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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

PLANT OPERATIONS AND PRA SUBCOMMITTEES

SOUTH TEXAS PROJECT EXEMPTION REQUEST

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WEDNESDAY,

FEBRUARY 21, 2001

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ROCKVILLE, MARYLAND

The Subcommittees met at the Nuclear Regulatory Commission, Two White Flint North, Room T2B3, 11545 Rockville Pike, at 8:30 a.m., Doctor George Apostolakis, Chairman, presiding.

COMMITTEE MEMBERS:

GEORGE APOSTOLAKIS, Chairman (of ACRS and) PRA Subcommittee

JOHN D. SIEBER, Chairman, Plant Operations Subcommittee

MARIO V. BONACA, Vice Chairman, ACRS

THOMAS S. KRESS, Member

DANA A. POWERS, Member

WILLIAM J. SHACK, Member

ROBERT E. UHRIG, Member

NRC STAFF:

GOUTAM BACCHI, NRR/DE

RICH BARRETT, NRR/SPSB

MIKE CHEOK, NRR/SPSB

BILL DAM, NRC

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BIFF BRADLEY, NEI

RALPH CHACKAL, STPNOC

NANCY CHAPMAN, SERCH/Bechtel

STEVE FRANTZ, Morgan, Lewis & Beckins

RICK GRANTOM, STPNOC

NRC STAFF: (cont.)

BOB JAQUITH, Westinghouse

MIKE KNAPIK, McGraw-Hill

STANLEY LEVINSON, Framatome ANP

J. RUSSELL LOVELL, STPNOC

ALLEN C. MOLDENHAUER, STPNOC

JIM PETRO, Winston & Strawn

CRAIG SEIVERS, ITSC

GLEN SCHINZEL, STPNOC

DOUG TRUE, ERIN

TAKASHI YAMAGUSHI, Kyusho EPCO

A-G-E-N-D-A

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

(8:30 a.m.)

CHAIRMAN APOSTOLAKIS: The meeting will now come to order. This is a meeting of the ARCS Subcommittee, Plant Operations and PRA. I'm George Apostolakis, Chairman of the PRA Subcommittee. Mr. John Sieber on my left is Chairman of the Plant Operations Subcommittee.

ACRS members in attendance are Mario Bonaca, Thomas Kress, William Shack, Robert Uhrig and Dana Powers.

The purpose of this meeting is to discuss categorization and associated open items related to the South Texas Project request to exclude certain components from the scope of special treatment requirements in 10 CFR, Parts 21, 50 and 100.

Maggalean W. Weston is the ACRS staff engineer for this meeting.

The rules for participation in today's meeting have been announced as part of the notice of this meeting previously published in the Federal Register on January 29, 2001. A transcript of the meeting is being kept and will be made available as stated in the Federal Register notice. It is requested that speakers first identify themselves and

speak with sufficient clarity and volume so that they can be readily heard.

We have received no written comments from members of the public regarding today's meeting.

We'll now proceed with the meeting, and I call upon Mr. Rick Grantom of South Texas to begin.

Rick?

MR. GRANTOM: I appreciate the opportunity to address the ACRS. We are here today to talk about STP's categorization process. This process was started back during the time when we went for the graded quality assurance pilot which was developed during that period of time. We've done some refinements to address the treatment requirements for special treatment requirements, and at this time what we plan to do is, Glen Schinzel will be doing most of the presentation. We brought with us Russ Lovell, Allen Moldenhauer from my staff, and Russ Lovell from the Training Department, and Ralph Chackal.

So, with that, I'll turn it over to Glen to start the presentation, if there aren't any other questions.

DOCTOR SHACK: Can you just tell me how many open items are left on the categorization process from the SER? I was trying to keep track of that.

MR. SCHINZEL: We have three open items specific to categorization. All three of those are still open, have not yet been fully resolved.

DOCTOR SHACK: That's what, 32, 33 —

MR. SCHINZEL: 34, 35 and 36.

DOCTOR SHACK: You guys punted on the common cause one, 31.

MR. GRANTOM: Yes. We went back to the way that we had done that in the graded quality assurance.

MR. SCHINZEL: We will discuss that in our presentation.

Okay. If we could get our Power Point presentation. Okay.

Again, good morning to the ACRS members.

The STP attendees today, like Rick mentioned, includes Rick Grantom, who is an Expert Panel member on our process groups, Allen Moldenhauer is to his left. Allen is our Working Group PRA member. Russ Lovell to his left is a past Working Group chair. Ralph Chackal, to the far left, is our Working Group facilitator, and my name is Glen Schinzel, I essentially serve as the Working Group sponsor for our graded quality assurance Working Group.

CHAIRMAN APOSTOLAKIS: It's not obvious what the difference is between a sponsor, a facilitator and a chairman of the Working Group.

MR. SCHINZEL: Okay.

Essentially, the chair has the responsibility for maintaining the meeting, the activities of each Working Group meeting activity. The facilitator, essentially, prepares the information to be brought to the meetings for the Working Group members, and then as a sponsor I'm the primary interface between the Working Group and the Expert Panel, and in showing that from a schedule standpoint we are getting done what we have intended to.

CHAIRMAN APOSTOLAKIS: So, you are a member of the Expert Panel?

MR. SCHINZEL: I'm not a member of the Expert Panel or the Working Group.

CHAIRMAN APOSTOLAKIS: I see.

MR. LOVELL: Can I mention, Russ Lovell, I'm also now a member of the Expert Panel. I originally was the Working Group chairman, now on the Expert Panel. It was my reward for doing things right, I guess.

MR. SCHINZEL: Any other questions? Okay.

We'll continue with the next slide. From

a categorization process, our categorization does include two areas. One is the PRA input, the other is the deterministic input. As we start in on each individual system, we do review the bases for the PRA model for that particular system. We look at the model inputs and the results coming from that model. In addition, for the model components we identify what the categorization results from the PRA are for those individual components.

On the deterministic side —

DOCTOR KRESS: Is that based on importance measures?

MR. SCHINZEL: Yes, it is. We are going to go through that in some detail, as to exactly how we determine those.

So, here I just want to give a very high-level overview of the process, I'll just do that on one slide, and then we'll step into the details.

On the deterministic side, we do identify the functions that are performed by the system, those primarily come through our design basis document, also with input from our system engineer. We established a risk significance for each one of those functions, and that goes through our categorization process, asking our five critical questions. We'll go through

that in some detail later.

DOCTOR BONACA: Just a question with that, the deterministic process is to focus only on the core damage issues or containment challenges, you do not look at the intermediate goals that you have inside the FSAR, for example.

MR. SCHINZEL: That's correct.

DOCTOR BONACA: You don't look at DNB as a condition that you want to —

MR. SCHINZEL: That's correct, we focus on core damage frequency.

DOCTOR BONACA: So, your deterministic process really is not part of the — FSAR, it just still focuses on the same criteria that you meet.

MR. SCHINZEL: That is correct.

DOCTOR BONACA: All the intermediate criteria that were in the FSAR are not of concern anymore.

MR. SCHINZEL: That's correct.

DOCTOR KRESS: Since risk is inherently a probabilistic issue, are you going to explain what a deterministic risk significance is and how that differs from the normal risk significance?

MR. SCHINZEL: We will. I think as we step through the presentation we'll try to make that clear.

CHAIRMAN APOSTOLAKIS: I think the use of the word deterministic is unfortunate here. It's really a non-PRA or a subjective categorization, because there's nothing deterministic about it. I mean, you are asking people to categorize things and put them in bins, so the word deterministic really doesn't belong here.

But, it's not obvious what a better word is.

DOCTOR BONACA: No, but when you read deterministic the first thing you do, you say, oh, okay —

CHAIRMAN APOSTOLAKIS: Subjective is better, but I can understand why you would be reluctant to use that word.

MR. GRANTOM: That's kind of evolved over time, where the word deterministic has been used to characterize judgment.

MR. SCHINZEL: And, I think as we go through the process you'll see that there is structure to the process.

CHAIRMAN APOSTOLAKIS: Sure.

MR. SCHINZEL: There's consistency to the process, so one thing that we want to ensure that you understand is, it's not a group of people, and a

different set of people coming in at different times, throwing in different ideas, different bases for the determinations.

CHAIRMAN APOSTOLAKIS: Maybe you can call it methodology using structured judgment, because that's really what you are doing.

MR. SCHINZEL: It is.

CHAIRMAN APOSTOLAKIS: It's a structured judgment approach.

MR. SCHINZEL: It is.

CHAIRMAN APOSTOLAKIS: Because deterministic is — and deterministic risk significance, as Doctor Kress said, is kind of an oxymoron, right?

MR. SCHINZEL: If you could kindly accept our use of deterministic for the focus of this presentation, we're going to use it several times.

CHAIRMAN APOSTOLAKIS: We are just trying to be constructive.

MR. SCHINZEL: I understand.

DOCTOR BONACA: I think it's substantial for a reason, that again the point I made is that a member of performance measures, which were the original designer of the plant, for certain transients of a given frequency, are eliminated, and that's

really where the whole deterministic process was focusing on, was the ANSI standards, the approach to categorization, and what kind of performance measure you accepted for that.

So, there is a history behind that, that's why I was confused at the beginning when I was reading it over, I jumped into that and I said, well, it's not here.

MR. SCHINZEL: Once we do identify the significance of each function, then we map that function to the individual components, and then based upon that mapping process a determination is made of the significance of each individual component, and that's broadly what we do in that portion of the determination or the risk significance process.

Once we have gone through the PRA and the deterministic aspects, then we come up with the final categorization for the individual components, and that's comparing the categorization for both the PRA and the deterministic, and we select the higher of the two and we can never have the final categorization being less than what the PRA categorization is.

In addition, we do identify critical attributes. These are the attributes that have made that specific function or that specific component

important, and then the Working Group, once we document the bases for all of our information and decisions, then these decisions are presented in draft form to an Expert Panel, and the Expert Panel reviews, critically assesses the product, and then the Expert Panel has the priority of, or the responsibility of approving the process before it can be used.

CHAIRMAN APOSTOLAKIS: Now, when you say based on the higher of PRA and deterministic, do you mean for every component that is part of the PRA you also did the deterministic risk evaluation?

MR. SCHINZEL: That is correct. Every component receives, if it's in the PRA, it also receives the deterministic side. Those that were not in the PRA only received the deterministic.

CHAIRMAN APOSTOLAKIS: Now, how consistent were the rankings according to the PRA and the deterministic?

MR. SCHINZEL: Generally, they were very consistent. There are times where, based on the subjective insight from the panel members, we've identified areas where we feel that the categorization should be higher, and in those cases we made it higher. In some of those cases, PRA came out with a categorization of low, deterministically we felt that

the categorization should be somewhat higher. So —

DOCTOR POWERS: That would suggest to me that there must be something in the PRA that is not reflective of the group's judgment. Have you tried to identify what that is?

MR. GRANTOM: I think a lot of the cases that happened in there is the fact that the PRA is focused on being a power model, and the deterministic sets of questions follow things from emergency operating procedures, is it necessary for a mode change or shutdown safety, and that's part of the reason why we asked both deterministic and probabilistic, we cover those uncertainties. Some of those differences lie in the answering of those kinds of questions.

DOCTOR POWERS: So, the improved technology in the area of, say, shutdown as an example, could obviously help.

CHAIRMAN APOSTOLAKIS: Well, what you are saying, Rick, is that, perhaps — I mean, the way I understand it is that, if I were to do a PRA categorization, using importance measures that would focus on intermediate goals, as Doctor Bonaca said earlier, rather than CDF, let's say on a function, then, perhaps, the rankings would not be that

different, because you said that in the deterministic categorization people look at things like, well, in addition to shutdown, support of procedures and so on. So, you know, it's a matter of focus.

MR. GRANTOM: Exactly, it's a different question. The traditional — of merit that we have used have been based on 5046 criteria, ETCS acceptance criteria, this is based on a core damaging event, that's different.

CHAIRMAN APOSTOLAKIS: Yes, sure.

So, you brought in some of that old thinking through the deterministic categorization.

MR. GRANTOM: Right, to handle issues like uncertainties and incompleteness, scope issues.

CHAIRMAN APOSTOLAKIS: Right. We'll come back to that, yes.

MR. SCHINZEL: The next slide shows a very broad overview of a flow chart of the categorization, and, again, this is a very high level. It does show on the far upper left-hand side our PRA ranking. The model will develop a ranking of either high, medium or low, and we'll go through those in some detail as to how we developed those. It does factor in station and industry experience separately from the PRA categorization. There is a graded quality assurance

Working Group categorization, and again, the bullets there broadly identify the activities of the Working Group to analyze performance data, consider the risk ranking, inject the deterministic insight, and then develop recommendations regarding the final categorization and those programmatic controls that would be placed over those components.

Then, coming from the Working Group, there is a documented, what we call a risk significance basis document, which documents the judgments and results from the working group. That documented bases is then sent to an Expert Panel. The Expert Panel reviews these inputs, considers the risk categorizations recommended, and injects their own deterministic insights into the process.

Upon approval, then those changes to the processes are available to be inputted into the station, and we do have an ongoing feedback loop that feeds back into both the PRA and the deterministic insights of the Working Group for potential changes to either the PRA model or the Working Group's inputs and following categorizations.

So, that was, basically, the high-level overview. We'll start into —

MR. SIEBER: Maybe I can ask a question.

MR. SCHINZEL: Certainly.

MR. SIEBER: Overall, you've deal with or categorized something like 42,000 components, how many of those actually appears specifically in your PRA?

MR. SCHINZEL: We have a total of approximately 1,200 components that are in the PRA. Now those, for the systems that have been categorized to date, 886 of those model components are included in those categorized systems. So, it's roughly 3/4s.

MR. SIEBER: And, what process do you go through to gather the 39 out of 40 that don't appear in the PRA into the categorization process? Just go through your Q list?

MR. GRANTOM: That's what we are going to cover here in just a second, just go through how we handle those components that are included within the scope of the PRA.

MR. SIEBER: Okay.

MR. GRANTOM: And then, that's in several of the slides in here, so we'll be able to address your question.

DOCTOR KRESS: Your categorization from the PSA is based on importance measures, do you have a – what was your criteria on which – where to draw the lines between high, medium, low and none?

MR. SCHINZEL: We are going to have a specific slide that goes through that, as far as where those thresholds are.

DOCTOR KRESS: Okay.

MR. SCHINZEL: So, as far as the next page, the categorization controls, again, just broadly, generally, the industry views this as an integrated decision-making process. We call that our Expert Panel and Working Group. These are made up of experienced, qualified personnel. There is specific training that we have identified for these personnel. There's a designation of experience that we want these members to have.

The membership is diverse. We have people from our maintenance organization, licensing organization, operating experience from our PRA group, operations, a broad background, a broad insight that's brought to the table, and then we ensure from a decision-making standpoint that we do use consensus decision-making. If we have one member who feels that he can't support the final recommendation or judgment, we do have the ability, it's procedurally allowed, to document a differing opinion, and that differing opinion is then taken up to a more senior panel, and that more senior panel then hears the pros and the

cons and makes a judgment on what the final categorization or what the resolution for that issue should be.

Like I said, the process is procedurally controlled. There is a Working Group procedure and there's a separate procedure for the Expert Panel, and we do categorize our components into one of four categories. We have the high safety significant, medium safety significant, low safety significant and not risk significant. And, that traditionally follows a four box approach that the NRC staff and the industry is currently looking at.

That takes us into the specifics of the PRA categorization approach, and we'll get into some of the details specifically with the PRA. The PRA risk ranking process is procedurally controlled. There are several procedures that give insights as to how we do that categorization. The PRA model at South Texas, it is a full scope model quantification that includes at-power Level 1 and Level 2, with both external events and internal floods and fires. I mentioned that we modeled roughly 1,200 components, that's on a per unit basis, so with both units that's 2,400 components.

DOCTOR KRESS: When you say it includes

fires, do you have a PRA that has fire initiating frequencies and models that carry that to core damage frequency?

MR. GRANTOM: We do have a fire PRA.

DOCTOR KRESS: You have a fire PRA.

MR. GRANTOM: A fire PRA, and we do have an internal flooding PRA.

DOCTOR POWERS: The fire PRA handles all areas of the plant, it doesn't look at only a subset of fire regions.

MR. GRANTOM: All areas.

DOCTOR POWERS: Nothing is screened out.

MR. GRANTOM: Yes, there are things that screen out, yes.

DOCTOR BONACA: You said your PRA model is about 1,200 SSCs, and there was a question before, I didn't get the answer I guess, but when I look at this breakdown I see that probably roughly 40,000 components are addressed insofar as the separation, so that's – but only 1,200 of those are really modeled in the PRA.

MR. SCHINZEL: Yes. We've had – you know, on that slide it shows roughly 44,000 or so that have bene categorized.

DOCTOR BONACA: Something like that.

MR. SCHINZEL: Out of 29 systems.

Now, of those we've mentioned that there's 1,200 that's included in the PRA, but only 886 of those are included in these 29 systems that have been categorized. So, roughly, 3/4s of the modeled PRA components are included in what we've categorized already.

MR. LOVELL: Basically, what happens when we get to doing the deterministic side of it —

DOCTOR BONACA: Yes.

MR. LOVELL: — is we do it by system, and we take a list of all of the components that are listed in our total plant numbering system, and that's then the group that we do the deterministic ranking on. That's why it's a much larger size.

DOCTOR BONACA: You take categories, okay, that's what I wanted to clear up.

MR. LOVELL: You take the whole system, like, for instance, safety injection, we take everything that's listed in their total plant numbering system, and then rank it from there.

DOCTOR BONACA: Okay, so also — okay.

MR. SCHINZEL: For example, the safety injection system might have 3,000 tagged components. There may be 50 of those that are included in the PRA.

DOCTOR BONACA: Yes, I understand.

MR. SCHINZEL: But, we'll categorize every one of the components, and we do that for each system as we go through the categorization process.

CHAIRMAN APOSTOLAKIS: But, at some level all of these are in the PRA, because I can go higher and find the component or a subsystem which is in the PRA. Now, below that you may have a number of components that do not appear explicitly in the PRA, correct? Because if the function of the system appears in the PRA, it depends how far down you go.

MR. SCHINZEL: That's true, however, there are a lot of components in the system that are associated with maintenance functions, or testing functions, or maybe just monitoring functions, that would have the system tag number would be pulled into the categorization process, but they don't play a role directly in the actual safety significant function of the system.

So, when we talk about we look at all the functions, we are really talking about we are looking at all the functions a system does, everything from draining the system, to venting the system, to monitoring the system, all of those things represent a function that are categorized or risk ranked by the

CHAIRMAN APOSTOLAKIS: But, the function itself must be in the PRA someplace.

MR. SCHINZEL: Yes.

CHAIRMAN APOSTOLAKIS: Maintenance, for example.

Now, you are saying there are lots of things that we do in the course of maintenance that do not appear explicitly in the PRA, but maintenance itself does.

MR. SCHINZEL: Yes.

CHAIRMAN APOSTOLAKIS: That's important for later.

MR. SCHINZEL: Maintenance is in there, both planned and unplanned.

CHAIRMAN APOSTOLAKIS: Yes, right.

DOCTOR BONACA: The reason why I was asking that question is that you have in one of the documents we reviewed you have three tables, where you have general categories. For example, category one, vent, drains, test valves, one inch or less in size, no risk significant, that captures a significant population of valves.

MR. SCHINZEL: Correct.

DOCTOR BONACA: Each one of those is part

of the 44,000.

MR. SCHINZEL: Correct.

DOCTOR BONACA: Okay. I'm trying to understand it because otherwise I confuse system level versus component level.

These categories here must capture a very large fraction of the component that you have.

MR. CHACKAL: Just to clarify, the 43,000 number is for both units. The PRA numbers that we mentioned earlier, 1,200, and 886, are on a per unit basis.

CHAIRMAN APOSTOLAKIS: Per unit, so per unit we are talking roughly about 20,000.

MR. CHACKAL: Right.

CHAIRMAN APOSTOLAKIS: That's important.

How long did it take you to do this, 40,000 components?

MR. SCHINZEL: We started with the categorization process in the second quarter of '98, and by the time we got to the latter part of '99 we, essentially, had finished with the categorization of these 29 systems, and we've been focused on our exemption request and trying to get it completed prior to moving forward with additional systems. So, it was about 18 to 20 months.

MR. LOVELL: One of the things that helps on that is, you have those large number of components, but we are a three train plant, so like for safety injection, by doing – reviewing one train you covered all three trains in both units, so that helped us quite a bit in the numbers.

CHAIRMAN APOSTOLAKIS: There's a certain symmetry to it.

MR. LOVELL: Right.

And, I also point out, both units we've kept them very close to identical. The major difference between the two units right now is we replaced steam generators in unit one and are getting ready to replace steam generators in unit two. Other than that, the difference between the units are very small.

DOCTOR BONACA: At some point during the presentation, I would appreciate an explanation of how you can eliminate the full class of components based on a genetic statement. Okay, I'm sure you have some logic for that, it would be interesting to see how you do that, okay, and you'll know the time in the presentation when it's best to do that.

MR. SCHINZEL: Okay, we'll do that.

With the PRA categorization, the fourth

bullet, the PRA model is periodically updated. It is considered a living document, and this will reflect changes in performance of individual components and/or changes in Station design, whether there's been modifications that have been installed, or the way or manner in which we operate the plant.

CHAIRMAN APOSTOLAKIS: When was your PRA completed?

MR. GRANTOM: The original – we started the PRA study at STP in 1982, and we completed the initial phases of the PRA in the middle '80s. '87 we had our final PRA completed, and ever since that time the PRA has undergone just a periodic care and feeding type of stuff. We've used it for application since then, but that's about the time frame that we started.

CHAIRMAN APOSTOLAKIS: So, how many times have you updated, or is it difficult to say this was an update? I mean, does it happen in a continuous manner, or as necessary, or every 18 months?

MR. GRANTOM: It used to happen – when we weren't controlled and proceduralized, it used to happen almost continually. We found that we really have administrative problems in doing that when you are dealing with an operating station, so now we proceduralize the update process to where it's a

controlled roll-out periodically, every 18 months we have a controlled roll-out, and we'll have a statement in there of what the scope of a particular update is. You know, we can't physically update everything that's in the PRA. We don't update the human performance analysis every time, but we'll have a scope statement. At a minimum, we update performance, design and procedure changes. So, that's the way that the process works.

DOCTOR BONACA: In between the 18 months, do you perform a PRA significant determination of each change that you have not reflected in the PRA yet?

MR. GRANTOM: Yes. We have a configuration control process with a database that reads the drawing database, the procedure database.

DOCTOR BONACA: Okay, so you do that.

MR. GRANTOM: As a matter of fact, that's a performance indicator for the PRA group, is how well they keep up with their reviews.

MR. SCHINZEL: The next bullet is going to get us into the PRA categorization. We do base it on importance measures of Fussel-Vesely and RAW, risk achievement worth and Fussel-Vesely, and the next slide will show the details. And, I'll let either Rick or Allen step through the categorization itself.

MR. MOLDENHAUER: Basically, this categorization process that we have here was agreed to with the staff for the GQASER back in '98, I believe was the date, and what we base it on is both the risk achievement work and the Fussel-Vesely values. As you can here, the criteria we have for high, and then there's the medium, what we call medium R, or needing further additional review, which, basically, says to the Working Group that the critical attributes, or the attributes modeled in the PRA, should have full quality QA programs associated with them.

And then we have another group, medium, and then the final group of low.

DOCTOR KRESS: Is there some reason why these numbers are appropriate for RAW or Fussel-Vesely?

MR. MOLDENHAUER: What we have found is that these numbers match up real well with the deterministic aspect of it, and we feel comfortable with these thresholds as our current PRA categorization process.

DOCTOR KRESS: I had in mind more like something like, if you fall into the high category, does this RAW or Fussel-Vesely translate into a certain contribution of that set of components to the

CDF?

MR. GRANTOM: The values that we have in here originated for us back when we had the document of the EPRI PSA Applications Guide, and these values were listed in there.

There is a correlation. We have a cap on the RAW and the Fussel-Veselys, and you can see that the RAW are greater than 100, anything that would change core damage frequency, in and of itself, by two orders of magnitude is considered a high component. And, RAW looks at the avail – the importance of the availability of the component, where Fussel-Vesely is a little bit more aligned with the reliability of it.

So, and then we have a combination of the two. The RAW values of a doubling of CDF has been pretty much a standard that has been carried through the PSA Applications Guide, I think even before that, as some measure of significance. So, we've started at that point, and through the negotiations with the staff there was a concern that components that may not necessarily show up in the results of the PRA, because they are so highly reliable, but when removed from service could have a big impact. So, that's why you see the cap of a risk achievement worth of 100, so that we don't – we wouldn't reduce controls on a

component strictly because of its reliability as being so good.

CHAIRMAN APOSTOLAKIS: What is the core damage frequency now for South Texas?

MR. MOLDENHAUER: It is approximately 1E to the minus 5, it's a little above that, 1.174, I believe.

DOCTOR KRESS: If your core damage frequency were considerably higher than that, would you still use these same RAW values and Fussel-Vesely values?

MR. GRANTOM: Well, that's kind of an issue, the RAWs and the Fussel-Veselys are going to be relative. If you have a ten to the minus two core damage frequency, you'd still end up with numbers like this.

CHAIRMAN APOSTOLAKIS: As a matter of fact, you know, what we can do, just to play a game, we can put a system in series with everything else you have now, that fails with a frequency of ten to the minus — or five ten to the minus four per year, then the whole categorization is thrown out of the window because you cannot increase the core damage frequency by a factor of 100 by failing any one of the other components, because you have this big one now there

which controls the core damage frequency, which is a good example of what you just said, that the absolute value of the core damage frequency -- really doesn't enter into this. It's a very relative thing.

MR. GRANTOM: Well, in your example I'd say you probably need to go back and look at the PRA.

CHAIRMAN APOSTOLAKIS: You are violating the goals that way.

MR. GRANTOM: Yes, but it is, you have to depend on the fact that we have a robust PRA, it's a PRA that's been reviewed, both internally and externally, and we have confidence that the model has a good degree of fidelity and robustness that's associated with it. It's been proven over time.

So, but your concern is valid, these are relative importance measures, and risk ranking methodology and importance measures are going to, I feel, continue to evolve and we have to be ready to evolve with that. I think that's a good point.

CHAIRMAN APOSTOLAKIS: And, to take the other extreme, what if you have a unit that has a ten to the minus seven?

DOCTOR KRESS: They are unfairly penalized in a sense.

CHAIRMAN APOSTOLAKIS: You are penalizing

them.

DOCTOR KRESS: Yes.

CHAIRMAN APOSTOLAKIS: Because it would still have —

DOCTOR KRESS: It works both ways, yes.

MR. GRANTOM: It does, and with South Texas we'd say we might be penalizing ourselves in a sense with the investment of a third train having lower core damage frequency numbers, but these are relative so we are still treating these as important.

DOCTOR KRESS: Well, that's why I brought the whole question up.

DOCTOR POWERS: I am hardly expert in this, but my recollection is that these numbers are, risk achievement worth and risk reduction worth, are achieved by looking at the components only one at a time, and we don't look at the possibility that one component is degraded and the other one is either completely efficient or completely inefficient.

DOCTOR KRESS: Other than where we factor in common cause, that's true.

MR. MOLDENHAUER: Well, we did do a sensitivity study where we increased the failure rates for all the low risk significant components by a factor of ten, to see what the impact would be on core

damage frequency and whether the components would change classification from low to either medium or high.

MR. GRANTOM: It might be interesting to, when we get to the slide on the sensitivity studies, to get the committee's feelings and thoughts about that, because just like Mr. Powers question, we tried to answer that, we just don't look at the PRA and take the average PRA and here's the risk, the RAWs and the Fussel-Veselys and that's it, we go through a whole series of sensitivity studies to manipulate the model, to see what the sensitivities are.

So, when we get to that, maybe we can talk about some of the other – there might be some other questions that come up relative to things like that.

DOCTOR BONACA: Before you move away from this ranking, in the papers we got there is a description of how in some cases you may have a high safety significant system and components that make up the system, for example, the trains, be redundant, may be classified at a lower safety significant level. I would like to see how you go through that process.

MR. GRANTOM: Okay.

CHAIRMAN APOSTOLAKIS: That's in the deterministic part, right?

DOCTOR BONACA: Is it?

CHAIRMAN APOSTOLAKIS: Yes, right.

DOCTOR BONACA: Okay, so for the probabilistic you have – all right.

CHAIRMAN APOSTOLAKIS: The documents other than those from STP really don't go into full categories, right? They consider only two, I believe, high risk significance and low.

MR. GRANTOM: Right.

CHAIRMAN APOSTOLAKIS: And, they are all greater than two and Fussel-Vesely greater than .005 puts you in the high category and anything else, I think, puts you in the low. Something like that.

MR. GRANTOM: Something like that, yes.

CHAIRMAN APOSTOLAKIS: Now, what is the benefit of having a more detailed categorization scheme, have you thought about that? I mean, do you really gain much by going through this, or a simple up/down scheme is good enough?

MR GRANTOM: Well, I think there's a benefit to the medium category. I think it's an important aspect that through the process of updating a PRA, or in the event that you find an error, that you don't have mass migrations of equipment from low to high, and you need some intermediate buffer that

keeps components treated very close to what you are already doing for the high component, so that if you do have some movement the impact isn't nearly as great to the Station, the impact is not nearly as great to the requantified analysis.

However, with the way that the exemption request works, you know, low and non-risk significant components, through, just hypothetically speaking, some error were to show that one of those should be high, then you have a whole list of issues that could be concerning you then on how that component was treated, how you had recertified and reverified that component.

So, I feel that medium is an important buffer to have, and high and medium corresponds to what the staff has put, they call it the risk one box, that's basically where we have it, and low and NRS would be box three.

CHAIRMAN APOSTOLAKIS: Where is the no risk significant category? I thought you had one like that.

MR. SCHINZEL: We do have one for the deterministic only, not for the PRA, and for the deterministic that, essentially, identifies where, you know, the risk overall is so low that we call it non-

risk significant. And, we'll go through the thresholds that we use in that also.

CHAIRMAN APOSTOLAKIS: So, you have two medium categories, give an example of this medium R, this is the focused thing?

MR. GRANTOM: Right, there was still a concern that even a component that would change the core damage frequency by an order of magnitude, by the fact that it was out of service, was still a concern and we might need to look at the reliability level. Is it because it's just reliable, or what are the other reasons? And, some of these components, I mean, components that get high risk achievement worth are sometimes very reliable components. They can be passive, like a locked open manual valve that basically is a piece of the pipe, or it can be something very important like a solid state protection system, which are extremely reliable systems, and, therefore, in core damage scenarios they don't show up very often because they are very reliable.

You have this classic category here where the risk achievement could be, you know, greater than ten, but it's really less than 100, so we ought to look at those more. And so, it was just to make certain that you don't classify things without some

scrutiny associated with those things that fall in the middle here.

DOCTOR KRESS: Do you have an example of one?

MR. MOLDENHAUER: The only example I can think off my head is a locked open manual valve that we've modeled as transfer and close during the mission time, and there's probably one maybe in the auxiliary feed water system would be ranked medium R.

DOCTOR KRESS: I'd like to return a minute to Doctor Powers' question. If you have a component that has, say, a low risk significance coming out of the PRA, based on these RAW and Fussel-Vesely values, but you actually have 100 of those components in separate systems, and if the failure of the components are by chance, which is sort of the way we deal with them in PRA, then shouldn't those Fussel-Veselys and RAWs be multiplied by 100?

MR. GRANTOM: The sensitivity studies that we do, and the ones that we've done, is we've taken those ones that fall into the low and have increased their failure rates by an order of magnitude in total, to see what the impact on core damage frequency does, and, of course, the impact increases core damage frequency, but it's still within the guidelines of Reg

Guide 1174.

DOCTOR KRESS: Yes, well, that's the nature of sensitivity studies, but I'm trying to come up with a philosophical logical basis for how to deal with multiple components, rather than one at a time.

MR. GRANTOM: Well, there's a common cause aspect that we deal with, and common cause is explicitly — common cause basic events have their own —

DOCTOR KRESS: Yes, but even say there were no common cause failures at all, the probability of one of those things failure is the probability of one failure times the number of them that are there.

DOCTOR SHACK: But still, I mean, your ultimate goal is the delta CDF, and as long as that remains small in total, that's truly the real check on this. This is only a way to get you to some categorization, but the ultimate check is when you look at the delta CDF, it better be small in toto.

CHAIRMAN APOSTOLAKIS: Yes, we'll come back to that two slides later, when they talk about sensitivity studies, because that's an important point.

MR. GRANTOM: Yes.

CHAIRMAN APOSTOLAKIS: So, the main message

here is that these threshold values are sort of reasonable, that there is no really technical basis behind it, I mean, they just turned out to be reasonably in agreement with what people would expect to see.

MR. GRANTOM: Yes, and this is something we worked out with the staff to be reasonable.

CHAIRMAN APOSTOLAKIS: Yes, okay.

MR. SCHINZEL: The next slide gets into the approach to common cause. I know that there was a question about this when we met with the committee back in December. What we've evolved to here, that STP will use the conservative common cause approach that was approved in graded quality assurance.

Now, with that we recognize that there are some potentials for improvement, so we also recognize that his is a conservative approach, and from the standpoint of the application for this time it's probably going to be the right approach for us.

The approach that we're using does sum the Fussel-Vesely RAW importance measures for all the causes of basic event failures. The final component Fussel-Vesely RAW importance includes the total common cause contribution and the different failure modes.

CHAIRMAN APOSTOLAKIS: Well, I guess, is

the staff going to get into more detail on the issue of common cause failures?

UNIDENTIFIED SPEAKER: I don't know that we'll go into more detail.

MR. LEE: We are prepared to discuss, in a little more detail, as to the issue that you had raised in the last meeting, and how we came to a resolution of that, yes.

CHAIRMAN APOSTOLAKIS: Right.

Now, if we have, let's say, a three train system, okay, and you have the pump. You have three pumps, you will have the random failures plus the common cause contribution.

For Fussel-Vesely, I guess it's okay to add them up, because it's added, it's just all the minimal cut sets that contain the component, so it's okay.

For RAW, though, I'm not so sure we can do that, and, in fact, don't you say somewhere in your letters of January that for RAW you did something else? You said that, in Attachment 1 to your letter dated January 15, 2001, from Mr. Rosen to the NRC, open item 3.1, you say you are doing something else with RAW. "It has been determined that the PRA risk ranking incorrectly adds risk achievement worths

across differing failure modes. Rather, the proper approach considers the role for the component to be equal to the highest component failure mode and not the sum of the failure modes." This would appear to be inconsistent with your slide.

MR. MOLDENHAUER: Yes, we have gone back to the original, what we'd said in the graded QA SER, in that where we were going to sum them all up, instead of doing the approach, and I think we've probably resubmitted that, haven't we, Glen, that we were going to —

MR. SCHINZEL: Yes, that has been resubmitted. We had this as our original response to open item 3.1. The letter dated January 18, Attachment 6, includes a revised open item response to 3.1, and in that —

CHAIRMAN APOSTOLAKIS: Yes.

MR. SCHINZEL: — our response coincides with what we have on our slide.

CHAIRMAN APOSTOLAKIS: So, let me understand now, there are two letters here, one is dated January 15th, and the other three days later, January 18th. In the January 15th, the first letter, there is an attachment that says that what you did with RAW was not proper, and that you will change it.

But, three days later you say, let's go back to what we did with it in the GQA and be done with it. Where does that leave the advisory committee? Which one is right?

MR. GRANTOM: The one that we've chosen, as far as the way we did it in the graded QA is generally acknowledged as being a conservative approach.

CHAIRMAN APOSTOLAKIS: But, RAW, it cannot be added. You can't do that, I mean, as you yourself submit.

MR. GRANTOM: Right, we are not — we are trying to categorize equipment into groups, and we're not trying to make an accurate calculation of common cause contribution.

We recognize that there are better ways to do this, and certainly want to pursue solving this in the correct manner, but the constraints associated with getting the exemption request approved preclude us going to a totally new approach and the reviews associated with that.

So, we elected to go and maintain the conservative aspects of this.

CHAIRMAN APOSTOLAKIS: But, Rick, these are your words, "STPNOC will revert back to the recognized conservative approach for PRA risk rankings from the

GQA SER, with one exception as stated below." These are your words. And, the exception refers to RAW.

But then, three days later you come back and say forget about it, it's okay, because I think you are right in the January 15th letter, you are right, I mean, that's what you say, and if you have three failure modes you go with the highest, which is the correct way of doing it, because RAW assumes other component is down.

Now, I don't know what happened to the GQA, did you do that? Maybe that should be a question to the staff.

MR. SCHINZEL: I agree.

CHAIRMAN APOSTOLAKIS: Not right now, but you'll have time later.

So, what you have on the slide there is inconsistent with your January 15th letter, but it is consistent with the January 18th letter, which is all right.

MR. SCHINZEL: Yes, based on —

CHAIRMAN APOSTOLAKIS: Consistent with the latest.

MR. SCHINZEL: — upon receipt of our January 15 letter, the staff and South Texas did have some discussions, some phone conversations, and based

on those phone conversations the decision was made that we would revert back to our graded quality assurance approach. And so, that predicated the revision to that open item response, and our follow-up letter of January 18.

CHAIRMAN APOSTOLAKIS: Let me tell you what my overall feeling is about all this. I think the methodology, and we'll come to aspects of it as we review it, I think the methodology could be improved in several areas, and some things, perhaps, as you say, are improper and so on.

The problem I'm having is that I'm not sure that if one did it correctly one would find a very different categorization than you guys came up with. So, it is all well that ends well. That's a problem I'm having, and if this was a routine application maybe I wouldn't care that much, but this is setting a precedent. There will be some rulemaking in the near future, and so on, and so if it worked here why not put it in the rule. Well then, I'm going to really object.

But, the importance measures – it really – I don't think – and it's not because you don't know, I mean these things are as a community, now we are scrutinizing them more because they are becoming so

important. So, I'm not blaming you guys, I mean, you did the best you could do with the available methods. But, the truth of the matter is that a lot of this stuff really could be improved and in some ways it is really wrong.

But, the ultimate result still remains, and I have another case where this happened, I mean, where Sandia did 1150, first time around they were criticized that they didn't use formal methods for expert opinion elicitation, and then they went back and did it, spent a lot of dollars, and what was the result, the same as before.

MR. GRANTOM: Doctor Apostolakis, I would agree with you that risk ranking methodologies can improve. We were the first out of the box to go and do this stuff, and this is an important lesson learned and, hopefully, we can continue to work with the staff to improve the methodologies because there are some things that are out there that we would like to do, possibly, you know, at a formal professional or institutional conference somewhere, to say here's the difference between these two methods here, and we'd like to do that, but we are trying to get an exemption request approved also.

CHAIRMAN APOSTOLAKIS: Now, another thing

I don't understand, Rick, is, if you get your request approved, why would you continue to work with the industry to start to improve risk ranking methods?

MR. GRANTOM: Because we agree with you, they need to be improved.

CHAIRMAN APOSTOLAKIS: It was a glory of science.

MR. GRANTOM: It is for getting the right answer.

MR. SCHINZEL: Yes, it's really driving toward the right answer. We recognize that what we have is overly conservative, and in the process of discussing this with the staff it was recognized that in the PRA community there's not final agreement on what the right answer is.

And, we can turn this into a research project right now, but it's not the right time for South Texas to have this turned into a research project. So, from that perspective, we go back to a very conservative approach, which is recognized to be conservative, but at the same time we are not satisfied with where we are with this resolution. So, we want to continue to work with industry and staff, come up with a community position on what the right thing to do is.

CHAIRMAN APOSTOLAKIS: I think it's not really a matter of the final results changing that much, it's a matter of confidence. It's really a matter of confidence that we know what we are doing, and Doctor Wallace is not here to tell us how it's important to keep the technical communities on our side.

Shall we go to the next slide?

DOCTOR POWERS: He completely wore himself out yesterday.

CHAIRMAN APOSTOLAKIS: I'm sorry?

DOCTOR POWERS: He completely wore himself out yesterday making that point.

MR. SCHINZEL: You mentioned that you didn't think that the results would change that much, and I think I'm correct in saying that going to this alternate approach that we had in our January 15 letter, there were only a total of 46 components that ended up changing their categorization.

CHAIRMAN APOSTOLAKIS: But, they did change.

MR. SCHINZEL: They did change.

CHAIRMAN APOSTOLAKIS: But, you see, that's an interesting question now. I mean, if they changed because we changed the way you calculate RAW, why

didn't the Expert Panel catch that before you recalculated it? We seem to be placing a lot of confidence and trust in the Expert Panel, they are always conservative, they would move things up in the categories, and here are 46 components where you did something new with RAW, and the Expert Panel said not to change it.

MR. MOLDENHAUER: For the most part, the Working Group and the Expert Panel did catch that. They were deterministically ranked higher, there was only 12 of them that we had to actually go back and reclassify.

CHAIRMAN APOSTOLAKIS: So, only 12 instead of 46.

MR. SCHINZEL: Well, we had 46 that changed, but that was out of the PRA. Deterministically, all by just a handful had already deterministically been shown with a different categorization.

MR. MOLDENHAUER: And, they went from the rank of medium to high, so they were still not —

MR. GRANTOM: That's why it's important to have a buffer.

CHAIRMAN APOSTOLAKIS: So, you are already doing something.

Well, that's a good point. So, shall we move on to the sensitivity study?

MR. SCHINZEL: With the sensitivity studies, and I'll let Allen step through some of the details here, we do have 21 sensitivity studies that are currently in use in the South Texas PRA model. We give on this slide some of the sensitivity studies that are in use, and, Allen, I'll just let you talk through what you want to focus on, and we can step through some of these in more detail if the committee needs us to.

MR. MOLDENHAUER: I'd like to put up a slide here that was part of the additional handouts. And, this is how we categorized the PSAs. On the left-hand side are the component tag numbers, our total plant numbering system, to identify them, and then we had each of the sensitivity studies here going across and some of – the first set of sensitivities here are planned maintenance, and that where we are looking at, if you are in this planned maintenance state, if you have a central cooling water train out of service what is the effect of the other components that are still in service? Do their risk rankings go up?

And, there's 13 of them, of the planned

maintenance ones. The last three, PM1, PM2, PM3, deal specifically with no planned maintenance activities. And then, the GN1 through 10 deal with different maintenance activities that will be occurring on our 12-week rolling maintenance site for planned maintenance. Then the next set here is the increased failure rates. When we initially did it, we went and we looked at increasing the failure rates by a factor of two, five and ten, to see if there was any differences. The next one, NCC, is the removal of common cause, we wanted to see what the component risk ranking would be if we didn't have common cause in the model. REC is for removal of any operator recovery actions, to see just what the independent failures themselves, without the ability of the operators to mitigate the accident, what the impact would be. STP here is the average core damage frequency model. The LER is a sensitivity study on the large early release, where we decrease the frequency of steam generator tube rupture, so that we can see the effect of components, because steam generator tube rupture dominates our large early release and there aren't very many components that can mitigate it after that. The STP L2 is the large early release rankings, and then we had a composite ranking out of these, and then

we did a final category – excuse me, the final ranking is based off of looking at and making sure we are getting consistent results between the trains.

CHAIRMAN APOSTOLAKIS: This business of multiplying the failure rates by two, five and ten, now if I – let's take again the three train system, the failure rate of a pump will appear in many terms, but the two terms that are of importance are the random failure of the three pumps, so it would be Q^3 typically over one by other terms, and then a common cause term that will be Q times beta, times gamma in the multiple Greek letter method.

When you multiply the failure rate by ten, do you multiply it everywhere where Q appears, including the common cause term?

MR. MOLDENHAUER: We did include it in the common cause, but we didn't increase the failure rates of the beta and the gamma factors.

CHAIRMAN APOSTOLAKIS: No, but in Q?

MR. MOLDENHAUER: But, we did in the Q.

CHAIRMAN APOSTOLAKIS: So, the common cause term goes up by a factor of ten as well?

MR. MOLDENHAUER: Yes.

CHAIRMAN APOSTOLAKIS: I thought Rick told us last time you didn't do that in December.

MR. GRANTOM: I don't recall that, Doctor Apostolakis, so if I did I might have misspoke.

DOCTOR SHACK: You might have been talking about the betas.

MR. GRANTOM: Yes.

CHAIRMAN APOSTOLAKIS: No, the beta cannot be multiplied by ten, because it becomes one. The Q itself, because if you did that, then Doctor Shack is right, that what do I care? I mean, if the total is delta CDF is negligible it's okay, but if you didn't do that then that argument is not valid, because you are increasing selectively terms. So, this is a key question, because Q appears in a number — I mean, it also appears in the maintenance terms, right?

MR. MOLDENHAUER: Yes.

CHAIRMAN APOSTOLAKIS: That one pump is down, the other —

DOCTOR SHACK: I'd say assuming the failure rate goes up by a factor of ten, it's a fairly conservative assumption.

CHAIRMAN APOSTOLAKIS: But, you see, that's what bothers me about these things, when we increase it by ten and we find out the number is acceptable, then we are all happy. If it not acceptable then we say, well, gee, a factor of ten is really too high.

Well, I'm sorry, either you go with ten or you don't. Okay? And, if it turns out to be unacceptable, then don't come back and say, well, gee, it was too much.

MR. GRANTOM: Well, I appreciate Allen being here to correct anything that might have happened in the previous meeting, but that's why we do these series of sensitivity studies, to see what happens when you increase things by a factor of ten across the board.

CHAIRMAN APOSTOLAKIS: So, you actually included the common cause terms in increasing by a factor of ten?

MR. MOLDENHAUER: Yes, we did.

CHAIRMAN APOSTOLAKIS: Well then, you are right.

DOCTOR POWERS: Could you remind me —

CHAIRMAN APOSTOLAKIS: If that's the case, then it doesn't matter.

DOCTOR POWERS: — could you remind me what T stands for in this table?

MR. MOLDENHAUER: Oh, T is for truncated. Those are components that fall outside of the PRA that we didn't get any results from. They were modeled, but there were no — they weren't captured in the sequence database.

DOCTOR POWERS: So, T is less than low.

MR. MOLDENHAUER: Yes.

DOCTOR POWERS: T is off the table.

MR. MOLDENHAUER: Still from a graded quality assurance standpoint, we call it low, because anything that's modeled in PRA has got to have some risk associated with it.

CHAIRMAN APOSTOLAKIS: Isn't it amazing, though, that you took all the low components, how many of those do you have, thousands, don't you?

MR. MOLDENHAUER: In the PRA?

CHAIRMAN APOSTOLAKIS: Low risk, in the PRA you have a few hundred, I guess.

MR. MOLDENHAUER: Yes, a few hundred.

CHAIRMAN APOSTOLAKIS: You increase their failure rate by a factor of ten, and you still didn't find any impact of the core damage frequency?

MR. MOLDENHAUER: The impact of the core damage frequency was approximately 2.5 E to the minus seven.

MR. LOVELL: Allen, do you want to pull up that slide?

MR. MOLDENHAUER: Sure.

MR. LOVELL: We have a slide that specifically goes through this.

MR. MOLDENHAUER: When we initially did the PRA risk ranking, we didn't know which components were going to come out low through the graded quality assurance process, so when we initially did it we just took check valves, we figured that for the most part check valves, if they only had one state they needed to open, or, actually, they may have two states they need to stay open, we increased their failure rates by a factor of two, five and ten, but after we had gone through the process and we knew exactly which components were going to be ranked out low from this process, we went back and that's when we increased the failure rates for those components specifically, and here's the results from it.

CHAIRMAN APOSTOLAKIS: So, when you say low rank components, you mean all of them?

MR. MOLDENHAUER: Yes, all of them. Well, all of the 843 that have gone through the risk ranking process are in the PRA.

CHAIRMAN APOSTOLAKIS: Well, I guess this is a powerful argument. I mean, the staff has confirmed all this?

MR. BARRETT: Yes, the staff has reviewed all this, it is a powerful argument. You know, the other side of this, of course, is to assure ourselves

that the changes that are in the treatment are such that the reliabilities do not degrade beyond the factor of ten, because some of these equipments have ten to the minus three and ten to the minus four based on reliabilities.

MR. LOVELL: Yes, I think the simple part, I'm not an expert in the PRA, but being involved in the graded QA, the thing I get out of it is, in fact, if it's rated low it's low. There's not a lot of core damage impact, and even if you change it a number of times it still doesn't affect the overall number. So, low is really low, and we ought to be looking at it from that standpoint, even when we get into the treatments.

CHAIRMAN APOSTOLAKIS: What do you mean the removal of common cause failures in the previous slide?

MR. MOLDENHAUER: That was one of the sensitivity studies that we thought — we wanted to see if there would be any impact on just the independent failures of the component, not including common cause. If for some reason the component would go from a low to a medium or a high.

CHAIRMAN APOSTOLAKIS: I thought — I mean, removing common cause failure terms is kind of an

optimistic thing. Why would it make the ranking of the component worse?

MR. MOLDENHAUER: There were no cases where it did make it worse, but it was just something that we needed to prove to ourselves.

CHAIRMAN APOSTOLAKIS: I guess what I'm saying is, it's kind of obvious, but anyway.

DOCTOR SHACK: But, I think, isn't it sort of like the steam tube generator, because they dominate the thing you really take away the high stuff to sort of see – you get a more sensitive appreciation of what the individual component does if you get rid of the thing that's really dominating the picture. At least that's sort of what I see.

MR. GRANTOM: Well, and with STP it's particularly true. I mean, you know, global common cause failures pretty much dominates everything, and so when you do a risk ranking they always pop up to the top. So, when you go in to remove those, you can kind of get a feel for what's the independent components, I mean, when you are viewing the PRA under different alignments, okay, different trains running, different trains may be in standby, the alignment subsystems can play a role when you are looking at individual component effects and the number of common

cause events also changes, too. So, there's some things that filter out of that.

CHAIRMAN APOSTOLAKIS: Why do we have to bother with all this importance measure business and deterministic thing? Why don't we say this will be a performance based decision? You tell us which components you want to put in the low risk category, you come in and say, we want these, then you multiply their failure rates by ten and if the — CDF and LERF is negligible then your argument is acceptable? What's wrong with that, so we don't have to worry about Fussel-Vesely? I mean, you made the case, you multiplied everything by ten, then next time 20, until somebody gets into trouble, but as far as I'm concerned this is it.

DOCTOR KRESS: Well, you have to choose that pen carefully.

CHAIRMAN APOSTOLAKIS: But, that's the next thing, as Rick pointed out, that then you have to ask yourself, you know, the removal of certain things, does it decrease —

DOCTOR KRESS: But, in principle, I think you are right.

CHAIRMAN APOSTOLAKIS: Why do I have to bother with all this stuff and create all sorts of

questions? I mean, this set of components, if they are multiplied by ten doesn't do anything.

MR. BARRETT: I'll take that as a question for the staff. I'm Richard Barrett, I'm with the NRR staff.

There are, as was pointed out, a number — a large majority of the pieces of equipment in the plant that are being categorized that are not modeled in the PRA, and it's true to say that a lot of them are not in the PRA because they have no particular — they have no strong impact on the risk of the plant, and I think for those pieces of equipment it's fair to say that they are not credited in the PRA, which is another way of saying they really don't matter very much.

On the other hand, there are a number of pieces of equipment in that category that are implicitly in the PRA. They are not explicitly modeled in the PRA, and yet they can have a very strong impact on the result in a way that is not particularly modeled. And so, that's really a lot of the questions that we've raised have to do with, for instance, the questions of pressure boundary type of issues and things like that.

So, you know, there are, I guess I'll call

them secondary effects, but I agree with you, that the argument that you've taken everything, requantified it and shown that the impact on CDF and LERF is very, very small, I think that's a very powerful argument.

CHAIRMAN APOSTOLAKIS: The danger is that another licensee in the future may not be able to live with a factor of ten increase, so you guys have extreme redundancy, and where did the pen come from? Right?

MR. BARRETT: Yes, those are the two —

CHAIRMAN APOSTOLAKIS: I mean, you are taking the arbitrariness here and moving it somewhere else.

MR. GRANTOM: Well, the ten has a bit of a basis to it, because we count, on our corrective action program, there's also 10 CFR 5065, which is a maintenance rule that looks at functions and how they are working, and those are barriers, in a sense, that preclude failure rates to reach such a bounding level as a factor of ten. And, the corrective action program is used across the site for all components, no matter what their risk significance or non-risk significance is, and to have a component that would reach a factor of ten in its failure rate, those controls and those programs would come into play well

before that level would happen.

So, we felt like the ten is a really, in a sense, a bounding case, based on an effective corrective action program.

CHAIRMAN APOSTOLAKIS: Right, plus I think in the PRA community we are dealing with factors of ten, because we are being conditioned from the —

DOCTOR SHACK: Well, again, George, you wouldn't be disturbed if a plant with a higher CDF couldn't put as many components in the low category.

CHAIRMAN APOSTOLAKIS: No.

DOCTOR SHACK: These guys get an advantage for having three trains.

CHAIRMAN APOSTOLAKIS: Yes, although it's not clear to me that the higher your CDF the fewer components you can put in the low category. It's not clear at all.

DOCTOR SHACK: Well, it may not be, because they don't have any effect on it. If it turns out that way.

CHAIRMAN APOSTOLAKIS: Yeah, if it turns out that way it turns out that way.

Shall we go to slide 12, because we are running out of time. Yes, please go to 12.

MR. SCHINZEL: Slide 12 takes us into the

deterministic categorization function. As a Working Group, we do use what we call five critical questions in aiding us and guiding through the deterministic categorization process. These five critical questions are summarized below. We ask ourselves if the failure would directly cause an initiating event, whether the loss of the function would fail another risk significant system, whether that system mitigates accidents or transients, whether it is specifically called out in our emergency operating procedures or emergency response procedures, and if it's significant for either shutdown or mode changes. Those are the five specific areas that we look at.

And, as we go through and address those questions, we'll either address those in either a positive or a negative response.

CHAIRMAN APOSTOLAKIS: But, again, well now actually we are getting into a territory where things become more important, because you can't use your sensitivity analysis to make the argument, right?

MR. SCHINZEL: Correct.

CHAIRMAN APOSTOLAKIS: Now, this is really, what you are using here is an application, really, of decision analysis, where you have your categories, five categories, and then you rank – you rate each

component from zero to five within each category, multiply by the weight and add them up.

One of the important constraints when you use methods like this is that your objectives, or what you call questions, should be preferentially independent. So, when we ask a question, is the function specifically called out in the emergency operating procedures, and then we ask, is the function used to mitigate accidents or transients, isn't there a significant overlap there? Are you double counting? I mean, if the function is specifically called out in emergency operating procedures or emergency response procedures, doesn't it follow that that function most likely is used to mitigate accidents or transients?

MR. GRANTOM: Yes, it does. I think you do see some overlap. However, and Russ can probably speak to this much better than I can, there's a lot of other – there's other equipment that the operators may use for accident mitigation. Maybe, Russ, you can fill in.

MR. LOVELL: Probably the difference more is there's a lot of equipment that's called out in the emergency operating procedures that's used for monitoring of the accident and decision making of where you go in the procedures that may not be looked

at quite as much as accident mitigation.

CHAIRMAN APOSTOLAKIS: So, for a number of components then there is double counting, and for some there isn't.

MR. LOVELL: Correct.

CHAIRMAN APOSTOLAKIS: Well, maybe a more careful —

DOCTOR POWERS: Is this double counting? I mean, all it is is a set of questions, they are not counting anything here.

CHAIRMAN APOSTOLAKIS: No, because then they put a weight of five to each, and then they multiply —

MR. SCHINZEL: We have different weightings. We can go through those details if you wish us to.

CHAIRMAN APOSTOLAKIS: In your letter dated January 23rd, Attachment 4, that's what you say, that you have a weight of five, five, four, four, three and three.

MR. SCHINZEL: Correct.

CHAIRMAN APOSTOLAKIS: Then you rate each component from zero to five, starting from negative response all the way to positive response.

MR. SCHINZEL: That's correct.

CHAIRMAN APOSTOLAKIS: With respect to each one of these, right?

MR. SCHINZEL: Correct.

CHAIRMAN APOSTOLAKIS: See what they do their, Dana? So, they take now one component that is important with respect to accident transient, and also EOPs, and multiply the rating times five and find the weights, and they get scores, 25 and 25. That component now gets a score of 50, essentially, for the same function, because it is important to mitigate the accident, and it also appears in the EOPs, but the reason why it's in the EOPs is because it's important to mitigate accidents.

MR. LOVELL: In many cases that's right.

The other thing to point out, though, because this is a problem that we ran into in trying to explain this thing, is we do not use these rankings for component categorization, we do it only at the function level, the system function level, not at the component level.

CHAIRMAN APOSTOLAKIS: Which brings up another, system function, why do you have to do this? The system functions should be in the PRA, shouldn't they? I mean, I can't imagine that there is a function that is important to accident mitigation that

is not in the PRA.

MR. GRANTOM: That's true, they are, but there are a lot of —

CHAIRMAN APOSTOLAKIS: So, why do I need this?

MR. GRANTOM: — there are a lot of functions that a system does that aren't in a PRA also, and there may be — and, I don't really —

MR. LOVELL: Let me give you an example. One of the things we have up here is the ability to make sure you can make a mode change, or you don't make a mode change, you maintain your shutdown, I don't believe that's covered in the PRA, but we included that in our deterministic review.

MR. SCHINZEL: And, there are certain systems that really the PRA doesn't have any interest in. We've categorized some of those systems.

CHAIRMAN APOSTOLAKIS: Wait, wait, let's not confuse the issue. If I look at the five questions, they all use the word function, not system, right?

MR. SCHINZEL: Right.

CHAIRMAN APOSTOLAKIS: Is the function used to mitigate, is the function specifically called, does the loss of the function directly fail another risk

significant system, it's always function.

And, it seems to me that these questions are at a high enough level, except for the shutdown because your PRA is only for power and mode changes, that these are at a high enough level that I can't imagine that there is a function that does any one of these and is not in the PRA. So, why do I need to go to this weighting scheme to find out how important they are when the PRA tells me how important they are? In other words, find the Fussel-Vesely and RAW of the function, you already have done a lot of it.

MR. MOLDENHAUER: One function that wouldn't be covered by the PRA that would be risk significant is fuel handling building accidents, spent fuel pool cooling.

CHAIRMAN APOSTOLAKIS: Yes, because you are talking about different – well then, it seems to me that it would have been much more clean to say these things, that we are going to do this, which is highly subjective for functions that are not in the PRA. In other words, we are relying on the PRA as much as we can, and get the RAW and Fussel-Vesely for the function, which you don't need because you know that they are – to begin with.

MR. MOLDENHAUER: Well, to some extent we

did do that. We did a straw man before we took this to the Working Group, where certain individuals in the Working Group are responsible for taking a first cut at answering these questions, and I was responsible for doing the mitigation of accidents and transients and causes initiating event, and the input I provided into that was from the PRA perspective of it, and I looked at mainly the common cause issue in that. If you have a common cause issue that could affect this function here, you get a function ranking, and that's basically how I came up with whether it should be a five, four, three, two, or one.

DOCTOR KRESS: There are some people on the committee who think the risk of shutdown is at least comparable to risk at-power, so that brings me to a question of why three weighting for that particular item instead of a five?

CHAIRMAN APOSTOLAKIS: And not only that, but this is probably the only question where you will identify systems and components that are not in the PRA, right, because your PRA is not shutdown.

MR. GRANTOM: Let me clarify something, though, too. There are functions that aren't modeled in the PRA. Draining the system is not modeled in the PRA, it's a function that a system does. Every system

does it out there. They've got certain components that drain the system for maintenance for those types of things. When we say, all right, we are looking at drain valves, does that mitigate accidents or transients, the probable answer to that is low or no. So, we are covering all the functions that a system does.

Yes, there's the significant functions of mitigating the core damaging event, and those are going to be asked too, which they are going to get a very high ranking and the components get a high ranking. So, that's why that happens.

But, in regard to the shutdown issue, the PRA does, in fact, cover, you know, the power dissension pieces of that, to cold shutdown, and what we are concerned about now is, now that we are in a cold shutdown condition, the weighting comes, there's longer times to recover from many of the plant configurations, and I wouldn't argue the fact at all that more work needs to be done in shutdown risk models, I mean, and once those are matured, you know, that could roll into this process here.

But, currently what we have, we are concerned with already being in a shutdown mode.

DOCTOR POWERS: Are all shutdown modes

slow, are all shutdown accidents slow to develop?

MR. GRANTOM: Not all, no.

MR. LOVELL: The main one would be when you are mid-loop.

MR. GRANTOM: Yes, front end mid-loops where time to boiling is very short.

DOCTOR POWERS: So, I mean, shouldn't the weighting factor then depend on whether it affects this mid-loop operation or not?

MR. GRANTOM: I guess, you know, one could make a clarification that if you wanted to include something special with mid-loop, you are still dealing with the same systems, residual heat removal capabilities, which have already been categorized through the PRA. So, most of the systems have been subsumed just in the power transition to mid-loop.

There are some other things associated with mid-loop, you know, with people being in containment that need to look at as far as the plant systems have been subsumed.

MR. SCHINZEL: We based these five questions as a guide for the Working Group for all systems. As we've got to systems where mid-loop is an issue deterministically the members bring that to light as we address our specific questions, what the

final categorization is.

MR. LOVELL: I can't think of a specific component or function we did this on, but I remember in our discussions we had a couple where we just raised the risk ranking in the Working Group based on the fact that it specifically affected mid-loop.

MR. MOLDENHAUER: There were some level indicators.

MR. LOVELL: Level indicators, that's right, we moved them up significantly, just on the fact that it was so important for the mid-loop, raised them to medium.

DOCTOR KRESS: I was intrigued by the parenthetical expression that says your weight was based on contribution to public health and safety, and the only way I know how to get that contribution is with a PRA.

CHAIRMAN APOSTOLAKIS: Sure, that's my point.

DOCTOR KRESS: And so, being a little bit of a loss as to where the weighting factors actually come from, and —

CHAIRMAN APOSTOLAKIS: The other thing is, why do add, why didn't you use them as a norm, in other words, you tell the group, look, these are five

questions, if you think that this particular function is important to anyone, then we'll look at it, instead of adding them up, and double counting, and triple counting.

MR. CHACKAL: We do that in instances where there's a high answer to one particular question, and we don't want it to mask the other questions.

CHAIRMAN APOSTOLAKIS: Yes, I remember that.

MR. CHACKAL: We do that.

CHAIRMAN APOSTOLAKIS: But, this score there of 25, plus 25, plus 20, is so artificial, it really doesn't mean anything.

MR. CHACKAL: Well, the other thing to note is that we really are — our approach here was to provide an independent subjective, if you will, determination apart from the PRA, independent of the PRA, where we as a group, our experiences and knowledge of our particular plant, would reach conclusion.

Now, it's true that in a lot of cases there end result from that subjective grouping turns out to be the same as with PRA, but we felt it was important to provide that independently to make up some of the PRAs limitations and assumptions.

CHAIRMAN APOSTOLAKIS: Well, I guess the way I would look at this is —

DOCTOR POWERS: They're just being risk averse, George.

CHAIRMAN APOSTOLAKIS: Huh?

DOCTOR POWERS: They're just being risk averse, that's all.

CHAIRMAN APOSTOLAKIS: I don't know what they are doing.

Well, the real issue, the problem here is that you don't have the sensitivity study at the end that saves the day, because these things are not in the PRA, although you could. See, the way I see it, at some high level the function is in the PRA, and the only way to connect anything you do with public health and safety as Doctor Kress said is through the PRA. Otherwise, what have we been doing all these years.

Then you keep going down, and I admit, you know, as you said, that — it's not a matter of admission actually — that's the way it is, as you go down you find certain functions and so on that are not explicitly modeled in the PRA, yet at some level they affect the PRA.

So, why don't we start with the PRA there and keep going down, in other words, why don't you do

what Westinghouse proposed for in-service inspection, with surrogate components and all that, which ties very nicely with the PRA and deals with things that are not in the PRA, and it seems to me this cries for it.

Now, you probably were not aware of it, the surrogate component idea.

MR. GRANTOM: No, I'm not familiar with what that is.

CHAIRMAN APOSTOLAKIS: Basically, what they do is, they take a pipe, a piece of pipe that is not in the PRA, obviously, but then they ask themselves, if this fails what are the consequences, it affects this component, or this system which is in the PRA, so now I can tell what the impact is.

MR. GRANTOM: I haven't heard it called surrogate, but, yeah, well, in fact, we —

CHAIRMAN APOSTOLAKIS: I think that's what they call it.

MR. GRANTOM: — yes, we've had discussions with this about, is this process robust enough to categorize passive components, and for the very reason you just said this process does that. We'd asked the very same question, we fail this piece of pie, well, it's associated with an aux feed water train. Well,

what does it do? Well, it fails that train, which goes directly back up to the risk significant function that it's associated with.

CHAIRMAN APOSTOLAKIS: But, that's not what you do, you are assigning a weight to the auxiliary feed water system.

MR. GRANTOM: Right, but you are talking about an auxiliary feed water system, what about the little local pressure indicator over there that merely is used by an operator to go around and look at what the pressure of the system is right now, and it's not used for anything else, it's just merely for him to go and check off a control room log. It's safety related, so how are we going to categorize that? I don't think it's going to cause an initiating event, and I don't think it's going to fail the system, but the indicator, it's not going to actually be used to mitigate the accident. I don't think – it would probably fall as a no to a lot of these things and be called non risk significant, but when you are going through a total plant numbering system and you are looking at all of the tag numbers that are associated with the system, you are going to have to somehow be able to do the bookkeeping here to say we looked at all of this.

And, a lot of them have functions that are somehow related, like you say, to maintenance, but they are only maintenance during shutdown conditions when we completely drain the system and go do stuff at that point.

So, their function is different, and you are really talking – and that's why the PRA is the way it is, people always ask why are there so few components modeled in the PRA, because, you know, those are the components that really determine the risk. Those are the main big pumps, big motors, those types of things, active components that have to work, so we can tie it all to this, and I don't disagree with you all, that we probably are double counting some of these things in here, but we are also trying to get a conservative process because we are a prototype effort going forth here, and there's a lot of things that can be improved.

CHAIRMAN APOSTOLAKIS: And, it's really maybe unfortunate or, I don't want to use the word unfair, but, I mean, you guys, because you are pioneers, you get all these questions. So, I'm completely aware of that, but I would like also to make a point here which may be obscure to you, but it's directed to Doctor Powers. One of the reasons

why you see all these things here is precisely because as a community we have not paid attention to decision making theories.

DOCTOR POWERS: — to you to ignore the narrative — I mean, to ignore that, the failed methodology.

CHAIRMAN APOSTOLAKIS: What failed —

DOCTOR POWERS: To ignore the decision-making failed methodology, not make the mistakes of the famous F-111.

CHAIRMAN APOSTOLAKIS: It's very difficult to communicate with this group. I think as a community we have not paid much attention to these kinds of methodologies, which are being used routinely elsewhere. In fact, the Department of Defense uses these a lot, but you have to —

DOCTOR POWERS: They being a paragon of economic and judicious decision making.

CHAIRMAN APOSTOLAKIS: As you have told us many times, that they know how to plan research. So, it seems to me that again you are being put on the spot here for something that has not been scrutinized by the community. But, the issue of double counting is very, very important. I mean, you can't have decision theories like that.

DOCTOR POWERS: Well, yes, the double counting is not that important, it is simply a reflection of a different utility function.

CHAIRMAN APOSTOLAKIS: Oh, no, no, no.

MR. GRANTOM: And, I would like to just add here, these questions here are very similar to the same screening questions used in the maintenance rule, for scope in the maintenance rule, it's very similar.

CHAIRMAN APOSTOLAKIS: That's why I'm saying, instead of adding them up, it probably would have been an "or" gate there, if any one of these is important do something, because they overlap so much.

MR. GRANTOM: I think that's part of the reason of the weighting, if the weighting falls into place it kind of creates a pseudo kind of "or" gate, because if you multiply it by its weighting it flops over into —

CHAIRMAN APOSTOLAKIS: So, there's the issue of the questions overlapping, there is the issue of the appropriateness of the weights, right, and then the —

DOCTOR KRESS: And then there's the threshold.

CHAIRMAN APOSTOLAKIS: — and the bigger issue is really why didn't we use the PRA coming down,

and then, like you say -- the component, and the final issue is on the next slide, which is related to the thresholds that Doctor Kress raised, why is the score range between zero and 20 non risk significant, and does that correspond to Fussel-Vesely less than .05 or whatever it was, and risk achievement were less than two, right?

DOCTOR KRESS: These are the questions, yes.

CHAIRMAN APOSTOLAKIS: This is really the question here. I mean, actually, it was low safety significance, I think, in that case. But, I mean, how did we decide, and that's where, again, the double counting comes in to its full glory, that a score less than 40 corresponds to a Fussel-Vesely less than .001, and RAW less than two. Obviously, it's a judgment, right?

MR. SCHINZEL: It was judgment on that. You know, we took the overall score range of 100, we looked at the lower 40 percent being low and non risk significant, and then the upper 60 percent being high or medium safety significant, and from the perspective of the thresholds that was judgment on our part as to what was considered reasonable, as far as where we would draw the lines to segregate low from non risk

significant, medium from high.

DOCTOR POWERS: Have you done anything just to validate that judgment, by running a few things that you run the Fussel-Vesely through just to see if it works?

MR. SCHINZEL: One thing that we've done is, we've done, you know, extensive comparisons with all the components that we've categorized to date, and we've seen very good correlation with the PRA categorization in deterministically what we've come up with.

DOCTOR POWERS: I think I would take some credit for that, and advertise that a little bit, so that you can avoid him getting lock horned to these decision theory things that he likes to do.

MR. LOVELL: I think it's been a help to, like for myself as an operator, I have an SRO, is that it does give a lot of credibility to the process, and we go through it, and then you compare the results, and generally they are comparable. There are some cases where we rate it higher and some cases we would have gone lower, but the PRA had it higher and we went with that rating.

So, it's kind of the internal consistency that, for me to understand it and to have confidence

in it, has really helped.

MR. CHACKAL: And, this is the type of process that we might use if we didn't have the PRA. I mean, we developed this independent of what — of the PRA. We said, well, how would we do this as a Working Group subjectively, deterministically, what kind of a threshold do we want to establish, and this is what we came up with, and it was, again, to provide an independent perspective.

And, just to give out some numbers, out of 886 modeled components, PRA modeled components that we had already categorized in our systems, 800 were the same ranking. So, it's about 85 percent or so, and the ones that were not the same ranking are, of course, by definition, higher. We deterministically ranked them higher, because we can never be lower than the PRA.

CHAIRMAN APOSTOLAKIS: Well, the PRA, if we want to push this point, things that are in the PRA, and are ranked high in the PRA, will definitely be in the high safety category here, because you have triple counted them. So, that doesn't surprise me a bit. It doesn't prove anything. Right, because there will be important initiating events, they will be important — all the questions, the function will be in the EOPs,

does the loss of function directly affect other systems, you know, the whole thing, except for the shutdown. So, those systems will get five, times five, times five, plus, plus, plus, 95.

MR. LOVELL: Well, let me give you an example, a specific one that I always give Mr. Moldenhauer a bad time about, and that's a refueling water storage tank. I mean, doing it deterministically it's an important piece of equipment, but its failure rate is, essentially, zero. You know, it's a very reliable piece of equipment, and we would have ranked it, I don't remember what, but it was less than the high that the PRA had, I think probably because of the RAW score?

MR. MOLDENHAUER: Yes.

MR. LOVELL: And so, deterministically, we would have actually come out with a lower number than what the PRA had.

CHAIRMAN APOSTOLAKIS: But, the PRA — excuse me, the PRA in the RAW says assume the system is down, so the failure rate is irrelevant, so in terms of RAW it would sky rocket.

MR. LOVELL: That's right, but overall, even deterministic, going through these questions, we came out with a lower risk ranking than high. So, it

doesn't necessarily say that the PRA systems automatically go to the same things because of how we add these things up.

CHAIRMAN APOSTOLAKIS: If you take the refueling water storage tank, is the function used to mitigate accidents? Is it needed? Yes. I don't know that it's called an operating procedure, probably not.

MR. LOVELL: It is.

CHAIRMAN APOSTOLAKIS: It is, specifically? Okay, so that's there, too. Does the loss of the function directly fail other risk significant systems?

MR. CHACKAL: You bet.

CHAIRMAN APOSTOLAKIS: You bet.

Is the loss of the function safety significant for shutdown or mode changes? Does the loss of the function in and of itself directly cause an initiating event?

MR. CHACKAL: No.

CHAIRMAN APOSTOLAKIS: No, so we have four yeses and one no.

MR. LOVELL: But, what would happen, though, is, one of the things we used in our deterministic ranking is the reliability of the component. So, instead of writing it at a five for any of those answers, and it was probably a three —

CHAIRMAN APOSTOLAKIS: But, if you go to the PRA and calculate RAW, the fact that you have to assume that a tank is down, I mean, defeats so many things.

MR. LOVELL: Right.

CHAIRMAN APOSTOLAKIS: So, it's not — anyway, I mean —

MR. GRANTOM: Well, George, the questions are good screening questions for what you ought to put into a PRA.

CHAIRMAN APOSTOLAKIS: Sure.

MR. GRANTOM: They really are. And, what we are trying to do here is, we are trying to make certain that somehow there isn't some function that an operator knows about, that is used somewhere, that somehow has been screened over in the PRA because it's not directly called for, but has been used for a mode change or shutdown, or it has been shown in our experience that this component tripped the plant, even though it probably cascaded to some degree. So, it's trying to catch things in that regard, but I don't disagree with you that, yeah, you can use the PRA strictly, but also you have to realize this is also supposed to be a risk informed approach, which is supposed to blend probabilistic and subjective —

CHAIRMAN APOSTOLAKIS: Yes, structured judgment.

MR. GRANTOM: — structured judgment.

CHAIRMAN APOSTOLAKIS: I guess what I'm saying is that —

MR. GRANTOM: And so, this is an attempt to blend those pieces together.

CHAIRMAN APOSTOLAKIS: — I think what you are doing in your so-called deterministic approach in parallel to the PRA.

MR. GRANTOM: Yes, it is a parallel process.

CHAIRMAN APOSTOLAKIS: The blending is not very good.

MR. LOVELL: And, where this really comes in important is, is that as we mentioned, most components we've ranked do not have a PRA ranking. So, this is how we really get to rank them for those, the majority of the components, the vast majority.

CHAIRMAN APOSTOLAKIS: Is there a sensitivity study here? Did you assume that all the low safety significant and non risk significant components are down, and you sort of know — did you do anything dramatic as in the PRA case?

MR. GRANTOM: There is certainly no

quantified, they are not in the scope.

MR. LOVELL: But, on the other hand, we've talked about this in the Working Group, and again, this is all subjective judgement, but, basically, looking at the people who are in that group looking at it, is what would happen if all these lows went away, and the feeling we had with our subjective judgment is that it really did not impact the overall core damage frequency.

CHAIRMAN APOSTOLAKIS: So, you actually did —

MR. LOVELL: Informally, I mean —

DOCTOR SHACK: But, to use something like a RAW, where, you know, you don't want to penalize the component because it's normally so reliable, that, you know, if it failed, as unlikely as it was.

MR. GRANTOM: Well, then you are really kind of getting into — I don't know, to me the question came up, you know, what if all the drain valves failed during an event, I mean, now you are getting into ridiculous, you know, assumptions about things.

I mean, if all of the non risk significant components failed, would it be a good thing, well, of course, it wouldn't be a good thing, it would probably

be messy or something, but it wouldn't preclude our ability to bring that plant to a safe shutdown condition. It might be messy, and things might have to be fixed, but it's not – it's not going to make or break our ability to maintain a safe plant, or protect public health and safety I should say.

DOCTOR KRESS: Well, the fact that you came out with a consistency with your PRA in this process is helpful to me in saying, for your particular system that you may have chosen the right weighting values and the right ranges for the thresholds, but what bothers me is, the next plant that comes in, which is going to be a lot different than your's, will probably, because we've set a precedent, will want to use these same values, these same thresholds, and even the same process, and I'm not sure that this is not a plant specific consistency, because I don't have a firm basis for choosing this that is based in the actual risk numbers in some way. And so, I'm not sure that this is universally true. That's my problem.

I would be willing to accept that you've validated it for your system by the consistency.

CHAIRMAN APOSTOLAKIS: One could have done this without any knowledge of the PRA technology.

DOCTOR KRESS: You could have, but you

would have trouble, in my mind, saying — picking the right range for the score of the thresholds.

CHAIRMAN APOSTOLAKIS: Yes, but it —

DOCTOR KRESS: Because that was completely arbitrary. You know, I might have picked one, somebody else might have picked another, but the fact that they are shown as a consistency then says you probably picked pretty good values for your plant.

CHAIRMAN APOSTOLAKIS: Sure.

MR. GRANTOM: Well, there are criteria that go to determining how frequent a component's demand is, and what the impact of the failure of that component is, and that's included in the number that would be assigned to that component or that function.

DOCTOR KRESS: The number —

MR. GRANTOM: The number, and then the weighting gets multiplied by that number. If we expect something that's always continuously demanded, which is possible because it's a running system, continuously running system, well, that gets the highest level. If it's something like accumulators, we might say that never or at most once per lifetime would it ever be demanded to do —

DOCTOR KRESS: Well, are these criteria spelled out somewhere?

MR. GRANTOM: Yes.

DOCTOR KRESS: Is there guidance given as to how much —

MR. SCHINZEL: We'll put those slides up and we'll go through that. That's included as the additional information.

CHAIRMAN APOSTOLAKIS: Yes.

MR. SCHINZEL: Originally, in the graded quality assurance safety evaluation report, we were responding to these five questions with just a yes and a no. We started into the detailed categorization and looking forward at implementation, we recognized that just a yes/no answer didn't give us the necessary insights.

CHAIRMAN APOSTOLAKIS: How much time do you need? I mean, shall we take a break now, because we are already late, and then come back and continue with you?

MR. SCHINZEL: Yes, that's probably good.

CHAIRMAN APOSTOLAKIS: Okay. Let's take a 15-minute break until 10:30.

(Whereupon, at 10:16 a.m., a recess until 10:30 a.m.)

CHAIRMAN APOSTOLAKIS: Okay, we're back in session.

How much more time do you gentlemen need, because we have to have time for the staff. Ten minutes?

MR. SCHINZEL: We can, it's dependent on your questions.

CHAIRMAN APOSTOLAKIS: How much time does the staff need?

MR. SCHINZEL: Doctor Apostolakis, we are going to adjust our presentation to shorten it up to, what, maybe 25 minutes. It can be even shorter. A lot of what we have to say is actually the whole categorization process, which has been fairly well covered here. So, we just might want to highlight some points and give you an opportunity to ask questions.

CHAIRMAN APOSTOLAKIS: Well, we also have a —

DOCTOR BONACA: We have an hour for discussion anyway, we can discuss it for one hour.

CHAIRMAN APOSTOLAKIS: Well, maybe what we could do is give you ten/15 minutes now, then go to the staff, and then have a session at the end where we discuss issues, you know, after we have had the chance to hear from the staff as well.

You gentlemen will be here until 12:30?

MR. SCHINZEL: Yes, we will be.

CHAIRMAN APOSTOLAKIS: Okay.

So, why don't we do that.

MR. SCHINZEL: Okay.

CHAIRMAN APOSTOLAKIS: And, you don't have to go over every single vu-graph and bullet.

DOCTOR BONACA: We also have some questions that may take some more time than just what the plan is.

CHAIRMAN APOSTOLAKIS: Well, that would be unusual.

Where are we now?

MR. SCHINZEL: The question prior to the break was associated with some of the foundational bases to the answers that we have for our five critical questions. The slide that we have on the overhead does show the weightings or the responses that we can give for each of the positive responses, and they go anywhere from a one, which is incidents that can impact are occurring very rarely, up to a five, which is high impact, or occurring frequently. Now, each one of those impacts or occurrence adjectives we recognize that there is subjectivity associated with those.

We tried to offer a guideline to the

Working Group membership to guide them in how to address what is high impact, what's occurring rarely, so those are given under the frequency definitions, occurring frequently, up to occurring very rarely, and these are, again, guideline definitions that the staff uses.

On the next slide, we give the same type of insight for the impacts, from a high impact down to an insignificant impact, and again, these help guide the Working Group in the overall categorization.

And then, as we get toward the weighting scale on the following slide, we do have the questions that have a specific weight assigned to them. We've already discussed that, and then how we calculate the weighting factors against those scores, and come up with our maximum score of 100.

One thing that we do want to identify on the next slide, under the guidelines for the scoring, we do have some exceptions that we have, and that would be to ensure that there is no masking, if there is a specific question that comes out with a very high score. So, the exceptions that we show is that if we have a single question with a weighted score of 25, and that would be true for the two questions of EOP or accident mitigation, even if all the other questions

are answered in the negative that component or that function would still be categorized high.

On any one question, if it's 15 to 20, automatically that function is going to be medium, and then nine to 12 automatically going to be low, as a minimum.

So, those are some of the exceptions that we put into place to ensure that the masking isn't a problem for us as we go through the categorization.

So, those are kind of the backstops that we have with some of the subjective insights that we have.

DOCTOR KRESS: Would you explain that bottom line again to me, with the weighted score of nine to 12, on any one question it means it goes automatically to low, even though it may have ranked high on the other questions?

MR. SCHINZEL: No, that means that if we have a question, one single question that would come out with a score of nine to 12, and all the others are something less than that, might come out zeros, or non risk significant, but just because that one question — yes, you may have four questions answered in the negative and receive a score of zero, but this one question only might receive a score of nine or 12, and

normally if you looked at our scoring range that would normally have us down in the non risk significant area, but because one question received that type of mark it would be low.

DOCTOR KRESS: It's a kind of a way to deal with George's "or" comment.

MR. SCHINZEL: Yes.

DOCTOR KRESS: But, in a graded way.

MR. SCHINZEL: That's correct.

CHAIRMAN APOSTOLAKIS: Has the staff disagreed with any of the rankings, categorized components? Have you more or less agreed that what they've done is reasonable?

MR. LEE: This is Sam Lee of NRR. Are you asking, in particular, to the deterministic process here?

CHAIRMAN APOSTOLAKIS: Yes.

MR. LEE: In general, we have.

CHAIRMAN APOSTOLAKIS: You have what?

MR. LEE: In general, we do agree with the process.

CHAIRMAN APOSTOLAKIS: Okay.

MR. LEE: However, this has taken some time.

CHAIRMAN APOSTOLAKIS: You agree with the

process or the results of the process?

MR. LEE: We agree with the process. We are evaluating the process, so we are either approving or disapproving the process.

CHAIRMAN APOSTOLAKIS: So, you have not looked at the 40,000 components and looked at a sample and said, do we agree that this is low risk?

MR. LEE: We have taken a look at samples.

CHAIRMAN APOSTOLAKIS: And, you have what?

MR. LEE: And, we have found that in general that they have been good, and we have had some questions of samples that we reviewed that we needed to address, but, in general, they have been good.

CHAIRMAN APOSTOLAKIS: You know, this is a critical point for me, because, frankly, I think the methodology needs a lot to become reasonable, but if you guys agree with the final result, more power to everybody. That's great. I'm the performance based guy, right? If you agree, I mean, why not, but I can't say nice things about this.

Let me ask you a couple of questions that I have. In your letter dated January 23rd, Attachment 4, you say, page six, "In general ...," — you don't have to find it, you believe me, right?

MR. SCHINZEL: I believe you.

CHAIRMAN APOSTOLAKIS: "In general..." — I've had to believe you many times today, right? "In general, a component is given the same categorization as the system function that the component supports." When I read that, I thought of Rick. Many times he was furious, you know, you can't say that, that this little component here has the same safety significant, safety related because the system is. So, I said, what's going on.

"However, a component may be ranked lower than the associated system function."

MR. SCHINZEL: That's right.

CHAIRMAN APOSTOLAKIS: So, Rick won.

Then I asked the question, how is that done?

Then, there is another transmittal, January 18th, Attachment 1, which says that — well, it's a long paragraph, I don't want to read it, but, "In cases where failure of an individual component will not fail the function due to redundancy, diversity or other factors, and where component reliability has been good, the initial risk may be lower." But again, it doesn't tell us how.

So, is there a place where you explain how?

DOCTOR BONACA: In fact, I had a question on this specifically, because the – says that you may have a system that is rated, say, medium safety significance, you have multiple redundant systems below supporting it, you classify them as low and you take them out of your cure as part of the problem. Is it possible? So, you would have a system that is rated medium, and yet you have components that are not anymore in the quality product.

MR. SCHINZEL: That's correct, yes.

DOCTOR BONACA: It's possible.

MR. SCHINZEL: Yes.

As far as the control, we have a procedure that the Working Group uses that governs the approach and process for categorization, and specific for the area of redundancy and diversity there is a guideline in one of the addenda that tell us exactly how and when we can use redundancy and diversity as factors in adjusting the categorization process.

DOCTOR BONACA: Is it how you got the certain piping systems in the auxiliary system to be low safety significant? Is that how you got that?

MR. SCHINZEL: Yes.

DOCTOR BONACA: That surprises me.

CHAIRMAN APOSTOLAKIS: So, the scores that

you show this apply only to functions, not to individual components.

MR. SCHINZEL: That is correct.

CHAIRMAN APOSTOLAKIS: But, function, though, is something that is not well defined. I mean, Rick mentioned there your draining functions, other kinds of functions, why didn't you apply it to the component level? Wouldn't it have been a more reasonable thing to do, because you are using judgment after the function is categorized to do it now for the components, right? You say you are using things like redundancy, diversity, or other factors. Wouldn't it have been better to actually use a scoring rule to do that?

MR. CHACKAL: The way that we do it is, we – after we identify the functions, we risk rank the functions using these questions, we then map the components to the functions. For every component we identify the functions that that component supports, and, of course, in some courses more than one. We then provide – we then give the component the highest risk, you know, the risk of the highest system function that it supports.

CHAIRMAN APOSTOLAKIS: Right.

MR. CHACKAL: Okay?

And, that's our baseline. And, most components stay that way. But, when we discuss, when we deliberate on redundancy, diversity and reliability, in cases where we can take credit for those, we are able to conclude that the failure of that specific component will not fail the function. Why is that? Well, there is another component available, or there is a diverse method of safeguarding that function.

CHAIRMAN APOSTOLAKIS: And then, how do you decide, though, how far down to go and say this component now, even though the function is of high risk significance, this component is —

MR. CHACKAL: Generally, we only go down one level. One level, if it's high, if it supports a high risk function —

DOCTOR BONACA: But, you said this is a deterministic process, right?

MR. CHACKAL: Right.

DOCTOR BONACA: But, the auxiliary system has to be in the PRA, so for that you have a rule that says when you classify something of a high level in the PRA, any supporting components is as high in classification as the top, but in this case you didn't do it somehow. Why, I don't understand how you got to

those parts of the piping system of the auxiliary system as low safety significant. You told me that you got through the deterministic process, but really, the auxiliary system is in the PRA, therefore, you don't apply that deterministic process.

MR. CHACKAL: Well, when we come out of the deterministic process, okay, with a risk rank, we then look at the PRA risk, and if the PRA risk is higher, of course, procedurally we go with the higher PRA risk.

DOCTOR BONACA: That's right.

MR. CHACKAL: Okay?

If the deterministic risk is higher, we go with — we go with the higher of the two.

DOCTOR BONACA: Yes, and then with respect to one of the two would say the auxiliary system is pretty high safety significant, or medium I mean, no less than that.

MR. GRANTOM: Right, but there are other things that come off the system, the piping that comes off the system, instrument sensing lines, there can be —

mR. LOVELL: Recirculation piping.

MR. GRANTOM: — recirculation piping that's small, and even in PRA, and this is common in

most PRAs, that's why in PRAs we don't model all of these ancillary equipment, we can say, well, even if you lose that pipe you can't have enough flow out of that one-inch line or less to fail the system.

DOCTOR BONACA: So, there are specific elements, all right.

MR. GRANTOM: And, there are some rules of thumb about how, you know, we apply that in the PRA.

CHAIRMAN APOSTOLAKIS: But, I remember in your GQA presentations, I remember vu-graphs used by Mr. Grantom and Mr. Rosen, one of the very first systems you looked at was the diesel generators, which certainly is of high significance, the diesel, the function of the diesel.

And, you had some very impressive numbers there, that there were, what, 5,000 components associated with each diesel, and an incredible number were really not risk significant.

MR. GRANTOM: Yes.

CHAIRMAN APOSTOLAKIS: So, was that then based on judgment?

MR. GRANTOM: No, a lot of it, for the diesel example, we are looking at a diesel that we are trying to make certain that diesel can operate under the emergency mode operation of a diesel. There's a

lot of other equipment that's associated with testing the diesel that we use, that has a diesel generator tag number associated, but it's only used for testing, or it doesn't prevent the system from operating in emergency mode. There's a lot of trips and other things that are associated with the diesel.

CHAIRMAN APOSTOLAKIS: Right.

MR. GRANTOM: So, there's a lot of that equipment, that's the equipment that falls out, George, that isn't, it's the stuff that makes the diesel work when it really has to work under an emergency mode condition.

CHAIRMAN APOSTOLAKIS: The statement was made earlier that if the system function is high, then the most you can do is take individual components of the system and put them one level down, but in here it seems that you went down two, three levels.

MR. CHACKAL: Well, let me explain it this way. For the diesel, there's probably 50 separate functions, okay?

CHAIRMAN APOSTOLAKIS: Yes.

MR. CHACKAL: And, for example, one of the functions is standby lube wall system heating, to ensure that the lube wall is always at a certain, you know, minimum temperature. That's a separate

function. That function was ranked low. The components that support that function, the standby lube wall pump, not necessary for the operation of the diesel in emergency mode, would be ranked low as well.

So that, just to clarify it, I guess, the number of functions that we typically identify in a system, typically, at least 30 separate functions, it's not just the higher level functions.

DOCTOR BONACA: But, so much of this is really outside of the PRA. I mean, the PRA – so the question I have is, could your application be supported by a pure deterministic process? I mean, a lot of the judgments you are basing your decisions on is really deterministic, it's solid, I mean, in many ways.

CHAIRMAN APOSTOLAKIS: Another way of putting it is, why is this risk informed?

MR. GRANTOM: Well, it's risk informed for a couple of reasons. First of all, if you didn't have the PRA you might have a tendency to fall back to Chapter 15 in ECCS criteria, which is going to say accumulators are risk significant because you have no weighting of the frequency of the event. That's one important element.

The other part of it being risk informed

is the fact that you know, by the mere fact that you know what's in the scope of the PRA, you know you've got an analysis that's put these components at a special quantifiable level, and the rest of the items over here are supporting something else. That's good information in and of itself.

Yes, you could go and do strictly what we've done here on these deterministic questions, but you are going to pull — well, you'll have almost essentially the cross of safety related/non safety related that you —

CHAIRMAN APOSTOLAKIS: The context within which you apply the methodology is changed.

DOCTOR BONACA: And, you look at this general — that we discussed in the beginning and ask the question, like, you know, category one, bent frame, test valves, there must be hundreds of those or more.

MR. GRANTOM: Yes, thousands.

DOCTOR BONACA: Now, the argument you are using I believe is a credible and solid argument, but it doesn't need the PRA to do that, so I was wondering why would any power plant today not use the same argument throughout? I mean, it's just a question we have to ask ourselves, because we are making this kind

of step conditional on the existence of a solid PRA, and yet, so many of the elements are —

MR. GRANTOM: It's a good question, and it's question that is somewhat as a result of the time we were licensed and the time that we were constructed. The Q list associated with some of the older plants aren't as large as the Q lists that are associated with plants that are post TMI. So, you are seeing — what you are seeing is an artifact of the architect engineer and the licensee, in order to get licensed, putting everything into safety related because it was the way to get licensed. Now we've overscoped it tremendously, huge O&M costs to be able to do this, regulatory processes that lump on it, I mean, it all carries its own 9 tons of baggage, and now we are trying to extract some of that in the risk informed manner, so that's the roots of where a lot of that came from.

DOCTOR BONACA: I understand.

CHAIRMAN APOSTOLAKIS: The thing is that, I mean, again, Regulatory Guide 1174 says that risk informing the regulations means to look at the integrated decision-making process and one element of it is the input from delta CDF and delta LERF. Then we go on and use importance measures that are not

really related to delta CDF and delta LERF, and now we are going one gigantic step beyond that, we don't even use importance measures, we go to another methodology and so on, and that's within risk informing the regulations.

MR. GRANTOM: George, I agree with you.

CHAIRMAN APOSTOLAKIS: They may be very valid reasons. I mean, what you mentioned earlier about the Q lists and so on, I agree with you.

MR. GRANTOM: We are in an evolutionary process right now. I would like to think that we could be much further along with the acceptance of these technologies in the purest sense of what the PRA produces, but I don't think the culture, both within the staff and even within our own utilities, has reached that point to where they just readily accept PRA results and enable us to move on.

CHAIRMAN APOSTOLAKIS: I guess the question in my mind is that, when people ask us what is a risk informed regulatory system, and we say read Regulatory Guide 1174, is that really a fair answer? It is not. This is only one part of it.

MR. BARRETT: I would —

CHAIRMAN APOSTOLAKIS: And, a small part as it turns out.

MR. BARRETT: — I would point them to a more recent document, which is SECY 00168, which I think goes a step beyond Reg Guide 1.174 and talks about the whole question of using different types of information, such as the qualitative information and how that can be appropriate in some areas and in some ways, and how you have an integrated decision-making process that takes into account various types of information and the implication that that has for the quality of PRA.

I think that if you look at Attachment 2 to SECY 00160 — I think it's 168 —

CHAIRMAN APOSTOLAKIS: What is it about?

MR. BARRETT: It's, basically, about decision-making processes within the risk informed methodology.

CHAIRMAN APOSTOLAKIS: Yes, we should get a copy.

MR. BARRETT: I'll see to it that you get a copy of that.

CHAIRMAN APOSTOLAKIS: Thanks.

Okay, what else do you have to say that is extremely important?

MR. SCHINZEL: Well, one thing I wanted to make sure that the committee understood, we have

general notes that we do use to support some of the documentation. There's been some references made to the vents drain valves. Recognize that this is not an alternate categorization means, this is an aid for South Texas in documenting the bases for why things fall into certain families and the bases for the categorization that those have. So, I just wanted to bring that point up, make sure that the committee understood that portion.

DOCTOR BONACA: So, could you have a situation where a normally opened — well, that's not a good example, but say a type 3 valve in a specific location, in a specific condition, could, in fact?

MR. SCHINZEL: Yes.

DOCTOR BONACA: So, you do look at those. So, although you do have a general classification, but then you are looking at individual applications and making the judgment.

MR. SCHINZEL: Right, we are looking at each individual component and showing that its classification is proper.

DOCTOR BONACA: Okay.

MR. SCHINZEL: This just aids us in documenting the basis for why it is categorized as it is.

DOCTOR BONACA: I understand.

MR. LOVELL: It also helps with consistency, so how we started out with these in some ways was, we'd say, well, how do we handle this situation in the other systems. This helped us with consistency, but in each case there's a specific evaluation, do these apply, and is this the right decision.

DOCTOR BONACA: Good.

CHAIRMAN APOSTOLAKIS: Can you go to slide 16?

MR. SCHINZEL: Certainly.

Slide 16 reflects two of the open items that have not been fully resolved between South Texas and the staff. Open item, I believe it's 3.4, deals with containment integrity, and currently this was discussed last week with the staff. South Texas has agreed to go back, take a look at our PRA for how well it deals with latent effects, and to determine whether we need to do an additional sensitivity study to fully integrate the latent effects into the overall categorization process.

So, that is still an issue that South Texas is working with and has yet to be resolved.

The other open item, open item 3.5, deals

with pressure boundary categorization, and South Texas had proposed for Class 1 and 2 piping that we would envelope in the risk informed in-service inspection categorization process on top of graded quality assurance. Graded quality assurance does take a look broadly at the pressure boundary categorization for the system. Risk informed ISI takes a very narrow look at specific segments of piping and looks at the importance of those individual sections.

For Class 1 and 2 piping, we are doing a risk informed ISI categorization for those. We are going to take the highest, or we are going to factor in if the risk informed ISI categorization comes out higher in graded quality assurance, that's going to be the categorization that we are going to use.

South Texas was proposing using the graded quality assurance categorization only for Class 3 piping. Currently, our risk informed ISI process is not individually categorizing the Class 3 piping. What we have found is that there is good correlation between the risk informed ISI results generally, and the graded quality assurance categorization approach, you know, in most cases we are coming out with the same categorization. So, for the class rate piping, we're proposing to use the GQA ranking only.

The staff has recommended that we go back and perform risk informed ISI categorizations on those Class 3 piping, and currently that's being evaluated by South Texas.

DOCTOR KRESS: Could you explain your second sub-bullet under containment integrity to me?

MR. GRANTOM: Right. What we've talked about here is, we used large early release frequency as a figure of merit for the containment performance analysis. The feeling, or the surrogates for protecting against large early release, from an equipment point of view we've pretty much done everything we can do to protect from late over-pressurization. Most of the stuff that's associated in the containment event tree that we use to calculate the level 2 for the release categories is phenomenological stuff, at least in South Texas it's PRA, there's very little equipment that's associated with that, it's mostly early/late, you know, burns, those type of things. The question of whether you have dry or wet containments have already been answered and it's coming out of the plant damage states of the level 1.

So, we feel like LERF pretty much covers most of the stuff for the latent cancer fatalities

also. There has been an issue that's been brought up about late over-pressurizations. We run the analysis out to 48 hours. After that, we pretty much are very uncertain as to what the outcomes, resources, things that may happen in any given situation where you can look at those.

DOCTOR KRESS: But here, you are not really saying, none of these are surrogate for latent fatality risk, because it's a surrogate for everything.

MR. GRANTOM: Right.

DOCTOR KRESS: But, you are saying that it encompasses latent fatality because of the next sub-bullet?

MR. GRANTOM: Right.

DOCTOR KRESS: Now, does that next sub-bullet deal strictly with the comparison between latent fatalities and early fatalities, is that what that is dealing with?

MR. GRANTOM: Right, the level 3 studies that we have done in the past, we don't have a level 3, but we have taken a comparison for it and took a look at that level 3 analyses, show that by and large the dominant contributor to public health and safety is the large early release.

DOCTOR KRESS: The risk of early fatalities is higher.

MR. GRANTOM: Right.

DOCTOR KRESS: But, does that — that doesn't — I know there's in Reg Guide 1.174, and it's in other documents, there's no risk acceptance criteria for something like land contamination, but is that to say it's not important, that we shouldn't be thinking about it? You know, if you have late over-pressurization, and late release, it may not kill a lot of people, because you've already evacuated.

MR. GRANTOM: Right.

DOCTOR KRESS: It could cause some latent fatalities, because you don't evacuate everybody, but surely it's going to contaminate the land. Now, the question is, which is the dominant consequence, or the dominant risk?

MR. GRANTOM: Let me go back to what I was saying. You are right, the land contamination, those are still important issues —

DOCTOR KRESS: But, do you capture those some way in your importance measures, or in your subjective deterministic process?

MR. GRANTOM: No, not those kinds of issues, land contamination, we don't. We are trying

to categorize equipment in the station, and that categorization of equipment pretty much stops at the plant damage state level that leads into the containment performance analysis models. And, it doesn't carry on to what other equipment may or may not be used to prevent land contaminations or other issues that may be associated with that. It doesn't go that far.

DOCTOR KRESS: So, if such equipment exists, then it might end up in the low classification or non risk significant?

MR. GRANTOM: It probably wouldn't be classified at all. We would continue to treat it the way we currently treat it, but I can't think of an example of such a type of equipment. I mean, you are talking about severe accident management guidelines and those types of issues that come up now, and as I said we are very uncertain in the quantified sense of the level 2 analysis is to what types of resources would be flawless in the event we really did have a catastrophic event at a station. So, we pretty much have a pinch point of the plant damage state, where all the equipment has been statused to determine what the plant damage states are in, and then the containment event analysis is pretty much

phenomenological, that would step you into various release categories of whether you had early/late melts, early/late burns, phenomenological issues that are associated with that that carries to frequencies of release categories.

We feel like by capturing the equipment — we've captured the equipment of what we can do, everything after that are things that are either not proceduralized, which I'd be hesitant to take credit for in the PRA, or they are very uncertain, or they would be the result of outside resources coming in, you know, beyond the 48-hour time period. We wouldn't capture that. To answer your question, we wouldn't capture that class of components.

DOCTOR BONACA: On this subject, you know, on the same thing, if I look at Attachment 4 to your January 18 letter, "Containment isolation valve is typically characterized as low safety significant if they meet one or more of the following criteria," and the last one is, "The valve size is 1 inch or less, that is, by definition the valve failure does not contribute to large early release." And, I was surprised by that in a certain way, because it seemed to me that in a deterministic judgment you would still say, well, it's still an isolation valve that would

prevent releases maybe in the late phase of an accident and we should still categorize it as, you know, keep it in our Q list. I mean, that's the judgment I would make when I look at that statement that way, and so if you could elaborate on that a bit.

MR. GRANTOM: Yes, the categorization process would have looked at other things associated with it. It may be a 1-inch valve, but is the piping line rated much higher than the containment building itself. Is it in a closed system. There's even some —

MR. CHACKAL: There's a redundant valve on it.

MR. GRANTOM: — yes, there's a redundant valve that's somewhere else that can be closed off.

DOCTOR BONACA: But, it says that typically, if they meet one or more of the following criteria, and one is this, and that's —

MR. GRANTOM: And, that's true, typically, you know, for the definition of large early release, large has typically been something that we would say would have met the containment atmospheric conditions, well then, you win out. This type of thing would —

DOCTOR BONACA: See, I'm not troubled at all by the fact that you are stepping down your

quality program for intermediate events, for anticipated transients, although certainly we'd be interested to know if there is any big penalty we are going to see from that, and we don't know. I don't think so, but here you are talking about a containment which is – and that's why, you know, I saw this issue. I mean, that's not – we may make a judgment that, you know, a 1 inch release, 1 inch size is not much of a release, I wonder if other people around the plant, how happy they would be with the judgment. We agree it's not a large early release.

MR. GRANTOM: Right, but this doesn't – the fact that we may have categorized it to low doesn't mean that it's not maintained, not – I mean, it doesn't mean the controls are off of it, that it's left to fail.

DOCTOR BONACA: Yes.

MR. GRANTOM: I mean, we still expect those components to function and do their intended purpose.

DOCTOR BONACA: I understand.

MR. GRANTOM: So, there's nothing in here that assumes that in any way that we expect components to fail.

DOCTOR KRESS: But, you may lessen your frequency of inspection or something like that.

MR. SCHINZEL: We could adjust some of our processes and maybe decreasing some of the inspections, but we would still give ourselves the assurance, the reasonable assurance that this component is still going to meet its function.

MR. LOVELL: Yes, really what you are talking about here is how much effort are you going to go to verify that it will meet its function. We expect it to meet its function, and we'll put an appropriate level of controls on that, but it may not be as full level as a larger valve, one of our 48-inch valves for instance.

DOCTOR KRESS: Do you have a buffer system to control iodine re-evolution from sump water?

MR. LOVELL: Yes, we have, what is it, it's large – trisodium phosphate baskets in the bottom containment.

DOCTOR KRESS: Would that be classified then as non safety significant, your process?

MR. LOVELL: I think we rated those low, just because it's a very passive system.

MR. GRANTOM: And, that doesn't mean that we wouldn't check the basket, that doesn't mean anything, it just means that the controls would be commensurate with the importance and would be

associated with the proper function and failure by the component, that made the component important.

MR. LOVELL: If water touches it will work, and so we do a surveillance every outage to make sure it's there, and we keep that at the same level.

DOCTOR POWERS: Do you check the dissolution of it?

MR. LOVELL: Pardon?

DOCTOR POWERS: Do you check the dissolution on your tide, the trisodium phosphate?

MR. LOVELL: I am trying to remember the text back off the top of my head, but if I remember right it's just a level.

DOCTOR POWERS: It does cake together and —

MR. LOVELL: Right.

DOCTOR POWERS: — get tough to dissolve after a while.

MR. MOLDENHAUER: Should we move to slide 17, or —

CHAIRMAN APOSTOLAKIS: I think we should move on with the staff now, and come back.

MR. MOLDENHAUER: The remaining two slides are just summarization slides.

CHAIRMAN APOSTOLAKIS: Summary, yes, I saw

that.

DOCTOR BONACA: I just have one last question, and it's just a judgment on your part, you clearly are proposing, you know, to take away some of the pedigree and certainly step down some of the quality of some of the functions, even including some instrumentation that goes with the LPS, and I'm sure you asked yourself the question, what is the impact, if any, on the probability and consequences of anticipated transients in the FSAR. That would be an interesting question. Have you ever thought about that?

MR. GRANTOM: I don't think that there's very much, if any, impact on any of those things, because most of — a lot of the things that are in Chapter 15 are what most of us would call incredible events.

DOCTOR BONACA: No, I'm talking about, you know, loss of flow events, you have protection for that, clearly the protection is merely a focus of this kind of evaluation, because, I mean, you know, you go to some fueling DNB, well, some fueling DNB. I mean, it has nothing to do with — frequency.

MR. GRANTOM: Yes, I mean, the loss of the feed water and those types of things.

DOCTOR BONACA: So, what are you going to do, are you going to take the equipment, for example, from a specific trip and maybe put it at a low quality. I mean, some of the instrumentation doesn't need to be there.

MR. GRANTOM: No, you have to – one of the things that I kind of tend to preach on a little bit is that this categorization process is intended to answer the question that would be associated with public health and safety, core damage frequency, large early release frequency. Those components that are necessary for that would include loss of feed water, some of the balancing plant equipment, are included in here. There is a whole different analysis sitting out there that's associated with reduction in transients, which I would call a balance of plant model, which is a different question to ask at that point in time, because now you are talking about losses of generation.

This process is focused on the regulatory application, which is focused on public health and safety, and all the questions here that are associated with that are to be sure that those components that are necessary to ensure public health and safety are afforded the proper attention and the proper

awareness, and that even includes some non safety related components that we've identified.

DOCTOR BONACA: No, I agree with you, I'm only – you realize my question went to the fact that you used now two measures of performance, CDF and LERF. The original design on the plant had all kinds of measures of performance, okay? For certain transients at a given frequency you could not have more than – you could not fuel in DNB. Well, now it's not anymore a criteria, so you are going to have some components by definition, and they are not unsupported, I'm just trying to assess in my mind what is the potential impact, if there is any, on the kind of performance which is really intermediate level of performance.

CHAIRMAN APOSTOLAKIS: But, I thought that's what they were doing in the deterministic categorization, didn't they say that?

MR. GRANTOM: We are not going to go and determine that this component is important from DNBR, and what's the amount of margin we are affecting on DNBR. You know, the safety analyses and those types of things, they stand by themselves, and the components and the controls that we have in the station, our DNBR curves that we use in operations are

still predicated based on the safety analysis.

DOCTOR BONACA: I understand, but you are showing me a table that you are taking one of the high pressure trip in the containment and you are calling it low safety significant, and I don't disagree with you, it may be very much because you have redundant functions there. The result of that will be that it will taken out of the Q list. It will be still there, most likely, okay, but you have a lot of freedom in doing what you do.

So, I think the original question on my part of saying, have you ever thought about it, just to get a feeling for, you know, what are the consequences of taking down some of these existing defenses, which may not be important, but I'm saying that —

MR. GRANTOM: Well, we still expect the components to work, and we still intend to buy the components, and procure components, and install components that are capable of meeting their design functions, which include accident conditions and normal operations.

DOCTOR BONACA: So, you expected the liability to be increased.

MR. GRANTOM: I would not expect the

liability to be increased.

DOCTOR BONACA: Although, in some cases environmental quantification is not anymore a requirement.

MR. GRANTOM: I would not expect the reliability to decrease, I would expect that there would be examples to where we may have availability of even better components for certain areas, even though they may not have Appendix B programs associated with it, but for those that we still have to procure I would expect that those components will still be able to function. And, we have feedback processes in place and corrective action programs in place to assure that they —

DOCTOR BONACA: Yes, but I think that in the long run these are important questions, because I think since we are making a big change in the regulation we need to — almost like a verification process at the end, say, yeah, we feel comfortable because, okay, the consequences of what we've done is not the reincarnation of —

MR. GRANTOM: It goes back to belief in the categorization system, if we've done the categorization correctly, then if any one particular component is not going to prevent the station from

protecting public health and safety, or of these small groups of components. So, that comes up frequently, and your concern is well noted, we are certainly aware of that and sensitive to it, but we believe we have a robust categorization process. We put our best people doing it. We put a mix of disciplines, SROs, design engineers, system engineers, who know the plant very well, and we believe that once it is categorized as lower NRS that we can control that through our normal processes.

DOCTOR BONACA: Okay.

CHAIRMAN APOSTOLAKIS: Okay, thank you very much. Please, stick around so we can have a discussion later.

MR. NAKOSKI: While South Texas is leaving, I'm going to introduce the staff that's going to be doing the presentation. I'm John Nakoski, I'm the Project Manager responsible for facilitating the review. Doing a presentation is going to be Sam Lee, Steve Dinsmore, and Mike Cheok. Sam Lee is the Lead Reviewer for the South Texas Exemption Categorization Process. Steven Dinsmore was the Lead Reviewer for the GQA submittal, and Mike Cheok is the Lead Reviewer for Option 2 Categorization process.

And, with that, I'll turn it over to Sam

Lee.

MR. LEE: Good morning.

CHAIRMAN APOSTOLAKIS: A lot of your vu-graphs really are of low presentation significance.

MR. LEE: Doctor Apostolakis, we wanted to be able to point to what we were talking about.

CHAIRMAN APOSTOLAKIS: I didn't use any scoring scheme, I just declare them. I'm pretty confident that I know what I'm talking about.

So, if you can skip them, or go over them very quickly, that would help.

MR. LEE: Yes. Much of what we have here is repeat of what South Texas folks has given us.

CHAIRMAN APOSTOLAKIS: Yes.

MR. LEE: If I may make a couple of points, highlight a couple of points, and propose how we should end our presentation, and give you an opportunity to ask questions.

Many of the concerns that you had raised regarding the two parallel processes, probabilistic process, as well as the expert judgment process, if we were to re-term it, in the arena of the probabilistic process we share your concern about the use of importance measures, but, you know, strictly using that, not so much to categorize the components and

that's it, we rely on them as sort of a screening process, if you will.

And, as was discussed earlier, the powerful argument really for supporting the categorization is that if you put these LSS components and then multiply them by a factor of ten, and look at the results of the postulated increase in unreliability, that's a very powerful argument, and we really take comfort in the results for that.

CHAIRMAN APOSTOLAKIS: Would you put that in the rule?

MR. LEE: Would we put that in the rule?

CHAIRMAN APOSTOLAKIS: Yes, take the failure rates, multiply them by ten.

MR. LEE: Well, as far as I know, it's currently in 1. — oh, multiply them by ten.

MR. CHEOK: For option 2, we haven't said anything about multiplying by ten, but we did say that you have to requantify the change in risk so that your change in risk is comparable to what's going to be in Reg Guide 1.174.

CHAIRMAN APOSTOLAKIS: The problem with that, Mike, is that we really don't know what the input from the failure rates will be.

MR. CHEOK: That's correct, and I think we

will probably suggest something like a factor of ten.

CHAIRMAN APOSTOLAKIS: All right.

So, the methods that South Texas is proposing will find their way to the rule. Okay.

Can you go to slide 4?

MR. LEE: Sure.

CHAIRMAN APOSTOLAKIS: Now, this is kind of a new definition of RAW, isn't it? I mean, RAW says — there isn't such a thing as RAW pump A, plus RAW common cause.

MR. LEE: You are absolutely right.

CHAIRMAN APOSTOLAKIS: There is only RAW pump A, and you go everywhere and you set pump A down. So, I don't understand what this is.

MR. LEE: You are absolutely right, and maybe Steve can elaborate on this, but this goes back to your December concern about how can you do this, and we recognize that this is not an accepted practice per se. However, it does give us some feel for how contribution from common cause can be accounted for when we risk rank these components.

CHAIRMAN APOSTOLAKIS: But, I mean, pump A appears in a number of places in the PRA, one being the common cause failure of redundant components, another being maintenance contributions, right, and so

on, so the definition of RAW says go to all of these terms, set A down and recalculate the CDF and LERF, right, that's the definition.

MR. LEE: That's right.

MR. DINSMORE: Yes, the stated input, that's the definition, but sometimes that's difficult to calculate, because what you have to do is, you'd have to recalculate the PRA for each component and turn all its events on to —

CHAIRMAN APOSTOLAKIS: True, that's true.

MR. DINSMORE: — and the difference, what happened with this discussion between the initial GQA CCF, the proposed one, and the final one, is we worked together with some of the research engineers and they determined that if you do that the CCF methodology suggested by South Texas to use for the exemption request produced a lower number than if you go in and actually set each individual basic event —

CHAIRMAN APOSTOLAKIS: A higher number you mean.

MR. DINSMORE: A lower number. If it produced higher it would be okay, because then it's conservative, but it was producing a lower number. So, there was a bit of a discussion about that, and I think instead of really trying to resolve that issue

South Texas just decided to go back to the old calculation. But, again, there's a difference —

CHAIRMAN APOSTOLAKIS: Oh, not, but I'm talking about the old calculation, and this would probably be a higher number, wouldn't it?

MR. DINSMORE: The old, yeah, the original GQA calculation produced a higher number.

CHAIRMAN APOSTOLAKIS: Yes.

MR. LEE: Yes, this is the method.

CHAIRMAN APOSTOLAKIS: But, the point is that RAW is a global quantity. It says RAW pump A, that means everywhere where pump A appears has to be down. There isn't such a thing as RAW pump A failing independently, or RAW pump A failing in common cause, and that implies that there is. Actually, this is conservative, because you set the term of common cause failure equal to one, where in — I mean, if you follow the definition it should be just beta in the multiple grid, right? So, Q is one beta, so that says it is conservative.

MR. CHEOK: Unless you want to add in the HEP factor of using pump A in a recovery action, then the common cause does not cover that.

CHAIRMAN APOSTOLAKIS: That's right.

MR. CHEOK: Okay.

MR. LEE: The other point that I wanted to make about the expert judgment process, without going through all the pages, and surely feel free, we can go to any page you like, but the other general point that I wanted to make with regards to the expert judgment process is that the scoring scheme that we are relying on has evolved through several versions, and initially the staff didn't quite know what the score of zero meant, or what the score of three meant per se per question, and I think as a result of further discussion with the licensee what you see, and if I may just put it up for your review is — South Texas folks have provided this also — is anchoring, if you will, of these scores, and that helps us to say, hey, three means this, and two means that.

And, if we go further down to the overall total scoring scheme, where they take 100 points, and we have these ranges of score for categories, one thing — or maybe one thing that I can share with you that might shed some light is that if you take a component per se and you rank the functions, and let's say the highest ranking function had a score of two for each question, and if you multiply by the weighting factor and sum it up, the maximum score, if you score a two, is 40. And, 40 is the high end of

the LSS. So, there is some reasoning behind these scoring ranges, and a score of 40 for questions that you answer two for each one of those, give us some level of comfort as to why they used that scheme.

CHAIRMAN APOSTOLAKIS: You see, this methodology is the same one that SLIM MOD uses for quantification of human error, and it's really decision theory.

MR. LEE: Yes.

CHAIRMAN APOSTOLAKIS: That's what it is, you have a number of objectives, you weigh them and you rate the thing, and multiply and add them up.

The most important question here is not whether 40 means this or that, the most important question is on your slide seven, will these five things represent something meaningful, or are we repeating the same question five different times with different words?

If you go to the literature and decision theory, this is the key. In SLIM MOD case, instead of critical questions they call them performance shaping factors. The big question there is, are you using a set of PSFs that are reasonably different from each other. Right? That's the issue in human error quantification. Here is a different one. So, this is

really the fundamental question, does it really – is it really meaningful to ask the same question five times?

And then, the next step is, of course, the weighting factor. As Doctor Kress said earlier, why is it a three for shutdown and so. I mean, so these are the key questions here, and the bigger question, of course, is why didn't the PRA find their own here someplace at the function level?

So now, the question I have for you gentlemen is, you have looked at the results of the categorization, do you have any problem with the results?

MR. LEE: When we looked at a component level, and we take a component?

CHAIRMAN APOSTOLAKIS: Anything.

MR. LEE: In general, the examples that we have looked at we have not had problems. Now, there are a couple of issues that we are still following up on that pertains to the usability of this particular expert judgment process.

CHAIRMAN APOSTOLAKIS: No, not the process, the results. How was – maybe some of my colleagues can help me – how was the Q list developed? Was it a judgment thing within the staff and the licensee?

MR. SIEBER: Not really, it was the architect engineer.

CHAIRMAN APOSTOLAKIS: Yeah, the architect engineer.

MR. SIEBER: And, it was based on Chapter 15.

CHAIRMAN APOSTOLAKIS: It was, basically, you know, you think this, we think that, and we both agree.

MR. SIEBER: Right.

CHAIRMAN APOSTOLAKIS: Okay.

How is that different from what happened here? Why can't we say the staff has reviewed the results of the STP process, they find them reasonable?

MR. NAKOSKI: This is John Nakoski, if I could answer that. What that would require is that South Texas complete the categorization for every single component, provide us with a list, and the categorization and the classification of all of the components from which we could then take a sample, and, basically, inspect to ensure that those classifications are correct.

What South Texas is proposing to do is, and the staff has agreed to consider is, approve a process. We have, to some limited extent, looked at

a sample of the risk significance bases documents that have the categorization of components, and the basis for the categorization of those components, and as Sam said, we generally found those were reasonable and acceptable.

Moving forward with the exemption, though, we need to rely on these processes or we need to have the complete list of components that then would be scoped within the exemption. At this time, we would prefer to go forward with the process.

MR. BARRETT: Let me add something to that, though. I think that if you look at the list of open items, it's down to three, and, in fact, it's probably down to two, really. And, you might ask yourself, are there examples in those two areas of component classifications that we at least have questions about, and the answer, I believe, is yes. I think the answer, for instance, regarding the whole issue of the containment as a defense in-depth boundary against late containment failure in core damage accidents, the question – essentially, all of the equipment that might be related to that, or that you might expect would be related to that question, has been categorized as low safety significant.

So, that raises the question in the

staff's mind, and that's why that's an open issue.

In the area of the, I think Steve could probably do a better job on this than I can, I'm certain he could, but in the area related to the pressure boundary, I think we've seen some examples as well of cases where the categorization process has led to what we would call surprising results in any event, so we are pursuing areas where we believe that there is a logical reason for the staff to have questions about the categorization process, and where there are some examples that raise questions as well.

But, by and large, what we see across this entire process is a good process, a logically sound process that we are comfortable with, that produces results. When we look at those results, that we are also comfortable with.

MR. NAKOSKI: And, just to add one more thought to carry it through, many of the open items that we identified were specifically the result of our review of how specific components were categorized.

MR. DINSMORE: If I may add something, you asked earlier if we could do this without PRA, and I think the answer would be no, because these questions, you seem to be focusing on these questions and how reasonable they are, and these questions really only

categorize stuff that's not in the PRA. So, we are kind of assuming, and we are fairly certain, that the PRA is actually modeling most of the real important stuff.

So, we go into these questions with that feeling, that, okay, most of the important stuff is in the PRA, we have a way of dealing with it, we think it's conservative. We are pretty sure that the LSS stuff that comes out of the PRA is actually LSS. Now, the question is, what are you going to do with all these other thousands of components?

And, South Texas has proposed to deal with it like this, and I think we might not approve this as a stand alone, that's just kind of my personal opinion. If you just did this on all the components in the plant, maybe we wouldn't really be as receptive, but we are just doing this with what's not included in the PRA.

CHAIRMAN APOSTOLAKIS: But, let's look for a moment at what the process that we like is. We are using measures that, perhaps, are not perfect, but at the end what really counts is the fact that they multiplied the failure rates by ten, including common cause terms, you've checked that?

MR. LEE: Yes.

CHAIRMAN APOSTOLAKIS: Okay.

And, it turns out that the delta CDF is small.

Is that something now that would – I mean, for this plant, maybe this is good enough, but to say that this will be the way we are going to do it in the future, I mean, bothers me. Why ten and not 15? And, why – you know, and what if in some cases, you know, the risk of all the sensitivity studies you find the delta CDF is unacceptable?

MR. CHEOK: I think that all applications we have to see the other side of the coin, which is what kind of relaxations we are allowing. In this case, it's treatment requirements, and we are going to retain function. So, in this case we feel that a factor of ten is, indeed, bounding. For other cases, ten might not be bounding, and the way we define our requirements would have to factor in this factor of ten, basically. We have to relate these two considerations together.

CHAIRMAN APOSTOLAKIS: The factor of ten where, Mike? I mean, these things have distributions. It's a factor of ten on the mean? That's an incredibly high change.

MR. CHEOK: Yes, it is.

CHAIRMAN APOSTOLAKIS: That the mean shifted by a factor of ten. So, where are you – what is the point of reference of the factor of ten?

MR. DINSMORE: The factor of ten came from discussions with the different – I guess the QA engineers and –

CHAIRMAN APOSTOLAKIS: Yes, but ten –

MR. DINSMORE: – the system engineers, and their opinion was that, they said, well, could it go up by a factor of two if you stopped doing –

CHAIRMAN APOSTOLAKIS: – but, what is it that goes by a factor of ten?

MR. DINSMORE: The failure rate.

DOCTOR KRESS: The mean failure rate.

CHAIRMAN APOSTOLAKIS: A factor of ten on the mean is you are shifting the distribution way out there.

MR. CHEOK: Probably up to the 95th percentile.

MR. LEE: Typically, Doctor Apostolakis, typically, I think for South Texas, for most components, the 95th percentile is about an error factor of three.

CHAIRMAN APOSTOLAKIS: Yes.

MR. LEE: So, ten really exceeds that, and

it is highly conservative.

MR. DINSMORE: But, it was a general agreement, I mean, most of these numbers, including those cutoff values, the 110 and all that stuff, there was very many very intense discussions between different groups, and the eventual judgment, common judgment was that those would bound us, those were reasonable. And, that's kind of where the factor of ten came from. It was just people believed that if you changed the treatment like this, and now I think it's a bit twisted, that people are looking to make sure the treatment will keep it below a factor of ten, but there was a common belief that this factor of ten would bound it.

And, since we were interested in moving forward, and everybody agreed that the factor of ten would bound it, we used it, and when the result came out reasonable we were very happy.

CHAIRMAN APOSTOLAKIS: Okay, do you do that for the future, can you really put it in the rule and say that in the future you want option two benefits tell us which components you want to put in the low risk significant category, and then do the sensitivity analysis and if it works, it works.

MR. NAKOSKI: This is John Nakoski again.

I think an important part of their categorization process is the feedback mechanism that takes into consideration increase in failure rates of these components, which I believe would keep them well within the bounding analysis of increasing the failure probability by a factor of ten. I think that's an important aspect of their process and, Mike, correct me if I'm wrong, but I think that would be a part of the process that would be in the rule going forward in option two.

CHAIRMAN APOSTOLAKIS: I don't understand it. Isn't the basis of the acceptance of this the fact that the sensitivity study shows the delta CDF is small?

MR. CHEOK: That's correct.

I guess your question was why do we do importance analyses.

CHAIRMAN APOSTOLAKIS: Yeah, skip it.

MR. CHEOK: Well, I guess the answer would be —

CHAIRMAN APOSTOLAKIS: Or, they can do it in private without submitting it to you.

MR. CHEOK: — that's true, but I guess the answer would be, if they want the biggest group of SSCs possible they would do an importance analysis,

because if they are just picking and choosing they could have picked some high safety significant ones, and so they will be dealing with four SSCs as opposed to 800.

So, if you want to have the most SSCs that would conform to some delta risk increase, you would use importance analyses. That's one.

The second part of this is that, we are also looking for people to identify SSCs that may be high safety significant, that may not be treated as they should be. And, in this sense, importance analysis would help us identify those SSCs, and I guess importance analyses, as flawed as they may, do tell you things like defense in depth. I mean, if you have a high RAW, in essence, you can say, hey, look, maybe this is a single event cut set. Maybe this is not a event that I want to deal with in the box three case. Importance analysis can also point out some components that may not be performing as well as they should be in the plant now, Fussel-Vesely was pointed out to you, if you have a high failure rate.

In essence, I don't think we want to go ahead and allow people to put things in box three that are already risk outliers. We want to know that the components they are dealing with are, indeed, low

safety significant from –

CHAIRMAN APOSTOLAKIS: But, the RAW really has nothing to do with special treatment, because it's such an extreme measure, just put the thing down. I mean, come on.

MR. DINSMORE: The RAW tells you that the increase in the CDF, that this component is not functioning. It gives you a piece of information.

CHAIRMAN APOSTOLAKIS: So, do many things.

MR. DINSMORE: Well, we need a couple pieces, and that was one of the pieces.

DOCTOR POWERS: I wonder if I could come back to the slide that you have up there and ask what the staff thinks about those weighting factors. I mean, they are kind of remarkable, if you ask me. We have - functions used to mitigate an accident transient we'd give it a five, but if it initiates an accident we only give it a three?

Similarly, if a function – if a function causes impact on a safety significant system it gets a four, but if it initiates an accident it's still only a three. I mean, that seems remarkable to me.

CHAIRMAN APOSTOLAKIS: See, if you want to focus on the process, this is the kind of thing you have, because now this has to be scrutinized.

MR. BARRETT: I think – let me say a word about the whole question of the factor of ten, because I think if you take – I'll get back to this question of weighting factors in a minute – if you do a sensitivity analyses using a factor of ten on the unavailability, unreliability of every piece of equipment that's ranked risk three, LSS or NRS, and it comes out acceptable, that basically tells you that somehow or other you've bounded the potential impact of this, provided, provided that the treatment you provide to this equipment assures its functionality.

And so, that result, combined with another result which you didn't do, namely, that if you took every piece of equipment in risk three and set its unreliability to one, you know what the core damage frequency there would be, it would be something close to unity.

So, you know that you can't allow this equipment – the treatment of this equipment to be such that it would have a high probability of failure, and you know that you have to concentrate, therefore, on things like environmental qualification, where the question might be functional versus non-functional, as opposed to reliable versus unreliable.

So, there's a very important result there,

it's a qualitative result that comes out of the quantitative answer, and, yeah, you can certainly question whether there should be a factor of three or a factor of ten in the end reliability, but the important thing is that you are not – is that if you set the unreliability to a factor of ten you can make reasonable choices about the treatment of this equipment in order to stay within those bounds. And so, you have a decision process that allows you to make a coupled decision, a decision that couples the categorization process with the treatment process.

Now, the question of whether we are comfortable with the weighting factors, I think it's fair to say we didn't focus on these weighting factors. I think this is a sufficiently qualitative process that they could have come in with weighting factors that were different. I think probably if we had seen weighting factors that were off by orders of magnitude we might have focused on it a little more, but since this is, essentially, a qualitative process I think we kind of glossed over the difference between a five and a three, and I think that's probably a fair statement.

MR. LEE: Yes, that would be a fair statement, but if I may add to that, the difference

between, say, a function — is the function used to mitigate accidents or transients that has a weighting factor of five, versus number five, does the loss of the function in and of itself directly cause an initiating event. I guess an example that I can think of is, if you lose the turbine, which initiates reactor trip, does that really contribute a whole lot to reactor safety, and the answer is there are safety systems there to mitigate that particular initiating event.

However, if we are talking about, say, a safety injection pump, or any other safety equipment that is used to mitigate an accident initiating event, I think in general that we would find that to be a little bit more important than equipment that would cause an initiating event. So, there is some sense as to why these weighting factors are the way they are.

DOCTOR POWERS: It makes no sense to me at all, absolutely no sense to me at all. There's an initiating event, I get excited. The fact that the safety injection pump goes out, and there is no initiating event is something I can handle. I mean, it seems to me that if something initiates — I mean, it's like saying, ah, we lost the integrity of the steam generator tube, oh, well, darn. Come on, I

mean, why did it get a ten?

CHAIRMAN APOSTOLAKIS: That's what RAW is supposed to do, actually. I mean, if you do RAW with initiating events consistently they run very high.

MR. DINSMORE: This is for non PRA components.

CHAIRMAN APOSTOLAKIS: Presumably, there is some correspondence. I think Doctor Powers is right, I mean —

DOCTOR SHACK: Yes, but I think the answer was, you know, that, one, this really isn't meant to be used on components that really — that's not the function that's being assessed here really, you know, as Mr. Dinsmore pointed out, that's really been addressed in the PRA itself, in the truly functional sense. The functions we are talking about here are the sort of auxiliary functions of the system.

The other answer is, you know, when they do go through the PRA and this, they seem to come up with comparable answers.

MR. CHEOK: And, a good test of this system would be for STP to bring this system up for all their PRA components and see if using this scheme they would come up with similar rankings, or if not more conservative rankings. That would be a good test of

how robust this system would be, or these weighting factors would be.

CHAIRMAN APOSTOLAKIS: It's a bit late now for that, because the assessment will not be —

DOCTOR SHACK: They've mentioned the numbers, they've actually made the comparison themselves, it's 800 and 846 or something like that.

MR. DINSMORE: It's also, we weren't sure, as Rich implied, you know, are we going to argue that the first one should be four and the third one should be five? I mean, once we start down that path, it would be, you know, we should —

CHAIRMAN APOSTOLAKIS: Doesn't double counting bother you guys at all? Those things overlap like hell.

MR. LEE: Is double counting conservative?

CHAIRMAN APOSTOLAKIS: I don't know that it is. I don't know that it is. How could it not be?

DOCTOR KRESS: It could not be because of where you put the thresholds.

CHAIRMAN APOSTOLAKIS: Yes. I mean, the obviously important ones will be counted four times, so they will be up there, and then the ones that are not that important, necessarily, will go down. These are relative, aren't they?

MR. DINSMORE: These aren't relative, these are absolute. They get the score for each function.

CHAIRMAN APOSTOLAKIS: The way they do the rankings it's relative, when the assessors do it.

MR. CHEOK: The relative part of it comes from the single component, but once you start adding them, I guess you go away from the single component aspect of it. So, when you talk about masking the relative part of it, you are doing it at the PRA importance measures level. At that point, that's relative, but as soon as you take the single importance out of it and start adding them, they are no longer – they wouldn't affect the rest of the rankings of the rest of the components.

MR. DINSMORE: It's an absolute score.

CHAIRMAN APOSTOLAKIS: It's an absolute score, so some components, which are important, appear in all five categories, or four of them.

MR. DINSMORE: But, these are functions.

CHAIRMAN APOSTOLAKIS: So, they get the 70 – they are functions, yes. So what, what difference does it make?

MR. DINSMORE: Well, they do the scoring at the function level and they come up with a score for the function.

CHAIRMAN APOSTOLAKIS: Right.

MR. DINSMORE: And, the function is, for example, control and ventilation, which is one which we looked at, and they get a score for that function and they give that a category based on their merits, and then they start – when they start going through the individual components that support that function they start with that function safety significance, if it's medium or if it's high, and then they have this process to include diversity and reliability and include that ingoing from the function to the specific component.

But, each function is an absolute score, and they assign the highest function safety – when they start going through the components, they start with the highest function safety significant for each component. So, I would say that it has more – it's more likely to be somewhat conservative than to double count.

CHAIRMAN APOSTOLAKIS: Well then, they themselves don't trust the process, and they say if in any particular category you get a high score, right, forget about the total, you look at it.

MR. DINSMORE: Well, again, it's a judgment process, and these little catches that keep you from

maybe doing —

CHAIRMAN APOSTOLAKIS: Yeah, and it says I really don't trust my process.

MR. DINSMORE: — or I don't trust my process to that fine a degree.

DOCTOR KRESS: Why did we settled on these particular five questions? For instance, would not the defense in depth question in there that says, does this function serve to preserve the containment integrity, for example, either late or early.

MR. LEE: That's a question that the staff has asked to the licensee also, and for that particular issue we are — hopefully, we are in the resolution path in addressing that. But, you are right, that is not explicitly asked in this deterministic process, and —

DOCTOR KRESS: And, it doesn't show up in the PRA process —

MR. LEE: That's exactly right.

DOCTOR KRESS: — because you are focusing on large early release.

MR. LEE: That's exactly right.

MR. DINSMORE: We are guided by 1.174, which actually doesn't promote this.

DOCTOR KRESS: But, 1.174 does say you

should preserve defense in depth, which gives you a 1.174 handle to grab a hold of.

DOCTOR BONACA: Although, I mean, the presentation from South Texas shows that they also have a list of questions which has to do with defense in depth, and that's why we are asking the question about containment, because it seems like that slipped through.

CHAIRMAN APOSTOLAKIS: Well, that's later for the components.

DOCTOR BONACA: I understand that.

CHAIRMAN APOSTOLAKIS: So, we have a situation here where none of the methods used can really withstand scrutiny, but the total results somehow is okay, right?

MR. LEE: No, that is –

CHAIRMAN APOSTOLAKIS: Isn't that true?

MR. LEE: – no, we have an open item that addresses this very question about the containment.

CHAIRMAN APOSTOLAKIS: Yes, but there are so many others.

MR. LEE: And, we are looking at a path in addition to these schemes – methods, I should say – to address and highlight the importance of containment systems.

MR. DINSMORE: I think each individual point you could obviously argue about. You could argue about whether number one should be five, and you could argue about whether the cutoff should be ten, and you could argue about whether change in reliability should be a factor of ten, and earlier you said why do we go through this whole process, why don't we just get a delta CDF from them, and if that's okay we say fine, do it. And, I think what we are approving is, we are approving kind of everything together. So, you can always find individual points, but I think, at least for the GQA stuff, in the end everybody that had to agree agreed that it was a reasonable process, in toto.

DOCTOR KRESS: Would that reasonableness encompass the concept that this is reasonable because you showed this consistency between the PRA and the deterministic results for a significant number of components that have already shown up in both, and does this reasonableness also encompass the fact that when you take the low safety significants and increase them by a factor of ten in this case, because it's special treatment, that you still don't impact the CDF very much or the LERF very much. I mean, is that part of the package of why this is reasonable, and would be

incorporated in the thinking for the next one that's coming in, which may not be, you know, it may have different things, it may not just be for special treatment, it may be for –

MR. DINSMORE: That would be reasonable, it's also reasonable, it includes the sensitivity studies that make the PRA results a little less sensitive to some of the more questionable modeling techniques. It's kind of everything, because, again, each individual one, each individual item one could discuss for a long time, but eventually you have to make a decision, which could be no.

DOCTOR POWERS: Doctor Kress, you are an expert on defense in depth, let me ask you a question. If I have an initiating event, do I challenge my safety systems?

DOCTOR KRESS: Yes, you do.

DOCTOR POWERS: And, is that considered within the context of safety regulations a challenge to the defense in depth?

DOCTOR KRESS: I would consider it as such, yes. I don't know, I am not expert enough to know how –

DOCTOR POWERS: If I discover, say, a failed system, a failed safety system, do I challenge

the safety systems?

DOCTOR KRESS: Yes.

DOCTOR POWERS: If I discover it, I don't think so.

DOCTOR KRESS: Not if you discover it.

DOCTOR POWERS: I discover it, if I don't discover it maybe I do, but — so I don't — I mean, it seems to me that if I operate from a defense depth perspective, not only do I turn this table upside down, I change the magnitude of the numbers as well.

DOCTOR KRESS: Yes, I think that's always my — that was one of the reasons I brought for bringing defense in depth in as an explicit criteria.

MR. LEE: Doctor Powers, in the events assessment arena, when we have an event at a plant, whether it be an initiating event or unavailability or a failure of a safety equipment, we actually quantify those risks for the initiating event frequency, where the initiating event has occurred we calculate a condition of core damage probability for that event. Whereas, in a situation where you have a safety equipment that's unavailable due to some sort of failure, and you have no initiating event, that still basically reduces your safety margin, and you calculate a condition of core damage probability for

that event. And, depending on which equipment we are talking about, one could be higher or lower.

DOCTOR POWERS: I think probably if you went through that and did it that you could make an argument to defend those tables, in the sense – in just the sense that you mentioned earlier, that all the initiating events that are liable to be triggered by this table are going to be relatively mild ones because you caught the big ones already in the PRA, but it may be also true of those things that are item two, you may have already caught the big ones there, too, but it still may turn the table upside down.

MR. LEE: We did not do that.

DOCTOR POWERS: It's a futile exercise to carry out.

CHAIRMAN APOSTOLAKIS: I suspect that the real use of these five questions is in an "or" sense. If you go back to one of the back-up slides from South Texas, where they say exceptions, I would say that's the rule. If a weighted score of 25 on any one question it's high, weighted score between 15 and 20 is medium, that probably would make much more sense to treat those five questions as being analyzed that way, and then the expert panel takes over and discusses it, and the medium may become high and so on. But, when

you take the sum you are really doing things that fly in the face of a lot of people and their work, and I'm not one of them by the way.

So, this is – you see, that's what I'm saying, I mean, Steve makes a point that it's the total, and this and that, but you can't ignore the fact that individual pieces cannot be scrutinized. You can't ignore that. I mean, I understand – that's why I'm trying to find a way out, that maybe the final result is okay, but this is not the weighted sum, this is probably treated as an "or" in practice, and then it works because you don't have to worry about overlapping.

DOCTOR SHACK: An "and" is more conservative than an "or."

CHAIRMAN APOSTOLAKIS: No, no, no, let's not put conservative arbitrarily, I don't know what conservative means in this case. "Or" is more conservative, because they are telling you if in any category you do this –

DOCTOR SHACK: But, the and/or.

CHAIRMAN APOSTOLAKIS: – you are out.

Oh, yeah, and then what is the other one, not, let's put that one, too.

MR. DINSMORE: It's inscrutable insofar as

you can go back and look –

CHAIRMAN APOSTOLAKIS: It's inscrutable to me.

MR. DINSMORE: – insofar as you can go back and find out why they put this thing –

CHAIRMAN APOSTOLAKIS: Even if it's wrong.

MR. DINSMORE: – well, that's right. When we did the audit, at least this provides us with a point of discussion. We say, well, why did you put the two –

CHAIRMAN APOSTOLAKIS: Yes, but shouldn't you guys scrutinize this and say, well, gee, it's really an "or" situation here, I mean, instead of saying, no, that sounds reasonable, let's accept it, and what's worse, put it in the rule.

And then, let's take number three, does the loss of the function directly fail another risk significant system? What is a risk significant system? Something that has already been evaluated with the five questions or what? What is a risk significant system in a methodology that is intended to identify risk significant systems? Isn't that kind of circular there? See, that's the kind of scrutiny you have to survive. I don't understand question three.

MR. DINSMORE: Well, they were supposed to do the – these are maintenance rule questions, so that we maybe didn't look a whole lot at the actual questions, since they were already in the rules.

Again, what I was trying to say was, it makes it inscrutable insofar as you can go back and say, if they just said this safety significant – this function is high, and you say why, well, you know, we sat around and we talked about it and we decided it was high. But, when they break it out like this, when we did the audit we could go back and ask exactly what you asked, for example, well, why is number four in this particular function two? Why isn't it three, or why isn't it zero? And, we did that back and forth a bit.

So, in that respect it provides a path for review, and understanding why they chose – why they ended up where they were.

CHAIRMAN APOSTOLAKIS: And, I fully agree with you. I think that's the great value of these methodologies, but that doesn't mean that we cannot question the premise and the basic – I mean, the fact that it gives you an opportunity to go back, I mean, is very commendable and it's good, but again, I mean, we have five questions, if they are treated in an "or"

gate I would be much more comfortable with that. And, the fact that these are the maintenance rule questions, I mean, so what, this is not a maintenance rule here.

MR. DINSMORE: Well, it gives them some validity.

CHAIRMAN APOSTOLAKIS: Yes, some validity, but, I mean, we are doing something else here.

And, I'm really bothered by this factor of ten, Mike. I really don't know where it came from, and this is the perennial problem with sensitivity studies. It's like in the old days, you know, boy the core damage frequency is ten to the minus 90, and then it turns out it is not, and we have to try to prove to people that it really didn't matter that it was ten to the minus 90.

As long as sensitivity studies work, everybody seems to be happy, without thinking ahead that maybe some time they will not work, and then what do you do? If you have a precedent that you have to multiply all your failure rates by ten, which is ridiculous in this case. Ten, wow.

DOCTOR KRESS: It would make more sense to have a distribution and do a Monte Carlo and get an uncertainty, wouldn't it?

CHAIRMAN APOSTOLAKIS: A lot of other things would make much more sense, but somehow — so, that's what I'm saying, that I'm really torn here. I think each method cannot stand scrutiny, yet the final result seems to be reasonable.

MR. BARRETT: George, let me —

CHAIRMAN APOSTOLAKIS: Explain to me how one writes a letter that says that. One sits down and writes it, right?

MR. BARRETT: — let me make a suggestion that in a sense what we are talking about here is two separate issues. We're talking about whether the staff has a technical basis for granting these specific exemptions for this specific plant.

CHAIRMAN APOSTOLAKIS: Yes.

MR. BARRETT: And, South Texas is a unique plant in many ways, unique in the quality of its PRA, in the redundancy of its systems, and the size —

CHAIRMAN APOSTOLAKIS: Yes.

MR. BARRETT: — of its containment, and all that sort of thing.

CHAIRMAN APOSTOLAKIS: And, the sensitivity study worked in this case.

MR. BARRETT: In this case, I think — I hope you feel comfortable, as we do, that having

resolved the open issues regarding the categorization that this is a good categorization as the basis for these exemptions for this plant.

The second thing on the table, however, is that this plant is a first pilot or a proof of principle for option two, and a lot of the questions you are raising are questions that we should really throw in the hopper for option two.

CHAIRMAN APOSTOLAKIS: And, I think you stated it in a way that I cannot disagree. I think this is exactly the issue. What worries me is that these things will be approved for the future. My concern is not so much here, I mean, you can change the words here, because they've already done a lot of things that are complimentary, overlap a lot, and they give you that warm feeling, but for the future, though, I mean, I'm really troubled by this. Just because it worked for one of the more recent plants that well run and very redundant and so on, that doesn't mean we put it in the rule.

Anyway, are there any other comments or questions? Well, first of all, do you gentlemen want to add anything?

MR. LEE: Well —

CHAIRMAN APOSTOLAKIS: At the risk of

raising more questions.

MR. LEE: — that's about the extent of our presentation. At the end there, we have a couple of open items that we can go over with you if you wish.

CHAIRMAN APOSTOLAKIS: But, these are the results.

MR. LEE: But, the South Texas folks already have —

CHAIRMAN APOSTOLAKIS: Can you tell us a little bit about — I mean, one of you, I think it was you, Sam, said that you actually looked at random samples of components to see whether you agreed with the classification.

MR. LEE: As you know, we have quite a few staff members working on the review of this, and not just us, but from other branches, they have looked at this.

CHAIRMAN APOSTOLAKIS: Yes, but did anybody find cases where there was disagreement, significant disagreement, not minor.

MR. LEE: And, actually, this was actually what led to the open item 3.4, I believe, which is the containment systems, and we've looked at those components and they were ranked to be low, and we didn't understand why they were ranked low, so now we

are further reviewing where —

CHAIRMAN APOSTOLAKIS: But, again, this is only because they were using different criteria.

MR. LEE: That's correct.

CHAIRMAN APOSTOLAKIS: But, for the components where the criteria were common —

MR. LEE: Yes.

CHAIRMAN APOSTOLAKIS: — did you find any differences?

MR. LEE: We have not.

CHAIRMAN APOSTOLAKIS: Well, that's good to know.

Maybe you can make that a little more formal, pick up random components and look at them and see, because I think this has to be based on the results.

Any comments from my colleagues? Staff? South Texas?

MR. SCHINZEL: A couple of comments.

Doctor Apostolakis, you made the comment about South Texas didn't trust our categorization process because of the need for —

CHAIRMAN APOSTOLAKIS: You are scrutinizing my every word now?

MR. SCHINZEL: You are scrutinizing our's.

CHAIRMAN APOSTOLAKIS: You have to take my comments in toto.

MR. SCHINZEL: We do want to say that we have full confidence and trust in our categorization process. We feel it's very robust, and the exceptions where identified were really identified more as backstops to ensure that there would be no masking in the overall categorization process. We recognized as we were going through the categorization process that there could be the potential where a single question could end up with high significance, but because of the total score could come out low. And, we kind of treat individual questions both as "or" gates and "and" gates.

CHAIRMAN APOSTOLAKIS: Isn't it true, though, that what you are doing is you are looking at all five categories and the scores and then you deliberate? That's really what you are doing.

MR. SCHINZEL: We do stand back and say does it make sense.

CHAIRMAN APOSTOLAKIS: Exactly, which is what you should do.

Now, let me ask you, would you take your methods, everything you've done, edit it a little bit and say this is a new rule for option two, for all

plants around the country?

MR. SCHINZEL: Well, I would say that we would have to look – to work with the industry to make sure that a process similar to this is going to be workable.

I think what we've proven is that, for South Texas, this works well. I can't say explicitly that this exact same process, exactly how South Texas did it, is going to work equally as well for every other plant in the industry. But, I do think it's a very sound process, it's a robust process. It's a conservative process, and it's coming up with the right end result. And, I think based on it coming up with the right end results, that's the springboard for moving into option two, and adjusting the treatments on these components. It goes back to the original intent of 98.300 that said for the components that are low safety significant you ought to be able to reduce that treatment and go down to commercial practices. T hat's what we certainly feel confident of we can do.

MR. GRANTOM: Doctor Apostolakis, we do need to take this – and realize, this is the first out, first of a kind effort to do this, we are going to have lessons learned out of this. Some of the points you brought up are good points. I think when

you look at our process of categorization, the key elements of it, I think, are translatable to any case. There may be some refinements, some positions, some other areas that maybe need to be looked at from a lesson learned point of view, but from the overall structure of how we are doing this I think it's a very good process to go and regroup these components for any station, I'd say for any industry.

CHAIRMAN APOSTOLAKIS: Any other comments?

MR. LEE: I'd just like to make one correction.

CHAIRMAN APOSTOLAKIS: Sure.

MR. LEE: In your page five graph, we actually graphed the RAW versus Fussel-Vesely that was used. That number should be 100, not ten.

CHAIRMAN APOSTOLAKIS: All right.

Now, there are two mediums there, which one is the medium-R?

MR. LEE: Medium-R is this one.

CHAIRMAN APOSTOLAKIS: Okay.

MR. LEE: But, for all practical purposes in the multiple exemption case, medium is the same as the highs, and really the exemption applies only to the LSS components.

CHAIRMAN APOSTOLAKIS: Any other comments

from anyone?

MR. SCHINZEL: I have a couple comments I'd like to make.

CHAIRMAN APOSTOLAKIS: Sure.

MR. SCHINZEL: From the standpoint, I think we recognize that there is conservatism in the categorization process. I don't think necessarily that should be viewed as a negative. It ought to garner some additional confidence in the results that South Texas is gaining, and based on those results it ought to have confidence that we are truly segregating those components that are important to safety and those that are not important to safety, and then based on that go in and adjust the treatments as specified in SECY 98-300.

So, you know, we recognize the conservatism, and I think that that conservatism is adding to the confidence of the results that we're receiving.

CHAIRMAN APOSTOLAKIS: Any other comments from anyone?

DOCTOR POWERS: I wonder if they had any response to my question about an initiating event versus some obscure piece of equipment that shows up in the Ops.

CHAIRMAN APOSTOLAKIS: Is that question asked to STP?

DOCTOR POWERS: Yes.

CHAIRMAN APOSTOLAKIS: I don't think they followed it.

MR. SCHINZEL: Could you repeat the question, please?

DOCTOR POWERS: Well, if you are looking at something that is called — a loss of some function that's called out in the emergency operating procedures but doesn't show up in the PRA you weight it a five, but if there's some loss of function that will produce an initiating event then you have weighted three. I guess I don't understand that.

MR. SCHINZEL: There are some functions that can be lost at a station that could create an initiating event for which some safety systems would not be required, a general transient turbine generator trip would not require the actuation of any safety systems. So, there could be a whole category of components that you'd say, yes, you get an initiating event, but you might be able to answer no on the other questions.

DOCTOR POWERS: So, really, the defense of that table is that your PRA is sufficiently big that

it gets all of those initiating events, you have the safety of systems rule reactivated.

MR. SCHINZEL: Yes.

DOCTOR POWERS: And, that this is really — I mean, I think this is a good answer, is that those things that are categorized three truly are three. I mean, they are very inconsequential things, and they shouldn't be there, whereas, not having something available in the procedures that the operator anticipates being available, whether he needs it or not, is going to be disrupting to him.

MR. SCHINZEL: Exactly, yes.

DOCTOR POWERS: I think that's a good answer, but what it does is, it makes that table conditional upon having a sufficiently high quality PRA.

MR. SCHINZEL: Yes.

CHAIRMAN APOSTOLAKIS: One of the lessons learned, Rick, is, I think, the presentation of the methodology. I think what is actually being done and what you are inviting are not quite the same. I think what is being done is much more comprehensive and integrated. It doesn't rely on any one of — any single approach to really make a decision, because even with the scores, you look at the individual

scores, you add them up, you look at that, too, God knows what else you are doing. I mean, that's different, that's different from just the presentation that says, and we add them up and if it's between 70 and 100 it's this, because that's not really what you do. You are looking at a lot of things, and I think a lesson learned is that when you go to methodologies like this, which are really trying to structure the process of making judgments, the presentation is very important.

MR. GRANTOM: I agree.

CHAIRMAN APOSTOLAKIS: Okay, any comments from the public, members of the public?

This is it, thank you very much.

(Whereupon, the meeting was concluded at 12:11 p.m.)

CERTIFICATE

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

Name of Proceeding: ACRS Plant Operations and PRA Subcommittees

Docket Number: (not applicable)

Location: Rockville, Maryland

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

John Mongoven
Official Reporter
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