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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

489TH MEETING

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THURSDAY

FEBRUARY 7, 2002

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ROCKVILLE, MARYLAND

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

COMMITTEE MEMBERS:

GEORGE E. APOSTOLAKIS, Chairman

MARIO V. BONACA, Vice Chairman

F. PETER FORD

THOMAS S. KRESS

DANA A. POWERS

STEPHEN L. ROSEN

WILLIAM J. SHACK

JOHN D. SIEBER

GRAHAM B. WALLIS

ACNW MEMBERS PRESENT:

B. JOHN GARRICK, ACNW, Acting Chairman

MILTON N. LEVENSON

STAFF PRESENT:

MICHAEL T. MARKLEY

SAM DURAISWAMY

HOWARD J. LARSON

SHER BAHADUR

CAROL A. HARRIS

NOEL DUDLEY

JOHN T. LARKINS

ALSO PRESENT:

VICTOR H. RANSOM, Invited Expert

MARK CUNNINGHAM

FRANK GILLESPIE

STEWART MAGRUDER

RICHARD BARRET

LAWRENCE KOKAJKO

SAMUEL J. COLLINS

ASHOK THADANI

WILLIAM D. TRAVERS

MARTIN VIRGILIO

GARY HOLAHAN

C-O-N-T-E-N-T-S

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

(8:34 a.m.)

CHAIRMAN APOSTOLAKIS: The meeting will now come to order. This is the first day of the 489th Meeting of the Advisory Committee on Reactor Safeguards. During today's meeting the Committee will consider the following, this Conformed Regulation Implementation Plan, meeting with the ADO and the Office Directors of NRR, NMSS and RES, status report on the proposed final revision to Regulatory Guide 1.174, and Standard Review Plan, Chapter 19, PTS Technical Basis Re-evaluation Project, Proposed ACRS reports. ACNW Members John Garrick and Milt Levenson will participate in the meeting with ADO and the NRC Office Directors.

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

We have received no written comments or requests for time to make oral statements from members of the public regarding today's sessions. A transcript of portions of the meeting is being kept, and it is requested that the speakers use one of the

microphones, identify themselves, and speak with sufficient clarity and volume so that they can be readily heard.

I will begin with some items of current interest. I'm pleased to announce that the Commission has approved the appointment of Dr. Victor Ransom to the ACLS, subject to final clearance review. Dr. Ransom is attending this meeting as an observer. Welcome.

Amarjit Singh is going on rotation for three months as Senior Project Manager in the Probabalistic Risk Analysis Branch of the Office of Research, effective February 10th. And I am happy and sad to announce that Mr. Noel Dudley is leaving the ACLS - will you stand up, Noel - to join the Office of Nuclear Reactor Regulation as a Senior Project Manager with the License Renewal Section, effective February 10th, as well.

Noel, as we all know, has been one of the most valuable members of the staff. He has been with ACLS for eight years, and he has made significant contributions in several areas, including License Renewal, Steam Generator Cube Integrity, Materials and Metallurgy, the Licensing of AP-600, Safeguards and Human Factors.

I'm happy to congratulate Noel, but I'm also sad, as I said, that he's leaving us, and I think he deserves a round of applause.

MEMBER ROSEN: I think we'll also miss Jit over the three months he --

CHAIRMAN APOSTOLAKIS: Jit is coming back in three months. I don't have to say too much about him.

MEMBER ROSEN: Can I get a -- can I be sure of that?

CHAIRMAN APOSTOLAKIS: Now one other item of interest, in the hand-out, those items of interest, please go to pages 34 and on, and find information on the Annual -- the 14th Annual Regulatory Information Conference, which will be held in Washington next March, March 5th, 6th, and 7th. So if any members decide that they would like to go, please let us know.

MEMBER POWERS: When is our meeting in March?

CHAIRMAN APOSTOLAKIS: When is our meeting? The last date.

MEMBER POWERS: Yeah.

MR. DUDLEY: I'd like to add to that that the registration form for the meeting is on -- is the last page of your package.

CHAIRMAN APOSTOLAKIS: Yeah.

MR. DUDLEY: You can also register on-line.

CHAIRMAN APOSTOLAKIS: Okay. Are there any comments or announcements from the members? Hearing none, we'll proceed with the agenda. The first item is Overview of Risk Informed Regulation Implementation Plan. Dr. Shack, you will lead the Committee through this.

MEMBER SHACK: Okay. We've, of course, spent a lot --

CHAIRMAN APOSTOLAKIS: Bill, your microphone.

MEMBER SHACK: We've spent a lot of time discussing individual issues under Risk Informed Regulation. I think this is the first time that I can recall reviewing the overall Risk Informed Implementation Plan, and I guess Mark Cunningham is going to lead the presentation for it.

MR. CUNNINGHAM: Thank you, sir. You're right. I think -- if the Committee has been briefed on the Implementation Plan, it's been a long time ago, so I think the intent of our briefing today is to both give you some ideas of the general structure of the plan, and the rationale for the plan as it's laid out.

And then give you some -- describe some of the more important initiatives that are embedded in the plan.

I'm Mark Cunningham in the Office of Research. With me is Stu Magruder and Frank Gillespie from NRR. Joining us shortly will be Lawrence Kokajko from Office of Nuclear Materials Safety and Safeguards.

We've got four parts to the presentation today. I'm going to give you an overview of the new Implementation Plan format and content, and some of the rationale of why it looks the way it does.

The Implementation Plan, the substance of the Implementation Plan is organized by a strategic arena. Frank and Stu will talk about the reactor arena work, including both major initiatives and challenges facing the staff right now, and at least one approach for identifying how we -- for how we would identify new areas, or new regulatory activities to be risk informed in the reactor arena.

Lawrence will then talk about the materials and waste arenas, again some important issues that are facing them, some upcoming milestones, and how they are now using -- what process they're now using to identify what else in NMSS they'd like to risk inform. And then I'll come back at the end with

some next steps that we're taking.

By way of background, those of you who have been on the Committee for a while may recall that there used to be a PRA Implementation Plan, and in the late 1990s, in 1999, we received some rather considerable criticism of that from the General Accounting Office, and the GAO advocated that to -- in order to really effectively implement NRC's PRA Policy Statement, we needed to develop a comprehensive strategy for risk informing NRC's Regulatory activities. In 1999, the Chairman made a commitment that we would modify the plan, and try to accomplish what GAO was interested in. Next slide.

We've gone through two iterations of the plan in the terms of the format of the plan since then. We had a March 2000 version that went to the Commission, and the Commission gave us some guidance at that point on three specific areas. They said they wanted to hear more about internal communications, of how we talk internally and bring the staff together on how the benefits of risk informing are requirements. They also wanted --

MEMBER WALLIS: Can I ask you something?

MR. CUNNINGHAM: Yes, sir.

MEMBER WALLIS: You have a plan. Is it

clear what the goals are? Is it clear what the objectives are before you have a plan to get there?

MR. CUNNINGHAM: I believe so. Yes, sir. We could give you some examples when we get done here, if you'd like.

MEMBER WALLIS: Okay.

MR. CUNNINGHAM: As I say, the -- at the high level, the purpose -- the -- what we're trying to do in Risk Informed Regulation is oriented to the strategic plan goals of the agency. They're much broader than this, and everything that we talk about in the plan is linked to the accomplishment of a specific, what they call strategy, in the strategic plan.

MEMBER WALLIS: It just seems to be -- Risk Informing seems to be sort of a method rather than an objective. Is more Risk Informing better, or is it itself a means to some other end, which is greater than itself?

MR. CUNNINGHAM: It's a means to another end, which is -- and one way to think about it is to improve the focus of our Regulatory activities on the most safety important issues and topics.

MEMBER WALLIS: Okay. Then you to have some measures of those successes.

MR. CUNNINGHAM: Yes.

MEMBER WALLIS: So you say we have Risk Informed this regulation, and in so doing, we have achieved some objectives which are measurable on some scale.

MR. CUNNINGHAM: That's correct.

MEMBER WALLIS: It would be very useful to have that.

MR. CUNNINGHAM: That's correct. That's the --

MEMBER WALLIS: We have reduced the number of pages in 10 CFR by 50 percent, or whatever.

MR. CUNNINGHAM: Yes, that's right. Probably the most obvious success so far has been in the new Oversight process used by inspection, where we are focusing our inspection activities on the most safety important issues, and that's led to a lot of challenges as well, but that's probably the biggest success.

CHAIRMAN APOSTOLAKIS: I thought the most successful one was the Risk Informed In-Service Inspection. They use a number of metrics, and it looks really good.

MR. CUNNINGHAM: That's another one. I think of it in terms of the -- how the -- there's a

large number of inspectors in this agency out in the regions, and how they spend the time on a day-to-day basis is dramatically different now than it was five or ten years ago. So in terms of NRC resources, certainly they're being allocated much differently today, and I think, to a much better focus on safety.

Okay. So at any rate, in 2000, the Commission asked for better communications internally, a plan for better communications internally, explicitly talk about staff training requirements, and to come back to the Commission, and tell them of impediments that we see in progress for achieving the goals of the PRA Policy Statement, so that led to an October 2000 version.

In January of 2001, the Commission came back with more specific instructions to us. They're shown on slide five. They wanted to have a better idea of the priorities of individual activities within the Implementation Plan. They wanted to see more detailed communications plans. That really means activity specific communications plans. They wanted to know what resources were being applied to what activities. They wanted to bring in performance-based regulation for us to identify where performance-based -- the performance-based policy aspects of what we're

doing is brought into the Risk Informed areas.

Also, to identify critical path items, and important, what they call cross-cutting activities, activities that have implications for a number of different Regulatory activities. And so on slide six, you see the current version of the Implementation Plan that was sent to the Commission in December. SECY 010218, does provide the priorities determined by the Implementing Offices.

MEMBER WALLIS: I'm sorry. This goes back to my question. It's all about activities, isn't it?

MR. CUNNINGHAM: Yes.

MEMBER WALLIS: And you've got keep sight of where you're going.

MR. CUNNINGHAM: Okay. If you would hold off on that one slide, we'll try and come back to that, or a couple of slides.

Again, we have added general and specific discussions of communication -- and project specific discussions of communications activities, resources for FY01 and 02, where it was appropriate to bring in the performance-based discussion, and identify cross-cutting activities.

So in terms of what you have in front of you now, there's two basic sections to the

Implementation Plan. One is the background and basis for why we're Risk Informing our activities, and this is a combination of the essence of the Commission's 1995 Policy Statement, and the strategic plan that was issued a couple of years ago.

It also talks in general terms about how we decide what activities to Risk Inform. There are factors -- there are a set of factors that are in there that are oriented towards making the decision whether or not to Risk Inform a particular Regulatory activity. They're at a more general level. Each of the arenas implements them in a somewhat different way. Again, it provides communications plans, training programs.

Part Two is, again, much more specifically oriented with the strategic plan, and the details of the strategic plan. If you recall, in the strategic plan, there are a set of agency strategic goals, and there are performance goals to accomplish the strategic goals. And there are strategies to accomplish the performance goals. What you'll --

MEMBER KRESS: Where is it you discuss the impediments?

MR. CUNNINGHAM: I'm sorry?

MEMBER KRESS: Where is it you discuss the

impediments that the Commission has asked for?

MR. CUNNINGHAM: They come in in the -- probably the -- typically in the body of the Commission paper. If we feel it's an impediment that the Commission can do something about, if it's necessary for the Commission to do something.

MEMBER KRESS: It's in the Commission paper, not in the plan.

MR. CUNNINGHAM: Typically, yes.

MEMBER KRESS: Okay.

MR. CUNNINGHAM: That's right. The Commission -- in the impediments here, the Commission was -- I think -- I believe it was Commissioner McGaffigan, I'm going to say, if there's something that we can do to help move this along, tell us and we'll see what we can do.

MEMBER KRESS: I see.

MR. CUNNINGHAM: And Part Two is described and is organized into two chapters, and focused by arenas. The reactor safety arena is one chapter, and we have the materials and waste arenas combined in a second chapter.

Going to slide eight, this is where, Dr. Wallis, we tried to get into how do we relate the what to the why, if you will. This is kind of an example

of the activity descriptions that you'll provide -- you'll see in the plan.

Up in the upper left corner are the agency performance goals and strategies that are relevant to a particular activity, so we've oriented the work that we're doing to say we need this body of work to accomplish this strategy that's laid out in the agency's strategic.

MEMBER WALLIS: Well, what does it say there under the performance goals?

MR. CUNNINGHAM: Well, let me pick -- I'll pick one as an example, see what --

MEMBER WALLIS: I can't read it. I'm sure you can't.

MR. CUNNINGHAM: Well, I'll pick it -- I've got the book in front of me, so I'll try to -- okay. Let's -- 8-8, there we go. Okay. So an agency primary performance goal, picking one example is, "maintain safety, protection of the environment and the common defense and security." Very high level goal. Okay.

There are a number of strategies that the agency has defined to accomplish that goal. Strategy eight is, "We will continue to develop and incrementally use Risk Informed, and where

appropriate, less prescriptive performance-based Regulatory approaches to maintain safety." And so what you'll get out of that is a set of projects that are intended to accomplish that strategy.

MEMBER WALLIS: It just seemed to me that's such a high level statement. I'm not sure it's very useful for planning a particular activity.

MR. CUNNINGHAM: The challenge -- I think the biggest challenge we faced in this is what is the necessary and sufficient set of projects needed to accomplish that strategy. And this is -- and Frank will get into some of this later. We have a set of activities --

MEMBER WALLIS: Well, you said you're already doing that with the present regulations. You've already met that strategy with the present regulations, so you've got to have something else which tells you what the payoff is for Risk Informing.

MR. CUNNINGHAM: Okay. Well, let's -- I'm not sure -- the strategic plan was something that --

CHAIRMAN APOSTOLAKIS: Well, could you read the goals again? It's safety?

MR. CUNNINGHAM: The perform -- the higher level goal --

CHAIRMAN APOSTOLAKIS: Higher level, yeah.

MR. CUNNINGHAM: Maintain safety, protection in the environment, and the common defense and security.

MEMBER WALLIS: We do that already.

CHAIRMAN APOSTOLAKIS: That's not why we're Risk Informing the regulation.

MR. CUNNINGHAM: I agree.

CHAIRMAN APOSTOLAKIS: These are boundary conditions actually.

MR. CUNNINGHAM: This is a very high performance goal, and there are many things that the staff does to accomplish that goal. A subset of those are Risk Informed activities.

CHAIRMAN APOSTOLAKIS: But shouldn't we say somewhere in there that the whole idea is to remove unnecessary burden and --

MR. CUNNINGHAM: For example, on 1-H you have a secondary performance goal, which is to reduce unnecessary burden.

CHAIRMAN APOSTOLAKIS: Yeah. There has to be a goal somewhere.

MR. CUNNINGHAM: That's correct.

CHAIRMAN APOSTOLAKIS: Because that's what's driving all this. We're not just conforming the regulations to maintain safety.

MEMBER KRESS: Increase sufficiency of the regulation --

CHAIRMAN APOSTOLAKIS: Yeah.

MEMBER KRESS: -- and to reduce burden where it's appropriate.

CHAIRMAN APOSTOLAKIS: That's right. Exactly.

MEMBER KRESS: I think we've stated those somewhere.

MR. CUNNINGHAM: That's right. And I picked one activity out of a bunch of activities. There are other -- that was -- the one I talked about, maintain safety, is a performance goal. Another performance goal is to reduce unnecessary Regulatory burden. And there's --

MEMBER WALLIS: Well, I think that you ought to give the safety prong much more weight. And my view is that if you really did Risk Informed Regulations, you'd have a far better idea, and the public would have a far better idea of how safety is really being maintained. That's a much better goal than this rather diffuse thing of reducing burden and being efficient.

CHAIRMAN APOSTOLAKIS: But these goals are not part of the plan. Right?

MR. CUNNINGHAM: Those goals are part of the strategic plan of the agencies.

CHAIRMAN APOSTOLAKIS: The strategic plan. Yeah.

MR. CUNNINGHAM: Not the Risk Informed Regulation.

CHAIRMAN APOSTOLAKIS: Yeah, so we can't really debate them.

MR. CUNNINGHAM: If you'd like -- there's another set of people you can debate those with, if you'd like, but that's not us.

MEMBER WALLIS: I'm trying to be helpful. I think if you could get these objectives in a better -- in a more specific form, it might be easier to plan the activities.

MR. CUNNINGHAM: Agreed.

MEMBER WALLIS: If you have something that's too general and too vague, then any activity will do.

MR. CUNNINGHAM: And that's where you get down to the strategy, and then what you need to accomplish the strategy.

CHAIRMAN APOSTOLAKIS: Well, I understand all this, but it seems to me that all this rests on the assumption that you already have the activities.

In other words, given an activity, I have these things, you know, how does it -- which goal does it serve, through which strategy, and so on. Isn't the most important part though, how to come up with the activities? What to do? I mean, given an activity, yeah, you can always give some justification. Is that part of the plan?

MR. CUNNINGHAM: Yes, it is.

CHAIRMAN APOSTOLAKIS: Okay.

MR. CUNNINGHAM: In the sense of the plan as you see it in the Commission paper is the -- actually, the August 2001 version of the plan, there's a commitment in there, and there's a statement in Part One that says this is, in effect, what we're doing today. And we're going to describe a process in Part One that says we're going to go out and continue to identify, seek out and identify whether or not there are other things, other Regulatory activities that need to be Risk Informed. That is a very key piece of the Implementation Plan.

One of the big criticisms from GAO was you've given me a catalogue of what you're doing. You haven't told me where you want to be and how you're going to get there, and that is a key piece.

CHAIRMAN APOSTOLAKIS: So the selection of

the activities.

MR. CUNNINGHAM: The selection of the activities is a key piece.

CHAIRMAN APOSTOLAKIS: Is a key piece which means what now? There is a methodology for doing this, or --

MR. CUNNINGHAM: There is a methodology in place in the waste and reactor arenas that you can -- you'll hear about later. The methodology for that in the reactor arena is still evolving. We have an IOU to the Commission, basically, the next version of the Implementation Plan, which is due in June, will describe in much more detail the process that we're going to use, and whatever results we have to date. But you're right, to get at the real goal, to accomplish the policy statement, to accomplish the intent of the strategic plan, you have to have that piece of it. And that has been a legitimate criticism of previous versions of this. It didn't show that path forward.

I'm leading into what Frank wants to talk about this morning, because he has some ideas on how we could do that. But the staff is working several different ways, in several different activities to lay out that future looking part of the plan.

MEMBER KRESS: Do you plan to talk about the waste arena today too?

MR. CUNNINGHAM: Yes. Yes.

MEMBER KRESS: I understand, they don't plan to use PRA. How can you risk inform any activity without PRA, is the question I might have.

MR. CUNNINGHAM: One of the challenges in trying to bring together all three arenas is a history of different terminology and things. And they say -- they may say we don't use PRA, but we use performance assessment. And then how is -- then you get into how is that different, and first blush, I'm not sure it's very different. They've evolved separately.

MEMBER KRESS: They may, in fact, have some sort of a risk analysis, you're saying.

MR. CUNNINGHAM: Yes. That's correct. They just may not call it that, if you will. And then when we get into the materials arena, again they are thinking of how risk assessment is to be used there. And you'll hear about how they're going to develop safety goals and that sort of thing, so that we're trying to bring things that have been done separately, under a common set of -- a common footing, if you will.

So at any rate, the intent of the plan as

we show on slide eight is to link activities to the strategic plan, performance goals, and to the more detailed strategies. Basically then, we provide a consistent set of information on individual activities, and so that becomes, if you will, the description of -- for the Commission of what we've said are the priorities, and what the resources are associated with individual activities.

Perhaps I'll just go on from there, and just say what we can do now is maybe turn to page -- slide nine, which is the reactor safety arena. And we'll get into some more of the substance, some initiatives, and their ideas on how they're going to proceed to identify other activities. Frank or Stu.

MR. GILLESPIE: Yeah. I'm going to start off, because I was told I have to absolutely put what you're about to hear in context. And the context is it has no management approval, other than having been shown to people. And what we're groping with is not in any way in conflict with the plan, the four strategic goals of the agency, the four strategic goals. And you might say when you pick a task, whether you want to do that task or not, is how it contributes to efficiency, and effectiveness, and burden reduction. So those goals help prioritize, but

not necessarily select.

The other thing we were grappling with, and what I'm suggesting is this is the rule making group in NRR grappling with risk as integral. When you change one rule, have you made the other rules more important? There's some fundamental questions you have to address when you start picking things one at a time. And I think you know that I was kind of involved in the early part of -- the first nine months anyway, of the oversight process. And what we've done is looked back on that and said what did we learn from that? How did we structure it? And I actually went back and looked at the old NEI white paper, and what we ended up with didn't look like anything what they had suggested in the first place. The pieces were there, but it came out different as it evolved.

So what you're about to hear is our best thinking as reflected on some view graphs, to try to structure or develop a structure that is a whole, that is going to have to have some lower level objectives that would allow us to explain how things fit together, because we found ourselves doing 50.46, 50.44, petitions on heat curves, Zircaloid, Zirca, and how does all this fit together? And how does it fit together with things like the safety goal, the

subsidiary safety goals we use. Where do all these things fit? How do we structure what we're doing so we know what we're either creating or destroying, and we can explain it, so this is very preliminary thinking.

We're happy to have feedback. This has not been displayed virtually to anybody. We sent these view graphs around yesterday, but it will give you an idea where Stu, who is kind of project managing, how do we organize rule making together in a Risk Informed manner. Tried to understand some discussions we had, so this is very preliminary. No one owns it but the rule making group right now, so I'm going to let Stu go through it, and let's see if we can answer some questions. I hope it does provoke some questions, because we need an active dialogue on how this all fits together.

MR. MAGRUDER: Thanks, Frank. Let me first go through some of the significant items from the reactor safety arena, if I could have slide number nine. There it is.

These are just a sample of the many activities from the plan, but we just wanted to highlight these, and see if the Committee had any questions about the status of any of these real

quickly.

We like to think that Risk Informed Technical Specifications are one of the successes that we've had in this area, that would fall under what we term Option One of the 98300 Plan. No rule changes are required for this. However, within the current regulations we're making a lot of progress, and getting a better safety focus on tech specs.

We've talked briefly about the oversight process, the significance determination process is evolving in that area. And Mark talked a lot about how the inspection have been more focused on safety important equipment.

Option Three, in general, is changes to the Technical Requirements, and Part 50. The 50.44 rule making, which you've heard about before, is close to proposed rule stage that should be coming out within a month or two for comment. 50.46, there's been a lot of discussion recently about how to approach that, how to break that down into more manageable pieces, maybe, but that's progressing as well.

50.69, which is the proposed name for Option Two Rule Making. I'm sure you've had a lot of discussion on that. That is progressing, although there's some

challenges in there we'll talk about. And obviously, the significant work on the PRA Standards with ASME, ANS, and NEI on guidance. Slide ten, please.

MEMBER SHACK: One of the things that, you know, we always come back to is, you know, how much risk information do you have to Risk Inform with.

MR. MAGRUDER: Uh-huh.

MEMBER SHACK: And as I went through the plan, I tried to sort of sum up everything that was involved in getting risk information, you know. And I came up with a tenth of an FTE on the standards work, you know. Now I see that's one of the major initiatives, and it gets a whole tenth of an FTE. You know, 1.5 for SAPHIRE, two for SPAR which is, you know, sort of fundamental for my level three analysis. It just doesn't seem like, you know -- we make the words that the significance determination process is, you know, the key ingredient we have to be working on in the ROP, and yet I can come up with maybe three FTEs out of the whole effort that seem focused on improving the SDP process. You know, I hear words, and then somehow the resources connected with them don't seem to be commensurate.

MR. CUNNINGHAM: Okay. Just to be clear on the standards, the large fraction, the vast

majority of the work going on in PRA standards is being done outside of NRC, by ASME and by ANS, and so it's not that it's not important, but our role in that is rather limited.

MEMBER SHACK: No, but the notion of how the standards and the whole PRA Review Process are incorporated -- you know, one of the difficulties we have every time there's a Risk Informed application, somebody trots in a PRA, you know. What is it good for? Is it good enough? And somehow, I don't see any emphasis in here on how we're going to use the standards, we're going to use the review process as part of a tool for the NRC to make that judgment as to whether the PRA is applicable.

MR. CUNNINGHAM: Okay. Now one of the challenges of the Implementation Plan is how do you capture inter-relationships among activities. The PRA Standards work is our support to the standards setting organizations. How we use that is in another activity in the Implementation Plan, which is Risk Inform, develop of guidance for Risk Informed applications, or something like that. So it goes -- it's another area of the plan.

One of the real frustrations we've had is how do you show those types of relationships, so that

somebody picking up the document would understand that there's more than just that tenth of an FTE associated with making the decisions on how we use PRA in licensing. That being said, that's one of the continuing challenges with the plan.

That being said, after lunch, I guess you're going to hear about where we're going on Reg Guide 1.174. And that -- you'll hear a lot this afternoon on how we intend to endorse the ASME Standards, and ANS work, and how we're going to bring the NEI 0002 into this, and all that sort of thing, and that's going to be discussed after lunch. And it's different than what shows up in the plan, because the work has evolved considerably in the last -- our ideas on how to do that have evolved considerably in the last six months or so. That's another challenge for the plan, how do you maintain a current, if you will.

MR. BARRET: If I could interrupt, my name is Richard Barret. I'm with NRR. I'd like to just take a second to address your statement about the Reactor Oversight process, Significance Determination process.

There is a fair bit of effort, and a lot of thought going on right now on the subject of where

are we going in the future with the Significance Determination process. We have a Phase Two -- a Phase One methodology that we're happy with. We have a Phase Two methodology that is a work in progress, very much a work in progress. And we have a Phase Three methodology, which also is a work in progress.

We are currently having discussions within the staff as to how much emphasis we would give to Phase Two versus Phase Three. And also, where our priorities and our resources will go in developing and finalizing particularly the Phase Two tool, but also the SPAR models. And questions are being raised as to, for instance, do we want to accelerate the bench marking of those methodologies, so I just want you to know that the question of the quality of the Significance Determination Process Tools is very much on our radar screen right now, and we --

MEMBER SHACK: It doesn't seem to be highlighted very well in the plan though. You know, I look at -- you know, they've got like a priority of six or seven for the SPAR stuff --

MR. CUNNINGHAM: Yes.

MEMBER SHACK: -- which sort of says yeah, okay. You know, we'll think about it when we get to it.

MR. CUNNINGHAM: Yeah. You're right. In August of 2001, that was a reflection of where the agency was and the importance of the SPAR work. Again, one of the challenges is that perspective has changed considerably over the last three or four -- as we've developed more experience with SDP, so the plan -- and so the challenge is how do you continue to reflect that, and somebody can look at this plan and see that it's up to date. SPAR, I think it's recognized, as Rich was alluding to, there's a much better recognition today of the importance of the SPAR models in the context of the three phases of the SDP.

MR. MAGRUDER: Okay. Real quickly, on page 10, I just wanted to highlight that there are obviously some challenges ahead of us in Risk Informed Regulation, and these are just some of the areas that I wanted to highlight. You can look through those.

The last one, I think, Dr. Wallis, we'll address in the next couple of slides here, which is how we see this all fitting together. This is -- as Frank said, these are preliminary views of this.

MEMBER ROSEN: Did you skip the third one for a reason?

MR. MAGRUDER: Just for time, but I'd be happy -- if you have a question about it.

MEMBER ROSEN: I don't know what it means.

MR. MAGRUDER: The Risk Informed Environment is an effort within NRR to -- well, it's got several phases. Basically, the goal is to try to make risk information more available to the staff and have the staff more open to using Risk Informed Regulation -- Risk Informed methods in their day-to-day work.

MEMBER POWERS: If I'm a Project Manager, let's say in NRR, and say I'm -- I have a job, maybe power upright maybe, and I say gee, I want to know whether this is a risky operation. How do I get -- how do I find out? Say it's -- let me just be very -- to be specific --

MR. MAGRUDER: Uh-huh.

MEMBER POWERS: Say I've got Indian Point II and they want to power upright.

MR. MAGRUDER: Right.

MEMBER POWERS: How do I go about getting risk information on Indian Point II?

MR. MAGRUDER: Well, I think Rich will probably talk -- if I can impose on Rich to talk some more about that, but I think generally, the Project Manager goes to Rich's staff in NRR, and ask them to look at the submittal from the licensee.

MR. BARRET: Dana, we have -- I guess we could say there are two classes of license amendments like that, those that come in that are flagged by the licensee as being Risk Informed license amendments. And then, of course, it's obvious that they should be reviewed by the risk staff. But then there's another class, a much larger class of license amendments that -- oh, and by the way, that first class -- no, let me not say that. That's not true.

MEMBER POWERS: Well, I'm -- regardless of what the licensee has submitted, I just want to know.

MR. BARRET: You mean, just woke up one morning and you just want to know about --

MEMBER POWERS: I got a thing in front of me from this licensee, wants to do something.

MR. BARRET: Okay.

MEMBER POWERS: He's got his case laid out, perhaps using risk information, perhaps not. I just want to know --

MR. BARRET: Right.

MEMBER POWERS: Because I've got -- I mean, you've already made a decision that if I want this information, I can get it.

MR. BARRET: Yes.

MEMBER POWERS: Okay. And now I want to

know whether I should be asking for more or less, because I want to know if it's risky, because it's different.

MR. BARRET: Yeah.

MEMBER POWERS: It's changed the plan.

MR. BARRET: Yeah. And that's -- one of the things we did in SECY 98300 was we raised this very issue, and that is, what if a licensee submits something, and it meets all of our regulations, and it looks like it's consistent with our current design basis, and it looks like something we should just approve based on our deterministic regulations. And yet, you have -- you wonder, is this risky anyway. And we put in place a process for questioning that, and it's -- without going into a lot of detail, it's sort of a three step process where we first ask ourselves does this represent a special circumstance?

MEMBER POWERS: I mean, I understand what you have to do if you want to go to the licensee, or you want to factor it in. I just want to know. I haven't decided yet whether this is risky or not. I don't know.

MR. BARRET: They would come to our staff. They should come to our staff, the Probabalistic Safety Assessment Branch, and get a read on it from

us.

MEMBER POWERS: And you do that by running a SPAR model, or --

MR. BARRET: Well, you know, it depends on the question. You know, there are -- as you all know, there are many questions where --

MEMBER POWERS: I'm in the last bastion of the risk ignorant. All I know is there's a thing called risk, and I want to know what it is for my particular plant and things like this. I haven't got a clue what question to ask.

MR. BARRET: Right. And you have the license amendment in front of you, and I -- you know, as you know, a risk analyst can kind of look at an issue and pretty quickly get a sense of whether it tends to be risk significant, or it tends not to be risk significant. And it may not go any farther than that. It may be that we could say right off the bat that this doesn't -- this is not in the range of the risk significant --

MEMBER POWERS: Okay. Suppose the licensee says gee, the NRC is making me inspect the upper heads of my reactor vessels all the time. And boy, that's a super pain to do because I've got all this insulation on there. What I'm -- the licensee is

proposing to do, is he's going to change out this insulation that he's got for this new micro porous insulation that's kind of elevated above a head, and you can get it off real easy, and do this inspection all the time.

How do -- and so the Project Manager wants to know whether that's -- that has any risk significance or not, because I mean, it's change but it doesn't seem like a very big change. I mean, one insulation for another. How does he find out?

MR. BARRET: He would come to us, I would say, if he had that curiosity. And we would look at the issue, and you know, ask ourselves some key questions about what affect would this have on initiating events, what would have on the availability and reliability of systems? Would it have any affect on operator actions, containment performance, you know. And if there was some plausible impact on risk, then we might look deeper. We might look at the SPAR model --

MEMBER POWERS: You think your risk models that you have model something as detailed as the insulation on the upper head?

MR. BARRET: Off the top of my head, I don't think that example would be in a PRA. In fact,

a great de al of what you might see in the way of license amendments you would not find explicitly modeled in a PRA.

MEMBER POWERS: And suppose I told you that this micro porous insulation that's proposed to use is extremely friable, and in a blow down system will produce a lot of particulum?

MR. BARRET: You know, I think that would be one of the questions that we would ask ourselves, for instance. You know, we -- we're cognizant of the work that's being going on with strainer blockage and the -- now that we're working on the PWR sumps issue, so that would be one of the questions. Sure, we would ask ourselves that.

CHAIRMAN APOSTOLAKIS: Well, when we say risk information, do we all understand the same thing? I -- the reason why I'm saying this is I was surprised recently in talking to some industry people that they don't think that uncertainty analysis is necessary, and the staff is not using it.

MR. CUNNINGHAM: That would be a surprise to me too.

CHAIRMAN APOSTOLAKIS: Well, I mean, if we look at the petitions from the industry, the risk informed things, are they doing explicitly risk -- I

mean, uncertainty assessments, or is it a qualitative discussion as it is in 1174, which says if you come close to the boundary, management will pay attention, will do something and thing about it.

MR. CUNNINGHAM: I suspect 1174 is -- today is as precise a characterization of how to deal with uncertainties as we've got.

CHAIRMAN APOSTOLAKIS: So if I go with 1174, then I don't need to do it explicitly.

MR. CUNNINGHAM: It depends on what the issue is, and what the decision you're trying to achieve is.

CHAIRMAN APOSTOLAKIS: But does NRR, for example, when you review a request, you look for explicit statements of uncertainty, or is it a qualitative discussion is good enough.

MR. BARRET: It's generally qualitative discussion. I mean --

CHAIRMAN APOSTOLAKIS: Ahh, see.

MR. BARRET: Well, again I want to make sure we're talking about the same thing. I mean, when we say qualitative you want to know if you're close to an edge, if you're close to a catastrophic change in the picture, or are you looking at something where if the temperature is five degrees higher everything

changes, or you know --

CHAIRMAN APOSTOLAKIS: Yeah, these are sensitivities really, but I mean --

MR. BARRET: Some of them have to do with margin, for instance.

CHAIRMAN APOSTOLAKIS: Yeah. Doing standard uncertainty analysis, standard means that you're right on something, is that kind of stuff.

MR. BARRET: Right.

CHAIRMAN APOSTOLAKIS: It is a trivial matter these days.

MR. BARRET: Yeah.

CHAIRMAN APOSTOLAKIS: I mean, with the computer programs that are available and so on. And yet, you know, from talking to people I get the impression that they don't think that that's something that's necessary. And why is it not necessary, because the staff does not request it. And that came as a surprise to me. Now I know when we're developing rules here, we're thinking about uncertainty all the time.

MR. BARRET: Yes.

CHAIRMAN APOSTOLAKIS: But when it comes to interacting with the licensees, evidently there's a different philosophy.

MR. CUNNINGHAM: Again, there's an element of --

MEMBER ROSEN: But later today we are going to talk about the PTS.

CHAIRMAN APOSTOLAKIS: Yes.

MR. CUNNINGHAM: And then there's a tremendous amount of thinking about uncertainty.

CHAIRMAN APOSTOLAKIS: Because that's us. The industry is not submitting anything there. We are doing that. And as I said, we are very sensitive to that issue when we are developing studies ourselves.

MR. CUNNINGHAM: In a sense, that gets at the point of what's the decision being made. The change for an individual license, associated with an individual license amendment may not necessitate that sophisticated of analysis. The change of a rule that could affect whether or not we have a PTS rule for a dozen or 15 plants looking for life extension, license extension is --

CHAIRMAN APOSTOLAKIS: I hope you could resolve that in the ASME Standard. That was a major issue of disagreement.

MR. CUNNINGHAM: I hope it is too. I'm not -- I suspect it is not.

CHAIRMAN APOSTOLAKIS: Is not. I mean,

it's true that we can do a lot of things without a rigorous uncertainty analysis. It's very true.

MR. CUNNINGHAM: Yes.

CHAIRMAN APOSTOLAKIS: I don't doubt that. The thing that's missing, like in many other places, is under what conditions can you do that, under what conditions can you do something else. And we don't seem to be paying attention to these things.

MR. CUNNINGHAM: I guess conceptually the three column approach in the ASME Standard is a step towards trying to lay out when you could do very simple, and when you need to do more sophisticated, or very sophisticated analyses. Whether it accomplishes it for -- in this particular area, I'm --

CHAIRMAN APOSTOLAKIS: Well, it's been a while since I saw that, but the I mean, the second column said use mean values.

MR. CUNNINGHAM: Yes.

CHAIRMAN APOSTOLAKIS: And I don't know how you can use mean values if you haven't done an uncertainty analysis.

MEMBER KRESS: Yeah, and that --

CHAIRMAN APOSTOLAKIS: If you declare them that they are mean values, then it's okay. All right.

MEMBER KRESS: That brings another

question to mind, and that is what we normally see from the submittals are "best estimates", which they declare to be a mean. They don't declare it, but it's understood that this is a mean.

I've never seen a study by this organization, or any other, that actually took what would be a best estimate, which to my mind, you go in with all the parameters that you can -- as input and part of the code that does it, and you try to pick your mean values for those, and end up with the final product, is my view of what that best estimate is. I've never seen a study that really compared that number to the real mean that you would get by quantifying the full uncertainty. Is that anywhere in your plan, because it seems to me like a key issue these days. You don't really know what you're getting from these things unless you have that.

CHAIRMAN APOSTOLAKIS: Exactly.

MEMBER KRESS: And I just don't see that task in the plan anywhere.

MR. CUNNINGHAM: Okay. No, that --

CHAIRMAN APOSTOLAKIS: Sensitivity analysis is used a lot.

MR. CUNNINGHAM: Yes.

CHAIRMAN APOSTOLAKIS: Which is really not

used, it's abused, so --

MR. CUNNINGHAM: I guess there's two things to Dr. Kress' point. There were studies done ages ago to look at that issue, and I don't know -- I don't even know that it was really documented very extensively but, you know, this was perhaps 15 or 20 years ago. I can remember somebody looking at that issue and saying the difference was a factor of two or three in the value, if you will. Whether that has any substance today, I don't know.

MEMBER KRESS: It would be useful to dig that out. I didn't realize that existed.

MR. CUNNINGHAM: There had been work on that ages ago, and I'm not trying to defend it or anything.

CHAIRMAN APOSTOLAKIS: Yeah. And this is part of our confusion. I mean, you don't know.

MR. CUNNINGHAM: Yeah.

CHAIRMAN APOSTOLAKIS: It depends a lot on how complex a problem is.

MR. CUNNINGHAM: Exactly. Exactly. And the characteristics of the underlying distributions, and all that sort of thing.

MEMBER KRESS: But if I knew I was no further off from the mean than a factor of two, for

example, I wouldn't worry much about it.

MR. CUNNINGHAM: Again, that was an example done years ago, and probably with the WASH 1400 PRA Models, and all of the baggage that goes with those, if you will. But the issue --

MEMBER KRESS: But is there a general conclusion, like if you did the central estimate, you end with the best estimate, can you make a statement like you always end up with a number that's higher than the mean?

CHAIRMAN APOSTOLAKIS: No, I don't think so.

MR. CUNNINGHAM: No.

CHAIRMAN APOSTOLAKIS: I don't think so.

MR. CUNNINGHAM: I suspect if you did the mean, you would --

CHAIRMAN APOSTOLAKIS: The kind of study you want has not been done. I agree with Mark that there have been pieces here and there.

MR. CUNNINGHAM: Yes.

CHAIRMAN APOSTOLAKIS: But the comprehensive study that looks at that has not been done, and I'm not sure it can come up with general conclusions, because it will depend a lot on what functions you're dealing with.

MR. CUNNINGHAM: Yeah. I think typically you tend to see mean values being higher than -- in the few examples I can think of, the mean values to be higher --

CHAIRMAN APOSTOLAKIS: The rigorous mean.

MR. CUNNINGHAM: The rigorous mean --

MEMBER KRESS: Has to be higher than this.

MR. CUNNINGHAM: Higher than the best estimate.

MEMBER KRESS: Okay.

CHAIRMAN APOSTOLAKIS: Also, it depends on how you handle the correlations and all of that.

MR. CUNNINGHAM: Yes. Yes.

CHAIRMAN APOSTOLAKIS: It is true though, it seems to me, that the industry does not feel that they have to do uncertainty analysis when they come to you, or not to you, to NRR. And again, we see that right now in the NEI document on Option Two. You will find the word sensitivity many, many times, but not uncertainty. And I don't know why they feel that by putting everything at the 95th percentile and carrying out the calculation is more meaningful than doing an uncertainty analysis. I just don't understand that, but we will discuss that with them when the time comes.

MR. MAGRUDER: Okay. Let me move on --

CHAIRMAN APOSTOLAKIS: But does the risk information, in your mind, include the uncertain?

MR. CUNNINGHAM: In my mind?

CHAIRMAN APOSTOLAKIS: Yeah.

MR. CUNNINGHAM: Every time. Yes, sir.

CHAIRMAN APOSTOLAKIS: So all these documents will do that. Rich?

MR. BARRET: Well, I think there's a lot of value in sensitivity analysis, and it tells you -- if you combine it with some sense of how wide, you know, the variances might be. I mean, if I believe that reliabilities might go down by a factor -- or unreliability might go up by a factor of ten, then I do a sensitivity analysis around that estimate, I think I've learned something from that.

CHAIRMAN APOSTOLAKIS: But it's not a substitute for uncertainty analysis. I mean, you learn something from sensitivity. In fact, if you do a rigorous uncertainty analysis, and you can structure your sensitivity analysis around that by not just changing point values, but maybe changing distributions and so on, which would be a much more meaningful thing.

MR. BARRET: Right.

CHAIRMAN APOSTOLAKIS: But as a rule, I don't think you guys require rigorous uncertainty estimation.

MEMBER KRESS: And along that same thing, Rich, I'm not sure I know or have seen any written material of what constitutes a rigorous uncertainty analysis. I mean, rigorous sensitivity analysis, because what's usually done, you take various parameters you think you might have a sensitivity to, and you change them one at a time. Sometimes you change all of them together.

MR. BARRET: Yes.

MEMBER KRESS: But I don't know what constitutes a rigorous sensitivity analysis. Those two don't do it for me at all. And, you know, sensitivity is a whole output space.

CHAIRMAN APOSTOLAKIS: Actually, the place will have done a lot of sophisticated sensitivity analysis and performance assessment. There are all chapters there where they do all sorts of things. In fact, they are so sophisticated that simple minds like ours have difficulty following what they are doing, because they had, you know, statisticians develop, you know, using the latest methods. So there is a gap, I think, you know, between doing very trivial stuff and

very sophisticated stuff, doing something in between. And for reactors I haven't see that, that kind of analysis.

MR. CUNNINGHAM: Yeah, that's true. And as you alluded to earlier, the PTS work that we're doing is closer --

CHAIRMAN APOSTOLAKIS: It's closer --

MR. CUNNINGHAM: -- on the scale to the performance assessment work --

CHAIRMAN APOSTOLAKIS: Yeah, among us boys again. I mean, I will --

MR. CUNNINGHAM: That's right. You know, and as part of that project we're trying to sort out, now how do you capture the importance of the uncertainties, the relative importance of different uncertainties in the process, and all of --

CHAIRMAN APOSTOLAKIS: For example, in Option Two, we are categorizing systems and components using the expert panel with a very input, being the importance measures. Now the importance measures are uncertain themselves.

MR. CUNNINGHAM: Yes.

CHAIRMAN APOSTOLAKIS: And that's nowhere to be found.

MEMBER POWERS: George, one of the things

that you've raised is the relative weakness of performance measures as a tool for understanding what the risk assessment is telling you. Is anyone trying to develop better tools for telling you what the risk assessment is commenting on these things, since we use -- I mean, we have a lot of work going on now that involves the categorization of things in both events and hardware. And Professor Apostolakis has written magnificently on why one should not attach great significance to things like fusel vessely or risk achievement worth, and risk reduction worth.

MR. CUNNINGHAM: Yes, there actually is. There's some work going on in my group. Using as an example, the categorization process used for South Texas to say, you know, that as you've said before and others have said, the fusel vessely and the other importance measurements were designed for a particular purpose, and now we're kind of using them for a different purpose. And we're asking the question in this project of given how things were done in the South Texas example, if you will, is there a better -- an alternative formulation of an importance measure, an importance calculation that might make more sense given that application. We're doing some work in that area right now, but -- partially at Brookhaven and

partially at the University of Maryland. At some point, it may be appropriate to come back and talk to the Committee about that.

MEMBER ROSEN: I think South Texas would have an interest in it, as well.

MR. CUNNINGHAM: That's probably true. Yes.

MEMBER POWERS: Minor.

CHAIRMAN APOSTOLAKIS: Shall we go on?

MR. MAGRUDER: Sounds good. Let's go to slide eleven, please. As Frank mentioned, the NRR rule making group has been looking at how our rule making, or what the next steps should be for risk informed rule making, along with discussions with Office of Research, obviously. And this is preliminary information here, but one of the goals that we think should have is to proceed with risk informed regulations such that our rules start to converge with the processes that we have in place.

We perceive that there may be a gap between some of the activities in place, and the rules to support the activities, and I'll talk a little bit about that in a couple of slides here. And of course, with the -- we want to follow the principles that we have laid out, dimension depth, safety margins, and

consistency with the safety goals that the Commission laid out.

MEMBER WALLIS: Now I read this slide ahead of time and tried to think about what it meant, and I don't really understand it. And it seems to me, you're always going to have some measure defense in depth, you're going to have some round of safety margins, but the regulations never tell you what defense in depth is, how you measure it, or what safety margins should be, or how you measure them, so it seems to me that they need to be risk informed. You need to -- when you ask the question how much defense in depth is necessary, that should be a risk informed decision. And when you ask the question how big should the safety margins be, that should be a risk informed decision, so they're not on some other plain or some other measure. And you should be risk informing those ideas themselves.

MR. MAGRUDER: If we could go to the next slide --

MEMBER WALLIS: Otherwise, you'll always be arguing, or someone will always say well we need more defense in depth. You'll never reach a conclusion.

MR. GILLESPIE: I think --

MR. MAGRUDER: Graham, we're in violent agreement.

MEMBER POWERS: Well, maybe I'm not. You know, I worry. We create this intellectual construct called risk information, which in examining it closely, you find all these deficiencies. I mean, there are uncertainties here, there are uncertainties there. We don't know whether this is included. You know, you go through and you do an uncertainty analysis. George will just excoriate you because all you've done is do parameter uncertainty, and you haven't worried about model uncertainty, things like that. And at some point, you have to ask what if I'm just completely wrong about all this stuff? And I think that that's where you start asking for defense in depth. And if you try to justify defense in depth based on the construct you're trying to protect yourself from, you're going to get into a paradox that's going to leave you vulnerable, I think. And so I'd be very careful about using risk information to guide my selection of defense in depth.

Now you will find on this august buddy certain people called rationalists, and I encourage them to think carefully about self-referencing sets before they try to advocate the use of risk

information to guide themselves on defense in depth.

MEMBER WALLIS: Well, what you're simply saying is that you've got to be more sophisticated about how you interpret and use risk information. But essentially, when you make decisions about defense in depth, it's made to change the risk. And you're making it -- because -- if you make it on some other basis than using PRAs, it's because you don't believe the PRAs, and that's information, that's risk information too. You're still making decisions based on --

CHAIRMAN APOSTOLAKIS: It seems to me that Option Three provides an example of -- I mean, actually set certain criteria, you know, attribution, prevention, mitigation quantitatively, so there is some degree of quantitative judgment already established in regulation, so are you referring to that here, or --

MR. GILLESPIE: Yeah. If -- let me ask Stu to jump in. Let me jump to the problem we had. The problem we had was --

MEMBER WALLIS: Well, Frank, you were in violent agreement with me, so --

MR. GILLESPIE: Yeah, I am. No, actually I'm kind of -- we're groping with those same

questions. And, Dana, I think we're also in agreement with you, which is why we started in the last several --

MEMBER POWERS: You didn't frown at all.

MR. GILLESPIE: Which is why we started this kind of construct. If you noticed, the first two view graphs were a list of rules, and they were being treated as independent rules. And I'll give you an example. Top of a report in the Pass said you didn't need a sampling system. Well, that was because we had a sampling system required by the Hydrogen Rule. And for a year and a half, the Hydrogen Rule people wrote a rule that said you didn't need a sampling system because the Pass people had it. And after about two years of work, got these two people to talk to each other, and we realized what we really needed was a single sampling system, not two.

What's that evidence of? That's evidence of when you start getting so many individual efforts going, and you haven't fit them into any kind of construct. And it's not that the one we've got up here is the right one, it's kind of the first one that Stu and I kicked around, and some smart people gave us some input on, to try to start to pull things together. And the next step in this is to fill in

some information. You'll see on there that we've got the -- under "Accident Prevention", we've got the surrogate safety goal, if you would, of 10 to the minus 4. What we did was just to put some plugs in of where some things fit that currently exist. You could see the oversight cornerstones in there. Those blocks are in there.

We went to a slightly lower level just in this picture, and the concept would be to try to balance things like defense in depth, is to write an objective for each of the blocks you would see, or however this might evolve. It would be kind of a regulatory objective. What's our objective? And we took initiating events, and just chatting about it with some brainstorming we said well, you know what, there's transients and there's accident events, like true events. What rules do we have that deal with transients, which might be like station blackout, things that happen that we don't necessary have all the regulations on, but we have some. And what regulations fit under each of these categories.

And then if you -- and I don't mean by whole regulation, by 50.46, or 50 -- I mean by subparagraph, so that you get the truly like things that deal with phenomena together, recognizing that

one regulation like single failure criteria could actually go across the board. And then when you change something, if we change 50.44 you can ask what's its affect on all the other objectives.

What we're trying to do is kind of link -- in DOT process is link our current body of regulations, which people would agree are not necessarily written in a risk informed context, although safety was in the context of the minds of the writers, with some set of risk informed objectives. And I say risk informed objectives because, just because an initiator is so low, doesn't mean you shouldn't have a mitigation function for it. So what we're trying to do is provide a structure in which to consider defense in depth. It's not totally driven by the PRA, it's driven by some of our deterministic thinking which we might not have totally let go of. But the important piece of where we're going with this, or where we think we might be going if it matures further, would be to write objectives for each of these blocks, sort the rules, the pieces of rules under this, and say now let's look at it. Is that rule needed to meet that objective?

The important piece, as we found in the ROP, was coming up with a consensus objective of what

is containment there for. And coming up with that one or two sentence objective was, once we did that in the ROP program, the rest was easy. The rest was actually quite easy. It was implementation.

So in trying to organize our thought processes, this was our first cut. You can see under the LERF box, we've got less than E minus 5. Well, that's not a conditional number, we recognize. That's kind of an absolute number, but there's also some conditional numbers, and we didn't -- Stu didn't have a chance to find it, but there used to be like a conditional number on containment that was thrown around in some literature in the agency also. And so -- I think it was .1, so what we're doing is right now is kind of searching around --

MEMBER KRESS: That was for the full conditional failure.

MR. GILLESPIE: Full conditional failure, yeah. So what we're doing now is searching around for all of this policy guidance and saying how can we create a structure and fit it in? How can we then take the next step and create an objective for each of these blocks which is risk informed, and it may be qualitative, it may be a number, it may be both. And we picture kind of a database -- a spreadsheet with

little Xs as a starting point to index our thinking relative to grouping the regulations, and then say does this regulation -- is it needed to meet that objective? Can these two be combined with a more performance oriented wording, like the example I used on sampling systems, to meet the objective?

If I take this rule out, am I more dependent on the other rules for meeting the objective? And it's those kind of questions that we're running into as we're dealing with things in isolation one at a time.

This doesn't compete, by the way. You prioritize what you work on by the four agency goals, which is what's in the plan.

MR. MAGRUDER: Right.

MR. GILLESPIE: This is a thought process to help us make sure we structure things. And if we destroy a rule, we know its impact is a synergistic affect in the whole. Let's skip to the next slide.

MEMBER SHACK: Didn't the research try to do that with their framework document?

MR. GILLESPIE: Well, we did. We took -- we scavenged a lot, you'll see in here, from the research document which was used to prioritize Option Three. But this thought process is the body of rules,

and it's kind of independent of Option Two/Option Three. And we're not using it to prioritize. What we're doing is using it kind of like an analytic approach, or an analytic tool to say do we really know what we're doing when we change this rule, or this paragraph, and know what its impact is overall, in kind of a risk informed structure. I'm not saying it's perfect, but it's a risk informed indexing, and now let's go in and change things, but let's understand how the impact is. Let's have something that helps us display and understand the impact.

MR. MAGRUDER: Yeah, this is -- I guess this is kind of an expansion of the framework document.

MEMBER WALLIS: Have you used this for something like 50.46? And I can see looking at -- I can see doing it with one regulation like 50.46. The difficulty though is, how does that relate to all the other regulations because I don't -- bringing all the regulations into this kind of a box you just showed us is going to be very difficult.

MR. GILLESPIE: Well, I think the first cut is not that difficult. It's a matter of just sitting down and taking the various subparagraphs, and separating them in some logic manner, grouping the

phenomenological things together.

MEMBER WALLIS: But they're also dependent on all the other regulations, so the interaction is not going to be --

MR. GILLESPIE: And that's what I'm concerned with, is we're trying to get a handle as those interactions. When I destroy a rule, have I become more dependent on the rest? And so this is our thought process. I picture the next thing being the bottom row of blocks here along the top of a database, and all of our regulations in some logical subset, because you can't deal with them in big pieces. Otherwise, you've kind of got to get them down, and also recognize underneath each one of those little paragraphs in the regulations is a big body of guidance.

I'm not saying it's simple, but what we're trying to do is get our thought processes away from thinking in isolation, and thinking in context, and take advantage of some of the thinking that went into the ROP and its development. And going to the next step, I'll tell you what I think the importance of being able to articulate what the objective of containment is, what the objective of protecting the fuel is, or protecting the primary circuit. What are

our expectations? Is in the next diagram --

MEMBER KRESS: Before you go to that Polish firing squad diagram, I have a comment about this one I'd like to --

MR. GILLESPIE: Remember, this is only me and Stu, and Cindy.

MEMBER KRESS: If you look at the row of initiating events, mitigation, containment, emergency planning, that's sort of a shorthand for PRA.

MR. GILLESPIE: Uh-huh.

MEMBER KRESS: That's what goes into a PRA when you calculate the risk. And what you -- I understand your thinking is that you're going to look at the body of regulations you now have to see where you deal with these things, and see how you might risk inform that part of it. The problem -- the partial problem I have with that is, the assumption -- there's an implied assumption there that what you now have is the right balance among those things. Let's talk about balance as a defense in depth concept.

MR. GILLESPIE: Okay.

MEMBER KRESS: Now I'm going to reveal my rationalist viewpoint here, but what -- when I look at this, and if I did this in a PRA for each individual plant, I would get different contributions along those

from each plant to establishing its risk status at -- with risk, some thing at the end of the PRA. And I would get different numbers, different contributions for those depending on the reactor, and the type, and so forth. And so, I have to ask myself, what is the contribution among those that I find acceptable from the defense in depth standpoint? That's a question I ask myself over and over. And I've never seen a rationalization of any kind of criteria, other than what we already have, which is kind of 10 to the minus 4, with nothing -- with no sequences that really -- outstanding versus -- and 10 to the minus 5. Those are the only two. Why are those appropriate in my mind, and what do they have to do with the uncertainties in the determination of each point along the line?

Now as a rationalist, I would say when I ask myself what if I'm wrong as a defense in depth concept? What if I'm wrong, and how do I accommodate that? I rephrase the questions and say what confidence do I have in my answer in the PRA? And that gives me a measure of how much I think I'm wrong, if you do the uncertainty wrong. So I think the rationalist approach can accommodate a structurist thinking, because I think you can answer that

question, what if I'm wrong, to some extent. And how wrong am I, and then I can have a handle with which to tie how much defense in depth I need, or where does it need to be put. And I don't see that in here at all, that handle.

MR. GILLESPIE: I agree with you, because that's -- kind of our next step would be -- and let me go back to what I said. No matter how low you can force initiating events down in the mathematical modeling, mitigating the core damage frequency accident is still a requirement, which means you need to set up a set of objectives. This is what we're grappling -- this is why you don't see an objective written down there. It's just a title right now, is independent of how good you can make your plant, it doesn't matter. WE still expect this, this is being able to mitigate the accident, and this in being able to contain it. And I think some of that thinking went into writing the regulations over the years, but no one wrote it down. It wasn't in a structured, necessarily, way. And what I'm suggesting is this how we and the staff are trying to at least get some structure to our thinking, to start putting those questions on the table, because that would get to, well what is the objective of mitigation systems?

CHAIRMAN APOSTOLAKIS: Now I have a problem here. At 10:00 we have the Officer Directors coming, and you, gentlemen, have to wrap it up in two minutes.

MR. GILLESPIE: If I could just jump to the next slide --

CHAIRMAN APOSTOLAKIS: Tell us what the most important thing is from your presentation.

MR. GILLESPIE: Okay. The next slide --

MEMBER ROSEN: You're going to wrap up the entire discussion, or just the reactor arena discussion, because we had two subjects, and we've talked about --

CHAIRMAN APOSTOLAKIS: This section is being wrapped up in two minutes.

MEMBER ROSEN: We talked about half of what we came to listen to.

CHAIRMAN APOSTOLAKIS: Well --

MR. GILLESPIE: Let me jump just to the next slide so I can wrap up our piece, and why I think the first slide is important. The first slide, which sets up a set of objectives, basically starts setting up a standard. And in this slide you see some of the things going around the outside that we've been doing kind of in isolation. And one would ask, why does the

ASME Code have a low categorization in ISI and IST, which could be different from Option Two's Risk Three, and why are they treated different? And what's the relationship between that and configuration management under A-4, which also has a scheme for having something that's called just leave it to the skill of the trades? And why are all those thresholds articulated in a different way, all in different places? And this is an endeavor to say as we're becoming more risk informed, we need to bring all of these things we've put out in the last three or four years together, and start using the same thresholds if they're, in fact, supposed to represent the same safety level of action or inaction. And we would see -- the first picture I showed you is actually fitting in, is kind of being the common risk informed objectives that would fit into this kind of central wheel.

It does mean going back and looking at how we articulated some other things in the past. For example, on A-4, because the way we did it might not have been the right way. We might be more informed by some of the things we're doing in Option Two right now, is we do need to bring these things together, and a central set of objectives is one way applying it

across the board to do that. Creating those objectives, I recognize, is going to be difficult because defense in depth is a balance. How do you consider uncertainty? But I need a structure to answer those question -- to even ask those questions, and I'd like to have a structure I can put the questions in, so that when I get the answers, I know how they fit together. And that's what we're trying. I just thought I'd put this on the table as -- it's a little different.

MR. MAGRUDER: I'm sure we'll talk a lot about this, but we need to turn over to Lawrence.

CHAIRMAN APOSTOLAKIS: I don't know for how long.

MR. KOKAJKO: I can do it very quickly. My name is Lawrence Kokajko. I'm the Section Chief of the Risk Task Group in the Office of Nuclear Material Safety and Safeguards. I have not appeared before the ACRS before, but I have appeared before the ACRS/ACNW Risk Sub-Committee, and so some of what I'm going to talk about, they have already heard.

Just very briefly, NMSS through the RIRIP has embarked on a way to modify the regulatory framework across a spectrum of regulated activities, all the way from small seal sources devices, all the

way through spent fuel, storage, transportation, fixed gauges, the gaseous diffusion plants, fuel fabrication facilities, and others. It's not the homogenous group that NRR is. And consequently, we have to be a little more creative in how we risk inform the regulatory framework.

MEMBER ROSEN: I'd say it's even less homogenous than the reactor safety arena.

MR. KOKAJKO: Even less.

MEMBER ROSEN: Yes.

MR. KOKAJKO: We like to think we're the more interesting program in all this. We have gone through conducting eight case studies recently. We've developed some final screening considerations, and implementing guidance to help us to determine what is amenable for risk informing within the office. We've initiated staff training like NRR has, and we're looking forward to training, perhaps -- having advanced training later on for the staff. And we've completed a number of our activities in December.

We are now looking at implementing a Phase Two approach, where we're looking at what is amenable, and looking at cross-cutting measure. I believe Margaret Federline has appeared before you some months ago, and she indicated that.

We are going to categorize any improvements through the PBPM process and prioritize them to see which ones are most effective.

CHAIRMAN APOSTOLAKIS: Through what process?

MR. KOKAJKO: PBPM, Planning, Budgeting, and Program Management Process. It's the way to prioritize the -- what we should do next. Although this work is ongoing, we will implement it in a Phase Three, there are things that are going on within NMSS right now, which we're taking advantage of.

A couple of things that we will -- that are being worked on is changing the inspection manual chapter for the fuel cycle facilities to be risk informed. Also, for Uranium recovery we're doing the same thing. Part 72 Geological and Seismological Siting Criteria in SFPO is -- will be risk informed. It will also match what is going on in the reactor arena.

CHAIRMAN APOSTOLAKIS: In June you're going to issue another plan, version of the plan. Right?

MR. KOKAJKO: Yes, sir.

CHAIRMAN APOSTOLAKIS: And we will meet again?

MR. KOKAJKO: I hope, yes.

CHAIRMAN APOSTOLAKIS: So then we'll start with you.

MR. KOKAJKO: Okay. That would be fine. Hopefully by June, we will have some other products available.

CHAIRMAN APOSTOLAKIS: Good.

MR. KOKAJKO: The other thing I'd like to say is we are working on developing draft safety goals with the Office of Nuclear Regulatory Research. The Sub-Committee, we've presented the three-tiered approach, and I think it was received pretty well.

We'll also be going to PSAM in June, and we're looking forward to that.

CHAIRMAN APOSTOLAKIS: You'll do what in PSAM?

MR. KOKAJKO: We're going to make about -- I think we're going to have about 12 presentations at PSAM in June.

CHAIRMAN APOSTOLAKIS: Okay.

MR. KOKAJKO: That's it in a nutshell.

CHAIRMAN APOSTOLAKIS: You choose good conferences to do it.

MEMBER ROSEN: Well, it certainly was quick. Right?

CHAIRMAN APOSTOLAKIS: But no, we will have another occasion to discuss these things --

MEMBER ROSEN: I think this is a very important area.

CHAIRMAN APOSTOLAKIS: -- in the next few months.

MEMBER ROSEN: And we gave the full Committee, really a very short shrift of it, and I think it deserves a lot more discussion.

CHAIRMAN APOSTOLAKIS: If we can only settle the issue of defense in depth, then everything will be going very quickly at these meetings.

MEMBER POWERS: It'S very well settled. We know what it is.

CHAIRMAN APOSTOLAKIS: Dr. Shack.

MEMBER SHACK: It's back to you. I guess we're done.

CHAIRMAN APOSTOLAKIS: Thank you very much, gentlemen. We'll recess until 10:00.

(Off the record at 9:52 a.m.)

(On the record at 10:04 a.m.)

CHAIRMAN APOSTOLAKIS: We're back in session. Well, on behalf of the ACRS, I would like to welcome the Executive Director for Operation, Dr. Travers. Director of the Office of Research, Ashok

Thadani. Director of the Office of --

MEMBER SHACK: It says NMSS in there, doesn't it?

MR. COLLINS: I got a promotion on way over.

CHAIRMAN APOSTOLAKIS: Nuclear Reactor Regulation, Mr. Sam Collins. And the Director of the Office of Nuclear Material Safety and Safeguards, Mr. Marty Virgilio. We're looking forward to discussing items of mutual interest with EDO and the Office Directors, and I understand this is the first time that either committee has had such an opportunity to exchange ideas and thoughts on both ongoing and future high priority activities with the Directors. I understand Dr. Garrick, Acting Chairman of the ACNW also has a few opening comments.

MR. GARRICK: Thanks, George. Good morning. My name is John Garrick, the Acting Chairman of the ACNW. The reason that I'm Acting is that neither our Chairman, George Hornberger, nor our Vice Chairman, Ray Wymer, could join us today. They do send their regrets. I am joined by the very able Committee Member, Milt Levenson, and he will -- he and I will have to do the best we can to represent the Committee.

I would like to add my welcome to that of Dr. Apostolakis. This happens to be an extremely timely event, because the ACNW will be holding its retreat, its planning activity later this month, and one of our goals is to select a limited number of high priority issues for the Committee to concentrate on the next year, and beyond. And these presentations, I'm sure, are going to be very helpful in that whole selection process, to ensure that the Committee and the NRC Staff share the same high priority issues, so we look forward to that very much. Thank you.

CHAIRMAN APOSTOLAKIS: Bill.

MR. TRAVERS: Thank you very much. Mr. Chairman, a limited number of high priority issues is a goal we have. We haven't managed to get to that point yet, but we do appreciate the opportunity to be here before both committees. There was a time in NRC/AEC history when we used to report to a joint committee of Congress, and some look forward, or look fondly on those days, but we are certainly happy to be here today with you to talk about some of our current issues, some of the issues that you've been addressing, and have a discussion, a dialogue on some of the activities that we see, and perhaps you see going forward.

Each of the Office Directors with me today, and I should mention that Bill Kane and Carl Paperiello, my Deputies, are here as well, are looking forward to a dialogue. We have a presentation. I'd like to make just a few brief comments at the outset, and leave plenty of time for the dialogue to following after the presentations.

I have to tell you that we are in the midst of an awfully dynamic time. I think you recognize that. It's, in my estimation, probably one of the most dynamic periods in NRC history. Certainly, we've had some of those in the past, after Three Mile Island, and at other times. But if you look across the spectrum of activities that we are involved in, and certainly you are involved in in your role, it is a daunting scope, and we are anxious to continue to make progress in many areas.

Let me begin by just touching on some of the areas where I think we have been particularly benefitted by activities of both the ACRS and the ACNW, and just touch on a few of those. I think we'll probably touch on some of these in the presentations to follow, as well.

Certainly, in the area of advanced or future reactors, ACRS has been significantly involved,

positive spin on it --

MR. TRAVERS: That's right.

MEMBER POWERS: -- but, I mean, telling us what we've done good, it's nice and we appreciate it. But we're not going to get better if you don't bring to our attention the things that haven't been helpful.

MR. TRAVERS: Well, let me propose that I start with where we've gotten good things.

MEMBER POWERS: Okay.

MR. TRAVERS: And perhaps the more appropriate place to go further than that would be in the discussion that follows, if that's acceptable.

CHAIRMAN APOSTOLAKIS: If, of course, there are any.

MR. TRAVERS: In the area of -- let me continue positively, if I may. In the area of license renewal, the ACRS has been involved in the review of the generic documents that have been produced, including the Sandia Review Plan, in our efforts to institutionalize some of the lessons learned in the generic age and lessons learned document.

I was going to mention in the ACNW's case, a number of positive interactions have occurred as well, including the input on the Draft Policy Statement on Decommissioning Criteria for the West

Valley Demonstration Project. This has really helped us in our sense to identify areas where clarifications that should have been made, were made.

We've had interactions, as well, with ACNW on the development of the Decommissioning Standard Review Plan. We think those have been particularly productive. And I'd have to comment on our very positive view of the recommendations that ACRS made, and ACNW made separately, on the safety and waste research plans in the Office of Research.

As you know, we largely agreed with the key recommendations in those reports. And, in fact, we've incorporated many of the ACRS' recommendations into our planning and budget process for the outlying years.

One thing that I personally would like to thank you for, and in concluding my opening statement is, your efforts at my request to look at a differing professional opinion, a rather complex one that had been under review for quite some time, we took the rather unusual step of asking the Committee if they would act as a technical review of this issue.

We take these issues that are raised by our staff very, very seriously. And we think that the effort that you put into the review of those technical

issues was very well done, and has helped not only put some closure to that issue, but identify a path in some activities moving forward to help further assure ourselves with confidence that we have, in fact, those steam generator issues well covered.

MEMBER POWERS: Let me interject. You're -- just to remind everyone that the only reason it was possible for the ACRS to arrive at any conclusion in that area was the fact that your staff and the differing professional opinion authors could provide such effective support, and effective presentations, forthright, frank, complete description of their various technical opinions, in a very clear fashion. When we get that kind of support from your staff, I think the Committee is far more effective, than if we have to delve into things, and try to find them for ourselves. We're not very good at that.

MR. TRAVERS: I should ask you for areas where we haven't done well, but perhaps we could take that up --

MEMBER POWERS: Well, we'll go into a couple of them by day's over.

MR. TRAVERS: Well, I think the last thing I'll mention in terms of our interactions with ACNW, and certainly things we see moving forward, are the

interactions that relate to our identification of the key technical issues in the Yucca Mountain project. I know the Commission has asked for some insight from ACNW on these issues. WE're happy to work with you on a roll-up of those things, a discussion of the significance of the various items that are on that list, and talk about a path moving forward.

So with that sort of brief and positive beginning, why don't I turn to Marty Virgilio, who is going to begin a presentation that we have planned in each of the program offices. Marty is going to talk about, obviously, NMSS programs. Ashok is going to talk about research, and Sam will, aside from what it says on his placque, he will talk about the Office of Nuclear Reactor Regulation. Marty.

MR. VIRGILIO: Good. Thank you, Bill.

Good morning, and thank you all for this opportunity to meet with you today to discuss some of NMSS' current and ongoing activities that we consider of high priority, and the ones that we value your input on, continuous dialogue and advice.

There are a number of high priority issues for NMSS that we'll be discussing with you today. Many of these issues represent what we consider technical resolutions to first of a kind applications

for radioactive waste transportation and storage, and disposal.

New standards are being developed around these issues, with what I consider worldwide interest. Compliance with these new standards are being demonstrated for the most part through modeling, with assumptions where we lack empirical data. That makes it rather challenging for all of us, I think. And there's a high degree of public interest in all of these activities.

MEMBER POWERS: Actually, that easy to do it. If you've got no data, and you just have to live on assumptions, those kinds of models are great to develop.

MR. VIRGILIO: Difficult to defend.

MEMBER POWERS: Difficult to defend.

MR. VIRGILIO: Right. We acknowledge that you've already provided us good advice in a number of areas involving high level waste, as Bill alluded to in his opening remarks, particularly on the KTIs. And we appreciate your continued feedback to us on the total system performance assessments, and some of the issues that we're dealing with there. And we just recently got a memo from you dated January 17th on this topic.

In the interest of time, I want to focus on just a few of the current and future issues that I see as the most significant, so if we could have slide two, please.

Today, these represent the four issues that I want to spend my time on, your time on. These are activities in the nuclear waste safety arena, and related programs that we believe will require continued ongoing discussion and consultation with, between the NMSS Staff and the ACRS and ACNW.

The first pertains to high level waste and repository issues, particularly the resolution of the KTIs, and subsequent performance confirmation. There's ongoing and increased interest in this area involving waste package, transportation safety issues, and our reviews in this area, and some of the other studies that are planned and ongoing, and I'll touch on them.

The second activity involves decommissioning and site cleanup issues, as well as technical issues related to demonstration of compliance with the license termination rule.

The third activity pertains to enhancements of NMSS' risk informed approaches. And the fourth area includes anticipatory and confirmatory

research areas in the waste arena.

There's this over arching need that I just want to make sure that you're sensitive to within NMSS, that we continue to make continuous improvements to our program, that we continue to challenge ourselves to seek most efficient and effective solutions to the problems that face us. And I just want to make sure that you're as sensitive to that as we are. If I can have slide three, please.

DOE now has officially announced its intent to recommend Yucca Mountain to the President, and so now we continue to prepare for the license application in light of that announcement. There are a number of important activities underway today with the staff, and you have interacted with us on several of these. First, the key technical issues.

The focus of the key technical issues and related agreements, when I think of those together, is to make sure that when we finish that, we have provided DOE guidance on the information they need to submit a sufficient license application. The scope and level of detail is based on what would be needed to provide the requisite confidence regarding demonstration of compliance with 10CFR Part 63.

The performance assessment approach which

is embodied in the Yucca Mountain Review Plan has been used to derive the risk insights for prioritizing and integrating these key technical issues. The key technical issues themselves add a varying complexity.

While DOE must satisfactorily address the KTIs to prepare a sufficient license application, it must take into account the risk significance in defining the scope of its response on each of these agreements.

The relative importance of these key technical issues and related agreements may be qualitatively assessed using a combination of factors, such as the risk significance of the associated structures, systems and components, and the processes, the number and complexity of the agreements associated with each of the KTIs, and of course, stakeholder issues and concerns, as well.

The agreements that we've reached with -- between NRC and DOE in the pre-licensing application process are based on extensive staff review of DOE's technical case, and subsequent identification of gaps in DOE's supporting information. So our future technical meetings with Doe will continue to focus on these gaps and provide strategies and answers that will help close each of these gaps.

scope and depth, the amount of energy we've put in them has changed based on our assessment of their significance, and how that's changed as we've gotten more information, as we've worked through these issues.

MEMBER POWERS: Have you thought about applying that kind of an approach to things like the transportation issues? I mean, many of our transportation regulations and approaches for safety in transportation are fairly geriatric, and people are interested in perhaps upgrading those. Have you thought about applying that in that same area?

MR. VIRGILIO: No, I think we're going to approach that from a different perspective. What I'd like to do there is take a more risk informed approach, instead of setting out at the front end saying that there are this set of a dozen particular issues that I want to focus on.

What we're working cooperatively with research today, is to get more insights around storage, dry cast storage, and working on transportation issues as well, in a more risk informed approach right from the beginning, and focus our attention based on what the risk information is telling us. Where we have large uncertainties, for

MEMBER POWERS: You guys prepared and developed a program of, I hesitate to call it, so much research as technical investigations let's call it, because I think it was a mixture of research and technical support, around a set of what you call KTIs, Key Technical Issues. And I think the Committee wrote a report some time back, saying gee, what a great idea this is, and how useful this is. They very much liked it. Is that kind of an approach still going on? I mean, do those KTIs evolve, or they -- they're the ones that you set up a long time ago, and you see no reason to change them?

MR. VIRGILIO: The KTIs have not evolved. What I think are some of the sub-issues, and how we are focusing on the sub-issues that I think have evolved is we've gained more information and more insights about the site. So if you look at the ten KTIs, or nine technical plus the performance assessment, they have held constant for the -- you know, for as long as I've been associated with the program. But what has evolved is our thinking around some of the sub-issues.

MEMBER POWERS: Uh-huh.

MR. VIRGILIO: While the titles haven't changed, I think the way we've looked at them, the

example. Well, overall the system might not be posing a large risk, the value of doing these kinds of assessments is to tell you where you've got large uncertainties, where you've got margins that you might be able to focus on, and where you've got maybe small margins --

MEMBER POWERS: So instead of KTIs, you'll have LUIs, Large Uncertainty Issues and things like that.

MR. VIRGILIO: I don't know --

MR. THADANI: Then I will touch on this issue --

MEMBER POWERS: Good.

MR. THADANI: -- when I brief you about what we're doing, and it's really basically along the lines of what Marty is saying. And one of my issues is going to be, this is an area where we're going to interact with you, and make sure that if there are any issues we're not considering, that we have the benefit of your thoughts on that.

MEMBER POWERS: Well, the -- I just comment that the KTI approach, since I have limited overlap with the issues of Yucca Mountain, was an extremely effective way, I think, of persuading me where the research needed to be done, because it had

been -- it was systematic and whatnot. Doing it with risk I think is no less systematic, and maybe more justifiable, but the articulation of these things was just a very effective --

MR. THADANI: Since you're on this issue, the approach we are using, of course, is phenomena identification ranking table type of an approach, so I think it's fairly systematic.

MEMBER POWERS: Yeah. I mean, a similar sort of thing.

MR. THADANI: Yeah.

MEMBER POWERS: Yeah. That -- I have to say that that -- your staff has been effective in taking a concept focused largely in thermal hydraulics, and seeing how they can apply it in other areas.

MR. THADANI: Yes.

MEMBER POWERS: And it's very impressive. I mean, that -- I think when people ask is there creativity in the NRC Research Program, that's one of the areas I'd point to.

MR. TRAVERS: I just have to comment on one thing mentioned, and one part of your statement indicated that there are those who would like to see changes in those requirements, and some would like to

see risk informing. There are others, however, who really aren't looking for change in the regulatory scheme, so sometimes there's a balancing of what we're doing in the context of stakeholder interest on the part of the industry.

MEMBER POWERS: Making that judgment is why you get the big bucks, sir.

MR. TRAVERS: It's a balancing act at times.

MR. VIRGILIO: Just to close on the KTIs, I wanted to recognize that there's international data and experience that we're trying to draw on as we work forward on the high level waste repository issues. I believe that the NRC Staff and the Committee, as well, needs to utilize the experience gained by the Finns and the Swedes to the maximum extent possible, so not only leveraging our dollars, but also leveraging our decision making, and I think it has an opportunity to enhance public confidence, as well.

That's really all I wanted to say about that issue. If we could move on to slide five, please. There's been increased national attention on spent fuel transportation and storage issues. These have been stimulated by the Baltimore Tunnel fire.

CHAIRMAN APOSTOLAKIS: Why did you skip

four?

MR. VIRGILIO: Oh, I'm sorry. I think I covered it. It was all covered in my notes. I'm sorry if --

CHAIRMAN APOSTOLAKIS: Well, I've got a question on the fourth.

MR. VIRGILIO: Sure.

CHAIRMAN APOSTOLAKIS: Can we go back to four?

MR. VIRGILIO: Yes, please.

CHAIRMAN APOSTOLAKIS: This issue of uncertainty and realistic assessment and all that stuff, I'm pretty sure you have significant model uncertainties in the performance assessment, and we do also in reactors. Now the way we are handling them to the extent that they can be handled is using defense in depth. How do you guys do it?

MR. VIRGILIO: We also use the defense in depth --

CHAIRMAN APOSTOLAKIS: Is that defense in depth, really?

MR. VIRGILIO: -- approach for the repository. That is part of the process.

CHAIRMAN APOSTOLAKIS: Multiple barriers, and that's it?

MR. VIRGILIO: Multiple -- yeah, an approach that looks at multiple barriers, that looks at the fuel, the waste package, and it also then takes into consideration the repository, the transport. Each of those provide a certain measure of defense in the process.

CHAIRMAN APOSTOLAKIS: And people compound this --

MEMBER POWERS: It's a good approach, George.

CHAIRMAN APOSTOLAKIS: Huh?

MEMBER POWERS: It's a good approach, defense in depth.

CHAIRMAN APOSTOLAKIS: Well, I'm not so sure. I think it's a very different application of defense in depth in barriers.

MR. VIRGILIO: Yes, it is. We've written several papers on it that we'd be happy to share with you, if you --

MEMBER KRESS: The only variable you have access to there in terms of what you can do is the cask. I mean, you've got the fuel. It's already put into some sort of form. You've got the repository external, so the defense in depth you have access to is what you -- how you design the cask. Now my

question is, how do you know how good of a cask you define to get the appropriate defense in depth you need?

MR. VIRGILIO: It is not limited alone to the cask. I think you have to look at the entire system. I think there are things that you can do with regard to how you store the waste, how you back fill behind the waste. There are a number of variables that you have in addition to the natural barriers that are provided. Am I sorry. Your question then was?

MEMBER KRESS: My question was how do you know when you've got enough of that, including those other things?

MR. VIRGILIO: Through tests and through modeling.

MEMBER KRESS: You have a criteria for how much change in some risk measure that you want this cask to give you?

MR. VIRGILIO: You can do sensitivity analysis, and you can do modeling in terms of -- you know, what would be the affect of you decrease the performance of the cask, for example. Take the package, and so you make some assumptions about how well it's going to perform. You can model and decrease, you know, the performance around a

particular element.

MEMBER KRESS: The performance is measured by some release somewhere, or some contamination --

MR. VIRGILIO: By the standards that have been established and incorporated in our rules. The standards are established by EPA. DOE brings forward the license application. NRC assesses that application, so there are a number of federal agencies involved in this. But EPA has set the standards that really are looking at what the affect might be on some hypothetical resident in the vicinity of the facility.

MEMBER KRESS: So you do sensitivity analysis to --

MR. VIRGILIO: Yes, in part to understand the contribution and affect.

MEMBER KRESS: Contribution, and do you know -- when you do a sensitivity analysis do you - what? Put some parameters at their 95 percentile values or something like that?

MR. VIRGILIO: And vary them? Yeah.

MEMBER KRESS: Vary them.

MR. VIRGILIO: As to what degree of performance you're getting, for example, out of the cask, or out of the package.

MEMBER KRESS: Okay.

MEMBER ROSEN: On your third bullet, how relevant is that experience to the plans at Yucca Mountain. In the reactor safety area we update PRAs with relevant experience from many thousand years of reactor experience. Is there analogous value to that data that you're getting out of others experience in repository performance?

MR. VIRGILIO: I think that it's coming in now in terms of what we're getting from the Finns and the Swedes, and I think that we'll see more from WIPP as we get more involved in what DOE has done, so there is some experience. But we rely heavily on the modeling.

CHAIRMAN APOSTOLAKIS: What is consistency in treatment of uncertainties?

MR. VIRGILIO: One of the things that we want to make sure that we're doing is in approaching the KTIs in a somewhat consistent manner, in terms of not having more conservatism in one, and less in another, for some of the same factors. It's a reconciliation of how we're approaching this.

Try to put everybody on the same playing field, where we can. That's -- I think it's a very important factor that we don't unnecessarily treat or use conservatisms around certain assumptions, which in

your last letter to us, I think the over arching issue there was, because it can bias the results. And I think that's very appropriate guidance.

MR. GARRICK: I think one thing that might be important to Tom Kress' question is the very different situation that exists with respect to the activity called site characterization, very different from the reactor problem.

The site characterization program is designed to really deal with the question of how much protection are we getting from the natural setting, and so that's a component of the defense in depth.

MEMBER KRESS: It seems like it's a highly uncertain --

MR. GARRICK: It is a highly uncertain, but on the other hand, if you look at the work that's going on, that's where most of the work is taking place, is in better understanding the performance of the natural setting. There's a lot of emphasis on the waste package, and that is very much an engineering effort, but the activity associated with the site characterization is very involved, and very extensive, and has been going on for many years, and there have been many lessons learned. And one of the lessons that probably is the most important from that whole

process is that it is very difficult to quantify the uncertainties associated with the performance of the natural setting. But I think that in general, they have learned along the way what is more important, and are focusing on those barriers, and those parts of the natural setting that are going to have the greatest impact on performance, such as how water moves through the mountain. And so I think that, to pick up on Marty's response, that it comes from both places, it's clearly correct, that there needs to be a component of defense in depth with respect to the engineer portion, which is primary what is called the near field, and primarily what is called the waste package. And there needs to be an expose of the ability of the natural setting to provide backup when and how a source term is actually developed. When you see the billions of dollars that are spent, most of it is spent in just trying to go as far in the direction as reasonable, to quantify the geological setting.

MR. VIRGILIO: Okay. If we can then move on to slide five. Okay. There's been increased national attention on spent fuel transportation. And as I said earlier, this has been stimulated by the Baltimore Tunnel fire, the terrorist acts of September 11th, and other things, including DOE's announcement

of Yucca Mountain. Staff is, and will continue to seek the ACNW's views and guidance on critical safety issues pertaining to spent fuel transportation issues.

The staff itself has been engaged in review of spent fuel transportation packages, and the performance of spent fuel transportation packages in severe design basis accidents, beyond design basis accidents, what we call the package performance study. And we've been working very cooperatively with research in this area.

We've developed a test plan that will be issued in the near future for comment. In addition, the Staff is also going to be involved in activities to validate the structural computer models that we use in risk assessment around transportation of spent fuel.

We've also recognized at the National Academy, The National Research Council Board of Radioactive Waste Management, will begin a broad transportation based study focused on spent fuel issues. This study is going to start in April of this year, and Staff will solicit the Committee's comments on the study.

NRC may also conduct additional transportation vulnerability studies in response to

the terrorist attack of September 11th, and our proposals are currently before the Commission in that area.

MR. LEVENSON: I have a question on transportation. You've listed it under high level waste. What about other -- at the moment, the big transportation process going on is stuff going to WIPP. It turns out that in many cases, it isn't the NRC licensed cask that's controlling much of anything, but DOT regulations. What's -- do we have the same fuzzy area with high level waste?

MR. VIRGILIO: No, that -- I don't -- well, first of all, I don't think it's very fuzzy at all. I think that the roles and responsibilities around transportation of waste in this country are fairly clear with regard to NRC's responsibilities, Department of Transportation's responsibilities.

With regard to high level waste, this is, you know, NRC and DOE responsibilities. This is not going to involve the Department of Transportation, to the same extent that you see for low level waste, and for other materials that are being transported around the country today. They still have some responsibilities associated with the conveyance, be it the truck or the rail conveyance, but there's a lot

more NRC requirements, if you will, around high level waste transportation.

That's changing though. I will recognize that there's a lot of change going on today around transportation of low level radioactive waste as well. We're working cooperatively with the Department of Transportation, Customs, and other organizations to make sure that we understand and refine all the different levels of protection, if you will, around transportation packages. That's, in part, being stimulated by our response to the terrorist attack.

MR. LEVENSON: Is there some regulation, or rule, or law that decreases the role of DOT for high level waste, compared to the waste going to WIPP?

MR. VIRGILIO: I'd have to get back to you on that. I'm --

MR. LEVENSON: Because the issues -- I mean, the shipping container for WIPP is licensed by NRC. It's an NRC DOE and that's fine, but DOT has all kinds of miscellaneous requirements arising from the conveyance, which is -- I just spent the last two days in an Academy meeting on WIPP. And the controlling thing resulting in maybe hundreds of millions of dollars per year additional expenditure rises from requirements of DOT, not NRC.

MR. TRAVERS: DOT will still have those conveyance requirements, as applicable to high level waste as they are to the WIPP shipments. I think what we were trying to convey was that in the context of the detailed reviews that are going to be conducted associated with high level waste transportation, they're more rigorous.

Certainly, we went through a certification process for the cask or the -- is that what it's called at WIPP? And I guess I'm not familiar with the specific DOT issues that may be limiting, or causing greater expense in connection with WIPP, but we think, when it comes to high level waste, it's much more likely that the reviews and the technical requirements of NRC are likely to dominate, if you will, versus some of the safety conveyance requirements of DOT. They're going to be applicable. DOT still has a principal, primary role in transportation throughout the country of anything that involves hazardous waste shipments.

MR. LEVENSON: Who is responsible, or is anybody, for looking at that interface, because I know I've seen what the problem has arisen at WIPP, that there's some DOT requirements -- right now, the big issue is because remote handled waste going to WIPP

can't necessarily be handled and looked at. You can't necessarily meet the DOT requirements, and with spent fuel, you're going to have that in spades.

MR. TRAVERS: Yeah. If you look at what historically has been the case, we've actually shipped high level waste around in this country. Not that much, but it's happened over the years. And am I saying there won't be issues associated with a much larger project? I'm not, but I think we have fair experience in the interaction of NRC requirements and DOT requirements as they apply to high level waste shipments in the country.

I don't know if any are actively going on right now, but they have over the years.

MR. VIRGILIO: There are a handful per year, moving fuel from one facility to another right now, so we do have some limited experience.

MR. TRAVERS: But it's a good issue, and I think it's one when you envision a much larger expansive project, that is worthy of consideration, and we'll take that as a challenge.

MR. VIRGILIO: Any other questions? If we can move on to slide six. In the area of decommissioning, NMSS Staff is currently evaluating activities and looking for ways to further risk inform

our technical reviews. Here's an area where we believe that the ACNW input and guidance has been and will continue to be helpful.

We're currently working on a consolidated decommissioning guidance project, where we'll update, and risk inform, and improve our technical reviews. The consolidated guidance project is a three volume set covering decommissioning process, characterization surveys, and radiological criteria, financial assurance, recordkeeping, and timeliness of our reviews.

The ACNW review of the consolidated guidance will help ensure that we achieve a clear, complete, and comprehensive set of guidance. The first volume of this three volume set has just been published.

Staff is also actively engaged in evaluating options for long term stewardship for decommissioned sites, and financial issues pertaining to cleanup activities, and will be continuing to interact with the Committee on those issues.

Dose modeling for complex sites, and consistencies, and conceptual models, as well as the selection of parameters, and probabalistic dose analysis are being addressed today in collaboration

with other federal agencies.

Important issues here are being addressed as well involving partial site releases and radionuclide transport and pathways. We'll continue to interact with the Committee around some of these issues. If I could move to slide seven.

CHAIRMAN APOSTOLAKIS: Now you mentioned long term stewardship of decommission site. How long is long term?

MR. VIRGILIO: For hundreds of years, as a matter of fact --

CHAIRMAN APOSTOLAKIS: Wow.

MR. VIRGILIO: -- for some of the sites that we have, some of the complex decommissioning sites that we're looking at. We're -- right now we're looking at Department of Energy for taking some of these sites. However, there are other options being considered for some of the sites. We're looking at states for some of the sites. We're looking at Tribal Governments. We're looking at a number of options in terms of ensuring enduring institutional controls, and forcible institutional controls, responsibility for the long term care and protection of these sites.

CHAIRMAN APOSTOLAKIS: Interesting.

MR. VIRGILIO: It's a very significant

issue for us today.

CHAIRMAN APOSTOLAKIS: I know it's a significant issue for DOE, for their side. I didn't realize it was significant for you, as well.

MR. VIRGILIO: Yes. And we're working with DOE and the states, and the Tribal Governments to try to find a success path around some of these issues.

CHAIRMAN APOSTOLAKIS: So we're going to have again long time periods. Right?

MR. VIRGILIO: Possibly. With, you know -- yes, with institutional controls on some of these sites. On slide seven, I just wanted to -- and I know we've met several times with the Joint Committee around risk informing the NMSS programs. We are continuing to work to further risk inform our decision making. We've briefed you in the past on this issue.

Today we're engaged in integration of case studies that were done, eight case studies, and I believe the staff has briefed you on this. We're addressing lessons learned and exploring applying a risk informed approach to other activities within NMSS.

One of the most significant tasks that we're working on today is to develop risk metrics and

safety goals appropriate for the materials and waste arena activities. We see this as very challenging, but we've been collaborating with the Joint Committee around these issues, and will continue to work with you as we move forward.

MEMBER POWERS: When you speak of risk metrics, could you clarify what you mean by that?

MR. VIRGILIO: Some of that is somewhat preliminary at this time, but --

MEMBER POWERS: Well, just give me the analogy to reactor world that you're --

MR. VIRGILIO: If you look at the safety goals at the fairly high level for reactors, those are some of the same things we're looking at in terms of societal risk, individual risk, those type of measures in metrics.

MEMBER POWERS: Yeah, I know what you mean now. I'm looking at things like risk achievement worth, or something like that.

MR. VIRGILIO: Not to that level of detail or sophistication.

MEMBER POWERS: I understand.

CHAIRMAN APOSTOLAKIS: Let's say deep diag.

MR. VIRGILIO: Yes.

CHAIRMAN APOSTOLAKIS: Period.

MEMBER ROSEN: Useful detail.

MR. VIRGILIO: We're also continuing with our training program to make sure that we're uniformly and consistently applying some of these risk informed decision making across NMSS.

The last slide I wanted to just touch on, confirmatory and anticipatory research. And I met with the Committee before on this, and so has Margaret. If you think about high level waste, Sub-Part F of Part 63 requires DOE to submit a performance confirmation plan as part of their application.

This plan should, in fact, lay out a program that identifies some of the key assumptions for the overall site performance assessment. The plan will also take into account some risk insights, and develop new and continuous analysis, tests and experiments that probe and challenge the assumptions and technical basis for the licensing case.

Anticipatory -- and we'll continue to work on that issue. As far as the anticipatory research, I think we need to consider what could be needed in the future, and most importantly, prioritize what should be done, prioritizing the funding for anticipatory research needs to integrate external

stakeholder input, the ACNW/ACRS recommendations, and NMSS views, and of course, researches, technical insights and planning.

Margaret Federline and I have both discussed this issue with the ACNW in the past, and we look forward to further discussion around these issues.

IN closing, I just welcome your continued contributions and guidance to the Staff. Your critical review contributes to ensuring public health and safety, and enhancing public confidence in the NRC, so we appreciate your continued interactions. And I thank you for the opportunity to meet with you today.

MR. TRAVERS: Sam, we're going to continue with your presentation, if that's all right.

MR. COLLINS: Very good. Good morning. I'm Sam Collins. I'm the Director of the Office of Nuclear Reactor Regulation. I believe I've had the opportunity in various capacities to speak to you as individuals. I'd like to welcome Steve Rosen. Steve and I have worked at a couple of forums together, the most recently being South Texas. And I think it's an indication of your stage in career when you have been at least two places working with one person through

your various stages, but it does lend perspective. And I think on Steve's part, I never really envisioned you to be a government employee, but I welcome you.

MEMBER ROSEN: Thank you very much, Sam. I'm a special government employee.

(Laughter)

MR. LEVENSON: Special means no benefits.

MEMBER ROSEN: That's exactly one of the things it means.

MR. COLLINS: What I hope to accomplish in the next period of presentation and questions, is to provide a broad overview of some of the areas within the purview of the Office of Nuclear Reactor Regulation that are of interest to the Committees.

We have a very large span of control in the Office of Nuclear Reactor Regulation, most of them being programmatic, so our processes are areas that we focus on, as well as the technical decision making within those processes.

In the past, the ACRS has been involved in both of those forums, and we do have continuing challenges to achieve success, as we define it. And I will clarify some of those as I go through.

We appreciate the opportunity to continue what I would call constructive exchange. And clearly,

that means an exchange of views, in some cases differing views with perspectives taken into consideration, and we recognize that both our staffs play a key role in defining issues.

Here with me today I have members of the Executive and Leadership Team from the Office of Nuclear Reactor Regulation. They're here not only to gain perspective from the presentations and the questions, but if necessary, to help support responses to your questions.

I will address a number of cross-cutting issues today within the areas of presentation, and I'd like to acknowledge that the three offices here really work in partnership to address many of the agency's challenges. We rely heavily on the technical expertise within the Office of Research to support the decision making with our programs, and Marty and I have cross-cutting arena areas in the area of decommissioning, and we're working on those program structures also to become more efficient and effective, and to align those processes between the offices.

Let me go into the areas of interest, and begin by talking with technical specifications. Technical specifications are probably the most

important guidance that's provided to the facilities within the bounds of operation of the plants. Those of you who have experience with testing research reactors in the power reactor community, understand that this is where the regulations are applied in the control room 24 hours a day, under varying conditions.

We do have guidance from the Commission. It's one of the areas of challenge, to risk inform programs. I think Ashok will be talking about that also. Marty has mentioned it in his arena, and along with our efforts to standardize the technical specifications, we are embarking on a program to risk inform various areas of the technical specifications. This is one of our fundamental focuses now in improving that technical specification tool.

We do have risk informed decision making guidance, and Marty responded to a question of Dr. Apostolakis having to do with risk informed decision making. And we have Reg Guide 1174, was developed in partnership primarily by the Office of Research, which does include a fairly prescriptive decision making process, although some of the inputs to those process might not be prescriptive, of how to consider the deterministic aspect, as well as the risk and the consequences in those variables to come to a good risk

informed decision. We've had some revisions to that process in the past, and I think it will continue to be refined as we apply the program itself.

In the area of technical specifications in that risk informed decision making process, we're really going to focus today on two areas that we believe the ACRS involvement will be important. Although we have one proposal on missed surveillances that's been approved by the staff, and two others which are modified in state and mod change flexibility should be complete by the end of the summer. There are two areas, one being configuration risk management for completion times, which would permit managed temporary extension of existing completion times within a limiting condition of operation, and that concept is currently under development.

The second being the risk significant scope for technical specifications, which would review tech specs to remove systems, are included solely because they were judged as risk significant at one time, and have now been shown by analysis not to be.

Those two initiatives under the eight total initiatives under risk informed tech specs will be provided to the Commission, as a part of our process, as major policy areas. And we will --

CHAIRMAN APOSTOLAKIS: What exactly is an initiative?

MR. COLLINS: -- be giving those to the ACRS.

CHAIRMAN APOSTOLAKIS: Sam, when you say initiative, what do you mean? Do you mean the agencies doing this, or the industry has requested that something like this happen, and they are proposing something?

MR. COLLINS: Right. That's a good question. We have been working with the industry and our stakeholders, primarily through NEI as leveraging the industry to provide the input to the areas that they believe the risk informed decision making could be applied. We're focusing on eight of those areas. This is being done in a stakeholder environment. We're continuing to involve not only the industry through NEI, but the other stakeholders with public meetings on the progress of these initiatives. And, of course, as changes to the tech specs, they would be subject to public comment.

In the process sense, we're using a new implementation, or a revised implementation process which provides for what we would call a pre-screened amendment review, in that we put out a template, and

as the licensee meets that template, then they are automatically allowed to change their technical specifications, but that's on the process end.

CHAIRMAN APOSTOLAKIS: So configuration of risk management for completion times, that means that -- what, that something has failed, and I'm looking at the new configuration during my risk assessment. And I decide that, you know, the risk would be acceptable if I completed repair or whatever is required by such and such time?

MR. COLLINS: Yes. I think you have captured it. Right.

CHAIRMAN APOSTOLAKIS: Now the -- you know, this creates an interesting problem. It seems to me that PRA was done, as was done in the early 70s and the last 25, 30 years, was not really developed for this kind of thing. It was developed for a study state long term kind of assessment, developing frequencies of core damage or accident sequences and so on. And now we are rushing into applications for which the baseline risk information was not intended. That doesn't mean that it's inappropriate, but that's not why it was developed in the first place. And in particular, talking about time dependent situations -- I mean, I don't think PRA was really very good at

that. We are averaging too many things. We are averaging the input of periodic tests, this and that. Now when it comes to real time applications, I don't know that we really have thought about it very well. And this is just one example where we're -- I think we are rushing into applications for which the original tool was not designed.

Now some -- that doesn't mean that, you know, it's useless. Most of the information is there, but I think we need to really be careful, and pay attention to the fact that now it's a different application. Now you've been trying to say something.

MR. THADANI: I'll touch on --

CHAIRMAN APOSTOLAKIS: Sam, yes.

MR. COLLINS: I think your caution is appropriate. However, I'm not sure rushing into it is the right connotation. I think if we were to look at the history of the maintenance rule, which is really configuration management giving risk insights, that was a fairly deliberate process. I would call it deliberate. The industry would call it excruciating probably, and it's not that different, other than the conditions set by operational conditions, which would result in corrective maintenance, rather than the prescriptive -- the conditions that are pre-planned

for corrective maintenance. So the configuration is a little more tenuous, perhaps, and less able to be pre-planned, so the process is twisted that way. But I do think that we have a history with the maintenance rule that would indicate that these tools are appropriate, but the input has to be correct.

MR. THADANI: George, I understand the point you're making, and I recognize that time dependence is not built into today's PRAs, and so there are some limitations in what we have in front of us. On the other hand, we have much better understanding of where the significant risks might be. We have these tools, in spite of the imperfections and uncertainties in these analyses. I think these tools are very valuable in bringing better discipline to the set of requirements that are embodied in the technical specifications. Particularly, as you know, the tech specs were developed with the concept of one change at a time. Reality is different than that, so configuration management, to the extent one can take advantage of the plant models, so to speak, I think is a step forward, is the right thing to do, as long as we're sensitive that there are some limitations in the tools that we're utilizing. So it's progress, and we need to be looking at the issues of dynamic aspects as

we go forward. I think this is the right direction to go in, and not to wait until we finish everything.

CHAIRMAN APOSTOLAKIS: I agree that it is the right direction. It's just the availability of the appropriate tools that worries me.

MEMBER POWERS: Well, I guess the question I'd ask is, do we even have the appropriate tools right now? You've gotten -- the IPEEE insights document comes out. It says gee, all these operational things that you guys are talking about, that's half the risk. I mean, is it appropriate to do analyses of configuration management taking into account half the risk?

MR. THADANI: I think the answer to that, in my view, is yes. External initiators are going to look at, and the same way as you would internal initiators. I think I can agree with you that half the risk may be from external initiators. That does not mean that the components, and systems, and structures within the plant, you shouldn't look at from the best risk perspective you can get. And the industry, I think to me that's progress. Industry is making better use of IPEs and IPEEEs, and that mode. I recognize the limitations. You recognize the limitations. I mean, the spectrum of these studies

and analyses, but nevertheless, I mean is there something better we can use to risk inform various activities?

MEMBER POWERS: Well, let's make sure --

MR. THADANI: I don't think there is.

MEMBER POWERS: -- we understand, that one of the external initiators you're talking about, it's actually an internal fire.

MR. THADANI: Yes, I understand that.

MEMBER POWERS: And it seems to me that we have -- I mean, the IPEEE insights document is a wake-up call that says you've got a problem when you're using the conventional PRA tool, that you're ignoring half the risk. And I think there's no question if your current PRA tool comes back and says this component is important, or this configuration is important. The answer is yeah, it is. It's when it comes back and says well, you can live with this, that you have the question because of the incompleteness of your tools.

CHAIRMAN APOSTOLAKIS: John, you wanted to say something.

MR. GARRICK: Well, I just wanted to comment that I think that as far as this time dependent question is concerned, it's correct that

most of the logic diagrams are static models. But it is also important to note that a lot of the applications have been with respect to dynamic situations. And the way that is often addressed is in the context of discretizing that dynamic situation in such a manner that you can assemble a set of so-called steady state or static models, in a manner that will represent a dynamic representation.

Examples of that, and where it's done more than in the reactor field, is in the chemical field when you're trying to do a risk assessment of a process, where you fundamentally divide that process up into a series of unit operations. And you connect the individual unit operations with pinchpoints that logically and reasonably defensible.

The same thing is true with respect to developing a risk assessment of something like the space shuttle, where you map an entire mission. And the way that's often been done is with some clever discretizing of the model, and defining of the input and output states, that do a reasonable job of representing what's going on. So my only comment is that there's a great deal of ingenuity being applied to some of these models that goes beyond what we're having described here.

CHAIRMAN APOSTOLAKIS: Yeah. My concern was not so much how to handle time, because I agree with John, that discretizing has worked very well. My concern with configuration management is when I change the configuration, and we saw that in the calculations of the risk achievement work, which actually does do some of that. When I change the configuration, and I use now the new PRA, which is usually a variation of what I already have, am I doing it correctly? Because if one component is down, or more than one component are down, several terms in the PRA are affected. And some of them in a subtle way, and I'm not sure that we have -- I'm not saying we cannot do it. I'm just saying we have not really thought about it very carefully, and established rules how to do it and so on. The time dependent part I agree with John with.

In other words, don't misunderstand me. I'm not saying we should go to the dynamic PRA that some groups are proposing. So far we don't seem to have that compelling reason to do that, but the configurations worry me a little bit.

VICE CHAIRMAN BONACA: Well, one thing we have to also reflect is what's in tech specs right now, and what is the basis for them. And typically, there isn't a basis. I mean, it's just -- there were

numbers often times coming from -- so I totally agree on the need of cautiousness.

Mr. APOSTOLAKIS: But this is true for -- there is no logical basis for anything that's not PRA based.

CHAIRMAN APOSTOLAKIS: Okay.

MR. COLLINS: Okay. Again, the goal here, as Dr. Powers indicated, I guess I would debate the words that the goal is to live with this. The goal is really to acknowledge that there is a trade-off between the risk of taking an action with a dynamic power plant that's called for by the license, which may be ramping down in power, as opposed to a steady - state operation with a calculated length of time that provides for recovery of the equipment, so that's the balance we're trying to achieve.

The next area I'd like to focus on - and I thank you for your questions. It's good debate - is rule making. This is clearly an area where the agency, again, is interdependent. I'm going to talk about a few areas, specifically 50.44 and 50.46 that are part of the Option Three Rule Making Area where research has leave to define the criteria. I'm in rule making space now, which is really when we're talking to the ACRS concerning the application of

these tools themselves. And clearly, many of these are of interest to the ACRS, and will likely be activities that we will bring to the ACRS.

50.44 is combustion gas control systems. We're looking at a final rule in early fiscal year '03. 50.69 is a risk informed treatment of structure, systems and components. It's called the Option Two. South Texas, which you're familiar with, we understand the issues from the ACRS having to do with South Texas. We could call that a proof of concept, but there are some differences between the approaches to 50.69. We are wrestling, as you are, with the categorization and the treatment balance.

CHAIRMAN APOSTOLAKIS: We have a Sub-Committee meeting scheduled for later this month to discuss the NEI document.

MR. COLLINS: Okay. We have proposed rule in spring of 2002, final rule in fiscal year '03. We are getting feedback from South Texas on the application of the South Texas proofer concept which was a license exemption, and we're continuing to learn from that process also.

The ECCS acceptance criteria 50.46, the technical reviews are ongoing. Ashok has lead for that. We're looking at what we call an "unbundling"

of the technical issues which is the separation of the interdependencies in that area. We do have a paper that was provided to the Commission in July of 2001. It's SECY 0133, and as a result of the recent arena update to the Commission which occurred last week, we anticipate that we'll be requested to update that paper, and that will provide for clarification of the challenges that the staff has in looking at 50.46.

50.61, pressurized thermal shock. The technical reviews are ongoing. And again, we'll rely on the input from research. There's a possible proposed rule in fiscal year '03 in that area.

50.48, fire protection rule making. Again, the regulatory framework in the adoption for NFPA 805 and the proposed rule in fiscal year '03.

MEMBER POWERS: Sam, do you think anybody is going to take advantage of NFPA 805? Is there any advantage to the 805 to take?

MR. COLLINS: I think it's going to have to be looked at on a case by case basis, where licensees would look at the ability to bring realism to the code, if you will. Where fire protection systems already exist, there will be a balance between maintaining those systems, and/or modifying those systems, and there has to be a value associated with

that, so the answer to your question, I think, right now is indeterminate. And I think it relies fairly heavily on how the staff use the implementation guidelines with the fire code. How much leeway will we allow for a mix and much, if you will, of the regulations.

MEMBER POWERS: Pick and choose among the things?

MR. COLLINS: Right.

CHAIRMAN APOSTOLAKIS: I'm a little bit -- I'm confused actually. I don't understand how a major technical society can come up with something that is not very useful to a major technical agency. In fact, it's almost useless. I don't understand that. How can that happen? Do you have any thoughts on that? I mean, the ASME Standard on PRA, we have disagreements with them, I mean the staff does, but there is some substance there. You can see what they're doing. The other guys are -- I mean, in one of the earlier versions you're supposed to do the deterministic stuff, and then you, you know, do a risk assessment on top of it. I mean, a complete misunderstanding of why one does a risk assessment. It's a mystery to me how that can happen. I mean, are we approaching fire protection in such a different way

from the National Fire Protection Association, or they don't know what risk information means?

MR. COLLINS: Let me ask Gary to respond to that.

MR. HOLAHAN: Gary Holahan, NRR. First, George, I think -- we've had some of these discussions before. The first point is that NFPA 805 is the Fire Protection Agency's -- I mean, it is the consensus among the fire protection experts of the country as to how to approach these issues. And I think it's not a proper characterization to say that the approach is to have deterministic requirements, and on top of it do a PRA.

CHAIRMAN APOSTOLAKIS: At some point it was, now maybe not now.

MR. HOLAHAN: I think at this point -- in fact, 805 has been -- was published last year. The way 805 works is to have identified those areas in which the technology exists to risk inform specific parts of fire protection requirements. Okay. And those are specifically identified, and then what the fire protection community felt, there was no technology available to risk inform it. They identified what were, in effect, deterministic requirements. Okay. So the document has areas that

can and should be risk informed, and those for which there ought to be deterministic requirements.

In the NRC's endorsement of this rule, it is likely that we will accept that as the current state of the art, but then also recognize that where that state of the art is changing, where a licensee or an industry group wants to come in and say some of those things which 805 is not risk informed, we now have developed the technology to do that. We will be receptive to those, as well. And the rule that we write, which is still in the formative stage, but the rule that we write will be receptive to using the risk informed pieces of 805, but also be receptive to additional risk informed activities in some areas that are not currently developed. But it will send a signal that we're receptive to those, and it will give a rule that will allow us to do those things without going through an exemption process. So I view it as a step forward within the existing technology. Okay. But an invitation to stretch the technology, as well. And I think the previous comments about usability and who will use this, frankly, we don't have a pilot plant who wants to try this out. And it may be, at least early on, that licensees will only want to pick and choose pieces of 805 and the new rule, you know,

as it suits them, or as they have changes to their programs, they will pick up pieces. But the fire protection community, you know, was highly involved, something like 60,000 fire protection engineers around the country, you know, voted on this thing, so I think they think it's useful. But I think utilities will pick and choose the pieces of this that they find appropriate.

CHAIRMAN APOSTOLAKIS: I think that's a clear case where you see how this agency differs from everybody else. I mean, there is a much higher appreciation of risk information within this agency than in other places. And I think that was part of why 805 was not --

MR. THADANI: George, to round out this discussion, I think -- I suspect you know, but in case the Committee doesn't know, there's been healthy debate about to what extent 805 really does consider risk information, provides guidance and how to go forward.

The American Nuclear Society has got effort -- they're initiating an effort to develop -- I believe they have decided - I may be wrong on that. I need to confirm - to initiate an effort to develop a standard for conducting fire risk analysis.

CHAIRMAN APOSTOLAKIS: So that says a lot.

MR. COLLINS: We would view any effort in this area that's a consensus agreement as a better place than the existing requirements for the fire protection that we have, so that's one of the impetus that we have in this area.

MR. TRAVERS: Sam, could I make one comment?

MR. COLLINS: Yes.

MR. TRAVERS: While we're on the rule making slide here, I thought I might make note of the fact, and it's probably not surprising to you that we've gotten just recently a rule making petition on 50.46 from NEI that focuses on just the size of the break. And that's clearly been the focus of industry stakeholders up until now, so we'll be treating that in the process that we use for considering those things. Of course, our effort has been broader in context.

MR. THADANI: Yeah, let me just -- I was going to get into it later on, so maybe this is the right place. The scope of 50.46 in the paper that Sam referred to that's in front of the Commission, issued in July, had certain options in it. The first piece had to do with models, the Appendix K models versus

should we look at the decay heat curve, clad water interactions and so on. The break size, to what extent we can rely on single failure criterion versus functional reliability systems, so we broke it down in three pieces. And the first piece had to do with sort of models, analysis, functionality. There is actually a petition even on that. Industry had a petition to modify the -- get rid of 1971 decay heat curve and use 1994 decay heat curve, which is clearly more realistic, and the '71 curve is conservative. But there are issues regarding Appendix K models, and we were trying to make sure we took an equal look at that.

The second piece was some of the assumptions that go in the analysis, such as large break, along with loss of off-site power and so on. We thought that was an area we could handle based on what we have in the near term, so we had hoped to complete that work next summer. There's been a delay of two to three months because of the September 11th follow-up activities. But the final issue, which is defining what's an appropriate break size, we identified a number of areas that we need to work on, and we felt it was going to take some time, so in the paper to the Commission we said it probably will take

us on the order of three years to get to a new, what I call design base accident for current plans. We now have a petition which would clearly require that we take another look and see where we can go.

MR. COLLINS: Okay. Thank you. As you know, these are integrated activities, as demonstrated by the discussion here today, and they are coordinated to the Risk Informed Regulatory Implementation Plan, latest update of that was December 5th, 2001.

MEMBER POWERS: Sam, if I were you -- had your job, I'd be a very frustrated individual. You've got a list of rule making activities here. I bet you've got another list that you fear on the horizon, and every single one of them has all this risk information that you're supposed to take into account. And you've got a Commission that's telling you to be more risk informed. But the way your staff goes about getting risk information strikes me as clumsy.

As I understand it, if they want risk information, they go down to Rich Barret and talk to him about risk information. It's always useful to talk to Rich Barret. I know, I always learn something from him. But, you know, Rich gets busy. And he's got a lot of other things, and you've got to kind of wait for him to deliver the risk information that you

need. He might have to go over to research because he -- it's a question beyond what the capabilities he has.

Your staff can't dial up risk information on a particular plant at any time they want one. Have you thought about what your staff needs to really facilitate this risk information move to make it convenient to address all these risk informed things that are coming down the pike at you?

MR. COLLINS: I guess you put a challenge in front of me that I didn't realize existed to the extent that you express it. We have a risk informed group within the Leadership Organization that cuts across all divisions, and the risk informed activities themselves are really centered in David Matthews' organization. Rich Barret is an expert in that area, but most of our risk application is really in the process area, how do you consider risk.

Plant specific information, we rely on the tool that in large part are provided by research, whether they be the SPAR models, or the SAPHIRE models, or the different phases of the workbooks for the significant determination process. But ultimately to make regulatory decisions, we need the input from the licensee if we're going to make what I would call

regulatory decision, as opposed to a programmatic process definition, if that makes sense to you.

MEMBER POWERS: I think what you're telling me is that you're comfortable relying on getting all your risk information from outside sources, and never playing with it yourself. I mean, just taking this as truth, and having all answered, and he's characterized for you satisfactorily all the contingency plans that -- for you by the outside. And that the individual in your organization that's actually formulating them, and it goes through a lot of processes and consideration, but there is somebody making the initial determination of actions to take, that he can rely on this, and he doesn't need direct access to risk information.

MR. COLLINS: Well, we have risk information that's available to us in the form of the tools that's been provided by research. We make Rich's decisions day to day in the Operating Events Analysis Group, where we get the event reports from the licensees. We do a rough cut of the event significance to determine what's our response. The region does the same based on their input to the plants themselves. That's a very different decision, and uses a different tool, than a long term, long term

being up to a year approval of a risk informed license amendment would be. In which case, we would rely on the licensee to submit the portion of the PRA that's most applicable to the area of the license that they in fact want to change, so it's a graded approach. And I think the graded approach is the tool we have today. Now can we improve that? I think the answer to that is yes, and it will be improved by the PRA standard being applied by the working agreements that we have with research to upgrade the tools for the field, as well as for those decision makers in NRR. But I'm trying to contrast a difference, Dr. Powers, in the dynamic decision making that's done as a result of events so we know how to respond in the short term, as a result of the more programmatic reviews which are done with the aid of the licensee's information.

Ultimately, when we make a regulatory decision in enforcement space, for example, or in the significance determination process, we use our internal tools, and we rely on the licensee to bring their information to the table, and then we reconcile that. And that's ultimately what prevails.

MR. THADANI: Let me just comment on what was just said. Coming from the culture I come from, I think what you described I will characterize as --

MEMBER POWERS: Well, the culture you come from is his culture.

MR. THADANI: And we -- I don't think we have reached that stage at the agency, obviously, but I don't -- I want to make sure you know the effort that's ongoing in developing SPAR models that cover all 70 sites, and the process we're going through to make sure they're technically appropriate and can be used by all the staff at NRR and regions, and so on. So I think that's an important step towards I believe what you're describing.

MEMBER POWERS: Well, I guess it is and, you know, we discuss these SPAR models and argue over well, are they good enough and things like that. And quite frankly, I think we both believe that perfect is the enemy of accomplishing anything here. And first steps are worthwhile, and the SPAR models are -- it's just that my comment is driven by if I were doing -- working for Sam, I -- and I knew he was being hammered with all these people saying take risk information and do more with it, and things like that, you know, I'd want that SPAR model yesterday, and I'd want it continuously better so that I could play with it and understand risk, rather than having to rely on somebody else because Sam is a very good

Administrative Assistant to hold me accountable as somebody working for him for what I produce. And maybe it's effectively taken care of, but like you say, maybe we can improve it, and maybe the SPAR models help.

CHAIRMAN APOSTOLAKIS: I wonder whether we should look at the clock every now and then. We want Mr. Thadani to have enough time, as well. Although, I'm sure that --

MR. COLLINS: Well, he's taken some time already.

CHAIRMAN APOSTOLAKIS: There will not be as many questions for him.

MEMBER POWERS: The program is in such good shape you can't have any questions then.

MR. THADANI: I will be very efficient.

MEMBER POWERS: Unfortunately, we won't.

MR. THADANI: I didn't say that.

CHAIRMAN APOSTOLAKIS: You are risk informed.

MR. THADANI: Yes.

MR. COLLINS: I'll move quickly so you can get --

CHAIRMAN APOSTOLAKIS: Okay. I don't want to rush you, but I will do it any way.

MR. COLLINS: New reactor licensing, in response to the Commission's request, we provided the Commission in October of last year, future licensing and inspection readiness assessment as SECY 0188. And that assessment identified several areas that may need to be performed in support of new reactor licensing.

Now I would have to indicate to you, as you well realize, that one of our challenges in this area is the uncertainty in the plans of the potential applicant. And having said that, there are areas that the Office of Research, and the Office of NRR are focusing on as we move forward in providing products to the stakeholders. One of those, I believe, is within the purview of the ACRS, as you well realize, is the pre-certification and the certification review of the AP1000.

During the week of January 28th, we completed the Phase Two evaluation, having to do with the scaling analysis, and we met with Westinghouse on the 23rd of January on two issues that Westinghouse has agreed to respond to as a result of that Phase Two review. The report is in preparation as a result of the review at this time.

On the 15th of this month, Jim Lyons' organization, the new reactor licensing project office

is scheduled to brief a sub-committee on the applicability of the AP600 standard design, analysis code and test program as it applies to the AP1000 standard design. WE're expected to brief the full Committee on these issues during March 14th and 15th, I believe.

We also have a challenge in defining Part 52, and those areas that need policy guidance from the Commission. WE have a tentative date right now for ACRS briefing on November 2002, and that timing of the ACRS interaction is dependent on when an SRM is received on the proposed rule itself.

The ACRS interaction on NEI proposed alternative regulatory framework for advanced reactor designs will be determined after staff has received the NEI white paper, and is currently expected in the second quarter of 2002. ACRS interaction will probably be late 2002 or 2003. Research plays a key role in that area.

The application reviews for the Pebble Bed marginal reactor, the AP1000, the GTMHR are expected to involve several policy issues that most likely will require ACRS interaction. And again, these schedules and policy issues are dependent on the application schedules and the applicant's willingness to support

the work from the staff.

The PBMR application review is expected approximately in 2004. The AP1000 standard design certification review is expected this year in 2002, and the gas turbine modular Helium reactor, GTMHR combined license application is expected in late 2004.

Also within our budget assumptions, we would be receiving requests for early site permits this year and in 2003, and all of those are in the budget assumptions that have been provided to the Commission itself.

CHAIRMAN APOSTOLAKIS: Are you going to get into this shop in your presentation as well?

MR. THADANI: Yes. I'm going to talk about what the research plans are.

CHAIRMAN APOSTOLAKIS: Okay. So we shouldn't be asking those questions now.

MR. COLLINS: And I can chime in, if necessary, if you want to just consolidate the questions in one area. That would be sufficient.

Licensing issues, there are three broad areas I'd like to bring to your attention. One, of course, is familiar to you, and that's power uprights, and we've had presentations in front of the Committee for power uprights. We think the first presentation,

the staff had a few missteps in support for ACRS in that area, and we did recover in our subsequent presentation. We are in receipt of the ACRS recommendation to consider a standard review plan in this area. We have it under advisement.

I would want to relay to you that that's a balancing of needs within the office now. We have taken a rough look at what it would take to formulate a standard review plan, and the time frame necessary, which essentially would be this year given the amount of power uprights that are coming in in 2002, 2003, that's when really the application would be. Against the use of the revised topical, which is currently under review by the NRR staff, as well as the initiative to use an already approved power upright as a template for the SER, and we will balance those and come to a weighted decision and provide that back, not only to the ACRS, but the Commission has asked us for that consideration also.

MEMBER WALLIS: While we're on power uprights, you're aware we've had some correspondence about the safety evaluation report, and this is, of course, the written technical justification for decisions made by the Commission. And I think both of us, or all of us are very concerned, are very

interested in it being as clear a document as possible, giving all the reasons for the decisions that are relevant.

MR. COLLINS: We agree, and I think we've made some revisions to the SER to provide for that standard, as indicated by the ACRS.

MEMBER WALLIS: Okay.

MR. TRAVERS: There's been a similar comment, Graham, that we got from the IG, noting that while we're getting to the right technical conclusion, very similar to your recommendation that there is a need to revisit, and NRR is developing an initiative to do that, looking at the characterization of those conclusions and the basis for them in SERs that we -- we agree with you that they're fundamental in a whole host of ways to the products that we put out. And I know Sam and his folks are working very hard on that.

MR. COLLINS: Right. The issue there is the basis for the decision, as you well indicated.

MR. TRAVERS: Not the bottom line.

MR. COLLINS: Right. We currently have eleven power uprights under staff review, including four extended power uprights, so this is a business line of our's which is very active. WE've completed 22 uprights during our review processes, including

five extended power uprights. That total for all power uprights is about 3,200 megawatts of electricity.

License renewals, you're well familiar with license renewals. Again, that's a premiere product line. The Commission, as well as the ACRS, is very interested in that. Under review we have Turkey Point, North Inniserry (phonetic), Catawba, McGuire, Peach Bottom, St. Louis, and Fort Calhoun. Next decision on license renewal is Turkey Point.

The generic guidance has been issued to assist the NRC and the future applicants in improving the effectiveness and efficiency of the reviews. And the first applicant to use this guidance fully is Fort Calhoun, we expect.

You should be aware that we're assuming a 33 percent efficiency in this area. It's part of the staff initiatives, and Marty mentioned the program office goal of NMSS of efficiency and effectiveness, and this is one of the assumptions that we have made in refining our processes, going from about eighteen and a half to about twelve and a half FDE per license renewal.

We're also looking at potential plant reactivations. Brown's Ferry is under consideration,

and to a lesser extent, WMP1 completion study is underway. These initiatives are not new licensing organization responsibilities under the project office. Those will come under John Zwalinsky in the licensing area, but those are challenges at this point that we have not budgeted for, although we do have a general knowledge of what it would take, particularly in the case of Brown's Ferry, for the recovery given the other two units that have been recovered. There would be additional challenges to the staff.

CHAIRMAN APOSTOLAKIS: But you have had some indications that somebody is thinking about it, but you may get some application?

MR. COLLINS: Our understanding, and I think it's been announced that a decision on Brown's Ferry would be expected in the early spring, in the April time frame.

CHAIRMAN APOSTOLAKIS: Okay.

MR. COLLINS: And there have been ongoing technical reviews for approximately the past year at that site.

MEMBER ROSEN: Have you heard anything about Zion?

MR. COLLINS: I've heard, Steve, probably what you have about Zion, and that's only in the trade

press. Let me move on to the summary. We have a great deal of work on our plate, as does the ACRS. I'd like to acknowledge the benefit in the exchange of staff with the ACRS. We thank you for Noel Dudley. He will be a great addition to our staff. We welcome him back.

MEMBER POWERS: We hate you for this.

MR. COLLINS: Well, we'll donate it in other areas. John and I have a healthy exchange on the support for ACRS, and we believe that it is a worthy rotation for our staff to understand not only the issues, but the perspectives that the ACRS brings to those, and we're working on rotational development opportunities.

We are meeting our commitments. We were very successful last year in our performance goals. And again, that's indicative of the support between the offices. One of our challenges is to find a way for the ACRS to understand some of the resource constraints that are facing the staff, and I think that is an area of a challenge for us to exchange. And that's a little bit of realism into the application of the answers. It's always good to think broadly, and to deal conceptually. And we welcome those inputs.

The Offices of NMSS and NRR are really where we have to apply the issues, and we're under fairly strict time constraints as mandated by the Commission in many of these areas, so I would believe that there's room for us to enter into a constructive conversation in that area, particularly when we're talking about refinement of programs.

MEMBER POWERS: It's one of -- I mean, it's a challenge that I don't know that the ACRS can ever meet on this. You know, we just don't know what your constraints are, and we can't evaluate it, so I think that's the most valuable when you respond to some of our suggestions. And you say well, look, you know, this is -- it's just a constraint of time, or manpower or things like that, you know, that's one we just have to accept from you, because there's no -- we just don't have the time or expertise, it seems to me, to go into that.

MR. COLLINS: I understand.

MEMBER POWERS: And I think it would be unwise for the ACRS to temper its comments by mentally -- suppressing them by mentally taking that into account.

MR. COLLINS: Right.

MEMBER POWERS: I mean, it's far better

for you to come back and say well, I just can't -- I just don't have the manpower to do this.

MR. COLLINS: That's a fair observation. I think it's information that we owe to the ACRS, and that is put in perspective in --

MEMBER POWERS: Yeah, I mean it's -- everybody has to somehow live within their budget plan.

MR. COLLINS: Right. And I do believe additionally there is a role, and it may be a by-product but its one that we would want to be sure you're aware of, of the ability of the ACRS in your decision making, in your input to help us with our public confidence goal. And again, that public confidence is not directly in the context of promoting nuclear power. It's in the context of the NRC as a strong credible regulator. And the role of the ACRS in looking at the products, and challenging the staff, and in providing for that independence, I think is important. It may not be well known, but -- and I think to some extent the staff ourselves can work with you on the right context to place that in. We don't want to leverage it overly, but I do believe it's valuable.

MR. GARRICK: Sam, a while ago you

referred to the collaboration between NRR and NMSS. One thing that occurred to me is that over the past four or five years in particular, the two Committees have written numerous letters to the Commission on this whole issue of risk informing the regulations, and risk informing the process.

You also mentioned a little earlier about a cross-cutting group in the risk area. I'm curious if somebody is looking at these letters from the standpoint of consistency of advice, consistency of application. In particular, our Committee has been very focused on the issue, some very fundamental and philosophical issues associated with what constitutes risk assessment, having to do with transitioning from assumption based to evidence based analyses, having to do with reasonable, as opposed to conservative, unnecessarily conservative.

The reason we want to do uncertainty analysis is because we don't have to make the choice of being conservative or non-conservative. We put forth our best shot at what we think the risk is.

These are very fundamental ideas and issues, and I just wonder if somebody is looking at that database, if you wish, and tracking the consistency of advice that the Commission is

receiving. That would seem to me to be a very useful platform of collaboration in this rather important concept.

The other thing I just wanted to mention before we got into the research area, is that Dana had referred to earlier, alluded to the difficulties of getting your arms around all of the risk informing activities that are going on. One of the things that this Committee found very useful was the Commission white paper of three or four years ago on risk performance based regulation. That paper was refreshing in that it reached out more than any I had ever seen to deal with the issues of what was meant by risk assessment, what was meant by performance based, and what was meant by defense in depth, and precipitated a whole list of very important points that we found very useful in using as a kind of a starting point for subsequent advice on risk and what have you, so those two things.

One, is somebody looking at the advice in terms of the consistency on these rather critical issues. And second, what prospect is there for maybe a sequel to the white paper, an update on the white paper that went beyond the rigid and formal structure of rules and regulations, and indicated some sense of

how the Committee -- how the Commission was thinking about these extremely important issues.

MR. COLLINS: The -- I'll defer to Ashok here in just a moment, but the forum we have to integrate our risk informed activities is the Risk Informed Implementation Panel and the Steering Committee, which Ashok is the Chairman of, and which Marty and I are also members.

Now in direct answer to your question, do we take the ACRS letters and look at those, and compare those? I think the answer to that is no. Each office does that individually.

MR. GARRICK: Uh-huh.

MR. COLLINS: I think what we would have to do is take that under advisement, and it could easily be done by the panel as an order of business.

MR. GARRICK: Well, what triggered it was your reference to a cross-cutting group. It just seemed to me this might be a useful exercise.

MR. COLLINS: I think it's the right forum for that.

MR. GARRICK: Yeah. Right.

MR. COLLINS: Right. Yeah.

MR. THADANI: John, just to add to what Sam was saying, we -- today we do not really have a

systematic process in place to look if various decisions are consistent in terms of risk information.

We are applying at least areas where we in research are involved, and for example, work on the cask. We're trying to make sure that there's consistent application of risk informed thinking as we go forward. Marty indicated that we're starting out on a number of areas just now, within NMSS activities, and research is engaged in that to make sure that again, if there are going to be differences in applications and decisions, we understand what those differences are, and able to account for those differences.

In addition to that, actually Marty's initiative, there is a PRS Steering Committee that I Chair, of the Program Officers who are members of the Committee. Louise Reyes from Region Two is a member. OTC is a member and so on.

Marty has actually brought to table a number of initiatives within NMSS just for that purpose, to share with the Committee, to see if there are some inconsistencies, there may be some inconsistences. At least offer an opportunity for discussion of those, but I could tell you, we're just barely starting. Marty may want to add to that, but

I think it's just an initial stage where we are.

MR. COLLINS: Yeah. Let me just finish by clarifying a comment that Ashok made, and that is that in the Office of NRR, when we make risk informed decision making, we do attempt to go back and do a quality check. For example, in the revised oversight process, or the significance determination process, we make those decisions as provided for by the ROP, the Revised Oversight Process. Research does an independent check of those after the fact, and provides us an input into whether that consideration was appropriate or not.

MR. THADANI: That's through our accident sequence precursor program.

MR. COLLINS: Right. So that's kind of -- that's how we're trying to balance that, but your two points are still appropriate for us to take away.

MR. THADANI: Yeah.

CHAIRMAN APOSTOLAKIS: One last question on the letters, since the issue of the letters came up. We are discussing among ourselves what, you know, the best way would be to communicate with you. And there are several ideas regarding the structure of the letters. And in fact, in the last several years we've been using that structure that has the recommendations

up front, or the conclusions and recommendations, and then a discussion, which we believe is an improvement over past practices, where you really had to look all over the place to find the recommendations.

But one of the things that's happening is that in some issues where there are disagreements among committee members, the letter has to be written, you know, at some point, so the easy way out is to eliminate as much as we can the controversial issues, and come up with the lowest common denominator and say this is a conclusion now. And some members feel that, you know, there is a lot of useful -- there are a lot of useful ideas and maybe possible recommendations that are eliminated that way, so you guys never know that some members felt that way, and others countered with counter arguments.

So what -- do you think that the letters are better if they have clear recommendations without any controversial debates, or they would be improved if some of the issues that the members have been discussing in the open forum here were actually reflected in the letter, but diluting the recommendations?

MR. TRAVERS: Yeah. Maybe I can start, and I'll be happy to --

CHAIRMAN APOSTOLAKIS: Sure. Sure.

MR. TRAVERS: -- hear conflicting views. But from my vantage, it's helpful to have a clearly articulated recommendation. It -- from a number of perspectives, not the least of which is being able to track our responsiveness to that. You know, clearly identify where, in a consensus sense, the Committee has come down on an issue.

Having said that, I don't think we'd look askance at additional information that bore on your deliberation on any particular issue, including views by members, as long as, you know, it was sort of illustrative of the debate or discussion that sort of was carried out in connection with that. But I -- from our -- you know, from a management standpoint, it's very helpful to be able to start with a consensus or majority view, however it's done here. I believe it's majority, and be able to work that top level view as we deem appropriate, and certainly be able to respond to you in the context of how we're doing that. Or if we disagree, why and what the constraints may be that force that view on our part.

MEMBER KRESS: From that standpoint, what do you do when you get a letter from us that has additional comments from particular members, that may

be either giving additional information, or may be contrary to what's in the main body of the letter? What do you do with that sort of information?

MR. TRAVERS: I think it's a matter of us considering that in an informing sense as we go about our duties and responsibilities. Any information of that sort, I think, can be helpful, and it may shed some additional light on the recommendation and conclusion that you reached. You know, it's illustrative, I think, of a healthy discussion/debate here on the part of the committees.

MR. COLLINS: In summary, I've covered the major areas I believe are of interest, although I've been very specific in the topics. Other areas that might be of interest for future discussions, one might be a presentation by the Steering Committee on Risk, for example, if that would be beneficial in response to some of the lines of questioning today.

Revised Oversight Process is clearly of interest to the ACRS Committee, including the use of PIs, the Significance Determination Process and the Colors. We do have materials engineering challenges with the cracking in the control rod drive mechanism. We have other areas that we're looking at, stress corrosion cracking in general. Do appreciate the

ACRS' involvement in the proposed orders that were formulated for the CRDM cracking.

License renewal I talked about a little bit. In response to the September 11th attack, and the resources and the focus of the program offices, I think will cascade down to some of our products, and we'll be talking to the ACRS, if necessary, on schedules.

Managing human capital is not necessarily an area of ACRS purview. I think it is a challenge for the agency right now to staff up to the levels that are necessary to support the new work in response to the event of 9/11, as well as new reactors. And improving our business practices, including defining performance goals is an area that I believe the ACRS, at least, should be aware of to know that we are accountable for our products, and our outputs, and our outcomes, and ACRS in many cases is an integral part of that. As you are in our definition of work as far as our work flow diagrams, ACRS is integrated into that processes, and we need to be coordinated to be successful. So that concludes my remarks, and I would leave the remaining five minutes to --

MR. THADANI: Okay. Well --

MEMBER POWERS: Never draws any

controversy.

MR. THADANI: As always. Let me also start out with some positive thoughts here. Every time I meet with you, the committees always walk away learning things, and recognizing there are areas that maybe I need to pay a little more attention to, so I find these dialogues extremely valuable and, I think, important.

I particularly want to acknowledge what I think was a tremendous amount of effort on your part, look at research programs and the document that you produce. It's, in my view, a masterpiece. It is extremely well thought out. As I have indicated to you before, I think we were in agreement in most of the areas. There were some small differences of views, but they were not fundamental in nature. It was just a matter of relative timing of what we do with some of the recommendations that you had in your report.

Similarly, this, of course, has some aspects of waste in it, as well. I also wanted to note that the February 5th letter, in particular, from the ACNW had a number of recommendations about research that were taking to heart there are things we can do, and there are things we cannot do. So to the

extent we, as an office, can address those, we are doing that. And, in fact, we've made progress in some of those areas.

What I will do since I only have about ten minutes, I think I have eight or nine charts. I'm not going to talk about everything. Let me briefly take each chart and see if I can't make what the key points may be, and we can move on. And I'll certainly try to answer whatever questions you may have on the topics that you will see. Let me go to the first -- may I have the first chart, please. Okay.

This is a list of -- I mean, this is not a complete list, but what I call major issues that we have been working with the committees, and we expect to continue to work on, different specific areas, but for the next two to three years, this is going to take a lot of attention and our time, and I expect a lot of interactions with you.

I'm not going to say anything about the follow-up to 9/11 activities, except that there is significant ongoing effort in the Office of Research. Much of it is classified, and I do expect down the road that there will be some interaction with the Committee in terms of what we're doing here.

Let me go on to the next chart. Advance

reactors, the two parts that I want to highlight first in terms of the importance of trying to make sure we have a reasonable framework in place, which would guide our activities, would define how far we go in certain areas, what the boundaries would be. And this is clearly -- this would include the role of safety goals. Obviously, safety goals alone would not be sufficient. The discussion is ongoing, and I know you're looking at issues of frequency consequences approach, and what's the role of deterministic thinking in this process. And then how to account, when you go to designs that are pretty unique and new to us, how are we going to account for lack of data, inexperience, and that would impact the quality of PRAs and the role of PRAs, and whatever decisions have to be made.

We're pulling together a research plan, and the scope of the research plan is going to cover PBMR, the GTMHR, AP1000, and IRIS. What are some of the key technical issues? How would we go about making sure we have appropriate tools to help us make those independent decisions as an agency? What sort of resources would be necessary, schedules? And this would be a living plan. It's one that we would hope to have a draft later this month. We have sent out

the first version for comments, but we expect to have our initial discussions with you on the plan in April. That means we'll get you a draft some time in March so you would have an opportunity to have looked at it.

Just to give you a sense of what's in it, if I can be brief. This is a snapshot. AS I said, this is a living plan. And I think you will recognize some similarity cornerstones approach that you're very familiar with. The idea here was that we want to take what I would call a systems approach to defining what we need to do in terms of research. And you will note that this includes also the fuel cycle issues, because we need to look up front from beginning to end, and not necessarily continue with the ways of the past, so to speak.

This -- the whole idea here is the idea of completeness. We want to make sure we lay out all the issues that may be important, and some of which may require research effort. Our intention is to go through this process in a very systematic way, the kind of thinking that I talked about, part type thinking has to be applied to each of these issues as we go forward.

CHAIRMAN APOSTOLAKIS: So you worry about the aging for future reactors?

MR. THADANI: Absolutely. Sixty years.

MEMBER POWERS: Well, if you're radiating graphite, you're better to learn about aging real quick.

MR. THADANI: Exactly. I would use the same example, and there are some very interesting technical issues from aging of graphite which could have very significant bearing on the design, I think. I'm not going to go through this. We will be discussing a lot of this with you in April. Let me go to the next chart.

On risk informed initiatives, obviously we can spend an awful lot of time, but let me make just a few comments. This is an area where we have very extensive interactions with you, and I anticipate will continue for the next three years, so -- but just to give -- to bring to your attention that we have a Risk Informed Regulation Implementation Plan. We updated it, and Sam mentioned that last version went to the Commission December 5th.

It includes everything that we at the agency are doing in terms of applications, risk informed thinking. I think that's a very good thing to do, because it does bring us together in terms of communication and so on. It includes prioritizing

activities, identifying necessary tools, resources, and integration activities, as well.

We're trying to identify in that plan what are some of the most critical milestones that need to be completed before one can go on to some place else, and what some of the cross-cutting issues are. I think we need to do better than what we've done up to now, but it is a good start, I think. It does identify what some of the cross-cutting issues are.

Another effort that's good in this document, we often talk about risk informed regulations, and performance based to the extent practical. WE've always said that. Here's a document we're trying to make sure as we go forward, and with any future rule makings, we systematically consider factors, but we can, in fact, be performance based in the articulation of our regulation. So that's -- I think that's a good move. It's -- to me, I look at it like a handbook. It's a good handbook, I think. And on individual pieces, of course, you may have to go elsewhere.

In terms of the PRA quality, you know about the standards. I won't dwell on it. WE're looking at all the standards, the ASME/ANS, as well as looking at the NEI peer review document. We're

planning to pull together a guide that will help us integrate the role of the standards, role of the peer review, so there's one place one can see how these things are going to be utilized. And our intention is to pull that guide together, and we'll be meeting with you on that guide.

I won't say anything about PTS because I know you're up to speed, 50.44, 50.46. We had the discussions. Human reliability analysis, I guess I just want to make sure you know that we're sunsetting ATHENA this year.

CHAIRMAN APOSTOLAKIS: You're what?

MR. THADANI: We're going to sunset developmental activities within ATHENA. We're applying it, as you know, in the area of --

CHAIRMAN APOSTOLAKIS: Speaking of cross-cutting and working with other offices, I saw the slides the two gentlemen from NMSS were using recently, two, three weeks ago in a presentation to the staff on human performance for NMSS.

MR. THADANI: NMSS, yes.

CHAIRMAN APOSTOLAKIS: They went back to THERP.

MR. THADANI: They went back --

CHAIRMAN APOSTOLAKIS: No mention of

ATHENA, no mention of --

MR. THADANI: Uh-huh.

CHAIRMAN APOSTOLAKIS: THERP, way back.

MR. THADANI: That went to THERP. Okay. That's good input. I told you, I always learn things here.

CHAIRMAN APOSTOLAKIS: I know that you guys have been doing this, or they studied it and they said this is not helpful.

MR. THADANI: Yeah. Yeah.

CHAIRMAN APOSTOLAKIS: Okay.

MR. THADANI: Yeah. Good thinking.

CHAIRMAN APOSTOLAKIS: This is always a question that comes to mind.

MR. THADANI: Yes. Thank you. It's a message that's well received, and will be followed up on. The only point I wanted to make sure you knew under human reliability analysis reach plan, that there are some boundaries that we're not crossing. We're not looking at the issues of safety culture. We're not looking at the issues of organization and management, but we are monitoring what's happening in the international community. And I think you know the next piece very well. We've got significant efforts going --

MEMBER POWERS: Let me just inject, Ashok. We've been holding off on looking at this, your current human reliability analysis research program because we had the perception that your staff was a little busy to come talk to us about this with other activities, and I still want to do that, if not to impose on them, but I don't want to hold you up either.

MR. THADANI: Yeah. In fact, I'm glad you raised that. I think we sent you a draft plan some time ago.

MEMBER POWERS: Yes.

MR. THADANI: It's got to be revised, I think.

MEMBER POWERS: Okay.

MR. THADANI: And that's the issue. I think we need to revise it, and then get it to you, and then have meetings with you.

CHAIRMAN APOSTOLAKIS: Ashok, we spent so much time reading it, now you're revising it?

MR. THADANI: When I say revised, certain elements. So you haven't read it as --

MEMBER POWERS: Tell him completely from top to bottom, throw away all those comments that he has.

MR. THADANI: I just wanted to note that I think you know all the work that research is doing to support NRR, in terms of looking at operating experience, and how it can be utilized, the analysis of this experience on a number of initiatives that NRR has ongoing.

CHAIRMAN APOSTOLAKIS: I have a comment on this. The rest of the slides deal with engineering issues and so on, so maybe this is the best place to raise it.

MR. THADANI: Sure.

CHAIRMAN APOSTOLAKIS: We made the recommendation -- well, I'm not going to raise decision theory when we talk about fuels.

MR. THADANI: Right. Fine.

CHAIRMAN APOSTOLAKIS: When you talk about risk informing initiatives, making decisions --

MR. THADANI: Uh-huh.

CHAIRMAN APOSTOLAKIS: -- and we had a recommendation in the research report --

MR. THADANI: Yes.

CHAIRMAN APOSTOLAKIS: -- that formal methods have existed for quite a while now, and we recommended that your staff investigate the possibility of taking advantage of this work that

people have done.

MR. THADANI: Uh-huh.

CHAIRMAN APOSTOLAKIS: And we don't see anything here. And I want to make it clear, that we are not really proposing that you use formal decision theory in all your decision making activities. I mean, that would be absurd, but there should be, I think, some appreciation of what these methods can do within the Office of Research, at least.

MR. THADANI: Yeah.

CHAIRMAN APOSTOLAKIS: And for example, in the last bullet with the performance indicators, you would have found this expertise useful. It would have helped you do certain things better than they were done in the documents we saw. And there may be other places where you may also take advantage.

MR. THADANI: Sure.

CHAIRMAN APOSTOLAKIS: In other words, here is a decision making agency that's using risk information, which means uncertainty estimates all the time.

MR. THADANI: Uh-huh.

CHAIRMAN APOSTOLAKIS: And it's trying to risk inform its regulations, and there is this large body of knowledge that tells you how to use these

uncertainty estimates in a rational way. And we are not really taking advantage of that. I mean, this is really where we're coming from. It's not that we want you to say well, gee, you know, Sam has a problem tomorrow. He has to make a decision, oh formal decision. No, not at all. But there is a lot of information there that could be useful.

MR. THADANI: Yeah.

CHAIRMAN APOSTOLAKIS: In fact, it would be. I know it would be, and we are not really using that. Now I know you have asked one of your staff members to do some investigation. That's not good enough, in my view.

MR. THADANI: Well, I --

CHAIRMAN APOSTOLAKIS: We should take it a bit more seriously in the sense of at least there should be a bullet there saying that you're thinking about it.

MR. THADANI: Well, let me say that we're thinking about.

CHAIRMAN APOSTOLAKIS: Okay.

MR. THADANI: If that satisfies you.

CHAIRMAN APOSTOLAKIS: You will take appropriate action in the future.

MR. THADANI: Yes. In addition to that,

I have asked, and Dr. Johnson happens to be sitting here.

CHAIRMAN APOSTOLAKIS: I know.

MR. THADANI: He is looking at what I would call looking at the state of the art, to what extent we can utilize these methods, which approach is maybe better, and so on. I can tell you that we're not embarked on an extensive evaluation. Until we do an initial assessment, then we'll have to decide how far we can go, or can't go in certain directions, but it is a first step. And once we get done with that first step, maybe I can come back and tell you more about where we are planning to go.

I just wanted to make a note here, you have in the past raised some concerns about the need to do a peer review of SAPHIRE, and we have -- I mean, you had this discussion just two weeks ago. And we've looked at all the information, and we think that we will go forward with peer review this year. The scope and so on is yet to be decided, but I've asked the staff to come and meet with you before we initiate any peer review, because I want to be sure that we are, in fact, properly focused on whatever issues there may be in terms of applying --

CHAIRMAN APOSTOLAKIS: You are aware of

the fact that some NASA Manager have volunteered --

MR. THADANI: Yes.

CHAIRMAN APOSTOLAKIS: -- to participate in this.

MR. THADANI: Yes, I am. Yes.

CHAIRMAN APOSTOLAKIS: Okay.

MR. THADANI: But I just wanted to let you know, because this is just recently we decided we'll go forward.

CHAIRMAN APOSTOLAKIS: Yeah.

MR. THADANI: Let me go to the next chart, and I think many of you are so familiar with this, that let me just say that much of -- in terms of the MOX fuel, the high burnup fuel, we've had a number of PIRT meetings. WE're going to have a draft report next month, and we'll be assessing various models. We'll be looking at taking advantage of data from different countries in terms of where we go. And this is one of those ongoing interactions with the ACRS.

MEMBER POWERS: Are we ever going to get the French data on MOX, and high burnup fuel?

MR. THADANI: Well, we -- I hesitate to say that we have reached that agreement, but I'm hoping we're there. I'll have to -- I don't think we have yet reached that end point, but I'm hoping we'll

get there. And we have to -- we're discussing options of how can we provide the necessary resources to get the data from the French.

MEMBER POWERS: Well, wouldn't -- and you might want to be aware that we've invited the -- some of the investigators from the PHEBUS Program to come speak to the Committee in May.

MR. THADANI: In May? Okay. I didn't know.

MEMBER POWERS: About both the current PHEBUS Program and some of their plans for follow on programs. Not that the Committee is taking any action, just for information purposes.

MR. THADANI: Yeah. We're hoping, depending on how '03 budget comes out in the end. We're hoping to continue our relationship with the French on PHEBUS Program.

MEMBER POWERS: That raises one of the questions. We've been very supportive of your efforts in the high burnup fuel area, and I note that you've even expanded those activities beyond what they originally convened, and they seem to be progressing well.

MR. THADANI: Yeah.

MEMBER POWERS: I mean, there are some

hiccups in just getting available fuel but, you know, those things happen in research, and that's why you have lots of white hair, undoubtedly.

One of the questions that's going to come up is that you're doing a lot of experiments on single rod, specialized experiments, and they look very useful. The question is, is that going to be enough? Do we have to go to multi rod experiments to understand things?

MR. THADANI: Let me -- because of my, you know, limited time, let me take that as a question to get back to.

MEMBER POWERS: Yeah. I mean, you don't have to give me an answer now. It's one of those --

CHAIRMAN APOSTOLAKIS: Speaking of that, Bill, is it okay to go to fifteen --

MR. TRAVERS: Sure.

CHAIRMAN APOSTOLAKIS: Okay. Great.

MEMBER KRESS: Ashok.

MR. THADANI: Yes, Tom.

MEMBER KRESS: Before we get off of the question of the French data, if you ever get the VERCORS data --

MR. THADANI: VERCORS --

MEMBER KRESS: -- I would be very

interested in getting it as soon as -- letting me know as soon as I could.

MR. THADANI: Okay. All right.

MEMBER KRESS: Because I could use it right now.

MR. THADANI: We're also talking to the Japanese, of course. I think you know about the VEGA. Okay. Another thought here that I just want to make sure and capture, is that we are looking at the burnup and correlation affects on cladding, cladding of various designs, Zircaloy 2, 4, Zirlo, M-5 and so on, so this is something that various types of testing, and trying to make sure that there are no surprises there for us. This talks a little about HTGR. I just wanted to make sure that you knew that this is going to be captured in the plan.

The next chart, in fact, I'm not sure that I need to say any more. We've had very extensive discussions with the Thermal Hydraulics Subcommittee, and we -- I think you're up to speed on where we stand in terms of assessment of TRACM and so on, and what some of our continuing efforts are going to be.

A point I'd like to highlight here is that I think this is an area where I'd like for us to be proud that we've got pretty good in-house capability,

and I hope it's coming through to you, as well. We've got a pretty strong group of people in this area.

MEMBER KRESS: Are you doing anything in severe accident area --

MR. THADANI: Yes.

MEMBER KRESS: -- on air ingression accidents?

MR. THADANI: Yes. We are now discussing with an Eastern European country to see what kind of test could be done at very reasonable cost to get some data.

MEMBER KRESS: You have good ideas.

MR. THADANI: Well, I am assuming you know we're looking at similar approach for severe accident codes, such as MELCORS, as we were with the DPA type activities. Next chart, please.

I mean, this is an area where NRR and research are very tightly integrated, I would say. Very significant information that's coming out of operating reactors, examples that Sam used, that clearly require that we be prepared to support NRR in dealing with some of those issues. And the work at Argonne and some international arenas has been very, very valuable, and I want to thank you for the support that you've given us.

Our focus now is largely on a radiation assisted stress corrosion cracking, crevice chemistry, and some of those fundamental mechanisms that may be involved, and trying to see how we can make sure we are prepared, that we can do appropriate -- we, as an agency, can do appropriate inspections, and know what's really going on.

The -- again I'll not say much about advanced reactors in this area, other than to just note that high temperature metals, Graphite and the containment confinement are going to be significant challenges that we're going to have to deal with this perspective as well.

Steam generators, we're following the plan that, Dana, you know about, and we're on course. Digital I and C, we've got a plan that's been discussed with you, so let me just move on to the next chart, unless you have questions.

Waste issues is sort of -- some of the issues that we're involved in. You touched upon dry cask. You raised a question earlier, Dana. Obviously, we're looking at structural material systems and probabalistic considerations in an integrated fashion. And we're doing a PRA. I'm happy to note much of the work is actually being done in-

house by our staff, so it's very important.

We do have some cooperative efforts with the Electric Power Research Institute, and Department of Energy to looking at fuels, for example, various burnup levels, trying to get the right data. The idea behind this, of course, is to support NMSS and their decisions on license extensions from 20 years, to 40, to 60 and so on, so this is sort of a time dependent element of this, how fast we can go.

Very quickly, package performance studies is related to transportation cask beyond -- looking at beyond design basis types of events. Marty indicated that, and we're looking at things like high speed impact, and fires and so on, as part of the -- when I say we're looking at, I'm sorry. Let me clear it -- clarify it. We developed a plan, and we need to get international support to -- we can elaborate our resources, and a number of countries have indicated very strong interest, and I don't anticipate a big problem in moving forward on that.

Radionuclide transport, John, there was very extension discussion, workshop. Let me not -- I'm looking forward to your report on that workshop because it would be very useful to get your insights on where you see things are going.

I already touched on the whole issue of looking at the full cycle for these new reactors.

MEMBER KRESS: Are you doing anything more on spent fuel pools?

MR. THADANI: Spent fuel pools, some of the work we're doing can be -- let me say, I can't talk about what we're doing as a following to the 9/11 event. We're doing some work there, but in terms of the source term, some of the other work we're doing can be of value to spent pool fuel issues.

Let me just quickly say that both -- you know, the expert panel which was headed by Commissioner Rogers and others, have clearly indicated need that we in the Office of Research need to do a better job of telling what we're doing, why, and how it can be of value to the agency and the public at large.

There's sort of a synopsis. I think you know of the paper that we prepared, lay out, vision, mission, role and responsibilities of research. And I think you know what is confirmatory, and what is anticipatory. Let me highlight two or three points.

We're going to -- we are embarked on a plan to do a much better job of communication, internal and external to the agency. And a number of

initiatives that we have, planned, some of them planned, others are ongoing. But in terms of the internal communication, we have -- I think the biggest step that has helped us in terms of better communication has been what I call -- what I guess we call leadership team meetings. At the division levels, there's very frequent contact between the offices, NRR and research in particular. And I know Cheryl meets with NMSS folks on a weekly basis to make sure there is proper communication taking place.

I think that has improved our understanding of the challenges NRR has, and NRR's understanding of how the work we do fits in in terms of the decisions they have to make.

The other part that's I think helping us, and that we still have to go further is the Research Effectiveness Review Board. I think you know generally what the plans are. They've been focusing in largely on the user needs, and the process of user needs and follow through. And that's going to continue, and I think it can only be of value to us.

I want to highlight one item under anticipatory research. You criticized us, and I think it was George, you in particular. And I notice that -- I wanted to get your attention, and actually it was

Rogers Expert Panel also, that in anticipatory research, we were too inward looking, that we didn't seek ideas and concepts from a broader spectrum of audience, so I have just this week sent letters, first internally to NRR/NMSS regions, to research staff, briefly giving background, and seeking ideas from them.

I've also sent letters to Nuclear Energy -- Nuclear Engineering Department Heads Organization, to NEI, to EPRI, to UCS, Nuclear Control Institute, and also in Federal Register Notice, making sure that we're not interested in just a lot of ideas. We're interested in ideas which are focused on the areas we've identified. And also, ideas that have a reasonable chance of success in terms of getting there.

We may well get some good ideas. Clearly, we're not going to be able to consider them for this budget cycle, because we have to provide our input in a matter of six weeks or so, so it can't be done. And I wanted to make sure that various organizations had enough time to really think about these things. I'm seeking input by June 1st, and we will then set up a group that will evaluate the recommendations and ideas, and then we will consider them for the

following budget cycle. It's taken a year longer than I had hoped, but nevertheless, we are moving in that arena.

The other point that I want to make that I think is helping in coordination is that we're now giving a number of briefings, for example, program review committee briefing and our research did it jointly, NMSS and research did it jointly. I think these are good steps forward. It's working better. I think coordination is improved. We need to go further, but it's going in the right direction. With that I will stop.

MEMBER SHACK: There's one exercise here that I happen to be the guinea pig that you did once upon a time, and it's never been repeated, but I thought it was quite successful, where you had a research program with an open meeting with the public.

MR. THADANI: Yes.

MEMBER SHACK: And then we had people from the NRC --

MR. THADANI: Yes.

MEMBER SHACK: -- utilities, owners groups, and intervenor groups. And I thought it was very successful. I think the intervenor groups went away with a much better feeling that the NRC was

getting some independent information. They had a chance to ask questions, which you never can ask questions of a report, and all in all, it was a pretty successful thing. And then, you know, it sort of -- we tried it once, and --

MR. THADANI: Yeah. I think you're exactly right. I know when that meeting was held, and it went very, very well. We have done a little bit more of that, but I think it's clear, and I'm glad you brought it up. We need to maybe expand in that area, as well.

MR. TRAVERS: That is a good point, as you probably. I'm sure you know, that increasing public confidence is one of our four agency strategic goals, so we're always looking for some good ideas on how to achieve that. And frankly, it's a difficult thing to get your arms around in any particular forum.

That does complete our presentation. I wanted to respond though. I didn't mean to keep you waiting, Dana, on any negatives that we had, hold you in any suspense. But the answer quite simply from a significant negative perspective, at least on our part, is that we don't have any. We think we enjoy today the kind of professional relationship that is advantageous to our separate, but very related

responsibilities, under statute. Can we do better? We can always do better. Can we do better from our standpoint in providing documents in a timely way, getting input from you in a timely way to support some of our activities? Of course. But I think what I would like to send as a final message is that we very much appreciate the relationship that we do have. We think its value added, frankly, from our perspective. Do we agree with everything you recommend? No, but we try to get back to you with reasoned basis for not agreeing in all instances. But I would say that in many, if not most instances, we take and implement much of the recommendations and --

MEMBER POWERS: Well, I think the message I give you here is that I, certainly, and I think the Committee as a whole is not adverse to you coming back and saying something was not helpful. Okay. Some direction that we're taking, some approach that we take, something like that. I mean, we can disagree with you too, but it's useful for us to know the downside, as well as the bright side. And, I mean, some mechanism to just indicate something is not helpful.

MR. TRAVERS: Okay. That's fair. I think we do have mechanisms for doing that, and we'll take

that as a --

MEMBER POWERS: Sure.

MR. TRAVERS: Thank you.

CHAIRMAN APOSTOLAKIS: Okay? Well, any members have any comments, observations they would like to make?

MEMBER POWERS: Ashok, you mentioned letters and a Federal Register Notice that you were sending.

MR. THADANI: Yes.

MEMBER POWERS: Could we get a copy of that?

MR. THADANI: Absolutely, yes.

MEMBER ROSEN: I have one, George.

CHAIRMAN APOSTOLAKIS: Sure.

MEMBER ROSEN: I was struck by the fact that you did not ask the stakeholders directly, the licensees for input on the research program. You did it through NEI. I think it might be valuable for you to think about that.

MR. TRAVERS: Thanks, Steve. Yeah, I will, and I think I understand the message there.

CHAIRMAN APOSTOLAKIS: Any other comments? All right, gentlemen. Thank you very much. WE really appreciate your taking the time to come to talk to us,

and let's hope that we'll do this again, maybe in the not too distant future. Okay? Thank you very much. We're recessing until 1:30.

(Whereupon, the proceedings went off the record for a lunch break at 12:35 p.m.)

A-F-T-E-R-N-O-O-N P-R-O-C-E-E-D-I-N-G-S

(1:35 p.m.)

CHAIRMAN APOSTOLAKIS: Do we have a quorum? One, two, three, four, five, six. All right.

We're back in session. The next item on the agenda is the Proposed Final Revision to Regulatory Guide 1.174 and SRP Chapter 19.

Ms. Drouin?

MS. DROUIN: Okay.

My name is Mary Drouin with the Office of Research, the Probable Risk Analysis Branch.

CHAIRMAN APOSTOLAKIS: Excuse me, Mary. I was suppose to make an announcement.

MS. DROUIN: Sorry.

CHAIRMAN APOSTOLAKIS: You have this hand-out number 10 in front of you, members? Number 10? You all have this? It's very thick. Reconciliation of ACRS Comments and Recommendations. Please take a few minutes to read it today. We're going to discuss it tomorrow. It includes the EDO's response to our letter on the reactive oversight process, steam-generated, tube integrity. There's a lot of good stuff here. So please do that.

Okay, Mary. Sorry.

MS. DROUIN: Are we ready?