13 minutes.

So this shrinkage was something new to us. We did not expect to see this. It messed up our nice test program that we had everything all laid out on quite truthfully. So we had Sandia do a little extra testing on that for us which we'll touch on here in a minute. But there really is a phenomena where the

material shrinks.

The first test was conduits and junction box. The second test, we had three tests in total, was on cable trays. So here we had two cable trays, a 12 inch and a 36. We tested these empty because just of the economy of it, the space inside to test that. We also put in some air gaps.

The junction box bothered us from the first test. So we had a little bit of room left in this test that we installed a junction box. We installed it the same way but this time we added the stainless steel bands that we had also seen in industry to try to keep it together.

What we saw was in the cable trays that we had failures between 18 and 35 minutes again here on temperature. The junction box with the banding, the banding did help keep the barrier system on the box this time. It did not fall off but we still exceeded the temperature at 31 minutes and the air drop lasted approximately 32 minutes.

Again, when you introduce this joint failure, it's a random failure in the test. So what you think is going to happen and what you want to say was going to happen if that joint opens up because of the different design that's skews your results.

CHAIRMAN WALLIS: So it failed in about half the time. It was supposed to last an hour. It lasted a half an hour.

MR. SALLEY: Yes. If you just had to throw a number up here.

CHAIRMAN WALLIS: It sounds like a big change. It's a big loss of properties for that to happen.

MEMBER DENNING: When you say loss of properties, you're going to see what's going to happen is it just separates.

CHAIRMAN WALLIS: It just opens up. So the effect of conductivity or whatever it is really drops or it's lost completely.

MEMBER DENNING: Right. The conductivity of the Kaowool is well known. There's no problem with that.

MR. SALLEY: Richard is exactly right. There's a slide in the back you can look at and you want to say from engineering background this is just Fourier's Law.

CHAIRMAN WALLIS: So it's a heat leak really. He's created a heat leak.

MR. SALLEY: Right. And we can solve this in the uniform properties and do the calculation and

this should all be good. But when you get that joint movement and opening here that's what gets you. Again we saw the same thing as we saw in the first test.

The third test was conducted in April. This was for the three hour assembly. Again we followed the same format. We're looking at an array of conduits, one inch, two and a half and four inch. We have them empty and loaded again. We're trying to follow that standardized format, junction box and an air drop. As I understand it, there's not much or any really of three hour barriers on cable trays in the industry. So our test here was strictly on the conduits. Again we had the two steel.

You can that again we're looking for three hours here and our failures are occurring on the conduits between 87 and 113 minutes. So again we're hitting that halfway, Graham, like you were saying. The junction box is 122. The cable air drops 159 minutes. Structural steel was roughly good for an hour the way it was protected here. It was protected a little further out.

Again we saw the same seal shrinkage. I guess we could test this 100 times and 100 times we would see the shrinkage. So we're pretty confident with that. We saw that in every test. This test had

18 inches for the structural steel support versus the three and the one hour design and you could see that that comes up a little bit short also.

CHAIRMAN WALLIS: Now does it shrinks because of temperature?

MR. SALLEY: Yes.

CHAIRMAN WALLIS: You would think that the inside would shrink almost immediately because it's hot and the outside would shrink later.

MR. SALLEY: The outside of it is close to the flux from the furnace. So that would be the first thing heated up.

CHAIRMAN WALLIS: That's the outside that's hot.

MEMBER DENNING: It's the fabric that's shrinking.

CHAIRMAN WALLIS: That would shrink almost immediately, wouldn't it, because it's the hottest part? It's the outside.

MEMBER-AT-LARGE SIEBER: The outside. Right.

MR. SALLEY: Right.

MEMBER DENNING: But you understand it's fabric.

CHAIRMAN WALLIS: It's the fabric that's

shrinks but the fabric is on the outside. You presume the outside is the hottest. So I would expect it to happen almost immediately on the outside and then later on progress to the rest of it.

MR. SALLEY: The inside. Yes.

CHAIRMAN WALLIS: But something would happen almost immediately, wouldn't it?

MEMBER-AT-LARGE SIEBER: On the outside.

MR. SALLEY: Immediately is a little too quick is what the Sandia test will tell us.

CHAIRMAN WALLIS: Yes. It is on the outside that's the hottest part.

MR. SALLEY: Yes. Again we saw the same shrinkage. Let's flip to that Sandia slide next, Dan. Sandia had done some small scale test and we saw this in the first test. We wanted to understand more about this welding cloth. And they had done some small scale radiant flux tests.

A couple of interesting points here. Kind of the history of it. You will hear the term sill temp used a lot and we use the term Siltemp if you read how we started this out. Like I said, Siltemp was if you think of Kleenex. You don't say give me a paper tissue. I want a Kleenex. It's a brand name. Siltemp was the big brand that was used.

When we did the testing we wanted to make the assemblies as representative as possible. So let's use all of the same things that industry did and the vendor had actually allowed a couple different manufacturers. So we went out in search of Siltemp. Lo and behold, Siltemp is manufactured I believe in Delaware and the company that manufactured Siltemp two years ago when the hurricane came up this way actually hit that company and took them out of business.

So the Siltemp manufacturer, we could not buy Siltemp brand welding cloth. So we used another brand that was Refroseal (PH) and we thought wait a minute. Maybe we got a bad material here or this different material made a change. So we had gotten some New Old Stock Siltemp from the `80s from one of the licensees and we had the material that we used in the test. These were sent off to Sandia, put in an radiant panel test and what we were looking for was is the shrinkage measurable.

So given the two samples side by side with the radiant flux on it, how did they react? Basically, what Sandia told us is around 800° Fahrenheit is when this phenomena wants to start taking place and for all intent and purposes how they measured it, the shrinkage was uniform. We were

comfortable that our tests were representative of what was actually installed.

Shrinkage again was on the order of five to ten percent. They did a nice simple test where they cut scale pieces, laid them side by side, had them scaled up, photographed it as it ran.

CHAIRMAN WALLIS: I presume it shrinks in both directions.

MR. SALLEY: Yes. There's a whole science of fabric which I know very little about and you can get into whether they're cross-weaved and that.

CHAIRMAN WALLIS: So it depends on how the weave is related to the way it's cut and everything.

MR. SALLEY: Right. The shrinkage was fairly uniform. For our purposes, we felt comfortable here and we were done.

Industry. Again, we put these results out. We had a meeting in April where we shared all this information and we shared all our test reports with all our stakeholders mainly. They needed to confirm that what research did is the facts of the matter and that's good. So they ran a second test or actually took one of ours that was left over and put their barriers on.

This was run in August of this past year.

It was basically a user group from industry. They had some of the original materials from 1980s. So they could back in their power storage warehouse, procure the material out and run the test. They also had done some minimal upgrades that some of the plants had done in their site-specific installations which they included in the test. We thought it would come down to instead of using a six inch collar like the vendor manual some utilities used an eight inch collar. Some use as much as a 12 inch collar.

The minimum overlap for the bell and spigot joint was two inches. Some plants in their site-specific may have gone three or four. So they were trying to test some of those upgrades. We used half inch stainless steel banding. Some plants used a larger banding. So a lot of this was included to get the feel for this in their testing. Again, they ran their testing and the results basically were similar. You saw the shrinkage. All the barriers failed before their minimum one hour rating and the problem is there.

So in summary, we've completed our three tests. The reports have been publicly available since April. We've handed it over to NRR. We're continuing to support. If there's any more testing from the

industry, we'll be happy to witness it. That's I guess in summary why we test, the importance of actually doing the testing is what we found here.

I would like to go and show you quickly before I run out of time a couple photos here that hopefully will bring this all together. This first photo is what the Hemyc looks like before the testing.

CHAIRMAN WALLIS: If you have a big enough collar, then the shrinkage wouldn't matter. I mean it would shrink but it wouldn't open up a gap.

MEMBER-AT-LARGE SIEBER: But layers on it.

CHAIRMAN WALLIS: If you have a big enough collar, it shrinks. The other one shrinks but there's still integrity.

MR. SALLEY: Right. You know an interesting thing about this, Graham. It's funny like I said. The more you work on it the more you learn. But this material if you had done welding cloth for a living is when you talk to the people who do this for a living in their mind, this is old knowledge. We make a preshrunk version. That was news to me. All the welding cloth I've ever used over the years has always been the tan material. I didn't realize you could get a preshrunk and the way they preshrink it is they heat it. We said "Wow. That's kind of like a

eureka here." But when we talked with the vendors and said why didn't you use the preshrunk version, the answer was it's a lot harder to work because in the heating of it apparently it stiffens it and it makes it much harder to sew, much harder to do and that's why we went with the other material.

MEMBER-AT-LARGE SIEBER: Pretty good stuff if there isn't a fire.

MR. SALLEY: Yes, it's noncombustible. I can say that in its favor. There's an actual piece that came out of the test that it's clearly noncombustible. Take a look at this photo real quick and I'm going to turn around and point a couple of things out to you. You can see a collar installed there. Of course, the two pieces butt up and the six inch collars is three inches on either side. The junction box is in the background there.

You'll notice between the collar and the junction box you can see one of the bell and spigot joints there with the two inch overlap. Again notice the color. It's tan. The furnace, we're looking through the door of the furnace before it's buttoned up for the test.

This one is the assembly just completely one hour, our first test, just completely one hour.

It's now being craned off of the top of the furnace. It's getting ready to be trolleyed over for the hose stream test. Probably the most dramatic thing about this one is if you look in the center you'll see our junction box and the barrier is laying on the floor of the furnace and you can see the junction is quite warm. It's actually cherry red there on the inside. So that was the worst of our failures.

If you look at the next slide, here is what you see on one of the collar joints and because of the shrinkage, and I say the randomness of the shrinkage, is the bands are installed by hand and the craftworkers say that's tight and you have to have at least a half inch indented is the spec to make sure that it is tight. So there is a randomness. It's not like we have torque fasteners.

What you would see is that when the shrinkage started occurring in the main pieces of the Hemyc the collar would want to slide to one side or the other. They wouldn't slide uniformly. They would slide to one side or the other.

CHAIRMAN WALLIS: If the collar was big enough, it wouldn't come out.

MR. SALLEY: Hopefully one would think that. Like I said, there are some different

variations. It's interesting but I remember looking at the vendor manual and Roy and I were when we saw this did we do it right and we started self-checking quite feverishly. And going through the vendor manual, yes, six inches was what was used. However, there were notes that I believe Gonet had a special note in the vendor manual which was odd to me that said we use 12 inch collars. So maybe that plant had a little different design. But this was a typical failure.

Again here's another view of looking at it. You can see the raceway where it's clearly exposed and once you expose the raceway it's instrumented. The thermal couples pick that up in a matter of minutes.

MEMBER APOSTOLAKIS: Does this imply that the cables inside also would fail?

MR. SALLEY: Yes. When you look at the temperatures when the furnace is 1,000° at ten minutes, 1,700° at one hour when you look at the final temperatures here from the testing, it was common to see them over 1,000° which we know thermoplastic, thermoset, would have clearly failed.

MEMBER APOSTOLAKIS: Thank you.

MR. SALLEY: Again here's another view of

the collar. This next one here is a cable tray and this one is quite interesting. Cable tray, take a look at it. The cable tray again had a two inch overlap. So this isn't rocket science. You measure your blanket out so you can wrap the tray with at least two inches. You sew the blanket up. It's very labor intensive and you bring the mat or blanket out and you wrap it around the tray. You pull the bands and you've installed the barrier.

When you bring this thermal shrinkage in as the material starts to constrict and shrink, you can see that it opened the whole side of the cable tray up. So the whole internal of that cable tray was open to the furnace and like I said, if you go back and look at the bare number rates and our surrogate cables as we call them for instrumentation, the temperatures are all over 1,000.

So there's some more summary material that I've put there if you would like to look at later. You see the randomness of the failures and some other background but I've used more than my time. If there are no questions, I'll turn this over to Angela.

MEMBER DENNING: Questions? Okay. Please.

(Discussion off microphone.)

MS. LAVRETTA: Thank you. I'm Angie Lavretta. As was said, I'm with the Fire Protection branch, Division of Risk Assessment and I'll presenting the final draft generic letter on the Hemyc/MT fire barriers. As far as an overview of the presentation, it will include a little bit of the history, current status, the generic letter contents, public comments and comment resolution and also a little on the CRGR review and we'll touch on the risk assessment and conclusion.

As Mark mentioned, the fire barrier issue was first raised in the 1980s with Thermo-Lag. Generic Letter 9208 was issued which called for the reassessment of other fire barriers types at that time and in the same timeframe, NEI had formed a fire barrier advisory committee that had concluded that the concerns raised for Thermo-Lag did not apply to Hemyc.

An action plan was developed by the Staff to resolve the Thermo-Lag issues and in 1999, upgraded fire protection program inspections were implemented. And also in `99, it was these inspections that began raising NRC concern about Hemyc performance. In response to those concerns, the Staff initiated the confirmatory test that you heard discussed by Mark.

The recent background is that these tests

revealed a previously unidentified failure mode. We issued an information notice highlighting this finding in April. Two public petitions were filed calling for prompt NRC action based on the results of these tests. So we needed to plant-specific assessments and drafted the generic letter and published it for comment in July.

CHAIRMAN WALLIS: I'm curious about whether the public petitions have anything to do with this. Did you only act because the public petitioned?

MS. LAVRETTA: No. We started this action with the information notice. But the petitions were significant.

CHAIRMAN WALLIS: Just gave you added stimulus.

MS. LAVRETTA: It added a lot of attention to this issue. The public meeting was held immediately after the public comment period on September 29th and the industry took the opportunity to ask questions and to expand on comments that they had provided. The two main areas of comment were focused on the interpretation of the Hemyc test results and a risk informed alternative especially for those plants applying 805. And the staff was able to provide additional guidance and details. The comments

were incorporated into the final draft.

Mr. Neal covered this in his introduction.

CHAIRMAN WALLIS: Now you get to my question. Do you think that your tests enabled them to tell whether they're in compliance? Suppose they have longer collars or bigger overlap or blankets or something. Do they say we're now in compliance because ten percent shrinkage won't cause a problem? Is that what they're going to do?

MS. LAVRETTA: Actually they did run their own tests and I was able to observe with Roy and they did use larger sized collars and it did result in some lessening of the shrinkage but the temperature effects were the same.

CHAIRMAN WALLIS: The same?

MS. LAVRETTA: It was consistent with the results that we came --

CHAIRMAN WALLIS: But presumably the tube didn't pull out of the collar, but the effects were still the same.

MS. LAVRETTA: The temperature effects were in the same ballpark.

CHAIRMAN WALLIS: It's hard to figure out why.

MR. SALLEY: I think that two points on

that. If the system remained intact and it didn't experience the shrinkage phenomena that we came up with, I think you would still fall short. We had expected to fall short and we expected to fall short with a gradient. That's why we tested a four inch loaded with 100 lbs. per linear foot of copper. We thought that four inch would clearly pass. So we were looking for where does the failure point occur and I think you would come up short with the material that way.

The second thing that I did on that, Graham, was I called a bunch of residents and I said give me some pictures of what's out in the plants and let me sure that what we got is realistic. When you're building these assemblies in a test lab, life is pretty good. I mean you have to space things out real nice because you don't want furnace shadow during the testing and you have a lot of room to work.

What you see in the field looks very different than what we tested because they had to work around obstructions and piping and heavy four inch tube steel supports. So I guess there could be some unique configurations. We ran into that in Thermo-Lag where all the vendor stuff was a single cable tray.

But when I looked TVA for example and what

was actually installed the guys got creative. If they needed to protect three trays, they could wrap three trays individually or you could just build one big box. And that same creativity, I think, ran over into Hemyc and you'll see a lot of that same creative installations that are out there.

CHAIRMAN WALLIS: But there could be some guidance that says that for so many feet of this stuff you must have an overlap of so much or something. There's nothing like that though, is there? They have to figure that out themselves.

MR. SALLEY: They have to figure that out.

MS. LAVRETTA: And they've said that they are -- I don't know what the intent is but it was discussed at the public meeting that some of these licensees would be doing additional testing because of the wide range of configurations they have and that they may be using that as a basis for some other conclusion.

MEMBER DENNING: It certainly is not the responsibility of the NRC's confirmatory testing program to provide all the answers. It's merely to identify that there's an issue in my opinion.

MR. WOODS: Could I add a comment? This is Roy Woods. Angie and I were the ones that went and

saw the industry test. I've spent about a week looking at the industry's data and what it shows is although the joints didn't open as obviously as our test because they had more overlap and whatever as you look at the data you see that the joints were in fact opening to a certain extent and you tended to see the higher temperatures near joints. In fact, one of them actually opened a small amount.

The added overlaps and whatever did help but it certainly didn't fix the problem and the shrinkage was about the same. The actual physical percentage shrinkage was about the same. You just had more overlap and more margin but it still didn't save you.

MS. LAVRETTA: On Slide 8, this is the generic letter purpose which again is to request that addressees identify whether Hemyc and MT is relied on for separation and/or safe shutdown; to request that effected licensees provide a description of their installation; a discussion of whether the installation is in compliance in light of the new information; description of the comp measures; and the corrective action schedule and require a written response in accordance with 50.54(f).

The generic letter request are

specifically that first within 60 days you provide the following: a statement on whether Hemyc or MT fire barrier material is used at their plant and whether it's relied on for separation and/or safe shutdown in accordance with 50.48 or other regulatory commitments including whether the Hemyc or MT is credited in other analyses and a description of the programmatic controls in place to ensure that other fire barrier types will be assessed for potential degradation in light of new information.

CHAIRMAN WALLIS: Now that's a very broad question, isn't it? Even if they're not using Hemyc, they're using all kinds of other stuff. Now they have to figure out if it could degrade.

MS. LAVRETTA: Well, we had issued --

CHAIRMAN WALLIS: You haven't given them information about that. They may use something which you've never tested.

MS. LAVRETTA: We had issued Generic Letter 9208 which did not specifically request a response to the question but stated that the Staff expectation was that the licensees would reassess their other fire barrier types.

CHAIRMAN WALLIS: Goes beyond Hemyc. It goes to all barrier types.

MS. LAVRETTA: And that's what this expectation relied in 9208 as well. So this is more or less consistent with the expectation then but because this new information has come to light and apparently wasn't found then, we've asked for a response to what they have in place.

CHAIRMAN WALLIS: So which is the next one we're going to hear about? We've heard about Thermo-Lag, Kaowool and Hemyc. What's next on the list? Are there lots of different kinds out there?

MS. LAVRETTA: From my understanding, Thermo-Lag was the widely used brand. Kaowool and Hemyc have been identified. We're not likely -- I don't know if there are any others.

CHAIRMAN WALLIS: They must use something else now. Right?

MR. SALLEY: There's a variety obviously out there. Thermo-Lag had 80 percent of the population and that was because of its better ability for capacity. So it had the lion's share and it clearly was the bigger ones. Kaowool/Hemyc, 3M had barrier systems.

Now 3M has done a lot of work with their Interam. They read that last sentence in Generic Letter 9208 and I believe there was some activities

with plants that had used the 3M. There was also stuff from France, Mecatiss, that had come in if you remember during the Thermo-Lag era and I believe that was tested and reviewed by the Staff and it was installed in a number of plants.

MR. FRUMKIN: And other material, Darmat, but Darmat and Mecatiss and for the most part as far as we know Interam have all been tested in 8610 Supplement 1 methodology with the E-119 criteria. For what is remaining, there is high confidence.

But to clarify something Mark said, we may have reviewed the tests for Mecatiss, Interam, Darmat. We don't approve them specifically because we're not going in and verifying that every configuration is exactly like what was tested. So just to clarify that. Something could always happen. But there is a much higher confidence that the licensees have followed all the guidance for the currently installed materials.

MS. LAVRETTA: And we're relying on the updated inspection program to identify this which it has done for Hemyc.

Slide 10, the second request that within 60 days effected licensees address the following: whether or not Hemyc and/or MT is degraded in light of

the new findings.

CHAIRMAN WALLIS: What does that mean? It hasn't been heated up 842°, has it? So how is it degraded? If it's still yellow, it's still bad, isn't it, degraded or not?

MS. LAVRETTA: The potential based on the configuration testing is that it's degraded if they have a different configuration from what's tested.

CHAIRMAN WALLIS: So it's the configuration that's degraded.

MEMBER DENNING: Yes, those words are funny but I think they are virtually out of the -- Those are the words that I think are used. This is a pretty good reproduction of the words that are actually in there by what it really means by degraded which I think obviously from your comments means that it is incapable --

MS. LAVRETTA: Of performing its intended use.

MEMBER DENNING: Presumably incapable of performing its intended use. Whereas as you read it, it sounds like it sat through and over the years it's been there. In some sense it got degraded. That's the way you read that unfortunately.

MR. SALLEY: Another way of thinking of

that is the fire resistance is indeterminate I think would give you a different flavor.

MR. FRUMKIN: And just to give you an example of a hypothetical licensee that could read this and say we are fine. If they have a license condition or a license commitment that says the Hemyc is only required to last for ten minutes, if that's what they committed to, they could look at our tests and see that all of our tests lasted ten minutes and have high confidence and answer this question and say ten minutes is good enough. We're not degraded.

MR. WEERAKKODY: In fact then, don't we have one of the Indian Point plants that are using it for 30 minute?

MR. FRUMKIN: Right. So their 30 minutes is in the middle ground. But we're not concluding from our testing that plants are degraded. That's up to the licensee.

CHAIRMAN WALLIS: Thirty minutes is a little dangerous it seems to me if it's going to shrink when it gets hot and if the fire is close enough, it's going to shrink pretty darn quickly. I'm not sure there's anything magic about 30 minutes.

MR. FRUMKIN: It's degradation with regard to their licensing basis. Are they in noncompliance?

So the material's never going to last an hour based on our testing.

CHAIRMAN WALLIS: But you see what I mean. The Kaowool's fine. The insulation properties are fine.

MR. FRUMKIN: Right.

CHAIRMAN WALLIS: But the shrinkage could happen it seems to me very early in the event if the outside gets hot enough quick enough.

MR. FRUMKIN: The results of the testing is that we didn't exceed this temperature of 325°.

CHAIRMAN WALLIS: Presumably if I took a torch and laid it on this stuff, it would shrink immediately, wouldn't it?

MR. FRUMKIN: It has to get up to a certain temperature.

CHAIRMAN WALLIS: That's Right. But it does do it quickly.

MR. FRUMKIN: And then if you see on the pillow, the outside would shrink very quickly but the inside has a lot of insulation. And if you have overlap, it could take awhile.

CHAIRMAN WALLIS: Yes.

MR. FRUMKIN: It turn into a trapezoid and then that leading edge would begin to shrink. So if

you look at all the testing outside of the supports and the junction box, it lasted a good 20 some minutes.

CHAIRMAN WALLIS: You don't know how much time. It seems to me the testing ought to lead to design requirements and some sort of a specification that overlap should be so much or something so that they know when they're in compliance and when they're not. Maybe that's industry's job.

MEMBER DENNING: Yes. I think the test is really defined and the industry's responsibility is to demonstrate that they can meet the test requirements.

CHAIRMAN WALLIS: But it should lead to some design specs or guidance or something rather than just figure it out for each thing yourselves somehow. Maybe that's something that industry should be doing.

MR. WEERAKKODY: Yes. In fact, Dr. Wallis, the purpose of the initial testing is to just find out how to do the modifications.

MS. LAVRETTA: Also within 60 days, effected licenses are requested to provide justification for no corrective actions, a detailed description of the Hemyc/MT installation, a detailed description of their comp measures and corrective actions implementation schedule including the intended

licensing actions or exemptions.

Thirdly, after implementing corrective actions but not later than December 1, 2007, they are requested to provide confirmation of compliance via corrective actions and a summary of the evaluation used for their safety assessment.

MEMBER APOSTOLAKIS: But I'm just curious how you come up with these dates. Why not October 1st?

MS. LAVRETTA: Oh, October 1st. We wanted to give them a full two years allowing them the outage time to implement these corrective actions while they're down. We figured two years would be sufficient and we expected the issuance in December of this year.

MEMBER APOSTOLAKIS: But also it seems to me in the back of your mind to have the probability or the frequency of occurrence of fires that would require.

MEMBER DENNING: And they're going to get to that because they have done risk assessment which indicates you don't have to run off and immediately do it. But you're right, George.

MS. LAVRETTA: Also we have compensatory measures in place. We've been working with the

industry since the findings of this test in April and have done a case by case dialogue and interaction to ensure that they have compensatory measures in place now.

Slide 12. We received public comments --

MEMBER APOSTOLAKIS: I'm just curious though. What is the mean time between fires of this size? It has to be much longer than this. Right?

MR. FRUMKIN: Right.

MEMBER APOSTOLAKIS: It has to be much longer than two years.

MEMBER-AT-LARGE SIEBER: One every 40 years.

MR. FRUMKIN: We did a safety assessment and that used that kind of information with the frequency of certain fires. We considered only a few types of fires like a large piece of switch gear or an oil fire that could create a 1,700° temperature for an hour or something like that and based on our analysis to get that temperature to shrink the Hemyc would be a very rare occurrence.

MS. LAVRETTA: The originators of the public comments were PCI Promatec who is the current vendor, Progress Energy, NEI, Duke, STARS, the Strategic Team and Resource Sharing, and

Exelon/AmerGen. We received a total of 29 comments.

We divided the comments into eight categories which are listed here. First was the comment on the back fit determination. This comment was also reiterated by CRGR and I'll go into this into more detail on the slide.

The comment on schedule which stems from comments relating to the licensee burden, in essence the plants that had 18 month cycles and a large amount of Hemyc expressed some concern for meeting this schedule and our response to them was that we would consider those unique situations on a case by case basis.

The comments on risk informing, questions asking on the application of 805 and whether we would seek prior NRC approval before they would apply and of course we said that we would not. This was something that we would only expect prior approval of those plants that did not incorporate 805.

Comments on Generic Letter 8610 Supplement 1, Miscellaneous -

CHAIRMAN WALLIS: One of the significant ones there was that the ROC seemed to be using generic communications to impose regulatory requirements. This is something that I think is taken up in a report

by the Inspector General. There's a concern about that in another context that generic letters are not really supposed to impose regulatory requirements.

MS. LAVRETTA: I can go on. I'll discuss this in the next slide.

CHAIRMAN WALLIS: I just wondered. Does that seem to -- It just struck me as being possibly an important issue.

MS. LAVRETTA: I'll discuss that in the next slide. There were comments also on the details, the wording and references which we incorporated and we did not receive comments on the burden estimate and you'll note that the numbers that you see on the right column fell into more than one category so that the sum is not equal to the total number of comments.

We met with CRGR last week, November 29th, for their review and the two main comments or questions revolved around the issues of back fit determination which Dr. Wallis was just referring to and the change in the estimate of the impact on the industry. On the back fit determination, the proposed generic letter referred to the information request as a compliance back fit and the comment we received from CRGR was that an information request was not a back fit. We addressed this by removing the incorrect

references to back fit.

The CRGR also was concerned with the application of 8610 Supplement 1 that the Staff expectation of this application may be a back fit. Because we did not provide a clear distinction in the generic letter between the acceptance criteria and NFPA-251 or ASTM-E 119 and the clarification guidance in Generic Letter 8610 Supplement 1, the Committee recommended adding this distinction. So in response, we clarified the use of NFPA-251 as the acceptance criteria and the use of 8610 Supplement 1 as guidance for the detail of the thermal couple placement and number.

The second issue was the change in the estimate of the impact because we had prepared a simplified value impact analysis following the public release of the draft or estimate change. But the change was minor and the conservatism large. So no revision was needed.

A simplified risk analysis was done with the assumptions listed here based on the results of the test that you heard described earlier by research including a sensitivity case. Conservatism was captured consistent with the fire protection SDP and configurations assumed were those estimated by the

staff to be typical and the determination was that we did not expect any high risk situation.

MEMBER DENNING: Let me ask you a few questions about that so we can understand. Typically in these applications, they are done where there is fixed fire suppression and detection available. Is that a true statement?

MR. FRUMKIN: Yes. Because a one hour barrier requires suppression.

MEMBER DENNING: Right. So now if you had a fire, even an oil fire, if you actually had the suppression system working would it prevent the damage? Is there a full protection really provided by the suppression system itself?

MR. FRUMKIN: We don't give -- The fire protection SDP never gives 100 percent effectiveness for a suppression system.

MEMBER DENNING: But the expectation is that at least you would wet the cables and so that even if it doesn't put the fire out that you're providing substantial cooling.

MR. FRUMKIN: Right.

MEMBER DENNING: I'm trying to determine what's reality versus what's --

MR. FRUMKIN: Personally if there's a

suppression system going off in a room and we need to reach 800° to get shrinkage in this cable, it's going to be unlikely that we're going to get that kind of temperature certainly with the water system because you'll get a lot of steam in the air and with a gaseous system, gaseous systems are very effective on flammable liquid fires. So if there's a system in the room, it's very comfortable there's going to be extinguishment or protection.

MEMBER DENNING: In the risk analysis, was there credit taken for the fire protection system and then one gets a low risk because of the unavailability of the fire protection system? Did you understand my question?

MR. FRUMKIN: Yes. Credit was given for fire protection systems and it was reduced, full credit was reduced, by the unavailability and it was given, the maximum unavailability of a gaseous system is only 95 percent available, five percent unavailable. So even though there may have been sprinklers which are 98 percent available, we went and backed off and used the higher unavailability.

MEMBER DENNING: Thank you.

MS. LAVRETTA: And finally the generic letter issuance will ensure compliance with fire

protection requirements. For plant specific issues, allow the Staff to determine the need for flexibility on a case by case basis and assure timely comp measures and corrective actions are put in place.

MEMBER DENNING: Good. Do the Committee members have questions?

MR. WEERAKKODY: Dr. Denning, this is Sunil Weerakkody. I have a couple of remarks.

MEMBER DENNING: Certainly.

MR. WEERAKKODY: I know Dr. Wallis mentioned these couple of very important questions. I want to make sure that we fully answered them. One was issuance of the generic letter. We received the results from the tests in March of 2005. Within a week, we should definitely know this, and right after that, the Senior Management pretty much concluded that we are going to issue an generic letter. The fact that one of the conditions as I recall pretty much asked us to write a generic letter. It was a coincidence. So it was on our part we understood that it is an important issue to reestablish compliance.

There was a high level question with respect to are we using the generic letter process. Generic letters to enforce burdens really clearly are not and in fact when we ask for your approval to issue

this generic letter we have done everything we can to basically use the generic letter appropriately, meaning we are basically telling the plants that these are the results we found. We believe that there could be -- for noncompliances. You guys tell us whether you are or you are not and if you are not, what you need to come back to compliance. So I just wanted to emphasize that when I ask for permission to issue a letter, we are not imposing an undue burden. We are using appropriate use of 5051(f) in the generic letter.

I would just want to share one thing to the Committee and this is somewhat not relevant to this topic, but I know you have a meeting with the Commissioners, and I did mention this to Dr. Apostolakis and Dr. Bonaca. With respect to the 805 reg guide, we are planning to come back to you as we had. There could be a couple of weeks here and there. But to date we have received five plans to adopt the 805. And Dr. Apostolakis -- I just wanted to share that with you.

MEMBER DENNING: Let me ask a speculative question and that relates to NFPA-805 and an issue of this type. Obviously, you've given some evidence and I've seen a paper that I think that Greg Gallucci put

together that indicated the magnitude of associated risk and indications are that risk isn't very high. That's not surprising. There's no question in my mind however that the deterministic safe shutdown requirements that we have are an important element of fire safety in nuclear power plants.

As you look at NFPA-805, what would be the response of an NFPA-805 plant versus a plant that has these deterministic requirements? Would you expect that an NFPA-805 plant produce an argument that said the risk is small? We don't really have to address this problem. Is that the direction that we're headed?

MR. WEERAKKODY: Dr. Denning, let me answer that in two ways. When we had the public meeting on Hemyc, two nuclear entities showed personally. One was Progress Energy and one was Duke Energy. These are the two plants that -- 805. I did mention that one nuclear entity that is now testing to find the appropriate fix and that's Progress Energy because Harris Power Plant has a lot of Hemyc. So people aren't jumping and saying their number is low. Therefore, I'm not going to do anything. It's more what Harris will be able to do if their Hemyc -- We expect them to do some fixes in the risk critical

areas but then there may be other areas where the defense in depth is met, safety -- is met where they may not.

MEMBER APOSTOLAKIS: I'm a little bit confused now. What does it mean to follow an NFPA-805? Don't you still have requirements related to defense in depth?

MR. WEERAKKODY: Yes.

MEMBER APOSTOLAKIS: You do. And this is really a defense in depth.

MR. WEERAKKODY: Yes. So you couldn't crunch a number and then -- The rule doesn't allow that and the 805 plants are not planning to do that.

MEMBER DENNING: Now you know when we talked about the proposed rule related to separation it was recognized that one way that plants could get out of the situation that they're currently in where they have not had approved exemptions is to make arguments through an NFPA-805 that would allow manual actions to take the place of these things. Is it your feeling that that's just a different form a defense in depth?

The thing that concerns me a little bit is the definition of defense in depth and the flexibility that people have in the interpretation. I rather

suspect that the direction is that in a case like this an argument would be made that we still have defense in depth. We have the fire suppression system for example. We really don't have to assure the fire barrier is intact for the one hour period. That would be my guess.

MEMBER APOSTOLAKIS: It's conceivable that in some location that might be valid given the whole context of risk.

MEMBER DENNING: Well, given the whole context of risk, you're right and I think that there are relaxations and I think that it is the dilemma that we're in of how much do we believe the risk assessment, how much faith do we place in the deterministic criteria and are we eroding safety when we accept those risk arguments or are we just putting our efforts in more effectively?

MEMBER APOSTOLAKIS: It's an integrated decision-making process. So presumably these issues will be raised there.

CHAIRMAN WALLIS: I have a question about this risk. You said you do not expect any high risk situation. You didn't show us the analysis and the components of the risk and I was wondering if the risk was low because fires that reach this temperature or

in the area where this stuff is are unlikely or it is because the Hemyc provides sufficient protection for long enough even when there is a fire. What's the answer?

MR. FRUMKIN: The answer to that is both. I'll just give you some numbers. This isn't a publicly-available document. I'm just go from here. We assume 25 pieces of switch gear are in a room or we assume that there's six pumps that are considered. So we are assuming that there are rooms with a lot of combustibles and we come up with fairly high frequencies, 3^{-3} kind of frequencies.

CHAIRMAN WALLIS: For a fire?

MR. FRUMKIN: For a fire. Then we also credit, I believe, and this is Ray's analysis, the capability for the Hemyc for as long as it was capable of giving protection. So if it was good for five or ten or at least I think 16 minutes in all cases, we credited that and we give the fire brigade credit for the probability that they'll come and suppress in that time or the suppression system, the probability that it will suppress. And if you look at the analysis, it's based on the frequency, that's a good piece of it. The effectiveness of the suppression system is a piece of it.

CHAIRMAN WALLIS: The Hemyc lasting some of the time is a piece of it.

MR. FRUMKIN: Yes. Well, the Hemyc lasting some of the time is a factor in the probability of nonsuppression.

CHAIRMAN WALLIS: Because from the simplistic view, if I showed the pictures you showed me to, I don't know who, my wife or students or something, they would say, "Look this stuff doesn't work. It has to be fixed." That would be the reaction I would think. It's supposed to be a fire barrier but it doesn't hold up. So I think the risk thing looks good but from the perception of the pictures you showed us, it doesn't look a very good fire barrier.

MR. FRUMKIN: Right. But again, if from a risk standpoint to get the fire brigade in there to put out the fire you only need a half hour, then this material at a half hour might look a lot better. If, for example, you had Thermo-Lag that you needed to last for an hour and a half, it would look really bad at an hour and a half. So we have the flexibility of going in and looking at some temperature numbers and some performance numbers and seeing that this material at maybe less than hour would give a really high

confidence that the suppression system would actuate or the fire brigade would be successful or that some other manual actions would have a chance to disable some serious actuations that could occur. So there's a balance with the frequency, again with the capability of even a degraded system in our analysis.

MR. WEERAKKODY: Dr. Wallis, we could, if the Committee is interested, make available to you a presentation that Dr. Gallucci made on this subject at a ANS conference.

MEMBER DENNING: We actually have a copy of that but actually I think that it is important input to us and we can review it. But I don't see a need for us unless somebody wants to. We can look at that paper. I think it's fairly obvious what the reasons are why risk analysis would show that the risk isn't very high. It doesn't mean that the changes don't have to be made but it does give us some confidence that we don't have to say shut all the plants down until it's done. Any other comments or questions?

VICE CHAIRMAN SHACK: I just had a question on the history. You said that the NRC inspections about Hemyc raised the concern and then you ran the tests.

MEMBER DENNING: How were they so smart?

VICE CHAIRMAN SHACK: Yes.

MEMBER DENNING: We'll give you an answer. You can give the answer.

MR. SALLEY: I can answer that a number of ways. Obviously with Thermo-Lag, the whole fire barrier issue came into light. One of the things the inspectors do if this was a perfect system, we would have a number of components that would put it together. We would have the vendor manual and I would be able to take the vendor manual and go and look at the qualification tests and every piece that was in that vendor manual I would be able to tie back to the testing and say here's why six inches is good. Here's a four inch conduit with it and I could tie every piece back. This is why this works. This is why this works.

A lot of what the inspectors will do is when I talked about that creativeness that was actually in the installation. So you may have had a good material. You may have had a good vendor manual. But if the licensee wrapped three cable trays rather than one, then it's fair game for the inspector to say wait a minute. The largest thing you ever wrapped was a 36 x 4 inch tray and I got out in the plant and I

see this four foot by three foot. That's clearly beyond what your testing was and bring it up that way. So the inspectors will do a lot of that. That's how this really got started.

MEMBER DENNING: I think there was a very specific event though that occurred and I'm not going to be able to reproduce it exactly in which an inspector went in and looked at the tag on it and the tag said what it had been qualified for and the tag disclaimed that it was applicable to nuclear if I'm properly reflecting it. But in stuff that I read here, it was obvious to the inspector that the tag was disclaiming applicability.

MR. QUALLS: Can I answer that question?

MEMBER DENNING: If you do, you have to come to the microphone over here and state your name.

MR. QUALLS: Hi. My name is Phil Qualls. I was actually on both inspections where the issue was originally raised. I was one of the inspectors involved with this issue. The Region II fire protection inspector had serious questions about the test. It was one of the things Jerry Harris at the original inspection where the issue was raised because he had noted that the oven, in his words, "was a very small test." It did not even compare with the testing

that we would have used in ASTME-199. So he had questions about the test.

We went on the inspection. He didn't know if the material was actually any good. We went on the inspection. We got copies from Region II as part of the inspection procedure and started looking at the test during inspection. The test during inspection raised enough questions that they sent it to us via a task interface agreement so that some of the licensed fire protection engineers here in Headquarters could look at the test.

During the test, we noted that a very limited number of configurations were tested. If you recall, the regulation requires a rated one hour or three hour barrier. In the original Generic Letter 8610, we defined a lot of criteria for what we meant by a rated barrier. Inclusive of those were configurations that were bounded by an existing fire test. Now this is the original 1986 version not Supplement 1.

What we found on a subsequent inspection at a licensee when we looked at the test in the office, we noted that a very limited number of configurations had been tested, for example. Dan's more familiar with that. He did that part of the

review. For example, a four inch conduit was the only conduit tested. On a subsequent inspection we noted that many conduits smaller than four inches were tested.

MR. FRUMKIN: Or installed.

MR. QUALLS: It was installed but not tested. Smaller conduits are not bounded. It didn't meet the criteria that would have satisfied a rated barrier per Generic Letter 8610. That's why we started -- That's the inspection question. So that's the history of the inspection questions. I won't go into any more detail than that.

MEMBER DENNING: Okay. Thank you. Does the Committee have -- Do you have something you want to say?

MR. SCOTT: Yes. Mike Scott, ACRS Staff. Can we go back to Slide 9 please? I got a little confused on the message here, your last bullet, a description of programmatic controls in place to ensure other fire barrier types will be assessed. Now I understand that one of them, Mark, was that the Staff has high confidence that the other fire barrier types out there are good and I'm wondering how that matches up against this bullet.

MS. LAVRETTA: I'm not sure that we said

that we have a high confidence.

MR. SCOTT: Maybe I misunderstood.

MS. LAVRETTA: We're confident that if there are any that have not been identified it's a very low likelihood. But because this issue was raised on Hemyc and apparently slipped between the cracks in response to the 9208 expectation that other fire barrier types be reassessed, we just wanted to make sure that we were aware of what controls they had in place in order to prevent any more gaps in what our expectations are.

MR. WEERAKKODY: Yeah. We have high confidence but I think we are striving for even higher confidence because right after these results came out, the Commission, the stakeholders, actually asked the same question you asked which is what else is out there. So really what we are trying to do here is getting the licensees to give us that emphasis.

MR. SCOTT: Thank you.

MEMBER DENNING: Thank you. Mr. Marion, would you like to make a comment or ask a question?

MR. MARION: Alex Marion, NEI. Thank you. I wasn't prepared to make any remarks but I feel compelled to offer a little clarification. This goes back to Dr. Wallis's point about using generic

communications to impose new regulatory positions. That in fact was done in Generic Letter 8610 Supplement 1 and let me just explain that. The NRC at that time identified new acceptance criteria for fire barrier testing and new methodology for conducting fire barrier testing. Prior to that, the acceptance criteria focused on demonstrating cable functionality.

Now there is nothing wrong with the NRC changing a regulatory position but it shouldn't be done in a generic communication. It should be done in a more disciplined rulemaking process. Secondly, this second bullet on Slide 9 represents the implementation of Generic Letter 8610 acceptance criteria to other fire barrier systems. In effect, it's a new regulatory position and another example where generic communication is being used to impose a new regulatory requirement. Thank you.

MEMBER DENNING: Thank you. I think that we are now done and I turn it back to you, Mr. Chairman.

CHAIRMAN WALLIS: Thank you very much and I thank the speakers. We are going to take lunch. We have a meeting with the Commission at 1:00 p.m. We all have to be there. Now would you like to meet here and go down there? I suggest that we either meet here

10 minutes ahead of time or those who don't want to meet here be already down there.

MEMBER-AT-LARGE SIEBER: I think we can find our way.

CHAIRMAN WALLIS: Most of you know the way. Okay. So we will now take this recess and we will meet in the -- Do we need the transcript for this afternoon?

VICE CHAIRMAN SHACK: Yes. The ANPR.

CHAIRMAN WALLIS: We have another event. So after 3:00 p.m., we'll need a transcript in here. Thank you. Off the record.

(Whereupon, at 11:55 a.m., the above-entitled matter recessed to reconvene at 3:34 p.m. the same day after a meeting with the NRC Commission.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

3:34 p.m.

CHAIRMAN WALLIS: On the record. We're going to continue the Proposed Program Plan and Advanced Notice of Proposed Rulemaking for Risk-Informing 10 CFR Part 50. My colleague and neighbor here, Bill Shack, I think is going to lead us through this one. Bill.

VICE CHAIRMAN SHACK: We've discussed risk-informing specific regulation such as 50.46. We've also had some interesting, more general discussions of risk-informing regulations such as tech neutral framework, single failure criterion and our favorite of course is the Commission's expectations for enhanced safety in new reactors. The Commission has directed the Staff to develop an advanced notice of proposed rulemaking to get public comment on approaches to making essentially risk-informing 10 CFR 50.

In the version that we got, there were two parallel paths proposed. One was developing an entirely new Part 53. The other one was to continue to risk inform by revising the regulations one at a time. There was a new version that was delivered last night where the parallels disappeared. The emphasis

was on developing a new Part 53 with the recognition that we would continue to work on specific regulations like 50.46 and 50.61 and the Staff will tell us a little bit more about their plans for the ANPR and the plans for developing a new Part 53. Mary, I guess you're going to make the presentation.

MS. DROUIN: Thank you. My name is Mary Drouin from the Office of Research. At the table with me is Joe Birmingham and Donnie Harrison from the NRR. But before I get started, Charlie Ader, my Division Director, would like to make some opening remarks.

MR. ADER: Actually I was going to thank the Committee for the opportunity to provide the informational briefing to you. We're not requesting a letter at this time due to the expeditious schedule we are on to meet the Commission's expectation for an ANPR due to some recent SRMs.

That paper is due and Mary will go through the details to the EDO tomorrow. But we are looking forward to continued dialogue with the Committee from the Commission meeting this afternoon. There is obviously a number of key policy issues that will require a lot of discussion as we move forward in time. So we'll be welcoming that opportunity. And with that, I will turn it back over to Mary.

MR. SNODDERLY: Excuse me. May I before you begin? Charlie, could you please clarify? In the proposed SECY that's about to go up, does the Staff still recommend that the Commission approve issuance of the ANPR?

MR. ADER: Why don't I let Mary? That's in the presentation.

MR. SNODDERLY: Okay.

MR. ADER: The answer is yes but why don't I let her go through the details of the change. The change from what you have and what's going up are really more format, content and substantive changes. But we can go through that.

MR. SNODDERLY: And the reason I brought that up is because I think I would like to point out to the Committee that I think the Commission will be interested in whether the Committee feels that the ANPR should go forward or should be amended. Thanks.

MS. DROUIN: The purpose of today's briefing as you know is to brief you on the SECY paper that we are sending forward and as you'll see later on, this paper is due to the EDO tomorrow. We're on a very tight schedule with the SRMs that came out and I'm going to get to those in a minute. We had a very short timeframe to pull together this plan and the

ANPR and write this SECY paper.

MEMBER DENNING: I think that third bullet is very understandable considering our last letter.

MS. DROUIN: I wasn't going to comment on that, but we also as part of this did want to in this packet inform the Committee how we are addressing the ACRS letter that was in response to SECY 130 on the two issues of level of safety and integrated risk and as Charlie noted, at this point in time we are not requesting a letter from the Committee.

MEMBER POWERS: Good. The Committee might not survive another letter on this section.

MS. DROUIN: You were given a draft SECY paper back on November 18th and in that SECY paper, you had two attachments. You had a program plan and you had an ANPR. As Charlie noted, it's really a formatting packaging difference that you see. The ANPR what we've done is we have taken the program plan and incorporated it directly into the ANPR.

So when you looked at your package, you'll see that there was the task to develop the new Part 53 that's now there's a section in the ANPR that's now called "Plan." So all of that has been moved into the Plan. It's been streamlined down but the essence of it is still there to develop the new Part 53, do the

technical basis, then go on to rulemaking and it does note that we still plan to continue on with risk informing the current Part 50.

How did we get here? There are for very relevant SRMs that for background we need to go through because they are the foundation and the formulation of this SECY paper and the ANPR. Back in April of this year, RES briefed the Commission on its research plans and programs, etc. and then on May 9th, the Commission came back in SRM and asked the Staff to develop, and you'll see the exact words there, "a formal program plan to make a risk-informed performance based revision to 10 CFR 50. We had a lot of discussion among the Staff of what did those directions of that SRM mean. We had several PRA steering committees and we formulated a plan to move forward and to develop the plan with ANPR.

During this same timeframe, three other SECY papers had gone forward and they're all related. The next one that came out was SECY 120 which talked about security. There was a relevant piece in there because it brought back into the technology neutral framework which said that we were going to develop security performance standards as part of the framework and the SRM on this one approved the Staff's

recommendation to the Commission.

Also in the summer, we had the famous SECY 130 that went forward on the two policy issues of level of safety and integrated risk. The Commission came back in their SRM and did not approve the Staff recommendation and asked the Staff to consider the Committee's views and to come back with a subsequent notation paper.

They also asked us to develop in expedition fashion an ANPR and incorporate into the ANPR the formal program plan and also to integrate security, safety and emergency preparedness as part of this effort. So you will see that's in ANPR. We have actually attached that to it and Joe will get into that later in the presentation. We've asked for comments on it and it's a actual part of the ANPR.

Also this past summer, another SECY paper went forward which was 138 which talked about how to revise the single failure criterion and there were recommendations. There was to release it to the public. Also should we consider maybe moving it into this new Part 53 and the Commission as you can see came back and said put this as part of the ANPR. Put it as part of the program plan, etc. which is what we have done. So you also see in the ANPR a whole list

of questions associated with this effort.

VICE CHAIRMAN SHACK: Now Part 53 is still intended to be voluntary though and you will continue to have a choice.

MS. DROUIN: Right now, we're characterizing it as an alternative. Ultimately that will have to be a policy decision for the Commission whether they want it to be voluntary or mandatory. But right now, we keep characterizing it as an alternative.

So as you see from these four SRMs that came out, there are four programs that have been impacted by these SRMS, the program for the regulatory structure new plant licensing which is where the technology neutral framework effort has been ongoing; the work on security design expectations is being impacted. Coherence was impacted by this in an indirect way. In the past, we had an SRM directly us to develop a plan for coherence. We did a draft plan. We circulated it around the Staff and the position and recommendation that we can came back to the Commission that it made more sense to incorporate this as part of this new Part 53. So it has brought that into it. And then also it's impacting the program that came out of SECY 98.300 which is risk informing the various

regulations and the current Part 50. We've tried to pull these efforts together into this ANPR or our proposal.

When you look at the plan that we have proposed in answering these SRMs and looking at the various ongoing programs that are impacted what we proposing is to create this new alternative Part 50. So this is a continuation and an advancement of the technology neutral framework effort in essence.

We plan to integrate safety security and emergency preparedness. I know when we've been here before the Committee in the past we always had a placeholder for security because we were waiting on Commission direction which came out of SECY 120 which did tell us to go forward and integrate it and develop these performance. So now we'll start doing that.

We're going to address coherence, you've probably see these famous words before, by ensuring that the reactor regulations and staff processes and programs are built on a unified safety concept and are properly integrated so that they compliment one another. We will be factoring that out into the program.

MEMBER APOSTOLAKIS: Now the word "coherence" refers to what? I mean Part 53 by its

nature will be coherent, won't it?

MS. DROUIN: Yes.

MEMBER APOSTOLAKIS: So you're referring to Part 50.

MS. DROUIN: That's the aim.

MEMBER APOSTOLAKIS: You are referring to Part 50 then?

MS. DROUIN: We're referring to Part 53 here.

MEMBER APOSTOLAKIS: Because the earlier effort was to achieve coherence in Part 50, wasn't it, the existing regulations?

MR. BIRMINGHAM: When we were focused on risk informing 10 CFR Part 50 on a regulation by regulation individual basis.

MEMBER APOSTOLAKIS: Right.

MR. BIRMINGHAM: Yes, that's was our intent. What we are considering here is seizing that effort of risk informing 10 CFR Part 50 regulation by regulation but focusing on 10 CFR Part 50 for this purpose and we're not going to stop looking at 10 CFR Part 50. But the majority of resources will be focused on Part 53.

MEMBER APOSTOLAKIS: Right. But when it says address coherence, you are referring to Part 50.

MR. HARRISON: Well, in this case, it's Part 53. To make sure --

MEMBER APOSTOLAKIS: Fifty-three will be coherent.

MR. HARRISON: By definition -- If you do it correctly, you will. Right.

MEMBER APOSTOLAKIS: Yes. The problem is the current regulations that are not coherent. Some of them are from the old days. Other are more recent. and so on. Part 53 you are starting with the technology neutral framework which is self consistent. Right? And you will go ahead with the regulatory guides at some point. So you don't need to address coherence. I mean it's inherent in the effort.

MS. DROUIN: I don't think it's necessarily inherent in the effort because when you create your alternative you certainly don't want it to be, borrowing from that same word, incoherent with our current regulatory structure.

MEMBER APOSTOLAKIS: But 53 will be.

MS. DROUIN: You could go off and you could create this Part 53 that's over here that's separate and independent but you want it to be coherent.

MEMBER APOSTOLAKIS: That's what I'm

saying.

MS. DROUIN: With the current regulatory structure.

MEMBER APOSTOLAKIS: I don't know what that means.

MEMBER KRESS: I don't either because the current regulatory certainly is incoherent. So how can you be coherent with something that's incoherent?

MEMBER APOSTOLAKIS: Yes. That doesn't make sense.

MR. BIRMINGHAM: A small part of the answer is in the next bullet. It doesn't answer your question fully but it helps.

MEMBER APOSTOLAKIS: But don't we agree that Part 53 the way you guys are developing it has an excellent chance to be coherent because you are starting with the top structure and you're proceeding down?

MS. DROUIN: Yes.

MEMBER APOSTOLAKIS: Now what you just said is something that is kind of new to me that you also wanted to be coherent with the existing Part 50 which as Tom says is itself incoherent. So you really don't want to do that. Perhaps you mean that there are certain principles in Part 50 that you want to

preserve and so on which I think is a very good idea.

MS. DROUIN: That's exactly what I mean.

MEMBER APOSTOLAKIS: But it's not -- Coherence means much more than that. So addressing coherence, it's really what you were talking about three or four years ago, Mary.

MS. DROUIN: I think that there are levels of coherence that can achieve and I think when you start with a new Part 53 and you look towards the future.

MEMBER APOSTOLAKIS: Yes.

MS. DROUIN: And that's going to be your future. Then you are going to be having coherence down the road.

MEMBER APOSTOLAKIS: Right. And that's my point.

MS. DROUIN: So in our mind, it makes sense then to try and do it here under this new Part 53 than try and restructure, I'm not sure of the correct word to use here, so that you have that ultimate -- coherence on Part 50 which I don't think is practical or very obtainable to do.

MEMBER APOSTOLAKIS: Part 50 will be very hard to be made coherent. It will be very hard. So when you say address coherence, I thought you were

talking about that because the new Part 53, there may be some inconsistencies here or there but by and large, it will be coherent.

MS. DROUIN: Yes.

VICE CHAIRMAN SHACK: You're in violent agreement.

MS. DROUIN: I think so.

MEMBER APOSTOLAKIS: Well, except when Mary says that 53 will be coherent with 50.

MS. DROUIN: I think it's coherent with 50 when I'm sitting here saying there's a lot of stuff from the past and lessons learned.

MEMBER APOSTOLAKIS: Yes.

MS. DROUIN: We certainly don't want to abandon and we want to be --

MEMBER APOSTOLAKIS: I agree.

MEMBER KRESS: There are lots of things that Part 50 had like one of my favorites is the siting criteria. When you get around to Part 53 and the new way of looking at it, you will have to somehow incorporate that into Part 53 in a coherent way.

MS. DROUIN: Right.

MEMBER KRESS: Because they had reasons for having those criteria.

MS. DROUIN: That's right and as you

transition --

MEMBER KRESS: So I can understand taking things that the current Part 50 are addressing and being sure you don't lose any.

MEMBER APOSTOLAKIS: That's right.

MEMBER KRESS: And if you're meaning that as coherence.

MS. DROUIN: To me, that's coherence.

MEMBER KRESS: Okay. That I go along with.

MEMBER APOSTOLAKIS: What is it that you're seizing at this point? Additional rulemakings will not be initiated. Additional to what?

MS. DROUIN: I haven't gotten to that bullet yet.

MEMBER APOSTOLAKIS: Additional to 50.46?

MS. DROUIN: Right. So right now the plan is to continue with the current ongoing efforts, complete those and then if we initiate anything new that will be decided down the road. But right now in the short term, the plan is not to initiate new work.

MEMBER KRESS: Good.

MS. DROUIN: Thank you.

MR. ADER: Mary, if I can correct. I think George asked beyond 50.46. There are a few

others in the process, LOCA loop that's being looked at.

PARTICIPANT: 50.61.

MR. ADER: PTS. So there are some other ongoing ones and those are included.

MS. DROUIN: Sorry. Those are ongoing.

MR. ADER: So it's not that we're stopping those also.

MS. DROUIN: Anything that's ongoing we will complete.

Okay. Now we want to get into the actual ANPR and at this point I'm going to turn it over to Joe to take you through the ANPR.

MR. BIRMINGHAM: Good afternoon. I'm Joe Birmingham in the Office of NRR. You've seen me before but mostly in fire protection. What I'm going to talk about is the ANPR and its contents, the Staff's proposed approach for a risk-informed Part 53. The Staff proposes to issue an advanced notice of proposed rulemaking, to solicit comment on the proposed approach and the Staff proposed that the ANPR will remain open until a technical basis is complete approximately in December 2007. This is to allow comment on the technical basis development, issues that arise during that time. Upon completion of the

technical basis, the Staff will request Commission direction and approval to initiate rulemaking.

CHAIRMAN WALLIS: Well, the technical basis presumably has to itself be based on some societal basis because the whole purpose of nuclear safety is to do something for society. It's not a purely technical exercise. So what are you going to start with as your societal basis?

MS. DROUIN: Those are some of the issues that we're going to be looking at. As it was raised in your letter, we'll be looking at that. We're going to solicit stakeholder input. So right now in terms of how we're going to explicitly address it, it hasn't been decided.

MEMBER KRESS: Remember you're free to discount and disagree with stakeholder input.

MS. DROUIN: Really?

CHAIRMAN WALLIS: You'll have to because it won't be consistent. It won't be coherent.

MR. BIRMINGHAM: That kind of lead into my next bullet. The ANPR will help ensure that NRC's intent to risk inform the reactor requirements is known to all stakeholders. They have an opportunity to comment and maybe point out means to improve our approach. The ANPR will allow NRC to proceed in this

effort in an open, integrated, transparent manner. We'll be holding public meetings, workshops and things like that.

CHAIRMAN WALLIS: By technical basis, do you mean a set of specifications, methods, measures and whatever from which everything else can be deduced in a logical way? Is that what you mean?

MR. BIRMINGHAM: Essentially yes. Since it's a risk-informed approach and performance-based approach, we will be looking at coming up with these technical performance standards to achieve without specifying.

CHAIRMAN WALLIS: And you'll apply the same ones universally across all the rules.

MR. BIRMINGHAM: Across all the reactor designs and --

CHAIRMAN WALLIS: And they all will be derived from the same route or trunk or something of logically expressed bases and everything will flow from rationally from the same.

MR. BIRMINGHAM: That will be the challenge.

CHAIRMAN WALLIS: Okay.

MR. BIRMINGHAM: That would be the ending. The ANPR will solicit stakeholder input throughout the

technical basis development period. As new issues are identified or as technology-neutral framework is completed, we will supplement the ANPR.

The NRC plans to develop an integrated risk-informed performance-based revision to 10 CFR Part 50. That will be one of the items that we spell out in the ANPR. Some of the policy issues in the ANPR will be the integration of safety, security and emergency preparedness, level of safety and integrated risk. The ACRS letter on these issues will be an attachment to the ANPR to allow stakeholder comment on the views raised by ACRS Committee members. The contention functional performance requirements, the definition of defense in depth and all that can be part of the risk-informed Part 53.

MEMBER APOSTOLAKIS: Why isn't the definition that the Commission has included in its White Paper sufficient? What do we mean by definition? I suspect what you mean is the second part of your statement how do we incorporate defense in depth in a risk-informed Part 53? Because the definition is there, isn't it?

MR. BIRMINGHAM: If you look at some of the new reactors, the definition of the defense in depth, the traditional one where you would have

barriers in succession, defense in depth barriers, will change somewhat. How important will a contention be for a pebble bed modular reactor? Will it be a case where the level of that barrier can be less provided some other level is greater? We'll have to look at how it affects these new technologies.

MEMBER APOSTOLAKIS: So it's how to use the concept not to define it. The definition is there.

MS. DROUIN: George, what you said was correct. When you look at the White Paper, the White Paper says the definition of defense in depth is the philosophy, blah, blah.

MEMBER APOSTOLAKIS: Yes.

MS. DROUIN: And as a strict high-level definition, yes. But now how you take that and implement it to develop your new Part 53, your requirements and everything, it needs more into that.

MEMBER APOSTOLAKIS: So it's really not the definition. It's the use, the utilization of the concept of defense in depth.

MS. DROUIN: Yes. Unfortunately, this was how we defined it. If you go back to SECY 030047 when we went to the Commission, we used the word definition and it was probably the wrong word.

MEMBER APOSTOLAKIS: We can change it in the future.

MS. DROUIN: Yes, we could.

CHAIRMAN WALLIS: I don't think saying you have further criterion is a policy. It's a method. It's an approach. It's not a policy at all.

MEMBER APOSTOLAKIS: Yes.

MEMBER KRESS: That's just a name for the policy.

CHAIRMAN WALLIS: It's a way of achieving something.

MEMBER KRESS: The policy is actually should you continue using it.

VICE CHAIRMAN SHACK: I thought the policy was whether you should have design basis accidents and how you would define them.

CHAIRMAN WALLIS: Whether you should have design requirements.

MEMBER KRESS: That ought to show up in here somewhere.

CHAIRMAN WALLIS: Right. That's the sort of thing.

MEMBER APOSTOLAKIS: In fact, why isn't that part of the question what Bill just said? Do we need the concept of design basis accidents in the new

system?

CHAIRMAN WALLIS: Yes.

MEMBER APOSTOLAKIS: Is that a policy issue or is that something else?

VICE CHAIRMAN SHACK: I think we're ahead of ourselves on that.

MR. BIRMINGHAM: The ANPR is of course to solicit wide stakeholder comment and we're not narrowing it down to this is a done deal type thing. Yes, we were --

MEMBER APOSTOLAKIS: I think it deserves it's own green line there.

MS. DROUIN: It is its own green line in the sense that we have the technology-neutral framework there and associated with the technology-neutral framework you will see coming out of that should we have design basis accidents.

CHAIRMAN WALLIS: Right, and what purpose do they have, do they fulfill, if you have them?

MEMBER APOSTOLAKIS: Well, that is an answer but it's not even there.

CHAIRMAN WALLIS: But that's important.

MS. DROUIN: There's a whole slew of questions --

CHAIRMAN WALLIS: It's much more important

that single failure criterion.

MEMBER APOSTOLAKIS: Yes. I think Bill is right. The single failure criterion is part of a definition of design basis accident. That's a broader concept.

MS. DROUIN: I understand that. What we're trying to do here, I'll show you on this view graph, was there were specific things coming out of SRM that we were asked to put into that ANPR. So there is that. We're also going to put with the ANPR the next version of the framework in April and the framework is going to have a whole slew of questions and some of the things that you raised are going to be the questions that will be added to ANPR.

MR. HARRISON: And just why I think we're a little ahead of ourselves is when that comes out in April would be the time we would ask those questions. So that's why they're not on here as a green line is because we're not issuing the technology-neutral framework at this point in time. So those questions haven't been -- That would be a supplement.

MEMBER APOSTOLAKIS: Isn't that NUREG report out with the technology-neutral? What do you mean you are not issuing?

MS. DROUIN: No, it's not out yet. The

last version that went out was this past January.

MEMBER APOSTOLAKIS: But it's public.

MS. DROUIN: A year ago.

MR. ADER: No, George. You're asking about the single failure NUREG or the technology-neutral.

MS. DROUIN: We issued on in January. We had a workshop in March for three days and we got a pile of comments that thick. We've been working on those comments.

MEMBER APOSTOLAKIS: And then they will reviewed.

MS. DROUIN: So this new revision that we're going to put out --

MEMBER APOSTOLAKIS: Right. But the basic structure, people are aware of.

MS. DROUIN: Yes.

MR. HARRISON: But the expectation is when that goes out we'll supplement the ANPR with a list of questions.

MEMBER APOSTOLAKIS: Let me -- I sense that you guys are too defensive here. We're trying to help.

MS. DROUIN: No, no. We're not being defensive. We're trying to explain to you why.

MEMBER APOSTOLAKIS: I think the recommendation to put DBAs there is very reasonable and you're resisting it.

MS. DROUIN: I'm not resisting it.

MEMBER APOSTOLAKIS: Okay. I can't imagine what you would do if you were to resist it.

MS. DROUIN: We're trying to explain what's on this slide and why the things you're not seeing why it's not here.

CHAIRMAN WALLIS: You are telling the world you intend to develop a new set of regulations, a fantastic undertaking. You have to tell the world something about what you're thinking of putting in there as a basis and what constituent parts it may have such as DBAs or design requirements or some general design criteria.

MS. DROUIN: Yes, I agree with you.

CHAIRMAN WALLIS: You're going to address those key things on which everything else will be built. Are you going to sketch that out for the world before you put this thing out?

MS. DROUIN: All I'm trying to explain is that we agree with you on all of those things and maybe we did a disservice by not putting subbullets under the technology-neutral framework.

MEMBER BONACA: But what we expected today was to have a complete list of policy issues. Let's give them credit. Let's say these are examples and I can live with that.

MEMBER APOSTOLAKIS: We are making the comment that DBAs is a broader issue than single failure criteria. That's all.

MEMBER BONACA: Yes.

CHAIRMAN WALLIS: It's more than that, George. It's we're trying to say what sort of things should be in this sketchy -- You're proposing to do something. You've written proposals. You have to say my proposals is going to have certain things in it. Otherwise, you have no idea what it is and you pick out the most important things like DBAs and so on and say we're doing to address those.

MEMBER BONACA: I'm only saying that why do we have to presume that this is a complete list now. This is communications to us and they're going to have a listing.

MEMBER APOSTOLAKIS: We are not assuming anything. We're just making comments trying to be constructive and as usual, we are misunderstood.

MEMBER BONACA: I know.

VICE CHAIRMAN SHACK: Just want to do

good. Right, George?

MEMBER APOSTOLAKIS: We want to do good.

MR. BIRMINGHAM: I heard the phrase I'm from the Government and I'm here to help you. But thank you. I appreciate that.

CHAIRMAN WALLIS: No, we're from the public and we're here to help the Government.

MEMBER APOSTOLAKIS: You can't win. So keep going.

VICE CHAIRMAN SHACK: Let me just ask the question. You said you were going to give this a higher priority than continuing to risk inform Part 50. What has a higher priority, development of Part 53 or completion of the 50.46 and 50.61 for example?

MR. BIRMINGHAM: 10 CFR 50.46 for example because it's already in the works and actually Eileen perhaps could help.

MS. McKENNA: This is Eileen McKenna, Policymaking Branch NRR. I don't know as we've prioritized them that way. We didn't run together the current rules. We prioritized on an individual rule basis. I think part of the point is that they're on different schedule tracks. The ones we have now, the 50.46(a) and 50.61, we have proposed rule out on 50.46. We're into the rule-plan stage on 50.61.

This effort as I think was clear from looking out, we're out a few years before we even begin rulemaking. So they're priorities. They're just on different tracks.

CHAIRMAN WALLIS: I think what we're trying to get at is does it have enough horsepower behind it to really go forward.

MS. McKENNA: You may have noticed in the draft we gave you we didn't put down resources and that's because we were still working through what resources we think are necessary and that is one of the considerations because we are being pulled in many different directions on supporting a lot of different efforts and the Commission ultimately will have to decide what priorities these different things have.

CHAIRMAN WALLIS: It sounds to me like a major and significant initiative and if it's going to go anywhere, it's going to have proper horsepower behind it, right people, right backup and everything else. Otherwise, you're going to be playing around for years. If you're serious about coming up with something real in a few years, it has to have all that effort behind it.

MR. ADER: I think we agree with that and what you see at this table is as this goes into ANPR

space, the technology-neutral framework had been a research lead with participation, we had support as a team from NRR and from NSER, is it's moving into ANPR stage.

That gives it a higher imprint on it and it puts more of starting to move it out of a development stage into let's start the rulemaking. Let's get these issues addressed. By that nature, you're going to expand the senior staff and the knowledgeable staff that will really be focusing and getting it closer to how you would implement it. So I think the emphasis is there and just by virtue of where we are now, there's already a movement to devote more resources and more staff to it.

MR. BIRMINGHAM: I think I was leaving off at technology-neutral framework and that will be in the ANPR but it's kind of an IOU because it's not fully developed yet and will be issued later. At that time, we supplement ANPR with an issuance.

CHAIRMAN WALLIS: What else could it be? If this is going to be a way of licensing new reactor, what else could it be other than technology-neutral it seems to be. It has to be able to deal with anything that comes along.

MR. BIRMINGHAM: I think we definitely

agree with that thought. It's the way that it will be developed as a technology-neutral framework. How should it be? There are thoughts on should it be high temperature gas modular reactors. How far should we consider and we're interested in those comments on every one of those technologies.

CHAIRMAN WALLIS: If you're going to identify the common features of all these technologies which have an influence on safety, then you'd better figure out how to deal with them.

MR. BIRMINGHAM: It's a challenge. Also we're going to itemize that the NRC plans to continue its ongoing efforts on risk-informing and performance-based certain regulations in 10 CFR Part 50 which we just covered.

We plan to provide updates to the Commission first of all on feedback on stakeholder comment on the ANPR. We plan to provide recommendations from the comments and also on Staff deliberation on policy issues, on level of safety and integrated risk, the path forward on containment functional performance standards and definition of defense in depth, additional policy and technical issues as identified, we expect that that will happen, initiation of former rulemaking on a new Part 53,

also our plan for formal rulemaking to revise any other regulations in 10 CFR Part 50 as they are identified.

CHAIRMAN WALLIS: Now when you have this new Part 53 it's going to be a government document, one similar like Part 50. Presumably you'll have some kind of a preamble which explains what's in it and why. It would be good if you would try to write that, the considerations for the whole thing. Describe your whole objective and how subsequent stuff fits into this objective that you have.

MR. BIRMINGHAM: Yes, that would have to be done.

MEMBER POWERS: It should have a statement of consideration --

CHAIRMAN WALLIS: No, but it should be out there somewhere.

MEMBER APOSTOLAKIS: But it's not part of the --

CHAIRMAN WALLIS: But you often go back to there.

MR. BIRMINGHAM: No.

MEMBER APOSTOLAKIS: You don't have a statement. An objective?

MR. HARRISON: Well, you state an overall

purpose or objective. But as it was stated earlier, that was to make a transparent process, seeks to feedback on the issues as we go forward. So you're not going to get one that talks about until you get into rulemaking a statement of consideration that says here's the ultimate purpose of having a risk-informed, performance-based Part 53. That wouldn't occur until you got into actual rulemaking space and wrote a statement of considerations.

CHAIRMAN WALLIS: You wouldn't have an ultimate purpose until you've delivered the rulemaking.

MR. HARRISON: No. I'm saying that's where you would state the framework for the rule itself and where it came from and how you derived it. At that point, you would also have to summarize all the comments that you have received during the ANPR period I believe and you'd have to say how you've reconciled that.

CHAIRMAN WALLIS: I find this very strange. The whole idea of a design process is to address a problem or a situation that has been defined by some customer and I'm not sure that this whole specification for this new rule has been laid out.

MR. HARRISON: These policy issues are in

many ways specifications.

CHAIRMAN WALLIS: I think your job is to set up those specifications. Right?

MS. DROUIN: That's what we'll be doing over the next two years.

CHAIRMAN WALLIS: Yes.

MR. BIRMINGHAM: And longer.

MS. DROUIN: And longer.

CHAIRMAN WALLIS: It sounds great and we're all trying to help.

MEMBER APOSTOLAKIS: Are you going to update us too? Are we part of this?

MS. DROUIN: That goes to the next slide.

MR. BIRMINGHAM: A great lead into the next slide. I'm going to turn this back over to Mary. She's going to provide the next steps and a brief summary.

MS. DROUIN: As I said, we owe the SECY paper with the enclosed ANPR to the EDO tomorrow, obtained all the concurrences at this point. So I don't see any delay in meeting that date. We plan to continue to engage the ACRS.

CHAIRMAN WALLIS: I think this is interesting enough that it's going to be a high priority item for us as long as you give us enough to

work with.

MS. DROUIN: And we've already been having discussions with Mike and Med on when we want to set up our next subcommittee meeting and we look forward to -- We'd asked for a full day for our next subcommittee meeting because there are enough issues and substance there to discuss. Throughout this whole process, as Joe said, we're going to having public meeting and workshops as we complete the development of the technical basis. Right now, we've just identified some things. So we thoroughly expect that as we complete this there are going to be other issues that are going to emerge out that we're going to want stakeholder input.

MEMBER POWERS: Can I ask a question about public meetings and workshops? Why are those effective for us? I'm not sure exactly what you mean by public meetings and workshops. But if I characterize what I typically see is that workshop or public meeting, either one, if declared we will have one, Staff goes to some length to invite the parties that they know to be interested in those particular items and they're held at some hotel here in Washington or maybe some other place but most often here in Washington. Is that what you're thinking of

there?

MS. DROUIN: I think there are two kinds of meetings and workshops. I think you have some meetings where you're just trying to communicate here's where we're at and we aren't necessarily trying to get feedback. It's us trying to present information. Then you have the meetings where you actually want a technical discussion back and forth.

I think that the workshop that we had last March was an incredible success. We had three days of very intense technical exchange between industry, I say industry, I mean all the stakeholders because it wasn't just industry that was there.

CHAIRMAN WALLIS: I would like to suggest your role as a leadership role. Your job is to go out there and sell what you're doing to people who are interested in it not to just listen. You have to listen too but I think you have to take a leadership role on something that's as important as this and do all the stuff and really get the critical feedback. But you have to sell them that you're doing something which is viable and worthwhile and all that. So it's really a leadership role.

MEMBER POWERS: What I'm asking is it seems to me that here you are. You're messing with

Federal regulations for nuclear power plants. Why isn't the appropriate forum for communicating with the interested community things like the American Nuclear Society meetings?

CHAIRMAN WALLIS: Yes.

MS. DROUIN: And I was going to continue because I wanted to comment on your statement that we go to pick selected people one that we announce these things in a *Federal Register* notice for all people.

MEMBER POWERS: And I know so many of my friends and neighbors just pour over the *Federal Register* each day looking for the least opportunity they can to come to Washington.

MS. DROUIN: Dana, we have also ongoing discussions with ANS, all the different SDOs.

MEMBER POWERS: S-D-O?

MS. DROUIN: Standards Developing Organizations, I'm sorry, with ANS --

MEMBER POWERS: Which is one of the weakest organizations in ANS.

MS. DROUIN: IEEE. We do try and reach out to the different professional societies. This is a topic that I know a lot of the professional societies have been interested in. We try and reach out to the international community. We try and use

all the mechanisms that are at our disposal to try and get the information out to all the stakeholders.

MEMBER POWERS: I guess I'm still coming back and why isn't the forum for discussion here the American Nuclear Society? At least you get the interested community going there anyway. Whereas a special trip to Washington, I doubt seriously that there are too many people that volunteer to do that.

MR. HARRISON: I think it's all valuable input. If there's an ANS annual meeting and we can coordinate to have this meeting.

MEMBER POWERS: Yes. There are two of them a year.

MR. HARRISON: Right. And I think that would be good.

MEMBER KRESS: ANS has these topical meeting. I think this would be a fine issue.

MEMBER POWERS: The trouble is that you have to schedule topical meetings, just to put them together, three years in advance.

MEMBER KRESS: That's true.

MEMBER POWERS: Whereas to get something in either one of the winter or the annual meeting of the ANS is a much easier chore.

MEMBER APOSTOLAKIS: But it shouldn't be

just a session. It should be something special.

MEMBER KRESS: Yes.

MEMBER POWERS: If you want something special, it will cost you a year in advance.

MEMBER APOSTOLAKIS: Yes. So okay.

MR. HARRISON: Or schedule it the day before like a premeeting.

MEMBER APOSTOLAKIS: Yes. Something like that.

MS. DROUIN: We have tried to coordinate some of these meetings like last year with the workshop. We coordinated that at the same time as the RIC conference because we knew a lot of the attendees would be out here at the same time. So we do look for those kinds of opportunities to do that.

CHAIRMAN WALLIS: I think another good audience is rather really smart students.

MEMBER APOSTOLAKIS: Where can you find those?

CHAIRMAN WALLIS: There are a lot more I might suggest. But really if you're going back to basics on nuclear safety and you're going to make a framework which makes sense, you ought to be able to explain it to engineering students who really --

MEMBER POWERS: I will just comment that

out of the mouth of babes often comes a lot of nonsense.

MS. DROUIN: As I said -

CHAIRMAN WALLIS: We're used to that. We're used to trying to explain things to students. They often are very helpful. If you can't explain it, then -

MS. DROUIN: I agree. We should be able to explain this at least --

CHAIRMAN WALLIS: You should be able to explain this to knowledgeable people who have open minds.

MS. DROUIN: Yes.

MEMBER POWERS: Or empty minds.

MS. DROUIN: We do plan to supplement the ANPR over time as needed. So this set of questions is not the end-all. As new things and we want more input, we will keep supplementing the ANPR as needed. We intend to complete the technology-neutral framework.

VICE CHAIRMAN SHACK: I forget which version I'm looking at. That's not the only one. There were 37 questions or something.

MS. DROUIN: Right. And those weren't all the questions. That's not it. There will be more to

come.

MEMBER APOSTOLAKIS: The problem I think, a general comment here, with efforts of this type is that the community at large is not really familiar with regulatory processes. That's a fact. That's why --

CHAIRMAN WALLIS: These are new ones.

MEMBER APOSTOLAKIS: What?

CHAIRMAN WALLIS: These are new regulatory processes which are going to be more transparent.

MEMBER APOSTOLAKIS: But still I don't think that the community, it's a unique culture.

CHAIRMAN WALLIS: That's the problem with the present regulations. It requires the unique culture to understand it. But the new ones are going to be so transparent it's not going to be a problem. Isn't that part of your objective?

MEMBER POWERS: Naive students. I'm being led by naive professors.

CHAIRMAN WALLIS: You don't need to use adjectives.

MEMBER POWERS: Pejorative adjectives to boot.

MS. DROUIN: Once the technical basis is complete as Joe noted, then the intent is to go back

to the Commission and ask for approval to initiate the formal rulemaking, developing the actual rulemaking language.

VICE CHAIRMAN SHACK: Excuse me. Mary. Before you leave the next steps, can we talk about in your Attachment 3 that you sent down, there's a Table 2 on page 28 of the program plan, the table that gives the milestones. I just want to make sure I understand what the next steps are. As you said, December 9, 2005 you're going to go forward with this SECY paper that has the enclosed ANPR and the questions and then you're going to be asking for -- Then you say that in March `06 assuming that the Commission approves publication of the ANPR within 30 days you publish the ANPR. Then you expect to come back in October of `06 with a SECY paper on stakeholder feedback from the ANPR.

But down in the technical basis, you also talk about issuing a draft of the technology-neutral framework in March of `06. I guess do you anticipate the Committee reviewing. When do you anticipate the Committee reviewing the technology-neutral framework?

MS. DROUIN: Right now, our intent was to take the next version because we've gotten all the comments, we've been working on those, to put that in

the ANPR actually in April not March, get some feedback to get a sense of what the stakeholder comments are and then come back to the ACRS because the ACRS would be receiving it at the same time. This would give the ACRS, the Committee, their time to really look at it and in that same timeframe, we would be getting the stakeholder comments and then as I say have at least a full day meeting with the subcommittee.

VICE CHAIRMAN SHACK: Good. Because I think that's going to be a lot more reasonable. Because it was March, I think it's just going to be too much to review that by March. But I think that would be more realistic. So then you're going to have this technology-neutral framework and then you're going to send that up to the Commission, it looks like, in that April/May timeframe and then say we're going to amend the ANPR to say here's the technology-neutral framework.

MS. DROUIN: The actual mechanism of how it's going to get put into the ANPR and on the website we have to work that out.

MS. McKENNA: Yes. It think what we've been envisioning is that we would use our Rule 4 on the website to post additional documents and

information as they come along. To the extent that were for example specific questions we wanted to list then we would supplement the ANPR.

I think one of the reasons we were talking about putting out the version of the framework we had in in April was to answer some of the comments the Committee had as to give the people who may be commenting on our plan a little bit idea of where we're headed. We may not be done yet but kind of see where we think we're going with the framework and the basis there. So that would help them inform their comments on should we continue going, are there issues that we haven't considered, those kinds of things. But the exact, is it this address on the forum or something like that we're going to have to work out.

VICE CHAIRMAN SHACK: Are you going to be posting comments as you receive them on the website? Is this going to be a live feedback kind of thing?

MS. McKENNA: Well, we normally post them but we don't really go into, I think there's something called, the technical conference or something. We haven't really been envisioning the interactive, online kind of thing. But we always do post the comments.

VICE CHAIRMAN SHACK: I meant if others

can actually review the comments that you see.

MS. McKENNA: Others can review the comments. It's the mechanism. But there's were proposals at one time where you could dialogue almost online and we're not really into that. Yes, when we get the comments we'll post them. People can see them and then if they choose to say, "Those are great comments" or "I disagree with what somebody said" then they would in turn post their comments.

VICE CHAIRMAN SHACK: They can post their own.

MEMBER KRESS: Let me ask you a strange question about that. Have you ever received comments on such a thing where you're asking for feedback and answering questions from a individual member of the ACRS?

MEMBER DENNING: You mean previously.

MEMBER KRESS: No, as a response to the advanced notice for rulemaking.

MS. DROUIN: I don't know.

MEMBER KRESS: As a member of the public for example.

MS. DROUIN: I don't know.

MEMBER KRESS: You may get something like that this time.

MS. DROUIN: That's a hint.

MEMBER KRESS: Yes.

CHAIRMAN WALLIS: That's advanced notice.

MS. DROUIN: Advanced notice.

CHAIRMAN WALLIS: I thought about that too. I just wonder if it's appropriate an individual member.

MEMBER KRESS: I think it's worth discussing whether it's appropriate or not.

CHAIRMAN WALLIS: Because I think we all have some views on this.

MEMBER KRESS: And they're different. And it's hard in a forum like this to really get everybody's view on every issue properly articulated and if you're answering a set of questions, do you sit down and --

CHAIRMAN WALLIS: Well, if we're not careful, this is so interesting we might become part of the team.

MEMBER KRESS: No thank you. Anyway, I just thought it was an interesting concept.

MR. HARRISON: Actually I asked a similar comment about it. What if the Staff wanted to make a comment and the comment I received was as a member of the public you can make a comment on what's been put

out on the rule forum. So even if you're a member of the NRC Staff, you actually could do that. So if a staff member could do that, then I would assume that the ACRS can do that.

MEMBER APOSTOLAKIS: Can you really complete the technology-neutral framework without attempting to write the regulatory guides? Will you know enough? Don't you think that by trying to write the regulatory guides for the gas cooled fast reactor for example will give you significant input and insights so that perhaps you will have to change the technology-neutral framework?

MS. DROUIN: That is a possibility and we recognize that.

MEMBER APOSTOLAKIS: It says complete. I assume that's before you're going to the regulatory guides.

MS. DROUIN: When I say complete, that doesn't mean that you can't come back and you may have completed building your house but over times you make changes to it.

MEMBER APOSTOLAKIS: Why isn't the framework you have in the report of last January complete?

MS. DROUIN: There were a lot of things we

hadn't worked out yet.

MEMBER APOSTOLAKIS: But the basic elements were there.

MS. DROUIN: At a conceptual level, yes.

MEMBER APOSTOLAKIS: Yes. But that's my point that until you start doing the regulatory guides which you cannot because you don't have designs, you will have to be at the conceptual level, won't it?

MS. DROUIN: No, there was still stuff that we have been working on for the past year that was going past the conceptual level.

MEMBER APOSTOLAKIS: Like?

MS. DROUIN: For example, I hate to bring this one up, but design basis accident versus design basis events. We have a concept for that and we've been trying to work out what do you mean if you want to have we're calling it licensing based events using risk insights from the get-go versus predescribing up front a set of design basis accidents. I don't need to go and develop regulatory guides to try and go past just that concept.

MEMBER APOSTOLAKIS: So it's conceptual.

MS. DROUIN: No, what I'm saying is I've gone past the concept and we've laid out a way to do that. When we put this out in April, we look forward

to the people's views on what we've proposed of how you go about doing that.

MEMBER APOSTOLAKIS: So the technology-neutral framework will play the role of the general design criteria? It will be at that level?

MS. DROUIN: Ultimately but I don't want to make promises at this point.

CHAIRMAN WALLIS: I think you should explain that though in this document you put that that's your intent to set up a framework which can replace general design criteria.

MS. DROUIN: The attempt of the framework is to give the criteria in the guidelines that when you implement those criterion guidelines it's telling you how to write.

CHAIRMAN WALLIS: So it's going to spawn some criteria. Is that what it's going to do? The framework is going to --

MS. DROUIN: No, it's going to contain criteria and guidelines and this is the criterion guidelines you use to formulate your technology-neutral regulations.

CHAIRMAN WALLIS: What I'm trying to say is you're going to go out and say I'm going to design an airplane to the world. You have to have some idea

what it's going to look like.

MEMBER KRESS: Wings and tail.

MEMBER-AT-LARGE SIEBER: Wings.

CHAIRMAN WALLIS: Very interesting.

MS. DROUIN: Okay. Then just in closing again as we started off, we were not requesting a letter and our paper is due tomorrow and thank you very much.

CHAIRMAN WALLIS: Is it ready?

MS. DROUIN: The paper is ready.

CHAIRMAN WALLIS: So it's ready to be mailed.

MS. DROUIN: It's ready to be --

VICE CHAIRMAN SHACK: There's a significant revision in the one you have.

CHAIRMAN WALLIS: But it's ready with the revision.

MEMBER APOSTOLAKIS: So tomorrow only the Commission gets it.

MS. DROUIN: No, tomorrow the EDO. It goes to the EDO.

MEMBER APOSTOLAKIS: When does the Commission get it?

MS. DROUIN: After the EDO signs off.

MEMBER POWERS: When the EDO says that's

what happens.

MR. BIRMINGHAM: You have a draft.

MS. DROUIN: You all receive it.

(Discussion off microphone.)

CHAIRMAN WALLIS: Are we finished, Joe?

MR. BIRMINGHAM: Yes.

CHAIRMAN WALLIS: Finished? Do you want to wrap it up?

MR. BIRMINGHAM: I'll maybe speaking a little bit out of school, but the EDO will probably sign it fairly shortly, three days maybe. Then it will go to the Commission. If the Commission doesn't object, the Commission frequently makes a SECY paper public in about five days.

CHAIRMAN WALLIS: Okay.

MR. BIRMINGHAM: There are exceptions of course but this doesn't appear to me to one of those.

MEMBER APOSTOLAKIS: That gives me an idea of the time schedule.

VICE CHAIRMAN SHACK: Are there any further questions?

MS. DROUIN: I wouldn't expect to see it go to the Commission before the end of December because of the holidays and everything that are factored into this.

VICE CHAIRMAN SHACK: Further input from the Committee?

MEMBER KRESS: What if the Commission asks you when you get to the point of taking it to them, what does the ACRS think about this? What would you tell them since we don't have a letter?

MS. DROUIN: I would say we briefed the ACRS.

MEMBER-AT-LARGE SIEBER: Yes, go ahead.

MEMBER POWERS: And they were extremely enthusiastic.

MR. BIRMINGHAM: We had several volunteers.

MS. DROUIN: To be on our team.

MR. BIRMINGHAM: I think the comment is that we briefed the ACRS.

MEMBER POWERS: It doesn't say we can't send them a letter even if they're not requesting one.

MEMBER APOSTOLAKIS: I don't even have a copy.

MEMBER KRESS: I'm toying with that thought.

MEMBER POWERS: Our ability to draft a letter in this area is questionable.

MEMBER AT LARGE SIEBER: Is this related

to your question about ACRS members -- so you can get comments?

MEMBER POWERS: Our ability to draft a useful letter in this area.

CHAIRMAN WALLIS: So do you want an agreement at this time that we're not going to write a letter? Would that be appropriate to decide and to give you feedback?

VICE CHAIRMAN SHACK: I don't think it's time to make the decision right now.

CHAIRMAN WALLIS: Does anybody have a burning desire to write a letter? Does anyone feel like we ought to write a letter? So it looks as though we're not going to write a letter.

VICE CHAIRMAN SHACK: No, I think that's something we need to discuss later.

CHAIRMAN WALLIS: I don't know. Just to give you some sort of feedback. Maybe there is some feeling we should write a letter.

MEMBER APOSTOLAKIS: Will we all have a copy of this?

MEMBER KRESS: No.

CHAIRMAN WALLIS: So it's premature to write a letter if you don't have it.

VICE CHAIRMAN SHACK: You have the older

version.

CHAIRMAN WALLIS: Yes.

VICE CHAIRMAN SHACK: You don't have the 12.6 version which is the most recent one I have.

MS. DROUIN: But you do have, we did send it to Mike. So you do have it.

CHAIRMAN WALLIS: But if we haven't gotten it, we would have to study it. We'll think about it.

MR. SNODDERLY: Plus the true fact was the questions that the ANPR itself has not changed the questions. The ANPR is changed but the intent has not changed.

VICE CHAIRMAN SHACK: Well, there's a certain flavor there in the earlier version. There was a question of whether this was a good idea and that comment was asked up front. Now in the new version, we're going ahead with Part 53.

MR. HARRISON: I think it still asks the question.

MS. DROUIN: We still have the question.

VICE CHAIRMAN SHACK: It's far less direct than it was in the earlier version at least as I read it.

MR. HARRISON: Because they were separate documents.

VICE CHAIRMAN SHACK: Because they were separate documents.

MR. HARRISON: When we brought them together, you got a front piece.

VICE CHAIRMAN SHACK: Right up front, it was more like what do you think of this idea.

MEMBER APOSTOLAKIS: I remember that the rumor was, it was more than a rumor, but the Commission was cool towards this. When did they change their views? Why is this all of a sudden an important endeavor or they were never cool? I remember Commissioner Merrifield saying that until somebody submits it.

CHAIRMAN WALLIS: The reason is that now it's become more realistic that there will be these new designs coming down the pipe.

MEMBER APOSTOLAKIS: Do you mean the design for generation floor?

CHAIRMAN WALLIS: Not necessarily.

MEMBER APOSTOLAKIS: What do we mean?

MR. SNODDERLY: I think the feedback that was given at the last public meeting was that industry wants to focus on the risk-informed rulemaking that are currently ongoing, 50.46(a), 50.69, finish those up and then we'll look at it from a case by case

basis. But I think the words that were used they're going to get most of their bang for their buck or that's where they want this focus and it probably won't be much more and that the technology-neutral framework would be more focused on the generation floor plans.

MEMBER APOSTOLAKIS: That's what I --

MR. SNODDERLY: But for the COLs that are being discussed today, those people would use the current framework, the current ESPs, COLs and design certs.

MEMBER APOSTOLAKIS: You're talking about something that's in the future.

MR. SNODDERLY: So we're talking about -- Yes, that was my impression.

MR. HARRISON: But just maybe from a personal perspective, I think one of the things we're finding now is if you wait until you see plants ready to come in you're too late.

MEMBER APOSTOLAKIS: I understand that.

MR. HARRISON: So this is to get a head start on that next generation.

MEMBER APOSTOLAKIS: I just don't understand the urgence.

CHAIRMAN WALLIS: Realistically, George,

it takes some years to develop this thing thoroughly.

MEMBER APOSTOLAKIS: How come it wasn't urgent six months ago?

CHAIRMAN WALLIS: Well, time has gone by.

MR. SNODDERLY: Well, Mary, maybe that's the answer. When is your due date for providing the technology-neutral framework, the next stage?

MS. DROUIN: I think if I recall the milestone in terms of having the technical basis complete was 2007.

MEMBER APOSTOLAKIS: That's what you said, December 2007.

MS. DROUIN: That sounds correct to me.

CHAIRMAN WALLIS: Two years from now.

MR. SNODDERLY: Because when I looked at that table too, it looks --

MS. DROUIN: And that's consistent with the schedule we've had all along. We haven't accelerated the schedule from what we've been working.

VICE CHAIRMAN SHACK: It looked like to me that the next time you're coming to us for our opinion is in this SECY paper in October `06. Because in the technology-neutral framework, it didn't appear from that table that you're saying you need a letter from us on the technology-neutral framework. Am I

mistaken?

MS. DROUIN: In terms of when we're going to come back to the full committee, a lot of that's going to dictate of what's going to happen over the next six months. We're going to get a lot of feedback from this ANPR. We're going to have this next version of the framework out in April. We're going to get I'm sure a lot of comments. We're going to come back to the subcommittee. I'm sure we'll get a lot of feedback from the subcommittee.

So it's hard for me to say until I see what those comments are. I'd like to think the comments are going to be that the team's done a great job. You don't need to do anything different. But I think that's unrealistic.

MR. HARRISON: But to come back to George's comment, I think if you look at the dates of the recent SRMs that are directing this, one was May. Three of them were September of this year.

MEMBER APOSTOLAKIS: Something changed.

MR. HARRISON: There is a move forward.

MEMBER APOSTOLAKIS: I don't know what it is.

MR. HARRISON: Like I say, when you see three SRMs back to back saying do this, then I think

it's moved this.

MEMBER APOSTOLAKIS: Something happened in the last three or four months. I remember distinctly that Commissioner Merrifield was very cool toward the whole thing.

MEMBER KRESS: But I think the concept may be that for the plants coming in for licensing or certification, the new ones. Maybe they'll come in and try to fit them into the current regulatory system more than likely. But to review them, it would be highly useful to have these concepts in mind that you're developing.

MS. DROUIN: Yes.

MEMBER KRESS: And I think you may not use them directly but you certainly could use them indirectly.

MS. DROUIN: And that's been recognized and that was as you know, I hate to resurrect SECY 130, one of the reasons we moved forward in June on that was to also support preapplication reviews. So we've always recognized that there are issues, technical and policy issues, and developing the technology-neutral framework that will support the ongoing preapplication reviews.

MR. HARRISON: And that's called out for

in the ANPR plan.

MEMBER APOSTOLAKIS: It just occurred to me. I don't know if you're already talking to them but maybe you should try a little harder to bring into your workshops actual designers of Gen-4 reactors because we had a workshop at MIT.

VICE CHAIRMAN SHACK: There's an actual designer.

MEMBER APOSTOLAKIS: What? There are a lot of efforts around the country.

VICE CHAIRMAN SHACK: It's conceptualized.

MEMBER APOSTOLAKIS: Well, yes. I mean at Oak Ridge there is a proposal that a lot of people are looking at by Charles Forsberg.

VICE CHAIRMAN SHACK: Yes. That's a proposal.

MEMBER APOSTOLAKIS: Favorably. There is a lot of work in France at MIT under gas cooled fast reactor and there was a workshop at MIT several months ago where there were people from Idaho and so on, all of them designers, and I gave a ten minute briefing on the technology-neutral framework. Nobody had ever heard of it.

MS. DROUIN: I'm surprised because Idaho has been coming.

MEMBER APOSTOLAKIS: Oh, but there are many Idahoes.

MS. DROUIN: No, but the design, they came in and gave us a two day workshop on their design.

MEMBER APOSTOLAKIS: Good. So maybe that was afterwards. But I think those people you should try to maybe encourage to participate a little more because for example if you take these policy issues that the CDF has to be 10^{-5} or whatever and so on, these guys have no idea that this may be coming. Right now, they are competing against each other. So they are producing 10^{-8}, 10^{-9}, 10^{-10} and 10^{-11}, but not because of licensing issues but because they don't want your design to look better than mine. Anyway, that's a thought.

CHAIRMAN WALLIS: Are we about through with this now?

MEMBER APOSTOLAKIS: We're never through with this.

CHAIRMAN WALLIS: But for today.

MEMBER APOSTOLAKIS: Yes, for today.

CHAIRMAN WALLIS: Are we through for today?

MS. DROUIN: Thank you very much.

CHAIRMAN WALLIS: Should we thank the

presenters? Thank you, Mary, very much.

MEMBER KRESS: Thank you, Mary.

CHAIRMAN WALLIS: We are going to take a break until 5:00 p.m.

MEMBER APOSTOLAKIS: And we'll write a letter.

CHAIRMAN WALLIS: Then I would like to have at least the first draft of as many letters as possible so we can go over all of them and know where we stand and give the major feedback necessary to the authors. We don't need the transcript from now on. We're going to come back at 5:00 p.m. Thank you. Off the record.

(Whereupon, at 4:39 p.m., the above-entitled matter was concluded.)