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ANN RILEY & ASSOCIATES, LTD.
1250 I St., N.W., Suite 300
Washington, D.C. 20005
(202) 842-0034

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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BRIEFING ON PRA IMPLEMENTATION PLAN

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PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland

Tuesday, May 6, 1997

The Commission met in open session, pursuant to notice, at 2:05 p.m., Shirley A. Jackson, Chairman, presiding.

COMMISSIONERS PRESENT:

SHIRLEY A. JACKSON, Chairman of the Commission
KENNETH C. ROGERS, Commissioner
GRETA J. DICUS, Commissioner
NILS J. DIAZ, Commissioner
EDWARD McGAFFIGAN, JR., Commissioner

STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

ANNETTE VIETTI-COOK, Assistant Secretary of the Commission

KAREN D. CYR, General Counsel

EDWARD JORDAN, Deputy EDO

SAMUEL COLLINS, Director, NRR

GARY HOLAHAN, Director, Division of Systems Safety and Analysis, NRR

CARL PAPERIELLO, Director, NMSS

ASHOK THADANI, Deputy Director, RES

THOMAS KING, Deputy Director, Division of Systems Technology, RES

DENWOOD ROSS, Director, AEOD

P R O C E E D I N G S

[2:05 p.m.]

CHAIRMAN JACKSON: Good afternoon. I'm pleased to welcome members of the NRC staff to brief the Commission on the status of the NRC PRA implementation plan. The PRA implementation plan was first issued in August 1994. The plan is intended to be a management tool to help ensure the timely and integrated agency-wide use of PRA methods and technology in the agency's regulatory activities. The last written update on the status of activities in the PRA implementation plan was provided to the Commission in January of this year. The Commission was last briefed on the plan in October 1996.

During today's briefing the staff will discuss recent accomplishments in particular where they have made risk-informed decisions. They will discuss revisions to the PRA implementation plan, draft regulatory guidance for public comment, performance monitoring and pilot applications, other pilot projects, and plans for future activities.

The draft regulatory guidance documents and standard review plan sections provide guidance on acceptable approaches for making plant-specific risk-informed changes to the current licensing basis of a nuclear power plant in a specific area. The staff is recommending that these

documents be issued for a 90-day public comment period.

I and my fellow Commissioners are looking forward to your briefing today. I understand that copies of the viewgraphs are available at the entrances to the room.

If none of my fellow Commissioners have any opening comments, Mr. Jordan, please proceed.

MR. JORDAN: Thank you, Chairman, Commissioners. Our briefing this afternoon will focus on the documents that were forwarded to the Commission by SECY-97-077. We will also discuss selected achievements described in the quarterly status update, SECY-97-076, which was issued April 3, and then in SECY-97-095, which is the tech spec program.

With me at the table today are Ashok Thadani and Tom King from the Office of Nuclear Regulatory Research; Sam Collins and Gary Holahan from Nuclear Reactor Regulation; Carl Paperiello from Nuclear Material Safety and Safeguards; and Denny Ross from the Office for Analysis and Evaluation of Operational Data.

All of the focus of this presentation is on the regulatory guide standard review plan. Dr. Ross and Dr. Paperiello are here representing their offices' important roles in the PRA program plan and can respond to questions related to AEOD and NMSS PRA activities.

As you know, Ashok Thadani has recently assumed the position of Deputy Director of the Office of Research.

CHAIRMAN JACKSON: Congratulations.

MR. THADANI: Thank you.

MR. JORDAN: In this new capacity he will continue to be responsible for overall coordination and monitoring of the agency's PRA program plan and will begin today's briefing.

MR. THADANI: Thank you.

May I have viewgraph number 1, please.

[Slide.]

MR. THADANI: As you noted, Chairman Jackson, and Ed Jordan did as well, this is clearly an activity where all the program offices are involved. The focus of today's briefing is going to be in three areas: the regulatory guides, the quantitative measures that we propose be utilized, the status of the pilots, and the issues related to performance monitoring.

I will very briefly go through some of the other issues to indicate that work is going on in other areas as well, but our focus is going to be on those three areas.

I will cover the background and some of the recent accomplishments as well as where we are on the implementation plan. Then Tom King will go through the draft regulatory guidance, the criteria, and what we are doing by way of posing a set of questions to get feedback from the public as well as industry.

After his presentation is complete on the PRA portion, he is also going to touch upon the issue that came up at the last meeting with the Advisory Committee on Reactor Safeguards, the issue of human data and coordination of that activity. Chairman Jackson, you had asked that we address that issue.

Gary Holahan will cover the performance monitoring and pilot applications and describe our future actions.

May I have the next viewgraph, please.

[Slide.]

MR. THADANI: We have been providing quarterly reports to the Commission on status of the implementation of the activities described in the plan as well as semiannual briefs to the Commission on status of these activities.

At the October briefing we covered some of the policy issues. These were issues, like should safety goals be used on plant-specific basis or should small increases in risk be allowed?

The Commission was also provided in January a status report on the activities and the plan.

January 22, 1997, the Commission provided guidance to the staff on those key policy issues. As we had indicated to the Commission, we were moving in the direction of using those guidelines and the guides. After we received the Commission SRM on this issue we finalized our guidance

documents to make sure that these documents were consistent with the guidelines described in the safety goal policy statement, the regulatory analysis guidelines documents, and other related documents.

We met with the Advisory Committee on Reactor Safeguards as well as the Committee on Review of Generic Requirements and have got their endorsement for these guides and documents to be issued for public comment.

In April, as Mr. Jordan noted, we provided to the Commission two documents, a status of the implementation plan, SECY-97-076, as well as SECY-97-077, which is a fairly thick document. It includes the general regulatory guide, the standard review plan, and topic-specific guides like graded QA, in-service testing, and so on.

In that document we also provided a draft Federal Register notice and highlighted the set of questions we proposed that we get feedback on from the industry as well as the public.

May I have the next viewgraph, please.

[Slide.]

MR. THADANI: These are just some examples of some of the recent accomplishments. Obviously the reg guide and the SRPs have been provided to the Commission. They provide framework and guidance for making changes to licensing basis of individual plants. Tom King is going to say a great deal

about that.

Another report that we recently sent to the Commission was the technical specification pilot application. This is working with the Combustion Engineering Owners Group wherein they had proposed changes in allowable outage time in the area of safety injection tanks. These are basically passive tanks. They wanted to change allowable outage time from one hour to 24 hours, and low pressure safety injection train outage time from three days to seven days.

We have used an approach consistent, as described in the regulatory guide, and provided a safety evaluation report approving those allowable outage time extensions. That information has been given to the Commission for information. If there are any questions or concerns, of course we will address them.

The approach we used there was to work with the lead plant. Arkansas Unit 2 was the lead plant. There are, I believe, ten plants that would be interested in these changes. We would expect to issue our evaluation on those ten plants by the end of July 1997.

CHAIRMAN JACKSON: You expect to issue?

MR. THADANI: Safety evaluation reports, July of 1997.

I will note that there are one or two questions

that we are going to have to deal with for one or two plants, because it appears in some cases the calculated mean core damage frequency is higher than 10 to the minus 4 per reactor year. That is an element that needs further discussion. Outside of that, we expect to be able to issue the safety evaluation reports approving those extensions in allowable outage time.

In February we issued NUREG-1021, Revision 8, which is the operator licensing examiner standards. These standards have now in them a number of the insights that have been gained through risk assessment studies and they have become part of the training program as well as examination portion. They identify, for example, dynamic testing considerations, pick up the more significant plant-specific accident sequences to see if they are covered through simulated training, et cetera.

All of those issues are now captured in this revision. It was published in February of 1997, after the Commission approval was received in December 1996.

CHAIRMAN JACKSON: Can you say how the guidance documents themselves were informed by the pilots or the IPE reviews, if they were?

MR. THADANI: The guidance documents give a number of insights and lessons. You will hear some of it.

MR. KING: I was going to cover that as part of

mine.

CHAIRMAN JACKSON: You are going to cover it in your presentation?

MR. KING: Yes.

MR. THADANI: Yes.

CHAIRMAN JACKSON: Okay.

MR. THADANI: But we can come back to it again to make sure.

CHAIRMAN JACKSON: We'll wait.

MR. THADANI: May I have the next viewgraph, please.

[Slide.]

MR. THADANI: If it appears I am moving quickly, I am, so that we have an opportunity to go through some of the issues that I know you are very interested in.

As you know, AEOD staff has been working on evaluating voluntary approaches to reporting reliability and availability data and the feasibility and practicality of that approach, and we expect to have a paper to the Commission in the next few days and anticipate that there will likely be a separate briefing as well on this topic.

We have also conducted a workshop on the insights from the IPE program and we have a briefing tomorrow afternoon on IPE, and we will cover some of the lessons and things we have learned tomorrow afternoon during that

briefing.

CHAIRMAN JACKSON: Let me ask you for the Commission's edification. What were the objectives of the IPE workshop and were they met?

MR. THADANI: I would ask Tom King to address that.

MR. KING: There were several objectives. One was to give the industry an opportunity to ask questions regarding what we felt were the important insights from the IPE, to provide information on things they have done since the middle of their IPE. Most of those submittals were years ago. It gave us a chance to talk about our IP follow-up activities, which you will hear about tomorrow. Ultimately, we understood the industry had been doing some IP insights work themselves, and it gave them an opportunity to present to us what they had been doing on their own initiatives.

So it was a multipurpose workshop.

CHAIRMAN JACKSON: Let me ask you a question about your first bullet, your evaluation of the voluntary approach for reporting reliability and availability data. What would be the scope of that voluntary approach? How many SSCs, systems, structures and components, and how does it compare in terms of the number of risk-significant SSCs in a plant, and if the scope is different than the scope of the

maintenance rule, why so?

MR. THADANI: Dr. Ross.

MR. ROSS: Of course this will be covered in more detail in the paper. The description that we got from INPO shows up very nicely on an embedded diagram, sort of like a bin diagram, where the safety system performance indicator is embedded into a larger group of maintenance rule, safety-related and other equipment. It would be covered by INPO but not part of the maintenance rule itself.

The voluntary approach would consist of all of the information under the safety system performance indicators and other information. As we will explain in the paper, it does contrast with the scope of the proposed rule that went out. Our arguments will show where the two are different, how we intend to make up for the differences.

CHAIRMAN JACKSON: So the answer to the question is, the scope is different than the scope of the SSCs in the maintenance rule?

MR. ROSS: The scope of the voluntary approach?

CHAIRMAN JACKSON: Right. That's what I'm talking about.

MR. ROSS: I believe in detail, yes. In terms of types of information.

MR. JORDAN: Maybe I could comment. The scope of the maintenance rule is very large. The scope of the

reliability data rule was relatively narrow. The scope of the data that would be obtained and used includes the principal data elements from the reliability data rule plus access to additional data for other systems and components. So we are continuing to structure the scheme of analyzing the data consistent with the reliability data rule, but there is not a deficiency in the scope.

CHAIRMAN JACKSON: You are answering questions the way I answer them. Let me ask it this way. What is the overlap between the scope of SSCs that are covered in the maintenance rule and the scope in this voluntary approach? Not the voluntary approach vice the reliability data rule, but the voluntary approach vice the maintenance rule.

MR. THADANI: If I may just comment on this, I don't think the answer is very crisp. However, it is fairly clear that even within the -- first of all, the proposed rule scope of systems is fairly narrow.

Let me just now go to the maintenance rule scope, which is very broad. It includes SSCs, both safety-related and non-safety-related, covering various aspects. Then the industry is to convert these SSCs into high safety-significant and low safety-significant categories. The focus all along of the agency efforts has been to make sure we have information on high safety-significant component.

Then you go to the voluntary program. The desire clearly would be to try and get information to cover those SSCs that have high safety significance. That could be a plant to plant variable. I think that issue is going to need some further evaluation, and I think you are going to see in the paper discussion the need to do some more evaluations to be able to give a crisp answer.

CHAIRMAN JACKSON: For a given plant, will the scope of the SSCs covered in the voluntary approach be a subset of those most safety-significant SSCs in the maintenance rule, or is it not that crisp?

MR. THADANI: I think it will clearly be a subset.

CHAIRMAN JACKSON: Where does the lack of crispness lie?

MR. THADANI: The lack of crispness is in that clearer definition that all of those SSCs are in fact covered in the voluntary program.

MR. ROSS: Chairman, one of the ways we are going to break down the answer, matrix or table is looking at the parameters such as failures -- all of these comments are under the voluntary approach -- then showing how failures, for example, would be provided for the small set known as the safety system performance indicator and then how would they be covered for everything else of high safety significance under the maintenance rule. This matrix is

developed for failures, demands, run times, and so on.

It's a rather complicated answer, but I think we have covered it all in this table.

MR. JORDAN: I think we owe you that discussion in a broader presentation.

CHAIRMAN JACKSON: I think you do.

MR. JORDAN: It is not terribly simple.

MR. THADANI: Quite honestly, that is why I thought it was likely that there will be a need for a briefing on just that topic.

May I have the next viewgraph, please.

[Slide.]

MR. THADANI: During this three month period we did not really make any major changes to the plan. However, I do want to touch upon some of the schedule or issues and briefly cover the status of the pilots, and then we will have some additional discussion as we go through.

What has happened basically is the whole process of developing these documents, making sure that the agency is involved and supportive of what we are trying to do, as well as our interactions with various committees. I think the Advisory Committee on Reactor Safeguards as well as CRGR has taken a lot of effort and time, more so than I think we had anticipated. That has had some impact. We have had to take time away occasionally from pilots to make sure we

dealt with those issues.

I do want to summarize where we stand on these pilots. I indicated that the technical specification, safety evaluation report is complete, and that we would expect to issue the remaining safety evaluation reports for other CE plants in July of 1997.

We have a team, as we speak now, at South Texas working on the graded QA program. Our expectation is that barring some surprises from this visit we expect to finish our safety evaluation report by the end of June of 1997.

In-service testing is yet another pilot that we have been working on. We have recently put together a set of additional questions to make sure that what we are doing under IST is in fact completely consistent with what we are saying in the regulatory guides. We expect to get fairly quick responses to those questions and complete our evaluation by the end of June of 1997.

The fourth pilot activity was in-service inspection area. The in-service inspection, in my view, is probably more challenging in terms of the issues on methodology than some of the other pilot applications, because now you are getting into areas like trying to get an idea -- incidentally, the scope of ISI is piping, all classes of piping. You need information on flaws, flaw distributions, fracture mechanics. These are more

contemporary approaches in terms of models.

We have been working with the industry on two approaches. One is the ASME Westinghouse approach, which is very probabilistic in nature; another approach from Electric Power Research Institute, which is less dependent on numerical analysis and more qualitative type of importance analysis type of an approach.

While have been working on the methodology issues, we have not received any submittal from any of the pilots. We expect Surrey to come in in September, using the ASME Westinghouse owners group methodology. It appears that perhaps Arkansas, and I think Fitzpatrick, may also come in using the EPRI approach.

Clearly you will hear through the presentation that in terms of in-service inspection we cannot complete our final document until we have actually gone through the pilot application. However, we do have a draft guide that we expect to get to the Commission in July. That will go out for public comment and those will be the ground rules that we will apply as we go through the pilot evaluation.

CHAIRMAN JACKSON: Do you plan to add any risk-informed performance-based initiatives to the PRA implementation plan?

MR. THADANI: I don't know of any specific plans. The Commission asked us in an SRM to not just be limited to

performance-based thinking as far as the PRA implementation plan is concerned and that it may be necessary to develop an implementation plan for performance-based thinking in other applications. If I remember correctly, we owe the Commission that response end of August, and we are working on that.

CHAIRMAN JACKSON: So you are going to address it at that time?

MR. THADANI: At that time. As part of that activity we would be meeting with the industry to solicit their views in this area.

CHAIRMAN JACKSON: This was asked in the context of another meeting, but I will ask it again within this context. It seems that there is some delay. We had discussions about the development of risk-based indicators, and the question is, what impact do you think any delays in developing the risk-based indicators will have on plan schedules for their use in the senior management meeting process?

MR. ROSS: Obviously we have taken a good look at the replacement set for the current PIs with risk-based indicators. I think it would probably have a moderate effect. I was looking at one of them in particular. We have a very deterministic approach to significant events now, when an event can be called significant. One concept

to replace it is using a tool like ASP to make a more quantitative description of what is a significant event. I don't think it will be perfect. I think there will be some significant events that it will still quantify low.

I would expect this would have a moderate effect on the senior management meeting. The admonition is we are not supposed to be overly influenced by singular events. I think with that precaution I would expect it to have at least a moderate effect. Whether it takes some additional risk-based training to understand this and criteria to understand what is and what isn't significant, I think it would probably take some additional training as well. These are supposed to be phased in, according to the plan, by 1999.

MR. JORDAN: The present set of indicators we felt have been risk informed, but now this is really a transition to the risk based.

CHAIRMAN JACKSON: Since we are talking about the PRA implementation plan, for the record I would like to hear from Dr. Paperiello on where we stand in terms of the development of PRA or like methods in your areas, fuel cycle facilities, industrial devices containing nuclear materials, et cetera.

MR. PAPERIELLO: Could I have the backup slides for materials?

[Slide.]

MR. PAPERIELLO: We have worked in several different areas. You are going to have a presentation next week on performance assessment in both high level waste, low level waste and decommissioning. Performance assessment in those areas looks much like PRA in the sense that you have models, you have inputs with, instead of discrete values, a range of values.

For example, if you look at Yucca Mountain, in a PRA sense it will be rain or no rain, because that is a significant factor in the model. For Yucca mountain you don't have that. You have a range of rainfalls. So that becomes a distribution that goes into the model rather than a yes or no or up or down value.

What comes out is identical to what comes out of a PRA. You have a risk distribution or dose distribution, as you will, that is characterized by a 95 percent confidence level and 5 percent confidence level, a mean, a median and a mode. You can choose how you are going to measure. We use median values, for example, in reactor space. We have a tendency to use mean values for what we do in performance assessment. So there is that group of things.

We have used PRA methods or risk-based methods in transportation. The modal study done several years ago. We are looking at that and using it to iterate the existing

NUREG-0170, the EIS on transportation that was done in the late 1970s, to update it with the insights in the modal study.

At our request Research is initiating a plan to apply PRA to spent fuel storage facilities. We are looking at methods to look at the risk associated with industrial gauges containing cesium 137 and cobalt 60, and we have developed an integrated safety assessment procedure for fuel facilities to assess the risk from chemical safety, critical safety and fire safety integrated. So they are the activities we have undertaken up to now in applying PRA in the NMSS side of the house.

We have in our budget plans in the future to actually set up a PRA group in NMSS to see how we can apply it in all our areas.

CHAIRMAN JACKSON: Can you have the slides shown again, please?

[Slide.]

CHAIRMAN JACKSON: When do you expect to come to closure? Let's leave aside the high level waste repository. For instance, on your next to the last bullet, or the ones involving transportation, but particularly the ones to demonstrate methods for PRA of spent fuel storage facilities or for determining the risk associated with industrial gauges, when do you expect to come to closure on some of

these?

MR. PAPERIELLO: On the gauges, I'll have to ask.

MR. COOL: Good afternoon. The contract for that particular action with Research is scheduled for the summer of next year, that is, summer of 1998.

CHAIRMAN JACKSON: Thank you.

MR. THADANI: If I may just make a quick comment. In reactor applications, the Commission's safety goals and the all the guidance of the Commission has given the staff is to utilize mean values and not median. I just want to be sure that there is not a misunderstanding of that. We are using mean values, and I think it is very important that we use mean values in these analyses.

Unless you have other questions, I'm going to go to Tom King.

MR. KING: If I could have slide 6, please.

[Slide.]

MR. KING: Slide 6 through 14 provide a summary of the reg guides and SRPs that were provided to you in SECY-97-077.

What I want to do in the briefing is focus on the overall approach and key issues associated with those documents. Just a little background information.

As you recall, the specific plans and schedule for developing these draft documents were put together after a

November 30, 1995, request from Chairman Jackson. The purpose of these documents is intended to help implement the Commission's PRA policy statement by providing guidance on an acceptable approach for making plant-specific, risk-informed changes to the current licensing basis of nuclear power plants.

The documents include general guidance, which provides an overall approach in guidance applicable to all risk-informed proposed CLB changes.

Then there is supplemental guidance in specific areas that are shown on the viewgraph. The supplemental guidance is not a replacement for the general guidance; as it says, it supplements the general guidance.

Also included in the package was draft NUREG-1602. This was prepared as a reference document to aid in making decisions on the scope and attributes of a PRA that would be appropriate in proposing a risk-informed change to a CLB.

Chairman Jackson, you had mentioned where the IPE had really helped influence this package. This is probably the most prominent area where we took IPE insights in terms of strengths and weaknesses of PRA methods, databases, and so forth, that the industry used and folded them into the guidance that is in that draft NUREG.

CHAIRMAN JACKSON: When using the guidance documents, will the staff be able to use the documents to

judge the quality of a PRA-based submittal?

For instance, let me give you some questions.

Will they be able to judge whether the appropriate models were used, appropriate data used, appropriate common cause models used, appropriate human performance modeling, or distributional assumptions? Can you make some comments in those areas?

MR. KING: The answer is yes to all of those. The intent of having the draft NUREG and the guidance in the reg guides and SRPs is to answer yes to all of those questions.

COMMISSIONER ROGERS: Before you leave that, one question on the CLB. The work that you have done to date concerns looking at using risk information for changes to the current licensing basis. How far would that approach take you, or could you use that to actually restructure the CLB on a risk-informed basis itself?

MR. KING: Go back through the regulations and see what would change if you apply risk insights. I think clearly starting with the safety goals and using metrics associated with core damage frequency, accident prevention and mitigation, the containment type requirements, would be used in any such process. We haven't really thought about taking this reg guide and are the metrics we developed for it appropriate for such an analysis, but I think where you start from would be the same, the overall guidance.

CHAIRMAN JACKSON: It might be worth considering.

MR. THADANI: We do have other areas, Commissioner Rogers, as you know, that look at some of the regulations to see what sort of value there is in some of those requirements. In making judgments there, it seems to me we would have to use the same sort of thinking and be consistent as we go forward.

COMMISSIONER ROGERS: That's a bigger job.

MR. THADANI: A much bigger job, yes.

COMMISSIONER ROGERS: It's always a little easier to look at incremental effects. But the general approach that you have had to adopt in analyzing changes, that may have given you some first steps towards what one might have to do in restructuring a CLB on a risk-informed basis.

MR. THADANI: Yes.

CHAIRMAN JACKSON: The guidance documents call for increased management attention when changes approach certain guidelines. You lay them out: core damage frequencies in a certain range with deltas of a certain size. Is it clearly spelled out what increased management attention means in the guidance documents? Otherwise, can you end up in a case where an approved pilot becomes the de facto standard guidance?

MR. KING: There is a set of items that should be looked at when you are in that increased management

attention region. It deals with things like recent plant performance, recent operating events, uncertainty analysis, sensitivity analysis, scope of the PRA, things like that that are highlighted. As you get closer to those guideline values you want to take a closer look at what is going on in terms of what is the uncertainty range, how do you deal with it, what other qualitative factors may influence my decision one way or the other.

MR. THADANI: I would just add to that that the thought process as you get closer and closer to these guidelines. The degree of robustness of the analysis would have to go up, and greater attention has to be paid to issues of defense in depth or what does that really mean; is there a great deal of reliance on human actions?

You asked a question in terms of value of IPEs, human reliability issue. We can give guidance and the best available techniques. The recognition is still there that there are very large uncertainties. Those are going to be difficult to deal with, particularly if we have a plant whose performance we are very uncomfortable with. Core damage frequency may be very low; the change in core damage frequency, while it may be small, we can't lose sight of the fact that the agency is concerned about performance of that plant. Those factors have to be integrated, and the management has to play a significant role in that.

MR. KING: If I could have slide 7, please.

[Slide.]

MR. KING: As you heard ACRS say last Friday, we had some extensive interactions with them in developing these regulatory guides. They felt it was constructive; we felt it was constructive. We feel the guides are much better off for that give and take and frank discussion we had with ACRS.

We also had similar discussions with CRGR. With the pilot programs we had interaction back and forth. The pilots provided some real world examples on the types of changes that the industry will be asking for. The practicality of the risk metrics and other traditional engineering type criteria or guidelines that we propose, is it practical to apply them? Do they cover a wide range of the types of changes that we believe will be coming in proposed by the industry?

Also, it had a chance for us to interact with the industry on expectations in terms of the quality and scope and depth of their analysis. We felt there was a broad range of feedback that we got from the pilots in that respect.

To get back to the IPEs for a minute, they provided some examples also in terms of the value of the risk metrics that we proposed. We could see from them what

their baseline core damage frequencies were, for example, where they made changes based on their IP, what they represent in terms of core damage frequency and other risk metrics. So there was some valuable feedback from that as well.

COMMISSIONER ROGERS: Could you make any comments about the nature of the interactions with CRGR and what came out of those?

MR. ROSS: I can respond. In the first place, this was not an imposed backfit. So we noted that. So 50.109 really was not triggered. We noted it was what we call a measured step along the path towards risk-informed regulation. Small but measured.

At that point you could say our strict CRGR role was complete. We reviewed the imposition of requirements. But we also have a value added role, and we noted that we are really talking about fairly small numbers. In some cases even smaller increases in these small numbers, and it might be difficult to characterize this as a change within the general feeling, especially as you get close to 10 to the minus 6.

We noted that there had been due consideration of the safety goal, and by and large we thought it was a good step. We thought the staff in the period that we dealt with them over a few months did an incredible amount of work, and

we so said. We complimented them on the give and take and the cooperative effort. It was a large job for them.

COMMISSIONER ROGERS: Thank you.

MR. THADANI: Let me note that CRGR views are the last two pages in this document, summarizing basically what Denny said.

MR. KING: Finally, before we leave slide 7, as you noted, Chairman Jackson, the package is at the Commission for approval. Included in that package is a Federal Register notice, which has a series of topics from which we would like feedback. It also indicates our intention to hold a workshop during the public comment period. We now have that scheduled for the third week in July. It will be here at NRC headquarters, in the auditorium. So we are anxious to get that out on the street and let people make their plans to attend.

CHAIRMAN JACKSON: See how it floats.

MR. KING: Slide 8, please.

[Slide.]

MR. KING: In developing these documents we had several fundamental questions which had to be addressed early in the program so that we could establish and settle in on an overall approach for these documents.

Specifically, we had questions regarding where do these documents fit in the overall regulatory process, what

is the benefit to licensees and the staff of using these documents, and how do we maintain consistency with Commission policies and practices.

We have settled in on an approach that basically puts these documents forth as one acceptable method for licensees to propose changes to their current licensing basis where NRC approval is required. These do not affect 50.59 type changes. In effect, they provide an alternative way to utilize risk insights when licensees propose changes under 10 CFR 50.90 through 92, which is license amendments.

Since these documents were written basically as a result of a PRA policy statement, we consider them voluntary on licensees. However, we have taken the approach or are taking the approach that using risk insights will be done by the staff in reviewing proposed changes to a plant CLB. So even if licensees come in and don't utilize risk insights, the staff is still free to ask questions regarding risk.

The benefits to the licensees and to the staff I think we expressed well in the PRA policy statement: improved decision-making, more efficient use of resources, and the potential for reduction in unnecessary regulatory burdens. So we feel there is certainly an incentive for both licensees and staff to use these documents.

Finally, we spent a lot of time trying to make sure that these were developed consistent with previous

Commission guidance and policies. One particular item I will note in that regard was the definition of the current licensing basis that we chose to use, which was straight out of 10 CFR Part 54, our license renewal rule. We feel that's a good definition. We feel it certainly can fit well into the context of these documents, and that's what we propose to use.

Slide 9, please.

[Slide.]

MR. KING: At our last semiannual briefing we put a slide up that talked about a six-step review process. Our six-step review process is now a four-step review process.

We haven't eliminated anything, but we have recognized that what we call engineering analysis, you can't really separate the traditional engineering from the probabilistic from the integrated decision-making. It really has to be done together and it complements one another.

So structurally we have rewritten the document to basically be a four-step review process, the steps you see on the slide here.

We feel that the implementation and monitoring program is still a very key element in all of this. It's important to verify the validity of assumptions and analysis and provide a vehicle for feedback and corrective action if

we find out from real plant data that things aren't turning out the way we were expecting. So it's an important part of this process.

CHAIRMAN JACKSON: Let me ask you a question. Since you are saying that one would have to do the overall engineering analysis that has the three pieces you have outlined, have we ended up adding a layer of analysis net net? I was going to say for ourselves, but I'll say for yourselves since you are going to do the analysis. Can you give me an answer to that?

MR. KING: Clearly you can view it as, well, now we have to do PRA on top of everything else, but I don't think that's the right way to look at it. I think the right way to look at is PRA helps you make judgments on what is important in the traditional engineering analysis. You may have been spending a lot of time trying to meet a limit that turns out isn't very important and maybe you can be relaxed somewhat. I think it's a way in the long run to be more efficient and to improve what we are doing.

MR. THADANI: I would like to add to that. We have been using risk-informed thinking in a number of ways when some of the license amendments come in and they propose relaxations. More and more we have tried to obtain insights from risk assessments, to see before we grant those relaxations to make sure we are not approving a change that

could have significant risk implications.

I think it has been done by and large in an ad hoc manner up to now. What this does is produces the right infrastructure, a level playing field, so to speak, not only for the industry but the staff as well to give guidance to both sides as to what would be a reasonable way to go forward. Yes, in some cases that does mean additional analyses would have to be conducted by the licensees.

CHAIRMAN JACKSON: I noted in what you sent to the Commission you say that these documents apply for risk-informed applications, but there is this performance monitoring program associated with each application. So what has to happen to make the applications both risk informed and performance based?

MR. THADANI: We are going to cover that. That is part of what Gary Holahan was going to cover. You had specifically asked, I think in the last SRM, that we should discuss that issue.

CHAIRMAN JACKSON: We will wait.

MR. KING: If I could have slide 10, please.

[Slide.]

MR. KING: Slide 10 starts with the top level or general guidance that is in the draft general reg guide, and it's also applicable to the application-specific reg guides.

Basically, the top level guidance is stated in

terms of five fundamental safety principles that are intended to preserve the essential element of NRC's regulatory philosophy, policies and practices, and to accomplish the integration of the traditional engineering along with the risk insights.

The five items are shown on the viewgraph. Let me just say a few words about them.

First, licensees are expected to meet the regulations or propose a change or an exemption if their proposal needs such a change or exemption. We don't view these regulatory guides and SRPs as a process to circumvent the regulations. I want to make that clear.

Second, defense-in-depth has certainly been a philosophy to assure safety and reliability in plant systems and features, and certainly a way that has been used to account for uncertainties in the past. Therefore we think maintaining the defense-in-depth philosophy is important.

We believe that PRA can provide a useful role in looking at the extent of defense-in-depth. We have provided some additional guidance on what we mean by defense-in-depth. For example, defense-in-depth is thought of in some respects as a balance between prevention and mitigation. Clearly PRA can play a role in trying to quantify and illustrate is that achieved or isn't that achieved. We don't view defense-in-depth as strictly

engineering judgment; we think PRA can provide a useful role in assessing the extent and usefulness of defense-in-depth.

CHAIRMAN JACKSON: Is there a difference between the staff's perspective and ACRS perspective? They speak of maintaining the defense-in-depth philosophy.

MR. KING: I caught that on Friday. No. What Dr. Apostolakis has said was, gee, I thought the principle was going to say maintain the defense-in-depth philosophy. The explanation of the principle says that, but we have tried to keep the statement of the principle itself short, and in the explanation you will find the word "philosophy" in there several times. So I don't think there is a difference.

CHAIRMAN JACKSON: Okay.

MR. KING: Safety margins have also been a traditional part of our safety analysis. Safety margins can be in terms of conservative methods, conservative acceptance criteria, use of codes and standards, and so forth.

We think it's important to maintain safety margins, although we believe that in this process of using risk insights it's reasonable to take a look at the extent of the safety margin: Is it above and beyond what is needed? Is it focusing on an item that really has some risk significance? Again, we believe risk can provide some useful insights into adjusting safety margins to focus in on

the right things.

COMMISSIONER DIAZ: I hope that we are narrowing down what is sufficient means.

COMMISSIONER ROGERS: That was exactly the same question I was going to ask. Provide you a way of defining sufficient.

MR. KING: What we say in the guide, in FSAR analysis, for example, there are criteria that have to be met. Part 100 dose guidelines, for example. We are not proposing that you throw those away. Maybe a plant that meets them with lots of margin could now meet them with a little less margin. If it would allow some relaxation on valve timing or something that would improve the reliability an operability of the valve, clearly that kind of thing is what we had in mind.

The fourth item is where we bring in the risk insights. We are going to talk more about the proposed metrics and guidelines that go along with that, but the idea is to use the safety goals to try and define what level of risk we believe is acceptable for the plants.

Finally, the fifth item emphasizes the usefulness and importance of performance-based implementation and monitoring strategies to assess whether the analysis and assumptions are really coming out as you would hope they would and there aren't any surprises.

CHAIRMAN JACKSON: How do you get at the cumulative effect of changes?

MR. KING: We would expect licensees that come in and propose a change and it's approved, that that would now be factored back into their baseline PRA. So if they come in again, their core damage frequency, their containment performance reflects the fact that they have made this previous change. They keep track of these things.

CHAIRMAN JACKSON: So they will have had to have continually updated the PRA in order to get you to consider the next proposed change based on this?

MR. KING: Basically, yes.

MR. THADANI: Yes. The guidance document says that when they come in with the submittal, that submittal should reflect design and operation of the plant, and if it has undergone a change, they have to make sure that the analysis is now consistent with whatever the design and operation track records are.

CHAIRMAN JACKSON: That's interesting. I have visited some plants. Admittedly what they may have in the plant may be different than what is in the resident's office. What you have in the resident offices many times may be five or six years old in terms of the data on the PRA that they have sitting in the offices. So it intersects with what you are talking about.

MR. THADANI: Yes. In fact I am sure you are correct. In many cases some of the studies are old and they don't really reflect plant design and operation today, and if they want to utilize these techniques, they have to make sure that they update that study so that it is in fact consistent with what is out there today. Otherwise we would just not know where we are.

CHAIRMAN JACKSON: What does it mean, that there has to be some relevant PRA submittal or update of the PRA submitted?

MR. THADANI: Every time a licensee comes in and requests a change to the licensing basis, for that application they would have to show that the analyses in fact do reflect the plant. That has to be done.

CHAIRMAN JACKSON: Mr. Holahan, you were going to make a comment?

MR. HOLAHAN: I was just going to mention that I think the staff has a previous commitment to the Commission to keep a database of cumulative changes made in this context.

CHAIRMAN JACKSON: Are there current plans that exceed the Commission's safety goals today?

MR. KING: You are going to hear more about this tomorrow.

CHAIRMAN JACKSON: The answer is yes, right?

MR. KING: I don't know if the answer is yes or not. The answer is maybe.

MR. THADANI: Maybe.

MR. KING: The answer is maybe.

MR. THADANI: But we will be discussing it further tomorrow.

CHAIRMAN JACKSON: You are going to be doing an awful lot tomorrow, and the day after tomorrow. You know I will come back on this.

MR. KING: If I could have slide 11.

[Slide.]

MR. KING: Slide 11 provides some additional information. We recognize that in the five fundamental safety principles there are rather important things that needed to be factored into the guidance. We have put another section in the reg guide that we call expectations. Basically it's some more general guidance on implementation.

The key items from that guidance are shown on this slide. Just a few words about those.

The licensee can do PRA and he may find out that there are things that need to have some safety improvements made and not just burden reduction. So we would expect an integrated assessment by the licensees of the safety impacts of their analyses and expect not just burden reductions to be proposed, but, if warranted, some safety improvements

made as well.

Because these are plant-specific changes, it's very important that the analyses reflect the as-built, as-operated plant using plant-specific data. We express that expectation in the reg guide as well.

The quality of the analyses in terms of is it appropriate for the nature and scope of the proposed change, are the appropriate models being used, appropriate data being used?

There is some guidance in there on that as well as the traditional quality assurance type activities: Are qualified people doing the analysis? Are records being kept? Is there independent verification and checks on the analysis? That kind of thing. So there is guidance that covers that as well in the regulatory guide.

We have defined the risk metrics of core damage frequency and large early release frequency. I will talk more about those. Basically they are intended to cover both accident prevention and mitigation in terms of looking at the risk impacts of the proposed change.

Then consideration of uncertainties is very important. We have a fairly long section on uncertainties in the general reg guide. It is written not as a prescriptive cook book type guidance, but it really will require some thinking to apply.

It talks about where does the uncertainty come from, what are ways to assess it in terms of qualitative factors. It does express the intent to start off using mean values, but then you need to take a look at what the sensitivity analyses tell you, what is in scope, what is out of scope, and make some judgments on how you treat uncertainty and how does it affect your decision.

CHAIRMAN JACKSON: Is the guidance clear enough? Is everyone who uses this guidance to review licensee submittals going to need to go through a training program to be able to know enough to give meaning to all of these guidelines?

MR. HOLAHAN: Yes, and we have some training plans. The other thing I would say is I'm not sure there is any individual who is going review these sort of complicated issues.

CHAIRMAN JACKSON: You are going to do it as a team approach.

MR. HOLAHAN: I think we are still thinking that a team approach is probably most appropriate.

MR. THADANI: I think it is important that we maintain that concept of team particularly for what I would call the more difficult and challenging submittals. We want to be sure that the right level of attention is given through a team process.

CHAIRMAN JACKSON: So you will pull the teams together as appropriate for the particular review on hand?

MR. THADANI: Yes.

MR. KING: This is an area we did highlight in the Federal Register notice for feedback and we do intend to continue some work on looking at the treatment of uncertainties and possibly enhance what we have in the regulatory guide.

CHAIRMAN JACKSON: That is an important area.

Commissioner McGaffigan.

COMMISSIONER McGAFFIGAN: I would like to ask a question that follows up on a question I asked ACRS last week. Are we essentially saying in so many words that in order to take advantage of this approach you are going to need a living PRA, and at what level, at level 2 or level 3?

CHAIRMAN JACKSON: Or scope level 1.

COMMISSIONER McGAFFIGAN: What sort of documentation is really going to be required to work in this area, and is it a very small number of licensees, the South Texases, the Palo Verdes, who are going to be able to go down this path?

MR. THADANI: I think it's going to be application driven. If the applications are very broad scope, covering much of the plant, then clearly one would have to have a robust risk assessment with the right scope.

On the other hand, you can get into some simpler applications where one could in fact rely on a risk assessment which doesn't necessarily have a very broad scope of information in it.

I would expect that licensees who have conducted IPEs, essentially all of them can use some parts of it to some level in addressing some issues. I don't know the numbers, but probably a good number of them, if they want to go to a very broad-based application, in-service testing or --

CHAIRMAN JACKSON: In fact, what I was going to suggest, if you take the pilots that you are talking about bringing to some closure, the tech specs, the graded QA, and ISI, IST, in-service inspection, in-service testing, how roughly would the IPE submittals that we have fall out relative to the criteria in terms of the potential for their use in each of these areas? You can pick one or two.

MR. THADANI: I think with some small changes most of the licensees should be able to utilize these studies for changes to technical specifications. Again, it depends on range and scope of those changes. That is one end, so to speak. Yet, in some cases, depending on the scope of technical specifications, we would want to make sure that the analysis is very robust. So it would depend on what pieces they pick.

Let's use in-service inspection as an example. One can use these studies in a very limited way for in-service inspection, because by and large the risk assessments make assumptions about frequency of small breaks and large breaks. They generally do not really discriminate which sections, which pipes, et cetera, may be more susceptible, which ones may be less susceptible, and thus where should one's inspection focus be, because there is a lot of dose commitment involved as well through these inspections.

That means a new methodology has to be applied to be able to discriminate among these pipes, so to speak, various categories of pipes, and that methodology has not been used. I may be wrong, but I don't think that has been done in probably any of the PRAs. I hope I am right on that one.

Westinghouse owners group and ASME are now developing that methodology and the staff has been working with them, so that pretty much on a real time basis we know what is going on within the industry.

I might also note that, based on my understanding, the monetary value is probably highest in areas of in-service inspection and graded quality assurance. Technical specifications could lead to substantial monetary savings. We have some examples in South Texas that

indicate, depending on the scope, one could end up having a fair amount of savings.

In-service testing of the pilots that we have been talking about, if I were to rank them, are probably the lowest dollar return, monetary return.

On the other hand, this approach we are on has a different type of value. As we go to in-service testing, we are not only talking about frequency of testing, but we are also looking at the scope of testing. The two together are important, because it could be that the testing required today may not cover some of the more important failure modes, which means the scope of testing has to be revised to make sure that those important failure modes are covered through testing.

In the end this approach may end up leading to improved safety even if the frequency goes down, because it's more focused and it's focused on the right failure modes.

CHAIRMAN JACKSON: Mr. Holahan had a comment.

MR. HOLAHAN: I would like to add something to it. This is a very important issue. I know it has gotten a lot of attention between the staff and the industry recently. I would say with the exception of those PRAs which the staff sort of sent back on the IPE program, saying they needed more work even to address the vulnerability issues, I think

all of the PRAs that have been developed can be used to a certain extent.

If you remember back to the framework document that the staff developed as a prelude to these guidance documents, we talked about there being categories, as Mr. Thadani mentioned, of some of the simpler to more complex range of issues. I think there are numerous day-to-day type issues that licensees can use their existing PRAs for. For prioritizing their own work, for example. I think virtually all the PRAs help and give licensees good insights for making those kind of decisions.

I think all of the pilot activities we are envisioning now can be addressed with the existing PRAs to a certain extent. I think even those which have limitations don't mean that they couldn't be used at all. I think the guidance documents will allow the industry to understand and the staff to understand some of those limitations so that some benefit, some improvements could be made even with limited PRA.

I think that is one of the reasons that we wrote what I think is a rather flexible document, that invites a range of qualitative insights to very detailed quantitative analysis and didn't provide just a cook book that says, if you do it this way, you pass, and if you don't do it this way, you fail.

CHAIRMAN JACKSON: I think Commissioner Dicus has a comment.

MR. HOLAHAN: Can I just follow up on one thing we didn't mention, on Commissioner McGaffigan's issue?

CHAIRMAN JACKSON: Fine.

MR. HOLAHAN: You asked if a living, continuous PRA was necessary. I don't think it's implied by this process. I think the word that Chairman Jackson used was "continual" updating is more appropriate in the sense that it is updated when it's used for a license amendment and not necessarily continuously in between. So it's sort of a once in a while update to be appropriate to the decision that is being made.

COMMISSIONER McGAFFIGAN: It depends what the words "as-built" and "as-operated" mean. If it's continual and if they are coming in for repeated amendments, then it's going to be pretty living. If they make a change every five years, maybe it's only every five years they have to. Is that right?

MR. HOLAHAN: Yes, I think that's right.

COMMISSIONER DICUS: My question comes out of a couple of things that I think you commented on. I pick up on or hear, and I think this is what you were at least in part addressing, that the nuclear power plant industry at some point bought into the whole concept of PRA, and

obviously has put resources into this, as we have as well. I am picking up and hearing now that the industry may be less enchanted with PRA than previously, in part because benefits that they perceived would be available at some point in time are not being realized.

Is that accurate, and if it is, what might we do about it? Because it's labor-intensive to us as well. If it's not really accurate or not as close to what is really the case as it should be, then where is this perception coming from? I think your views on that would be useful to me.

MR. JORDAN: Certainly it's a perception and we have all heard it at various meetings and in discussions with industry people. I think this guidance is now an articulation by the staff of how the industry and the NRC may use PRA in a wise fashion for beneficial purposes for both industry and the regulator. I believe this is the right answer, and now it's a matter of getting the industry comments on this set of material and seeing how this now fits their perception.

MR. HOLAHAN: It's clear that there is industry frustration at the timing. I hope they are not disenchanted with PRA as a tool. They might be somewhat disenchanted with the staff, at the pace of our progress, but I think that is easier to deal with than reinvigorating their

interest in the technology.

Hopefully the pilot applications that we are going to try to get out in this month and next month and putting the guidance document on the street may bring them back.

I think this is the right thing to do, and I think the industry will be receptive when they see that the staff is receptive.

CHAIRMAN JACKSON: Can you do the tie-in for us between these documents and the pilots? Are the pilots being evaluated relative to the criteria in the documents so that in fact in interacting with the industry on the pilots you are de facto getting feedback on these guidance documents?

MR. THADANI: Yes. That is in fact what we are doing. I would again add the industry has been very anxious to get the documents out in the public arena for further discussion. They have been concerned with the time that the staff has taken in getting these documents completed.

As I noted earlier, there are some products we can get out now. We do not have to wait much longer. For example, technical specifications change. For example, if we get the graded QA work completed on South Texas by the end of June, the understanding we have based on Commission SRM is that we will provide that information to the Commission. Should there be some objections, of course we

will not issue these evaluation reports. Barring that concern from the Commission, we would be able to issue the safety evaluation reports.

I would like to think that that would be a good signal to the industry once we get these documents out.

CHAIRMAN JACKSON: Let me make sure I understand. Were the safety evaluation reports that either have been done or you are saying will be done or should be done by July done relative to the guidance that is in the guidance documents that the Commission is considering for release to the public?

MR. THADANI: Yes. The Commission indicated to us that they would not review and approve issuance of those safety evaluation reports but that the Commission would like to see them for information.

CHAIRMAN JACKSON: Right. The point I'm asking is, were the safety evaluation reports themselves done referencing the guidelines in these guidance documents?

MR. THADANI: Yes, indeed.

MR. HOLAHAN: Indeed that is to a certain extent what has taken more time on the pilots, because they started out with a certain format and content and we have in fact imposed on them the approach that we have in the guidance documents here.

The one exception is the staff did approve the

boiling water reactor owners group testing program more than a year ago. I think that was done in line with our thinking at the time and is not quite the same scope and content as we have here.

CHAIRMAN JACKSON: But the others are aligned?

MR. HOLAHAN: Yes.

CHAIRMAN JACKSON: Okay.

MR. KING: If I could have slide 12, please.

[Slide.]

MR. KING: Slide 12 and 13 show our proposed risk guidelines. Slide 12 is the risk guideline for accident prevention, which we are proposing to use core damage frequency as the metric, and slide 13, the risk guideline for accident mitigation where we are proposing to use large early release frequency.

Basically these risk guidelines define the conditions under which changes in risk would be permitted both on an absolute scale and on a relative scale. The absolute scale is derived from the Commission's safety goals and their subsidiary objectives, and the relative scale from the regulatory analysis guidelines.

In effect, what we are proposing defines the terms "small" and "under certain conditions" which were discussed in the Commission's January 22nd SRM.

Core damage frequency. What we are proposing is

to use on the absolute scale 10 to the minus 4th per reactor year as the value above which further increases in risk would not be permitted. This is the same value the Commission endorsed for use back in 1990 as a benchmark for accident prevention.

For the relative change we are proposing a delta CDF or change in CDF of 10 to the minus 5th per reactor year. That guideline is consistent with the guideline in the regulatory analysis guidelines document. It essentially limits changes in risk to small steps.

We think from the regulatory analysis guideline standpoint it doesn't make sense to allow big changes, increases in risk that would essentially be candidates for backfit. Therefore we feel using the regulatory analysis guidelines value is appropriate.

CHAIRMAN JACKSON: I think Commissioner Diaz wants to ask something.

COMMISSIONER DIAZ: A relative change or each time change?

MR. KING: This is each time change.

COMMISSIONER DIAZ: Then the total cannot approach absolute.

MR. KING: Yes.

The other reason we think limiting increases in risk to small steps makes sense is it provides time for the

monitoring and feedback and corrective action process to be put in place and utilized.

MR. THADANI: Commissioner Diaz, if I may add to what Tom King was saying. The real thrust is if we allow one-time changes which are in this area of 10 to the minus 4 to 10 to the minus 5 frequency, then if you go to regulatory analysis guidelines, that can become a candidate for backfit because that is a definition of substantial improvement in safety. We are trying to be careful that we are not marching in a direction and then stepping back and saying, wait a minute, we can now backfit. That is really the key point.

CHAIRMAN JACKSON: Let me ask you a couple questions. Essentially your discussion of large early release frequency parallels that of core damage frequency. So let's talk about CDFs for the moment. Does this mean that plants with IPEs with core damage frequencies greater than 10 to the minus 4 need not apply for any relaxations?

MR. KING: No. We think relaxations can accompany risk decreases.

CHAIRMAN JACKSON: I understand your point.

Do any of the pilots have CDFs or LERFs such that "increased management attention" is required?

MR. HOLAHAN: Oh, yes.

MR. KING: Yes.

MR. HOLAHAN: Most, I would say.

CHAIRMAN JACKSON: Do you anticipate that for those specific applications the guidance documents would incorporate what that increased management attention process would be?

MR. HOLAHAN: The guidance documents treat the topics in general, and they are listed in the guidance document. It's not exactly a cook book. It's guidance as to what issues ought to be looked at more deeply.

CHAIRMAN JACKSON: These are mean values that are compared to the core damage frequency and to the LERF, right?

MR. KING: Yes, mean values.

CHAIRMAN JACKSON: Let me go through here. This is where a little bit of knowledge makes you dangerous, or dangerous to yourself if nothing else.

As I understand the PRA process, mean values can only be calculated if distributions are propagated through the fault trees. That's the way I learned it.

MR. HOLAHAN: Yes.

CHAIRMAN JACKSON: So how many of the IPEs actually propagated distributions through the fault trees?

MR. KING: Let me ask Mary Drouin, who you will be hearing from tomorrow. Maybe she can answer that one.

MS. DROUIN: What I first say is that they were

not asked in the generic letter to do a formal uncertainty analysis as part of their IPE. We did see that some of the licensees did do it. My suspicion is that most of the licensees probably did it but did not report it.

CHAIRMAN JACKSON: The real question is not so much whether in the IPEs as done in response to the generic letter were the distributions propagated through the fault trees, but that in making assessments relative to these risk guidelines will we be expecting that in those PRAs that the distributions are propagated through the fault trees in order to arrive at these judgments?

MR. THADANI: For those applications, yes.

CHAIRMAN JACKSON: That's what I'm saying.

MR. THADANI: For those applications, yes. They have to come back with mean values.

CHAIRMAN JACKSON: The appropriate mean values.

MR. THADANI: Yes.

MR. HOLAHAN: However, we had said that there may be some simple cases where the changes are so small and the risk is relatively low.

CHAIRMAN JACKSON: I'm talking about when you are talking about satisfying things according to what you have on these two sheets here, that you actually have to do the full distribution propagation.

MR. THADANI: Yes, for those.

MR. HOLAHAN: We did say there may be some cases in which even comparison with these numbers, if they are far enough away, if they are more than a factor of 10 away from these numbers, that point estimates could be --

CHAIRMAN JACKSON: But you have already specified by virtue of what you are saying what the delta CDF is and the delta LERF is. You have already said that, right, that that is the factor of 10?

MR. HOLAHAN: Once you are within the factor of 10, yes.

CHAIRMAN JACKSON: That's all I'm really asking.

MR. HOLAHAN: Yes, that's true.

CHAIRMAN JACKSON: In a certain sense that is what undergirds all of this. These are probabilistic quantities. So we can never have 100 percent certainty.

MR. THADANI: That's right.

CHAIRMAN JACKSON: Should we be saying or are you saying that these criteria should be met with some kind of assurance or confidence level?

MR. KING: There are some general words in the uncertainty section of the reg guide that talk about confidence level.

CHAIRMAN JACKSON: But you haven't really fleshed that out?

MR. KING: We did not specify a confidence level.

You will see a comment in the Federal Register notice. We are soliciting comment on confidence level, what are people's views on the confidence level that these things should be met at.

CHAIRMAN JACKSON: We talked about it coming back as a policy issue.

MR. THADANI: Yes. That's what I was going to say. That would be a policy issue.

CHAIRMAN JACKSON: The ACRS has proposed that the lower tier risk acceptance criteria, the CDFs and the LERFs again, be derived directly from the prompt fatality QHOs and be of such value as to bound all the current sites. Does the staff have a view on this?

MR. KING: Where we derived our LERF value was from starting with the early fatality QHO and using NUREG-1150 analysis and looking at if you were just to meet the early fatality QHO, which is the most controlling QHO, what kind of LERF would you need to have. The 1150 plants were below the QHO; they met it with some margin. We looked at what would it take for them to just meet it.

There was some adjustment and conservatism for the fact that 1150 didn't cover low power and shutdown, for example, and not all the plants included external events, but providing some adjustment factors for that, we arrived at the 10 to the minus 5th.

We are looking at the ACRS proposal, which I think maybe goes into a little more detail in that. Certainly we may want to adjust our number, but at this point we think we are pretty close to ACRS in terms of the numbers they proposed using their methods. So I think it's a good, reasonable ballpark number to work with.

CHAIRMAN JACKSON: I think it's important that you try to work to resolve this during this period that you are also resolving other public comments.

MR. THADANI: If I may make a comment. The Commission in an SRM -- I think it was in June of 1990 --

CHAIRMAN JACKSON: That was before our time.

MR. THADANI: -- recognized that the frequency of large early release of 10 to the minus 5 was probably more appropriately representative of meeting the quantitative health objective, the prompt fatality criterion.

The Commission also recognized that there are uncertainties in these calculations, recognized that the selection of 10 to the minus 6 guideline value for implementation purposes was a reasonable way to go, with full recognition that there was probably some conservatism in that guideline and that that level of conservatism was appropriate.

What we are talking about now is that -- I think that's the large early release frequency discussion that Tom

is going to go through -- we would like to hold at 10 to the minus 6 also. However, there may be some cases where the frequency could exceed 10 to the minus 6, and then what kind of attention would we give to that element.

I just wanted to make sure and bring up the issue of the 1990 SRM.

CHAIRMAN JACKSON: Let me ask you one last question. When full scope PRAs are not available, are you going to use something like bounding analyses to address things like external events, fire, earthquakes, and shutdown?

MR. KING: The approach we have taken now is if the proposed change, for example, doesn't affect low power and shutdown, then just a full power analysis would be fine, but if it does, the licensee is going to have to show either quantitatively or with some good qualitative arguments how the risk is impacted in those conditions that aren't explicitly modeled in the PRA.

The other thing we have done is provide in the general reg guide an appendix that if someone has just a level 1 PRA there is a way to estimate the level 2 results and estimate a LERF based upon the level 1 analysis and the previous work we have done, particularly with the 1150 and Lasalle PRAs.

CHAIRMAN JACKSON: So you would use the level 1

analysis with some kind of a bounding analysis to get some sense of the effect of external events on the overall risk?

MR. KING: This is for internal events only. Where just the level 1 analysis has been done and someone wants to estimate their LERF, there is a method proposed in the appendix to the general reg guide that allows them to do that.

CHAIRMAN JACKSON: I guess I am really asking you is, how do you intend to take account of external events within this context?

MR. HOLAHAN: What I would add is that the first thing is we would like to have licensees submit an analysis. That is always the easiest. I think if they wish to put a bounding analysis, that is certainly acceptable to the staff. In the absence of those, we will ask the licensees to make a judgment about how that would affect their proposal.

We haven't taken a position that it necessarily has to be bounding. In this arena we would like to keep the judgments closer to best estimate. Otherwise there is some biasing about what is important and what's not.

I think we will press the licensees to address full spectrum of issues and the staff also in a judgmental way when there is lack of analysis.

CHAIRMAN JACKSON: That's why you need a team.

MR. HOLAHAN: I think it helps.

MR. THADANI: Let me also emphasize that that is a very important issue, because if one were to truly go with bounding assessment of assumptions, then clearly external events are going to be the key. As you well know, in the hazard functions there is large uncertainty, and if one goes for bounding values, then those will be controlling.

CHAIRMAN JACKSON: And they have to be very conservative.

MR. THADANI: Yes, very conservative.

CHAIRMAN JACKSON: Commissioner McGaffigan.

COMMISSIONER McGAFFIGAN: Again I am going to return to questions I asked ACRS last week. I'm looking at a paper ACRS gave us about shutdown operations that you are familiar with. If you look at a BWR with a core damage frequency of 4.1 times 10 to the minus 6, how much of that number should I believe? Is it 4.1 times 10 to the minus 6, somewhere between 4.1 times 10 to the minus 10? Is it a factor of 10 or a factor of 100?

MR. THADANI: I will give you just a personal view. Every time I see numbers like 4.1 times 10 to the minus 6 my immediate conclusion is that there is much greater perceived precision than there really is in these analyses and calculations, particularly when you go to shutdown conditions where the majority of the contribution

is coming from human errors.

CHAIRMAN JACKSON: You have to be careful, though, because if you are talking about starting with a core damage frequency of one 10 to the minus 4 and you talk about delta core damage frequency that is 10 to the minus 5, you are talking about going from 1.0, 10 to the minus 4, to 1.1, 10 to the minus 4, right?

MR. THADANI: Absolutely, yes. I think we can come back to this issue for confidence in delta.

COMMISSIONER McGAFFIGAN: I'm going to get to that. As I told him last week, it's a matter of arithmetic why you have greater confidence in deltas than you do in the total, and I understand that, but that gets to the delta question. If I believe that this plant, whatever it is, a Mark 3 BWR, is at 4.1 times 10 to the minus 6, and now I say in the risk guidelines you can make changes of up to 10 to the minus 5 in core damage frequency, then I'm making a factor of a 2-1/2 change in that, if I believe any of this. Is that a small change in risk? When you guys chose 10 to the minus 5 as the delta, did you think about 10 to the minus 6 as an alternative?

MR. THADANI: Yes. In fact, what we are saying is by and large many of the changes actually are going to be below delta of 10 to the minus 6. If you look at general license amendments, most of them are not that significant.

We are saying 10 to the minus 6 delta is a fairly small change.

CHAIRMAN JACKSON: I think he's saying something else. If you start low, are you going to allow a factor of 10 to 100 increase?

MR. THADANI: Yes. I'm saying now you go up to 10 to the minus 5, which is an appreciable change. We are saying we are going to have to look at a number of factors before we say, yes, indeed, go ahead.

One issue we said we would take a very hard look at is going to be the issue of uncertainties. The other issue that we are going to take a very hard look at is, does it really potentially bypass two barriers? During shutdown condition, if it's a boiler, very likely the containment is open. So we have got to be very careful, because now we are are talking about delta CDF as well as potential for perhaps a significant release.

So one has to integrate all those issues as one goes to deltas, which are now appreciable. Ten to the minus 5 delta CDF, in my view at least, for a change through an amendment process is a very significant change.

COMMISSIONER McGAFFIGAN: That is my impression as well. Why not a number 2 times to the minus 6 rather than 10 to the minus? You are saying 10 to the minus 5 is where there will be more analysis.

MR. KING: Actually it starts at 10 to the minus 6. We are now within a factor of 10 of the value shown on the viewgraphs. You go into the more analysis tension region. I think that region is intended to address the concern you are expressing.

MR. HOLAHAN: There has been a lot of discussion on this issue. In the industry guidance to themselves as to how to use the PSA applications guide they chose to give their guidance in terms of percentage of the current value. In other words, if you were at 10 to the minus 6, 10 percent of 10 to the minus 6, not 10 percent of the safety goal subsidiary objective.

So we had considerable discussions among the staff and with the ACRS as to should changes be measured with respect to where you think the plant is or with respect to your safety guidance values. We came around to saying that it's more important to believe your speed limits than to just deal with the changes. I think that means you are treating the 10 to the minus 4's and 5's and 6's as though they matter more than in effect penalizing a plant that is very safe and saying it can make almost no changes.

MR. KING: I think we probably talked about most of the material on slide 13. So let me propose to go on.

[Slide.]

MR. KING: In slide 14, all I wanted to do there

was illustrate the areas where the application specific guidance supplements the general guidance. I don't intend to go into those in any detail, but I did want to point out that these are unique areas, that you will find discussion in the application specific guidance that you won't find in the general guidance.

CHAIRMAN JACKSON: So all of these are part of what we already have?

MR. KING: That is all part of the package of what you have.

COMMISSIONER ROGERS: Before you leave that I do have a concern, and that is that whether any of these really represent something that's in a rule or the equivalent of a rule and therefore using a PRA analysis strictly speaking might take one out of compliance with that rule. For instance, where any ASME codes are involved and referenced by rulemaking such as test intervals or something of that sort. How do you propose to deal with that?

MR. THADANI: There is under 50.55(a) an alternative approach option that the Director of NRR can approve. That is indeed what we indicated as one of the policy issues and indicated that is the path we go on in terms of in-service testing. I believe the Commission approved that path.

You are quite correct. Otherwise it could mean

change the regulation.

COMMISSIONER ROGERS: In every case is there some disclaimer of that sort?

MR. THADANI: Yes.

MR. HOLAHAN: In fact it's our first principle, that you meet the regulations or you get an exemption or we have a rule change.

CHAIRMAN JACKSON: Therefore any of the guidance that comes out of here is not going to conflict.

MR. THADANI: That's correct.

MR. HOLAHAN: In fact it ought to contribute to convergence between compliance and safety issues.

MR. KING: The final thing is not a viewgraph, but Ashok had mentioned in the beginning that we owed you a short update on the human performance and reliability assessment plan that you asked for last Friday.

As you recall, ACRS suggested we need such a plan. So did our Nuclear Safety Research Review Committee. We agree. We have responded to ACRS that we plan to have such a plan ready for review by the end of June.

That plan is going to cover human performance and human reliability aspects for both reactors and materials facilities. It is going to be based on an integrated model of human performance; it is going to deal with activities related to events assessment, inspection, design; it's going

to cover the database question; and it's going to talk about where do we get the data, both domestically and internationally, both nuclear industry and applicable data from outside the nuclear industry.

Our schedule is to have that plan available to be given to ACRS the end of June. We are having a subcommittee meeting with them June 3 where we will give them a status report and discuss it in viewgraph form.

We also plan to meet with ACRS later in the summer and eventually request a letter from them. We also plan to meet with the Nuclear Safety Research Review Committee on this.

Ultimately we hope to have it finalized and we'll provide it to the Commission by the end of September.

What we are not waiting for is to move out on the agency database question. We recognize that across the agency we have several databases. It probably would be more efficient to get together and have a common database. We've had a kickoff meeting among the offices to start that activity, to identify what are our data needs, what data do we want to put in there, what's the quality of the data we need, and we hope to begin implementation of that by the end of September.

In a very short fashion, that is what we plan to do in that area.

MR. THADANI: Gary.

[Slide.]

MR. HOLAHAN: On slide 15 there is a discussion of performance monitoring. Back in the January 22, 1997, SRM the Commission asked for a summary discussion of performance monitoring in the context of both the pilot applications and the guidance documents.

The guidance documents do have sections addressing performance monitoring. It is one of the four key steps that Tom King mentioned. In fact it's the third step. It's covered by discussion in section 2.5 of the regulatory guide, and there are corresponding sections in each of the other reg guides and standard review plans.

There have been discussions between the staff and the pilot applicants on the issue of performance monitoring. Those are along the same lines as we have presented in the guidance documents.

In the staff's report and even up until today the only document that we have really taken a final position on this issue is the CE owners group lead plant, the Arkansas tech specs.

In effect this issue is still in the review process for the graded QA and the IST pilot applicants. We have asked them questions and we are pursuing the issue consistent with the guidelines in the reg guides and the

SRPs.

CHAIRMAN JACKSON: How do the guidelines for performance monitoring here compare with the guidelines under the maintenance rule for performance monitoring?

MR. HOLAHAN: In our guidance documents and in the pilot applications, the Arkansas one as an example, we say that that the maintenance rule is the expected starting point for the licensee in their performance monitoring activities.

There are a few differences between what is monitored under the maintenance rule and what would apply to a specific application. One is that the maintenance rule calls for monitoring in the context of maintenance activities. So what they count, for example, is maintenance-preventable failures. That may or may not be sufficient for a given application. We may be interested in other type of failure mechanisms.

In practice many licensees are keeping a broader set of data even under the maintenance rule than just maintenance-preventable failures. As the data rule or voluntary approach to reliability data moves ahead, we are seeing that the industry will be developing a database one way or another for addressing these issues.

The other thing that the maintenance rule differs from some applications is that for low safety-significant

systems the monitoring in the maintenance rule is usually done on a plant basis and not on a component reliability basis. Since many of the applications we are talking about are making changes, reducing requirements for the low safety-significant systems, the monitoring we are talking about is making sure that those systems with reduced requirements don't become significantly less reliable than was expected.

The maintenance rule as it's currently written doesn't necessarily provide component or even system level information. So when we come to a specific pilot, performance monitoring on that application would either require reliability or availability information, depending upon what sort of pilot application it is.

Some of that might be available through the maintenance rule. But we see in most cases is you probably have to stretch the amount of data that is kept from the maintenance rule. It's done similarly, but I think probably a little more data has to be kept.

For example, in graded QA the concern is, with less quality assurance, is it possible that the equipment is becoming less reliable? So some sort of reliability data is the check to see whether that's happening or not.

In contrast to that, under the technical specification amendment in which longer outage times are

being allowed, what we are interested in checking is seeing whether those longer outage times are contributing to increased inappropriately large unavailabilities. So the monitoring approach is tailored to the individual issue.

If we go to slide 16, it discusses the specific example of the technical specifications in ANO 2. In that evaluation there is a specific section in the safety evaluation report parallel to what is in the guidance documents addressing performance monitoring.

As I mentioned, equipment availability is the concern with increased allowable outage times. That is written into the safety evaluation report and it's tied to the maintenance rule for the specific equipment that has changes.

The safety evaluation report has basically not only performance monitoring, but a corrective action section, in which case corrective action through the maintenance rule would look at whether the technical specification is contributing to an inappropriate amount of unavailability, in which case it would be addressed in the context of the maintenance rule.

This is done on a two-year basis in looking at reliability and unavailability, and if those numbers are exceeding the balance or the goals that licensees have established, then we would either consider rewriting the

technical specifications to pull that back or look at what other actions ought to be taken to address that issue.

This is the only case in which we have actually written when the Commission approves it, which would be an approved example. I think it establishes a general format that will be used in other cases, but since graded QA may be the next example to come by, I think we will see emphasis on equipment reliability data as opposed to availability in that case.

CHAIRMAN JACKSON: Commissioner McGaffigan.

COMMISSIONER McGAFFIGAN: In the paper you sent us on ANO 2's proposed change you say at some point here that in approving the proposed tech spec changes the staff is relying on a commitment made by the licensee with respect to utilization of a risk-informed configuration control technique to assess the risk associated with removal of equipment.

Are we essentially changing the "should" to "shall" in the maintenance rule with regard to configuration control by having this license condition or administrative control and tech specs put into this license?

I don't know how broad the configuration control is going to be, but if they have a risk-informed configuration control system, that is the "should" versus "shall" issue in the maintenance rule.

MR. HOLAHAN: I think what it says is this licensee has made a commitment to have a program.

COMMISSIONER McGAFFIGAN: Since this is a precedent, we will expect similar commitments from other licensees as they come in, and for that category of licensees the maintenance rule "should" has converted to a "shall."

MR. HOLAHAN: I think it's not quite converted. In terms of enforcement against the rule versus enforcement against this particular license amendment, I think there are a little different implications. But I think it does move it into a regulatory requirement of some sort.

MR. THADANI: Our focus as we are conducting these reviews is to make sure that prior to allowing relaxation that we have taken an integral look at safety implications of the change. We believe configuration control is very important because of the way risk analyses are traditionally done. We have indicated as a condition of approval that that control has to be maintained if this relaxation is to be granted.

You are exactly right. I have had calls from the industry, very unhappy with the staff at taking that approach, and why is this not covered under Part A3 of the maintenance rule, which industry, as I was told, considers is a requirement.

I know you have asked us to take a look to see if we should revise Part A3 of the rule, to change "should" to "shall," and I hope we will come back to you very quickly with a recommendation. Quite frankly, the interaction that I have had with NEI, they have indicated to me that they would support changing Part A3 of the rule from "should" to "shall" if that resolves this issue.

CHAIRMAN JACKSON: Do you want to vote it this afternoon?

COMMISSIONER McGAFFIGAN: I think you may have at least one Commissioner who is receptive. Having seen this paper, it struck me in a machiavellian sense that one reason you answered the question in a more ambiguous way when first asked is that you have these other methods to catch licensees' attention and you end up converting the "should" to "shall" anyway, so we might as well just do it up front.

MR. THADANI: We think it's an important safety issue and it ought to have some enforcement capability behind it.

CHAIRMAN JACKSON: And this is how you are doing it for now until you come back to us with a specific recommendation fast.

MR. THADANI: Yes.

CHAIRMAN JACKSON: Okay.

MR. HOLAHAN: The last thing I would like to cover

on performance monitoring is to go back to Chairman Jackson's question about what does it take to be fully risk based as opposed to being what we have called risk-informed with performance elements built into it. I think there are really two differences between what we have done here and what would be a fully risk-based approach.

The first is, frankly I'm not sure what a risk-based approach is. If you ask 100 people, you might get 100 different answers. So I think there is some development work to be done. The staff has an assignment to get back later this year to address that issue more fully.

But there is another issue involved in it, and that is we are making license amendment in the context of the existing regulatory framework. To be fully performance based, I think you would have to break out of part of the approach. We are still using Appendix B and the programmatic elements of that; we are still using technical specifications; we are still using a staff review and approval process; and I think all of those things might be changed to some extent in a fully performance-based program.

Within the context of these sort of measured steps, as Dr. Ross has mentioned, I don't think we can become fully performance based without changing some of the other paradigms.

The last thing I would like to cover is future

activities on slide 17.

[Slide.]

MR. HOLAHAN: I think much of this has already been mentioned. The staff would hope to issue the guidance documents in May, based on Commission guidance.

You will note that the package does not include an ISI program. We are looking towards getting the reg guide and SRP on ISI in July of this year.

I think Tom King already mentioned the workshop, and I think Mr. Thadani did a pretty detailed job of going through the status of the pilots.

One thing that I would mention. On the slide where it says graded QA, 12/97, that really applies to the three pilots, South Texas, Palo Verde, and Grand Gulf. We really are hoping to get the South Texas piece of that done end of June, early July, something in that time frame, in a much faster time frame than December.

[Slide.]

MR. HOLAHAN: On slide 18, this is just to remind the Commission that there are a few more IOUs from the January SRM. A number of these subjects are covered in our guidance documents.

In part, we will get public comment on those before we come back to the Commission. In addition, there are questions for OGC about the legal implications of some

of these that are also needed in responding to that Commission guidance.

I think we mentioned earlier that in fact there is some training planned for the staff on the reg guides and the standard review plans to help that process along.

Following the public comment period there will be a resolution process; there will be a series of meetings with the ACRS; there will be a second round through the CRGR; and we are still hoping to and are committed to getting the general guidance, the tech specs, IST and graded QA completed by the end of the year.

We are hoping to get in-service inspection done by February, but I think that date is somewhat dependent upon there being a pilot application by September. So I think that date is less certain than the others. We will have a number of opportunities to discuss that with the Commission well before that date and we will know more about how that is going with respect to a pilot application and progress on the guidance documents.

I think that's all we have for our presentation.

CHAIRMAN JACKSON: Thank you.

Commissioner Rogers, any follow-on questions?

COMMISSIONER ROGERS: Just two. One involves in-service testing. Do the failure rates that are being used for some pieces of equipment that are subject to

in-service testing depend on the rate of testing?

MR. THADANI: I was looking around to see if the specific staff member is here or not. The intention is to look at that issue specifically as part of our evaluation process. There are two key elements. I only touched on one. The second one is the one you mentioned. If you change frequency of testing from, let's say, every month to every year, you may introduce some new failure modes that one may not have.

COMMISSIONER ROGERS: Or you may reduce the failure.

MR. THADANI: Absolutely correct.

MR. KING: That is one of the items in the IST reg guide that has to be specifically addressed. That is one of those supplemental items you won't find in the general reg guide, but your specific question is in there.

COMMISSIONER ROGERS: I think for some equipment it is really very important. The value of a reduced testing, if out of a PRA the conclusion comes that a testing rate could be reduced, then you may even get a double benefit there. Not only an economic benefit. You may actually a real safety benefit from that.

MR. HOLAHAN: And I think these guidance documents provide a road map for the licensees to take those issues and present them to the staff in a way that we would be

receptive to change.

COMMISSIONER ROGERS: The other question involves the quality of the PRAs. We know they are of uneven quality, and yet the approach so far that we have heard about here is one that doesn't seem to specifically take that into account. I wondered to what extent you are thinking of somehow or other imposing something that provides a uniform standard here if one is going to apply these constraints on deltas and LERFs.

MR. KING: We have a long-range goal to look at standardization. At this point we think maybe that draft NUREG-1602 is a good start toward a standard for PRA quality. In fact, a couple of the items in the Federal Register notice soliciting feedback has to do with the use of that as a standard or any other suggestions for what could be a standard.

You are right. At this point we haven't required certain attributes or certain scope and depth of a PRA. It is sort of up to the licensee to come in and justify. But our long-range goal is to head in that direction.

MR. THADANI: There is a very strong recommendation in the guide for independent peer review, which I think is an important element in addressing quality as well. It is strongly encouraged throughout the guide as well as when you go to quality assurance section that the

independent peer review can go a long way towards satisfying the intent behind Appendix B of quality analysis.

COMMISSIONER ROGERS: When we started in on this IPE process we didn't really think it would ever take us as far as we are today. So now we have to look at what the quality is, it seems to me, if we want to use them.

CHAIRMAN JACKSON: Are we tracking regulatory uses of IPEs?

MR. THADANI: I have to make sure that this is correct, and I will need help. As part of the implementation plan, every time we make use of individual plan examination and regulatory decision we are supposed to keep track of it. I will confirm that in fact we are doing that.

CHAIRMAN JACKSON: Please do.

Commissioner Dicus.

COMMISSIONER DICUS: One question regarding the concept of current licensing basis and the application in this program that we are in now. I don't want to go back into what is current licensing basis. I recall from previous briefings and meetings there has been lengthy debate and discussion over how you use something that is undefined. In the applicable regulations it is only defined in Part 54 with license renewal. We have been through that.

In these applications for probabilistic risk

assessment and in submittals that licensees might be making do you have any plans to actually use the definition of current licensing basis in Part 54 for this?

MR. THADANI: What we are saying is what is within the scope. We are not suggesting with this that one needs to compile all this information. However, if there is an issue that impacts those elements that are within the current licensing basis, the licensee's proposal to make changes in that element has to cover both aspects, deterministic and probabilistic.

We are not suggesting in this guidance that one needs to compile current licensing basis information. I think that was the more difficult issue, who is going to compile this information. The scope of the risk assessment, we are not suggesting that changes as a result of this.

COMMISSIONER DICUS: I think the answer to my question was maybe. I'm not sure I heard yes or no, but I think that point needs to be made very clear, particularly to licensees.

MR. HOLAHAN: In most of the applications we have seen this hasn't turned out to be a problem. When you are writing a general guidance document to try to cover all future type applications, we needed some way of describing sort of the scope of all possibilities, and current licensing basis is kind of shorthand for doing that. If you

look at the actual examples, ISI and IST and graded QA, these are areas where the licensees understand what their licensing basis is and their need for a license amendment.

COMMISSIONER DICUS: I just don't want the regulatory guide to begin to confuse the issue. We should clarify the issue.

CHAIRMAN JACKSON: Commissioner Diaz.

COMMISSIONER DIAZ: The main question I have Commissioner Rogers, using seniority, already asked.

CHAIRMAN JACKSON: We will go in reverse. You will move up the queue.

COMMISSIONER DIAZ: I don't have any questions. I just want to say that I am very pleased that we have gotten to this point. I think it's a very, very great step, and I certainly commend you.

CHAIRMAN JACKSON: Commissioner McGaffigan.

COMMISSIONER McGAFFIGAN: On the time line on the last chart, 12/97 you hope to have final reg guides out. You have a 90-day comment period. That will take you into August. Do you expect there to be significant comments and policy issues that will then have to be resolved? Is that period between 8/97 and 12/97 optimistic?

CHAIRMAN JACKSON: A drop dead date.

MR. THADANI: It's a drop dead date that we have been working towards. If you look at the set of questions

in the Federal Register notice, they are very tough issues and a number of them are really policy issues. I would expect that we would end up having probably at least two separate meetings with the Advisory Committee on Reactor Safeguards and extensive discussion with CRGR, and very likely we may have to come August-September time frame to the Commission to seek guidance on some of these issues. Example. What confidence level one must ascribe. Is it 80 percent? 95 percent? Whatever it is, we will come back to Commission.

CHAIRMAN JACKSON: You could be doing some parallel processing.

MR. THADANI: Yes, and in fact we are going to be doing that. But I think it is a very, very tight schedule.

CHAIRMAN JACKSON: It's ambitious, but at the same time we have waited too long to get to this point.

COMMISSIONER McGAFFIGAN: I'm anxious to get to the concluding point too. There will be a lot of, as we are coming to call it, parallel processing going on if you are actually going to get to that point.

MR. HOLAHAN: We hope that the workshop we have in July will provide us early public feedback that we can start working on. That should be helpful.

CHAIRMAN JACKSON: I'd like to thank the staff for a very informative briefing. As you can tell by how much

time we have taken on the agency's PRA activities and as you have heard, we do commend you for the progress you have made to date and for being responsive on developing these documents and working on the pilots.

I know it has been sometimes a difficult area, but at the same time we encourage you to continue to improve the process and to provide appropriate review mechanisms, both internal and in terms of external reviews to ensure that we appropriately use PRA. It is becoming an important tool in support of the regulatory process. So we need to enhance the process where necessary, but, as you've heard, to ensure its consistent use where appropriate. I will just call out one or two of those.

For instance, we discussed that relative to the use of the reg guides and standard review plans in the pilots.

We talked about performance monitoring in the pilots compared with performance monitoring in the maintenance rule.

We talked about the implications of all of this for risk-informed configuration management in plants.

As you heard, relative to the definition of current licensing basis as defined in Part 54 and what that suggests relative to what we need to do in Part 50.

I want to especially commend you for your work in

producing these documents. I had asked you to do them within a certain time frame. The schedule slipped a little bit. We understand that. As Commissioner McGaffigan said, it's still ambitious, but we are still aiming for 12/97. So you should continue your efforts to complete in a timely manner the pilot applications of risk-informed regulation and to complete these draft guidance documents, particularly the ones for in-service inspection, on the time line that you have mentioned.

You should also evaluate the proposed decision criteria. You spoke to this yourself, Mr. Thadani. And the rationale for assuring conformance to those criteria. You need to develop additional guidance on acceptable approaches for confirming the assumptions and the analyses that are conducted to justify current license-basis changes. As we have discussed, this would include consideration of the role of uncertainty.

We look forward to getting some recommendations in the policy areas relative to the appropriate confidence or assurance levels in the use of PRA for decision-making as well as the development through the pilots of any additional guidance that is needed on this increased management attention process.

Unless my fellow Commissioners have any additional comments, we are adjourned.

[Whereupon, at 4:15 p.m., the briefing was adjourned.]

CERTIFICATE

This is to certify that the attached description of a meeting of the U.S. Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON PRA IMPLEMENTATION PLAN - PUBLIC MEETING

PLACE OF MEETING: Rockville, Maryland

DATE OF MEETING: Tuesday, May 6, 1997

was held as herein appears, is a true and accurate record of the meeting, and that this is the original transcript thereof taken stenographically by me, thereafter reduced to typewriting by me or under the direction of the court reporting company

Transcriber: Michael Paulus

Reporter: Michael Paulus

United States
Nuclear Regulatory Commission

STATUS UPDATE OF PROBABILISTIC RISK ASSESSMENT (PRA) IMPLEMENTATION PLAN

Ashok C. Thadani
Office of Nuclear Regulatory Research

Thomas L. King
Office of Nuclear Regulatory Research

Gary M. Holahan
Office of Nuclear Reactor Regulation

May 6, 1997

OVERVIEW

- Background
- Recent Accomplishments
- Revisions to PRA Implementation Plan
- Draft Regulatory Guidance for Public Comment
- Performance Monitoring in Pilot Applications
- Future Activities

BACKGROUND

- **October 1996 - Commission briefed on status of PRA implementation and proposed resolution of key policy issues.**

- **January 1997 - Status of PRA implementation updated in SECY-97-09.**

- **January 1997 - SRM issued providing Commission guidance on resolution of key policy issues regarding risk-informed regulation of commercial reactors.**

- **April 1997 - Status of PRA implementation updated SECY-97-076.**

RECENT ACCOMPLISHMENTS

- **Draft Regulatory Guides (RG) and Standard Review Plans (SRP) prepared for comment by the public.**

- **Staff safety evaluation report for risk-informed TS pilot application prepared for Commission review.**

- **Operator licensing examiner standards (NUREG-1021, Revision 8) issued which reflect PRA insights.**

RECENT ACCOMPLISHMENTS

- **Staff evaluation of voluntary approach to reporting reliability and availability data.**

- **Public workshop conducted to discuss Draft NUREG-1560 (report on insights from IPE program)**

REVISIONS TO PRA IMPLEMENTATION PLAN

- **No significant changes in work scope made to plan.**

- **Schedules for some items have been adjusted as necessary.**

Draft Regulatory Guidance

- **SECY-97-077 provided Commission four draft Regulatory Guides, three draft Standard Review Plan sections and a draft NUREG.**

- **These draft documents provide guidance on an acceptable approach for making plant specific risk-informed changes to the current licensing basis (CLB) of a NPP, in the following areas:**

  - **general guidance**
  - **inservice testing**
  - **technical specifications**
  - **graded quality assurance**

Draft Regulatory Guidance

- **These draft documents reflect input received from the Commission on four policy issues, feedback from pilot programs, and extensive interactions with ACRS and CRGR.**

- **Staff desires Commission approval for issuing the documents for public comment.**

Overall Approach

- Proposed guidance represents one acceptable method for licensees to propose changes to their CLB.

- Use of proposed guidance is voluntary on licensees; however, staff will consider risk in its review of proposed changes to the CLB.

- General guidance applies to all risk-informed applications. Application specific guidance supplements general guidance and addresses specific topics unique to that area.

- Guidance developed consistent with Commission's PRA and safety goal policies, regulatory analysis guidelines and other guidance.

Elements of Review Process

- **Define proposed change**

- **Perform engineering analysis:**

  - **traditional**
  - **probabilistic**
  - **integrated decision-making**

- **Define Implementation/Monitoring Program**

- **Document proposed change**

General Guidance

- **Proposed changes are to be judged against five fundamental safety principles:**

1. **meet the regulations (or propose a change/exemption)**
2. **maintain the defense-in-depth**
3. **maintain sufficient safety margins**
4. **proposed increases in risk, and their cumulative effect, are small and do not cause the NRC Safety Goals to be exceeded**
5. **use performance-based implementation and monitoring strategies that provide for timely feedback and corrective action.**

General Guidance (Cont)

- **Other general guidance on implementation:**
  - **assess all safety impacts in an integrated manner**
  - **analyses should reflect the as built, as operated plant (before and after the proposed change)**
  - **analyses should be appropriate for the nature and scope of the proposed change**
  - **analyses should be subject to quality controls**
  - **core damage frequency (CDF) and large early release frequency (LERF) can be metrics for assessing risk**
  - **appropriate consideration should be given to uncertainty**

Risk Guidelines

- **Derived from Commission's Safety Goal Policy and subsidiary objectives.**

- **Core Damage Frequency (CDF):**

  - **10^{-4}/RY** - **value above which further increases in risk would not be permitted**

  - **ΔCDF=10^{-5}/RY** - **value above which risk increases associated with individual CLB changes would not be permitted**

  - **increased review when within a factor of 10 of the above values**

Risk Guidelines

- **Large Early Release Frequency (LERF):**
  - **10^{-5}/RY - value above which further increases in risk would not be permitted**
  - **ΔLERF=10^{-6}/RY - value above which risk increases associated with individual CLB changes would not be permitted**
  - **increased review when within a factor of 10 of the above values**

- **Risk guidelines are intended for comparison with full scope PRA results; however, less than full scope PRA may be acceptable.**

Application Specific Guidance

- **IST:**
  - **safety categorization**
  - **guidance applicable to changes to test intervals**
  - **guidance applicable to changes to test methods**
- **Technical Specifications:**
  - **guidance applicable to changes to allowable outage times**
  - **guidance applicable to changes to surveillance test intervals**
- **Graded QA:**
  - **safety categorization**
  - **QA associated with high and low safety significant SSCs**

PERFORMANCE MONITORING
IN
PILOT APPLICATIONS

- **Performance monitoring is one of the four key steps in making risk-informed changes to the current licensing basis.**

- **Process for pilot applications will follow from staff safety evaluation.**

- **Process for technical specification changes has been developed; process for other pilots in progress.**

PERFORMANCE MONITORING
Technical Specifications

- **Staff safety evaluation for lead plant (Arkansas, Unit 2) documents performance monitoring approach for risk informed TS changes.**

- **Availability of equipment affected by TS change is trended over time as part of the licensee's maintenance program.**

- **Performance criteria established per the Maintenance Rule may be used to evaluate trends in availability.**

- **If performance criteria not met:**
  - **corrective action per Maintenance Rule must be taken;**
  - **consider change in TS allowed outage time.**

FUTURE ACTIVITIES

- **Issue proposed regulatory guidance for comment (May 1997)**

- **Complete draft RG and SRP for ISI and issue for comment by the public (July 1997).**

- **Conduct workshop on draft RGs and SRPs(July 1997)**

- **Complete pilot applications of risk-informed regulation**
  - **Technical Specifications 5/97**
  - **Inservice Testing 6/97**
  - **Graded QA 12/97**
  - **Inservice Inspection 4/98**

FUTURE ACTIVITIES

- **Address policy issues in January 22, 1997 SRM (August 1997)**
  - **role of performance based regulation in PRA plan**
  - **plant-specific application of safety goals**
  - **risk neutral vs. increases in risk**

- **Train NRC staff on RGs and SRPs (November 1997)**

- **Issue final RGs and SRPs**

- General Guidance	12/97
- Technical Specifications	12/97
- Inservice Testing	12/97
- Graded QA	12/97
- Inservice Inspection	2/98