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NUCLEAR REGULATORY COMMISSION

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JOINT MEETING

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

SUBCOMMITTEE ON RELIABILITY AND PROBABILISTIC

RISK ASSESSMENT

AND

SUBCOMMITTEE ON PLANT OPERATIONS

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FRIDAY,

NOVEMBER 1, 2002

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ROCKVILLE, MARYLAND

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The Subcommittee met at the Nuclear Regulatory Commission, Two White Flint North, Room T2B3, 11545 Rockville Pike, at 8:30 a.m., Stephen L. Rosen, Acting Chairman, presiding.

PRESENT:

STEPHEN L. ROSEN	Acting Chairman
MARIO V.BONACA	Member
THOMAS S. KRESS	Member
GRAHAM M. LEITCH	Member

PRESENT: (CONT.)

WILLIAM J. SHACK	Member
JOHN D. SIEBER	Member
GRAHAM M. WALLIS	Member

ACRS STAFF PRESENT:

MAGGALEAN W. WESTON

ALSO PRESENT:

PATRICK BARANOWSKY

WILLIAM BECKNER

TOM BOYCE

CINDI CARPENTER

BOB DENNIG

DAVID GAMBERONI

CHRIS GRIMES

DALE RASMUSON

NICK SALTOS

BOB TJADER

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

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

P R O C E E D I N G S

(8:33 a.m.)

MR. ROSEN: If everybody will take their seats, the meeting will now come to order. This is a meeting of the ACRS Subcommittees on Reliability and PRA, and Plant Operations. I'm Steve Rosen, serving today as Chairman of the Reliability and PRA Subcommittee in the absence of Dr. George Apostolakis. Mr. Jack Sieber is the Chairman of the Plant Operations Subcommittee. He's here. Other ACRS Members in attendance are Mario Bonaca, Tom Kress, Graham Leitch, Bill Shack, Graham Wallis.

The purpose of this meeting is to discuss the Risk Management Technical Specifications and the Industry Trends Program as it relates to the Initiating Events Performance Index. Mag Weston is the Cognizant ACRS Staff Engineer for this meeting.

The rules for participation in today's meeting have been announced as part of the notice of this meeting published in the Federal Register on October 23rd, 2002. A transcript of the meeting is being kept, and will be made available, as stated in the Federal Register notice.

It is requested that speakers use one of the microphones available, identify themselves, and

speak with sufficient clarity and volume that they can be readily heard. We have received no written comments from members of the public regarding today's meeting.

Jack, do you have any comments before we proceed?

MR. SIEBER: Not at this time. Thanks, Steve.

MR. ROSEN: Thank you. We'll now proceed with the meeting. Bill Beckner of NRR will begin.

MR. BECKNER: Okay. Thank you. I'm Bill Beckner. I'm the Director of the Operating Reactor Improvements Program, and I'll apologize to people, Mr. Kress here and so forth, I'll only talk to your back very briefly. Okay? I just want to give a very brief introduction.

This is a result of a July 10th meeting where we talked about the PRA Implementation Plan. Our objection there was primarily to get you interested in the subject, give you a status report. I think we were very successful. We heard a lot of interest, a lot of support. We also heard a lot of questions, or at least a few questions, so hopefully we'll continue that, get some more support, and I'll also be able to address some questions you had.

I want to point out that this is only a Staff presentation, but this is an effort we've been working with industry very closely with. I would point out that Biff Bradley from NEI is in the audience. I'm sure he'll be glad to answer any questions from the industry perspective, if asked.

Okay. With that, that's really all I want to do. Let me turn it over to Bob Dennig, who is my Section Chief of the Tech Spec Section. And I'll let him take over and point out the other people he has with him.

MR. DENNIG: Okay. Thanks very much, Bill. To my right I've got Bob Tjader from my staff, Tech Spec Section, Senior Engineer. And to my left, I have Nick Saltos, who has ably supported us in the area of Probabilistic Safety Assessment, as we go through these initiatives that we're going to talk about today.

The first slide, please. I very briefly wanted to kind of put today's discussion into context, in a historical context. We have been involved in Risk-Informing Technical Specifications and evolving toward a Risk Management, a configuration Risk Management approach for some time. At the very beginning, we start back in 1974 with a standard tech

spec structure that basically has limiting conditions for operation and corrective actions, and completion times, and so on and so forth. They're predicated on random single failures and judgments, engineering judgments of repair times for these random single failures, and then we moved forward. And one of the seminal documents in this development was NUREG-1024, 1983 Tech Specs, enhancing the safety impact, which is a document that contains a lot of the initial thoughts about applying risk information and risk techniques to technical specifications, mode changes, end-states, surveillance intervals, so on and so forth. You can trace what we're doing today back to that document in large part.

Moving forward, implementation of 50.65(a)(4) in 2000. AS I mentioned, we started out with a structure that has completion times and correction actions premised on dealing with single random failures and repair times for those single random failures, into an era where we're doing on-line maintenance. We are taking numbers of equipment out-of-service at the same time. And in order to really do a good job of managing that kind of an environment, 50.65(a)(4) was essential, and so we arrive at a structural -- we've got -- we have that in place

largely for managing a configuration with technical specifications as a back-up. And in our Risk Management Technical Specification Initiatives, which the concept as a set of initiatives was first broached in 1998. But those initiatives largely look at getting 50.65(a)(4) and technical specifications to work together, and to not fight each other, and to put together a single framework that is premised on managing risk, and allows a licensee to have an integrated approach and programming methodology that will meet both technical specifications in 50.65(a)(4).

Next slide, please. Principles is probably too grand a title. These are things that we've kept in mind as we've progressed through this development. Bill mentioned that we were here talking about coherence. We are very much aware of the importance of having what we do and the approaches that we take aligned with efforts, other risk-informing efforts going on. In particular, for example, in 50.69, Special Treatment, where we get to the point in technical specifications and talking about scope of specifications, and talking about equipment that is risk-significant, or significant to risk, we certainly want to have that concept aligned

with, be coherent with how that terminology is being used in 50.69 and other Special Treatment areas.

Also, there are points in time in these initiatives, places in the initiatives where PRA Technical Adequacy becomes important, and we certainly want how we treat that Technical Adequacy to align with the effort that NRR and research are involved in. For example, in the Draft Guide 1.122 that we're now working on, to have the same ideas, the same principles are supposed to be consonant with that.

A second principle would be that we have a graded approach in these initiatives, as far as how we are crediting 50.65(a)(4) programs as supporting the changes that we allow licensees to make. We go from an approach where we have a submittal from an owner's group, and the Staff entirely reviews that. We have the entire basis for why something is acceptable, and those changes get hard writing specifications, and as long as the plant is covered by the topical, covered by the generic analysis, then they can have that change.

And then we have things that are more programmatic and discretionary, and rely on the licensee's capability, a demonstration of the capability, and where we're delegating discretion to

the licensee. And in those areas, the licensee's 50.65(a)(4) program has to be more robust, has to be at one end of the spectrum as far as quantitative, real-time, so on and so forth. So we have initiatives that run the gamut, from pre-analyzed hardwired to discretionary based on a program.

And finally --

MR. ROSEN: Before you get off that point.

MR. BECKNER: Sure.

MR. ROSEN: I think it's important. If a licensee does not have a PRA, and there's no regulatory requirement to have one that I know of, how do they -- can they get any credit in this area?

MR. BECKNER: I think everybody has a PRA, thought it's not required. Nick help out, others help out as needed. Those licensees have to have a basic capability in order to comply with 50.65(a)(4) to manage their maintenance. And maintenance is a very broadly defined concept, and it pretty much encompasses any time equipment is being taken out of service, or goes out of service, is forced out of service.

They have to have a rudimentary capability. Those capabilities, as described in the Guidance and my understanding is, at the rock-bottom

can be derivative of some generic analysis that is then hardwired into somewhat prescriptive allowance or management approaches that they would then use to comply with 50.65(a)(4).

That same level of capability would be reflected in a generic analysis, such as I mentioned earlier, where there -- a notice group submits an analysis and says for our designs, this function is less important than this other function in this mode, and it applies to all our licensees. That becomes the basis of the safety evaluation, and the licensee with rudimentary capability would benefit from that, and be able to adopt the hardwired changes that go into the standard. They would not be in a position to take advantage of things, for instance, like mode changes for high risk mode shifts, or to extend completion times on the fly, if you will, which is Initiative 4. They would not be in a position to do that, so there's a graded approach. There are things that look a lot like the risk-informing that we've done for some time, extending an AOT or a completion time, particularly for diesel maintenance on-line. There's a generic analysis. It applies to a range of licensees. A licensee can come in and say I would like to adopt that change to my technical specifications, and point

to the generic analysis and say it applies to me, and then they can have that. But that time is then hardwired into their specs, and to change that time, they would have to come in for another amendment. So the brief answer is -- is there a brief answer? All licensees are benefitting at some rudimentary level from what we're doing, but the degree -- you're not going to get the whole package. You're not going to be in the position to take advantage of the whole thing, the whole set.

DR. BONACA: I have some concern about, you a number of times repeated the expression "rudimentary capability", and that was a different understanding that we had here, depending on the number of components you are taking out of service simultaneously. We felt that, and we communicated that you may have a rudimentary capability to take one component out of service, use engineering judgment in some cases. When you would begin to pull out of service two components, three components or more, I wouldn't agree with your statement of rudimentary capability, I mean, because it takes some sophistication and analysis to understand the consequences of multiple components and different trains, for example, taken out of service.

MR. ROSEN: Yeah, and it's not all voluntary. I mean, the devices, he may take one component out of service as a planned matter, but then another comes out of service -- emergent is found to be out of service, or doesn't work in the testing. So you could find yourself with a rudimentary capability in a situation you didn't anticipate. Then what?

DR. SALTOS: Okay. We have several of the initiatives, especially the ones we have worked on right now, we have pre-analyzed the conditions, both generically and on a plot-specific basis by comparing the design features and functions among plants. And for example, a change in the end-state from cold shutdown to hot shutdown is a comparison of risk. What is the risk in one end-state versus the other end-state? There are four -- we are not -- all the licensees would need is just have (a)(4) capability. They don't -- they would not need any more than that to apply this change.

MR. DENNIG: I think your question gets back more to the philosophy underpinning 50.65(a)(4) and its relationship to tech specs. Licensees still have to comply with technical specifications.

MR. BECKNER: Bob, can I try to help out. I've been listening here. I think the concern maybe

is with your term "rudimentary". Right now absent these initiatives, just why technical specifications generally deal with one system at a time, they are generally very conservative on one system at a time. They don't deal with a multi case issue period. Tech specs simply do not prevent that.

What had happened is basically, as we started thinking about extending AOTs we recognized this, and we put something in called a "Configuration Risk-Management Program Tech Specs". When the Maintenance Rule came about, the Commission looked at that and said gee, that looks similar to the Configuration Risk-Management Program, and basically the Maintenance Rule is currently -- and the Commission told us that the Maintenance Rule was adequate to handle these cases. We should take out the Configuration Risk-Management Program in the tech specs, so the bottom-line is that this term that Bob used, I think "rudimentary", which may have caused a reaction, the Maintenance Rule is what in our regulatory space currently handles multiple equipment out of service. Tech specs generally do not, and that's absent these Tech Spec Initiatives at all.

When Bob is using the term "rudimentary", I think what he meant -- I use another term. I call

it (a)(4) Plus, is that in the current environment, the Maintenance Rule governs and hopefully is adequate. And what I've seen industry doing is adequate. They do a pretty good job at this, but if we want to start stretching the envelope, particularly with some of the initiatives where we're getting rid of fixed completion times, and getting completion times that are based on a program and analysis, why we want to strengthen (a)(4). So rather than called (a)(4) rudimentary, I call what we're going to as (a)(4) Plus, where we basically would be putting commitments and requirements for qualities of PRA, many criteria, and so forth. So again, that's my short answer. I hope that may have helped.

MR. ROSEN: Well, that's a glass-half-full, glass-half-empty argument.

MR. BECKNER: Right.

MR. ROSEN: I think it's more about semantics. And really what I'm concerned about is, how much discretion you give a licensee to run an (a)(4)-like program with a PRA that ends up being one piece of paper, effectively a matrix, which to me is so rudimentary that I wouldn't give it the word "rudimentary".

DR. BONACA: The thing that troubles me

the most is the fact that, you know, in real life you know that when you project how many components you're taking out of service, you know, you have a certain projection number-wise. Then when you look back what happened in that period of time in which you had this component out of service, you discover that you had more components out of service, because somebody else took them out. I mean, they may happen to be out, and so you do have different configurations there that are not fully analyzed or understood at times. And that's the issue that --

MR. ROSEN: That's the issue on the low -- I think we have two issues here. We have an issue on the low end, which we've been discussing, which is that there are some plants with such rudimentary capability that they're getting more credit, it's a potential they could get more credit than they deserve, than they can control and use. And on the other end of the spectrum, plants with very sophisticated analyses who want credit, the question is how good is the underlying analysis? Is the underlying analysis really good enough to support the kind of extensive dynamic tech specs that we're thinking about.

So with that bracket on the problem, which

is goes from zero to a hundred plus percent, there are all the gradations in-between, so it's kind of a sophisticated question, as to where a given licensee in a given request, there needs to be a degree of conservatism here that we position along that spectrum that are appropriate.

MR. BECKNER: See, I think when they get to Initiative 4, I think you'll hear about the one end of the spectrum of what we're talking about as far as requirements for licensees to make maximum use of it. We'll hopefully talk about that. The other end of the spectrum are, I guess the status quo, what are licensees doing under the current Maintenance Rule and other requirements? That's an issue.

The Staff had some concerns too, and the only thing I can tell you is that we did have a workshop. How long ago was that, Bob? About six months ago, and basically, our objective was to try to figure out just what was -- for the Staff to understand better what the industry was doing under the existing Maintenance Rule absent these initiatives. And I'll say that we were impressed.

Now that doesn't say that every licensee is behaving as what we saw. And with that, Biff wants to make some remarks.

MR. BRADLEY: Biff Bradley of NEI. I'm pretty familiar with the (a)(4) implementation guidance. I can say that all plants use PSAs for their on-line, you know, at-power maintenance equipment out of service. For shutdown, typically plants do use qualitative methods. We rely on NUMARC -9106 for most plants. Some plants have shutdown PSAs, but all plants use their at-power PSA. And even if you're using a matrix that's evolved from your at-power PSA, we do have quantitative risk metric guidelines in there. We have -- basically, it is a graded approach. If you're routinely taking multiple equipment out of service, there is an expectation for more quantification, more tracking of aggregate and cumulative risk. And we did go to some length to put on a presentation for NRC Staff last year in February, to explain how the industry was doing this. And, you know, I think it was pretty effective at helping to understand these questions.

I would say, you know, we talked a lot about the rudimentary or the bottom level. It's not as low as you might think. I mean, we do have -- in the (a)(4) guidance, if you take a look at that, we even have PSA quality expectations. This predated the standard, so we refer to the PSA peer review process

requirements for that. But there's no plant out there that's not using their PSA as the basis for their at-power on-line maintenance.

MR. ROSEN: Well, that's very helpful, Biff, but I guess I would have to have seen the showing that a matrix, as you say, has properly evolved from a robust enough PRA to be more than simply a piece of paper that may or may not in any given circumstance be conservative.

DR. BONACA: I mean, I, for one, accept the graded approach in the sense that, you know, you take a component out of service. Maybe the matrix may be adequate, and I think when you go to two components or three components in different systems, then you need a level of sophistication in the PRA that is not necessarily rudimentary. In fact, it's not rudimentary at all. That was the point I was trying to make.

MR. TJADER: Let me reiterate --

MR. DENNIG: I wish the word "rudimentary" had never left my lips.

MR. TJADER: Let me just reiterate one thing that Bob had said, and that is, is that the different initiatives require different levels of sophistication. And the Initiative 2, the one that

has been approved to-date, requires the most rudimentary level of sophistication. It can rely on its risk assessment, the (a)(4) that a plant may have, let's say a matrix system, if that's what a plant had, all that it had. But we also expect that the plant would take conservative actions, or conservative results from that matrix that they -- in other words, the less sophisticated it would be, the less, you know, relaxation per se that you have.

MS. WESTON: Bob, you say that the plant is expected to take -- is there anything here that requires that, or assures that that happens? You said that they are expected -- they have the most rudimentary --

MR. TJADER: Well, what I'm saying is that Initiative 2 can rely on an (a)(4) risk assessment as plants have out there now, without any additional PRA quality. For instance, eventually I think the Initiative 4 where there's going to be flexible AOTs will have to rely on the PRA Quality Initiative that's ongoing with industry, and the code or the standard that's soon to be promulgated. I think we're going to have to rely on that to implement -- of course, plants have a certain minimal level of capability or they meet that standard in order to implement a flexible

Initiative 4 AOT.

MR. DENNIG: And as we go through these, I think we try to say in a summary fashion what the basis was for why something was acceptable from a risk perspective. And part of that picture is also how risky is the evolution or the action that we're talking about. And making up a missed surveillance is not a high-risk exercise, nor something that would happen frequently, and so the degree or control and detail, and specification of enforceable whatever is not, you know, it's not there. I mean, there's no need for that.

MR. ROSEN: Yeah, but I think you're trivializing the concern. Missed surveillance wasn't the concern, never was. It's about actions and completion times, and some of the other more substantive matters.

DR. SALTOS: For that, a good PRA would be required.

MR. ROSEN: Okay. I'm going to take the prerogative of the Chair to move us along here, and expunge the word "rudimentary" from the thing. But you can see the sense of the Subcommittee is that we're kind of like stirred up like fire ants. Down where I come from, when you stick a big stick in an

anthill, they all come out, they sting.

MR. SIEBER: Biff would like to --

MR. BRADLEY: I'll make one more comment since a question was asked about the regulatory framework for (a)(4). Reg Guide 1.182 is the regulatory guide that references the applicable portions of NUMARC 9301, which is the Implementation Guidance. The Staff has also developed inspection procedures for (a)(4), so there is a pretty explicit delineation of what is expected for a (a)(4) program, and it is inspectible, and it is laid out and referenced in a reg guide that's, you know, available for you to look at.

I don't want to leave the impression that there's not a clear understanding of what the minimal requirements for these programs are.

MR. ROSEN: Well, we'll keep all that in mind as we go forward.

MR. DENNIG: Okay. Initiative 1 - End States. Objective, the affect of this change would be to allow repair time in hot shutdown, instead of automatically requiring transition to cold shutdown, which is what all the LCOs require at the present time.

We've reviewed Combustion Engineering

Owners Group and a Boiling Water Reactor Owners Group generic analysis that deals with a support, a risk-informed support of a preferred mode for repair given that you've got equipment inoperable. And at the present time, we've just finished the safety evaluation for the CE Owners Group, and we're in the process of looking at the translation of that concept into markup of the actual standard specs. And BWR Owners Group just finished the safety evaluation, and the industry is working on the tech spec markup.

MR. ROSEN: Should I learn something about Westinghouse Owners Group by their absence from this, or know something about it?

MR. DENNIG: Well, maybe Biff wants to say something, but the Owner -- the way we've been pursuing these initiatives is basically by working with a consortium of owners groups, and they have decided amongst themselves whether to invest their money and effort into the topical analysis in this particular area.

MR. ROSEN: So Westinghouse plants wouldn't get this --

MR. DENNIG: Well, no. Until we see something similar to what we've gotten from the owners groups, no.

MR. BRADLEY: The short answer is, Westinghouse is working on a topical to support this. They're just a little bit behind the curve, so they will be coming in in the same way that CIs and PWRs have.

MR. GRIMES: This is Chris Grimes. I might also point out that it's fairly typical to see that because of the diversity of plants that the Westinghouse Owners Groups have to represent, that they usually let Combustion Engineering or B&W, or the BWR Owners Group blaze a trail so they can find out what is the optimum level of effort that is required for them to invest in a proposed regulatory action.

MR. DENNIG: Initiative 2 - Missed Surveillance Actions. As Bob mentioned, we have this one out for licensees to adopt. Forty-seven plants, so far, twenty-one amendment requests in process. This change basically is an extension of an allowance that was first granted in Generic Letter 8709, gave 24 hours to make up a missed surveillance. This risk-informs the 24 hours, allows you to go up to one additional surveillance interval, with the understanding that you will do that surveillance at the next available, or reasonable available time. The purpose of the extension is to make up the

surveillance, not to delay it for operational purposes.

And why this is okay, infrequent use, likelihood equipment is operable. There's a commitment to put this into the Corrective Action Program should you use a surveillance, so that we can see it in the reactor oversight area.

MR. ROSEN: And also to correct the source of -- the cause of the missed surveillance.

MR. DENNIG: Sure.

MR. ROSEN: I think that's the most substantive reason.

MR. DENNIG: Sure.

MR. ROSEN: So you don't get recurrence.

MR. DENNIG: Right, which feeds back into making sure that this is infrequent, it doesn't happen very often.

DR. BONACA: If I remember, the only -- we had some concern about going the whole length of the full interval again.

MR. DENNIG: You have to justify that. You have to have a basis for doing that. That is not the -- it's not the automatic default. Oh, I missed it. I get to go another six months. I get to go another cycle. That's not the concept.

DR. SALTOS: Although we had several exams where we calculated the risk, and the risk would not increase significantly by going --

MR. ROSEN: What exam? When you recalculate a risk of a missed surveillance, do you assume the components out of service?

DR. SALTOS: No, you assume the component -- you have the -- you calculate their unavailability based on increase in testing time, testing period.

MR. DENNIG: Yeah. One conservative approach would be to just assume that the thing is inoperable, can't perform its function, and enter your (a)(4) management space and look at the impact on CDF and ICCDP, look at those metrics and see where that brings you out, as far as how long you could postpone, or when you need to make that up.

The less conservative but -- well, still conservative, but a more sophisticated approach is to change the surveillance interval, rerun some calculations, and look at the impact.

MR. TJADER: And they are supposed to perform the missed surveillance at the first opportune time, not go to the extension that is permitted by --

MR. DENNIG: And all those thoughts, we've recently looked at the guidance that some owners

groups have put together, and all of those thoughts were appropriately factored into the guidance to licensees as to how to implement this appropriately.

DR. KRESS: Do you have some idea of what is meant by the "first opportune time"? You know, it seems to me like --

MR. TJADER: Well, if something -- let's say a surveillance is required to be done at shutdown and, you know --

DR. KRESS: At shutdown you had --

MR. TJADER: At a fueling interval, let's say, and you missed it, and the risk assessment concludes that you can do it at the next refueling outage, well, if you a mid-cycle refueling, or mid-cycle maintenance outage or something, do it at the maintenance outage, and not go the full refueling cycle, that type of thing. That's a simple example.

DR. KRESS: What would be the criteria for surveillance on a piece of equipment that you could do without shutting down?

MR. DENNIG: Well, if it doesn't require

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- well, the things that go into consideration are hazards to personnel, doses, those kinds of issues, accessibility. Do I have to have any special

equipment? Do I have that available? Do I have to have any special configuration? Do I have to maneuver the plant? Do I have to do any realignment? If I don't have to do any of those things, and there is no personnel hazard, there's no issues, then when we reschedule it and we do it, we make it up.

The idea is just that commensurate with the safety significant, you do not have to drop everything you're doing and focus on making of this surveillance. And everything else is in second place.

DR. WALLIS: How many are you allowed to miss at the same time?

MR. DENNIG: Not many.

DR. SALTOS: As we said, each of those is printed as an imagined condition, put in their Corrective Action Program and their Oversight Process to take it out.

DR. WALLIS: So someone will notice --

DR. SALTOS: In order to increase the risk significantly you'd have to miss many. And if they miss many, they're going to be --

DR. WALLIS: If they miss many, it's indicative of a management problem.

MR. SIEBER: Yeah. That's a different problem all together. I think typically a plant would

have one to three missed surveillances.

DR. BONACA: Yeah, but it's still a reporting requirement for a missed surveillance?

MR. DENNIG: No, there's no reporting requirement. What there is, is a stipulation that a missed surveillance, an instance of missed surveillance will be put into the Corrective Action Program.

DR. BONACA: That I understand.

MR. DENNIG: Okay. And that's where we would be able to see it.

MR. ROSEN: You're saying there's no longer a reporting requirement for a missed surveillance.

MR. DENNIG: I'm trying to think if there ever was a requirement for --

MR. BECKNER: No, it's been taken out. There used to be one, but it's no longer --

MR. REINHART: This is Mark Reinhart of the Probabilistic Safety Assessment Branch in NRR. One point I was thinking that might clarify some things. Generally, we don't find plants missing a lot of surveillances. When they do, it's not the whole surveillance. It might be they had to do an instrument channel, and there were 45 contacts, and

they missed two of them, but they can't do those under the current operating conditions. Whenever they got to a position they could pick up those two contacts, they would have to do it at that time. But at the same time, part of this safety assessment or risk assessment would be, what do we think, based on the information that we know, do we have an expectation that this equipment is operating? So there's that thought going in also.

DR. BONACA: I really think it's a good initiative. The only thing I still question is, there is an interest on the part of the NRC in trending certain conditions or issues, and so on and so forth. If there is no reporting of this, how do you trend? You know, what -- if there is, in fact, a shift in trend in the whole industry, you have 100 plants out there. If you have a proliferation of situations like this, you would want to know.

DR. SALTOS: The Reactor Oversight Process, they configure a significant determination process --

MR. GRIMES: This is Chris Grimes. I'd like to take a shot at that. Reporting requirements don't necessarily provide us with good trending of industry performance. We actually look to the

oversight process, overseeing the Corrective Action Program and the monitoring, and the record keeping that each utility has to do the trending. And we make an assessment through our inspection activities as to the effectiveness of the plant-specific trending activities, and the insights gained from those. And we would expect to see that revealed in a programmatic way, in terms of the effectiveness of the quality assurance process at individual plants.

DR. BONACA: Do you have a requirement that the licensee trends missed surveillances?

MR. GRIMES: We have a requirement that licensee trends all adverse conditions in the plant, which would include missed surveillances.

MR. ROSEN: I'm actually fairly comfortable with the idea that the Staff will pick up on a trend of missed surveillance at the plants, because my experience with plants is a missed surveillance is a big deal. And two of them is a convoy of missed surveillances, so this is something that becomes very, very high priority.

DR. BONACA: I have no doubt that within a plant is going to be surfacing. I'm just thinking about how all this is going to be pulled together for other plants, to where you have a perspective of

whether or not the implementation of new initiatives of this type are going to be no detrimental to --

MR. ROSEN: Allowing a relaxation that's so extreme that a lot of plants begin missing a lot of surveillances.

DR. BONACA: So, you know, I'm sure --

MR. ROSEN: That would be the concern. And I guess I would say yeah, that's a concern, but I don't think it's likely.

MR. BECKNER: I think that's the whole portion, and like Chris said, it's infrequent now and the basis is how do we keep it infrequent. And that's the Corrective Action Program, and we will have to rely on oversight of the Corrective Action Program. That's the mechanism.

MR. ROSEN: You know, one of the things we talk a lot about here is safety culture. And this is one of those safety culture things that's so ingrained in the current fleet of licensees that I'm fairly confident that there would be an enormous reaction to a spate of missed surveillances both by the regulator and the licensees. I'm not too concerned with this.

MR. LEITCH: Is there any higher level of attention if one of these missed surveillances when eventually done fails? Does that raise any kind of

flags, other than just with the corrective -- other than through the Corrective Action Program?

MR. BRADLEY: Well, the oversight process would -- you'd have to enter that into the oversight process and pick up the unavailability of that equipment over that period of time, so that would impact you on your performance indicators.

MR. BECKNER: I'm thinking out loud too here. Obviously, if you fail the surveillance and the equipment is inoperable, and again, depending on the reason you failed it, there may or may not be enforcement. And I'm thinking if this allowance had been grossly misused, it may well show up in enforcement space. On the other hand, it could have just been a random failure that happened to occur. I mean, it probably would not be picked up, other than like Biff said, you factor it into whatever your normal reliability.

MR. REINHART: You might also consider back on the Reactor Oversight Program in the Significance Determination Process, this would likely be a performance deficiency, so you would perform an SDP. And the exposure time would then expand to that whole time since the last known availability, and that would increase the significance.

MR. LEITCH: Right. Thank you.

MR. ROSEN: Okay. Let's go on.

MR. DENNIG: Initiative 3 - Mode Flexibility. The impact of this change, the intent of the change is to allow to extend the flexibility first granted in Generic Letter 8709 to allow mode transition up in power with inoperable equipment while relying on compliance with the tech spec actions in the higher mode. The high-level summary basis for acceptability is infrequent use. It is on the order of two start-ups a year where this might come into play on average at plants.

Generic risk-analysis that Dr. Saltos has looked at in some detail. The need to perform a 50.65(a)(4) risk assessment, manage the risk of the transition and oversight of 50.65(a)(4), which was mentioned previously in another context. Reg Guide 1.182 referencing NUMARC 9301, and our inspection guidance on (a)(4).

At the present time, we're resolving comments that we got on the Federal Register notice that was published on August 2nd. We had a 30-day comment period, and basically at the moment, we're resolving issues of implementation logic and how things are worded in tech specs to get the concept

clear, as far as the specific words in tech specs.

MR. ROSEN: Have you gotten any substantive negative comments from members of the public?

MR. DENNIG: Substantive? Well, we have gotten comments that express concerns about general enforceability of (a)(4) because of the connection to reliance on (a)(4) risk-assessment. We have got one comment about, what about a situation where a licensee would feel that it was beneficial to routinely return to power with inoperable equipment? In which case, we have said we do not understand any circumstance like that where it would be routine. And that's not the expectation for how this flexibility would be used, basically the same answer that was given when the flexibility was first extended under 8709 to change modes up in power. Anything else?

MR. TJADER: I think you got the --

MR. DENNIG: Yeah, those are the major ones.

MR. LEITCH: I'm a little confused here as to whether this risk-analysis is performed to allow this tech spec initiative on a plant-by-plant basis prior to granting this initiative? If you're a plant and you come up with a specific situation, do you do

a risk-analysis for that specific situation on a case-by-case basis?

DR. SALTOS: No. What was done here was done a risk-analysis to identify the systems that would increase the risk the most, especially would increase the risk more than if the component or the system is taken out of power for the completion time we have for that system. Therefore, this flexibility is not allowed for these systems, and would be identified as more risk-significant.

For the other systems, it is allowed, but only if the licensee performs an analysis and more planning, and figures out that there's almost certainty that it is going to be fixed, without having to change power and come down again, which would be an unplanned power change, and could trigger a significant determination process, so they won't have any incentive in changing modes and going up in power and then come down again.

MR. DENNIG: So there was a generic analysis that was done that ruled out across the board for a given owners group certain transitions. You cannot go from four to three, you cannot go from three to two for the owners group based on a bounding generic analysis.

MR. LEITCH: Okay.

MR. DENNIG: The decision criteria for that was that we've never parsed out these modes to look at risk-significance in given modes in tech specs before. We tend to treat one through four as monolithic. It doesn't matter. They're all the same as far as tech specs are concerned, so now we've looked at that, and parsed that out. And in going up in power, we disallowed some of those things because certain systems are more important in those lower modes than they would be at-power. So those are hardwired into specs as disallowed.

MR. LEITCH: Okay.

MR. DENNIG: Okay? Now a plant comes in and takes that situation, they are still required, all plants, to pick that up, to do a content sensitive risk-assessment under the (a)(4) Program to determine that it is appropriate for us to use this flexibility, even though it's allowed, so that's the second stage of review.

MR. LEITCH: And that stage would probably be done when the plant was facing a particular situation.

MR. DENNIG: Exactly. To put it in context, in the same way that we had the -- for

extending completion times or AOTs under 1177, there is the requirement, was the requirement for a Configuration Risk-Management Program to look at more than just that component, to look across the plant configuration, and ensure that using that AOT was not inappropriate, given other equipment out of service, to give that multi-component across plant look.

So again here, we had a particular equipment out of service, going to make a mode transition. What does the rest of the plant look like?

MR. LEITCH: Right.

MR. DENNIG: What other things do I have out? I may not want to do that, given I've got another thing out. I shouldn't do that. And this one is kind of interesting in that the graded approach did come into play in deciding what to do with this initiative. The original desire was for plants to be allowed to use their (a)(4) Programs for all mode transitions without this prohibition on some transitions, and we said no, we're not ready for that yet. We're not ready to give that discretion entirely to plants based on our knowledge of what your (a)(4) Programs are. We're going to hardwire in the things that you can't do, the high-risk stuff, and not leave

that to your discretion.

MR. LEITCH: If you use this particular flexibility in a specific situation, then the allowed outage timer, so to speak, starts running when you make that mode change.

MR. DENNIG: Yes.

DR. BONACA: I have a --

DR. SALTOS: It starts running when the equipment is unavailable.

MR. DENNIG: Well, once you change the mode you start the clock, and you've got to live with the clock for that mode.

DR. KRESS: Yeah, and I have a question about that. Could then they invoke Initiative Number 4?

MR. LEITCH: That was going to be my --

DR. KRESS: Okay. You were coming to that. Okay.

MR. DENNIG: To extend the time. I believe that industry's concept is that yes, indeed, if I am smart enough to use 4, I should be smart enough to use it in combination with that. And that kind of remains to be seen.

MR. ROSEN: Well, I think what you're hearing, Bob, is that the Subcommittee is concerned

with patterns of abuse that might emerge, and so the question to the Staff really is, have you thought about that? And how would you detect that kind of thing? Do you have enough information to detect patterns of abuse in each of these areas? I think there have been questions about what if the licensee started doing this? What if they started missing a lot of surveillances? What if they started making mode transitions, and then invoking the extensions after that? Basically, using this new-found freedoms as mechanisms to relax their licenses inappropriately across the board, in a way that the Staff in aggregate would become uncomfortable with. Do you have any system or thoughts in place about how you might gain ongoing confidence that that is not occurring?

MR. DENNIG: Well, I think in each one of the individual initiatives, especially talking about the less sophisticated ones, we have always considered about how would we know about the behavior? How would we get information about the behavior, so the Corrective Action Program was put in for Initiative 2. There are some trip wires in 50.72 reporting, and in the Reactor Oversight Program for mode changes, where things do not work out where they had to come back down. There is 50.65(a)(4) Oversight as far as the

quality of the risk-assessments, so we have factored in oversight and how would we know as we've gone along.

We appreciate the feedback on the need to continue to do that, and to be sensitive to that, and recalibrate, perhaps, ourselves on how much emphasis we give to that, but that has been part of how we've tried to approach this.

DR. BONACA: And I think Mr. Rosen has well-described the concern on my part. For example, you made a statement before that a missed surveillance is a big thing in a plant today. It is. Is it because until now you have to report it and it was a measured issue, and you could have, you know, an action against you because of that, or that kind of thing? Or is it -- and so the concern here is, is it going to become less important just because there is no regulatory action? It just goes in the Corrective Action Program. That's something the plant lives with on a daily basis. There are many things going into -- and more important probably than missed surveillance going into the Corrective Action Program, so the concern there is really an issue on impact on safety culture of the plant, you know, what will you tolerate as an acceptable condition on a daily basis? And

certainly, the last thing -- I think, you know, I am supportive of all these initiatives. I think they're smart, they're important, they're necessary, but I believe also that we have to make sure that they don't result in a degradation of safety culture at the plants. And this surveillance will still be a big thing at the plant, even if you have a means of dealing with the Corrective Action Program.

MR. BECKNER: Let me just go back here. Let me see. I think we have to agree, and this is a new thought, I think. We have looked at oversight, and we've been very concerned with individual, but I think, Bob, I think we need to take it as an action, is what we haven't carried, I think you used the term "trends". Okay. Even if we may be looking at each individual licensee is going to be looked at through oversight as there's some big picture where licensees are starting to use this, I think as you pointed out here.

MR. ROSEN: I used the word "patterns of use".

MR. BECKNER: Pattern. Yeah. And I think that's something --

MR. ROSEN: People abusing their new found freedoms, it is not the intent of this thing to

stretch it in every single way that you can. I don't know if there are any licensees out there like that, but if there are, or there become licensees like that, they need to be dissuaded from using the --

MR. BECKNER: I think we need to think about that. That's a good point we should look at.

MR. REINHART: This is Mark Reinhart again. In agreement with everything that's been said here, probably the area of most sensitivity is not (a)(4). That's where we've pre-decided additional time for allowed outage times, but (4)(b), which is still in development, where a licensee would have the more flexibility to operate the plant, a couple of things have to happen there. You need a mature licensee, and we have to be sure of that. And you need a very high quality comprehensive PSA, so the players that don't have that kind of PSA shouldn't be allowed this freedom. And part of developing, putting forth the initiative develop the PSA is going to show something about the maturity. But I think you brought up a good point, along with that oversight program, along with the maturity, along with the initiative, we have to really keep an eye on those licensees to make sure that this is being applied appropriately.

MR. GRIMES: This is Chris Grimes. I'd

also -- I'd like to point out that as we looked at what are the elements of coherent risk-informed and performance-based regulatory program, one of the things that we've considered and the attributes of an effective regulator's perspective of what is risk-informed and performance-based is, how will the inspection program and the enforcement program evolve? And part of the sentiment underlying your concern about a potential for pattern of abuses really gets back to the effectiveness of our inspection and enforcement activities to reveal and embarrass utilities who might have the best PSAs in the world, and the best of intentions, but through sloppy programmatic activities, end up pushing the boundaries in ways that aren't too terribly risky on an individual basis, but end up showing these patterns of pushing the boundary too far. And that really gets back to our ability to be able to establish good performance measures that will reveal these programmatic weaknesses, potential patterns of abuse and, you know, in all of our experience regulating nuclear power plants, there's no malicious intent to be abusive. It usually ends up being trying to cut corners or save money, or work with limited staff, or overworked staff. And it is revealed in a

programmatic way, and it usually is pretty revealing. But for us to be able to sit here and say that we can demonstrate that our inspection and enforcement activities are going to ensure that there's reasonable assurance that, you know, loose or regulatory standards are not going to be abused, I think that's something that we're sensitive to in terms of how is the NRC's performance going to be measured relative to revealing those circumstances.

MR. ROSEN: I think that's all useful comments, Chris. I think the simple matter, and just as an example, and as an example only since you have to decide how you monitor this, but if the inspection reports from the residents just simply catalogue how many times they were used and for what reason, then somebody in retrospect could go back and look at that over time and make a table up. And you found one or two, or three or four plants that routinely use these things, I think that would be a useful regulatory tool.

MR. BECKNER: I'm not sure how to do that, but I share you concern. This one, for example, licensees I assume legally, and probably even safely could routinely schedule the final maintenance on some piece of equipment as they're going up in power. They

could actually put that into their schedule, I think, legally, and that would certainly not be within the spirit and the intent of this. Is that a fair assessment, Bob?

MR. DENNIG: Right.

MR. BECKNER: And I would consider that an abuse.

MR. ROSEN: Right.

MR. BECKNER: And if that was done routinely -- if it was done because they couldn't get a part in at the last minute, so forth, that's I think what the purpose is here. But if they were scheduling it like that, that would be an abuse. And I think, like I indicated, I'm not sure that we don't need to think about that a little bit more.

MR. ROSEN: There's a very big difference between scheduling it and having it happen to you under some emergent condition.

MR. BECKNER: And you're right. I think we need to say that we're going to think about this a little bit.

MR. SIEBER: On the other hand, if they did have that practice, there isn't anything you could do about it. Right? Other than say boy, I don't like those guys.

MR. BECKNER: I think -- that's what I'm saying. I think it's legal and it's probably safe but, you know, how safe is safe when you start abusing, pushing the envelope? You know, that's the problem.

MR. ROSEN: There may not be anything in a formal regulatory sense that you could do about it, but there's clearly a lot of things that the Staff could do about that kind of thing, simply by having a talk with the Chief Nuclear Officer at the place, and say this is making us uncomfortable. And most Chief Nuclear Officers that I know would take that very seriously.

MR. SIEBER: Yeah, but there might be an occasional one that says here's what it says. Here's what we're doing. We're okay.

MR. GRIMES: Yeah. But we also have the mechanism to use peer pressure. In some cases, the regulator doesn't necessarily jump in and point out bad practices, but what we'll do is we'll share that information with INPO and then we'll say, you know, what are the rest of your -- you know, what do your colleagues think about this kind of behavior?

MR. SIEBER: Yeah, I know how that works.

MR. ROSEN: What we're saying is there are

effective mechanisms to bring patterns of abuse that are making the Staff uncomfortable to the attention of people who can change the pattern.

MR. TJADER: And we have written into the SE that we don't expect routine use of it.

DR. SALTOS: Actually, it's supposed to be unintentional, and not used for operational convenience to extend the surveillance testing interval.

MR. ROSEN: Right. So doing what we're talking about here attacks the very foundation, the premise of the program.

DR. KRESS: I have a question. Perhaps this is for Biff. If the industry's peer review process for the PRA, would it come in and say now this PRA is acceptable for use for this purpose? Would that be one of the findings of that peer review process?

MR. BRADLEY: Currently, the peer review process per se just -- it does look at all the technical elements of the PRA. It doesn't make recommendations about specific applications, but part of the guidance we're developing for DG-1122, which is coming out -- which is going to invoke the ASME standard, and we have what we call a self-assessment

process. Once that standard comes -- once the Reg Guide comes out final early next year, all plants will have to do the self-assessment to look at not only -- you know, use their peer review results, and use those to look at the ASME requirements. And one of the conditions we have in that self-assessment is that you would develop a statement of applicability. So while it's not explicit now in the peer review process, we are moving to the point where we will have developed a statement of, you know, what applications will this support. So the issuance of a standard, I think will -- in the Reg Guide will provide more meat on the bones of these types of decisions.

DR. WALLIS: All this discussion about abuse seems to assume that the general industry view of what is abuse, or INPO's view of what is abuse is somehow consistent with what you think here is abuse, and this may be true at the moment. I'm not sure it's always going to be true.

MR. BRADLEY: One comment I might add is, even under the current system of tech specs, you know, you have an AOT, and there's really no prohibition on how many times you enter that in, other than the things we've been talking about like the oversight process which you the hit on unavailability but, you

know, any system is potentially subject to abuse. And all we're really trying to do here is provide more of a risk management --

MR. DENNIG: You can game the existing tech specs if you wish. That's entirely possible. They do not prohibit all kinds of imprudent behavior. In fact, (a)(4)'s impart a creation to control things that tech specs don't do a very good job in.

DR. BONACA: I agree that an organization like INPO and NEI have it all to play here, because I mean, I just want to remind that, you know, the reason why we have such outstanding performance right now in reactors really wasn't driven by tech specs. They were driven by an INPO commitment to zero defect, and all committed to following that principle of zero defects. You could run these power plants with 100 delpins really, if you really go by tech specs, and yet nobody is running these power plants if you have more than five or ten pin fails. So I'm saying that's an example where the industry set the standard for itself, and polices itself, and the standard is well beyond what a tech spec requires, so I am not skeptical the possibility of having the industry itself setting up certain standards of behavior that they're using judgment. And power plants care very

much about INPO and NEI think.

MR. ROSEN: Yeah, I think individually -- but also there's the mechanism that if the Staff finds that there have been patterns of abuse and neither INPO, nor NEI, or individual licensees want to do anything about that, the Staff is always capable of going back and revising the tech specs, change it back to the way it was. I mean, to simply say this hasn't worked for us.

MR. DENNIG: Okay. We make it to Initiative 4. Okay. Almost halfway through. Okay. Well, this is kind of like the -- this is the centerpiece of discretionary capability on the part of licensees, and has the strongest reliance on that capability and ethos of the initiatives.

In its essence, this would allow a context-sensitive extension of a nominal of a time that's in your specs for completion time, allow you to extend that up to a maximum based on your configuration risk-management assessment.

DR. KRESS: Now would that maximum represent some sort of a cap on the temporary CDF status, for example?

MR. DENNIG: The metric for that, I guess, is a temporary change to its ICDP.

DR. KRESS: ICDP.

DR. SALTOS: Yeah. The ICCDP is going to control -- for its out -- the equipment that you take out is going to control how long you can stay. You can stay more than the current AOT, depending on the plant configuration. But also, will be the risk metric for the delta CDF and delta LERF that will make sure the overall plant, or the risk would not increase on an average basis, on a yearly basis.

DR. KRESS: I have a question about that when apply the PRA with that piece of equipment out of service for a given amount of time, and try to determine the risk implications of it. Do you use Lambda T over 2?

DR. SALTOS: No. You use that only when you extend the surveillance time, the testing time. But you use the -- you calculate the increases in risk, what the condition of risk times the outage, which is a probability --

DR. KRESS: Times the real time.

DR. SALTOS: Yeah. And this can be statewide, because systems can go out and come in under repair. And when you reach a certain limit, you can not go any farther. And still there is a backstop also which cannot go back beyond that anyway.

MR. DENNIG: And --

MR. LEITCH: Would it be proper to think of this as almost eliminating the request for enforcement discretion? It seems as though many of the requests for enforcement discretion relate to extending out of service times.

MR. DENNIG: I'd have to answer that yes.

MR. LEITCH: Or are we just really moving that decision-making process back to the licensee, rather than having --

MR. DENNIG: I think that is one way to conceptualize this. This initiative and others address areas where there have historically been NOED situations. The missed surveillance one is another --

MR. LEITCH: Right.

MR. DENNIG: -- opportunity for an NOED. So yes, one way to conceptualize this is that rather than having a context-specific conversation usually late on Friday afternoon about a situation, wherein we get information from the licensee about exactly the same kinds of things, what's the rest of the plant doing? What corrective or compensatory actions do you have in place? Well, we've stopped doing all maintenance on this. We're quarantined that. We take that information then and make a decision. I think

it's fair to say what we're doing is saying okay, you've demonstrated to our satisfaction that you have the capability to use that same kind of information in a decision mechanism that we understand with certain limits. And yes, then we don't have to have this phone call.

MR. LEITCH: Yes.

MR. ROSEN: Now one of the ways of dealing with the Friday afternoon thing I described was to go to four day weeks, so then we'd have it on Thursday.

MR. SIEBER: Six day weeks.

MR. DENNIG: Okay. I guess the other point to make that hasn't been made so far, I guess, with regard to this one is that we are going to use a pilot plant approach. Industry is rounding up volunteers for --

MR. ROSEN: The usual suspects.

MR. DENNIG: Yeah, the usual suspects to pilot this concept, and we have in the coherence arena made a linkage between piloting this flexible completion time concept, and piloting the PRA technical adequacy standard that's now in play. And the -- I guess the other interesting aspect of this one is that that piloting process is not a tabletop exercise. It's kind of a live fire exercise, in that

we would be dealing with an amendment where we would be amending somebody's license in a pilot application, if you will.

We're not aware of anybody in industry who wants to run dual programs for a while so that we can see how those would work. From industry's perspective it's -- you know, they would like to propose an amendment, have us review an amendment, and then be granted that amendment.

DR. WALLIS: This backstop, there's a risk-assessment to determine the backstop limit. It's conceivable to me that that limit might turn out to be longer than any reasonable person would grant.

MR. TJADER: I think the backstop is, is because you find that the interval is so long that it's beyond what you're willing to accept. In other words, the backstop might be 30 days when it shows the system could be out for 180 days or something like that.

MR. BRADLEY: The backstop as we're envisioning it right now is really purely deterministic. It's a hard stop, regardless of the risk significance. Because you're right, certain components on an ICCDP could go out for many months without incurring a large risk delta, and the back --

the risk part of this, the ICCDP accumulation is controlled through the (a)(4) Plus Program.

DR. WALLIS: Well, I'm just reading the sentence, and they look to me is that the risk-assessment actually determine the backstop limits, and the backstop into something independent of the risk-assessment stops you --

MR. BRADLEY: That's right.

DR. WALLIS: Okay. Because the way the sentence is written, it could be that risk-assessment itself influences the backstop.

MR. DENNIG: Yeah. That's something that's hardwired into the spec.

MR. BECKNER: I think, Graham, the answer is more of what you said, it's a reasonableness limit. Like 30 days, you can fix anything within 30 days.

MR. ROSEN: Well, it's also a reflection of the fact that some things that are in tech specs and have requirements for surveillance tests and allowed outage times are actually a very low risk, probably shouldn't have been safety-related in the tech specs to begin with. So in those cases, it's not surprising to find that the risk analysis calculated 1121 days of operation is okay.

MR. DENNIG: Right. Which would get us

into Initiative 8.

MR. ROSEN: So at that point we say yeah, but you're running a risk-informed circumstance -- program, not a risk-based program, so we'll put a deterministic backstop.

MR. BECKNER: Right. And again, it's more of what's reasonable. You don't want to go out forever. You want to put some reasonable limit on how far you're going to let that --

MR. LEITCH: In a situation where a plant has been granted this initiative, is the intention that the present allowed out of service times would still appear in the tech specs, and you can only get through these risk-based calculations if it looked as though you were in danger of exceeding those?

MR. DENNIG: Yes.

MR. LEITCH: Excuse me?

MR. DENNIG: Yes. You keep your current time, and that's the time you play off of to either get it done by, or have the risk analysis performed by.

MR. LEITCH: Okay.

MR. DENNIG: And it's kind of interesting, that -- part of the reason for having that in there is an operator concern. They like to have something

concrete to play off of.

MR. LEITCH: Right.

MR. DENNIG: Rather than have something that says equipment out of service. Go talk to the planning and risk assessment operation and find out how long you've got to get it back.

MR. LEITCH: So it still does nominally --

MR. DENNIG: Yes.

MR. ROSEN: Now talk to me a minute about what happens if you're in one of those circumstances where you're using the risk-informed approach short of your backstop, and something else, some other additional failure occurs in the plant.

MR. DENNIG: You have to re-analyze.

MR. ROSEN: And it may have no affect on what you're doing, or it may have a significant affect.

MR. DENNIG: Right. You have to re-analyze.

MR. ROSEN: Okay.

MR. DENNIG: You have to see if that determination still stands up.

MR. TJADER: When multiple systems are out, the AOT could be much less than what's hardwired into the specs.

MR. ROSEN: So this says that here's a case where a rudimentary, I hate to use the word --

MR. DENNIG: No, this is not --

MR. ROSEN: This is not the place to have --

MR. DENNIG: No. Nobody is going to want to play in this arena that does not have a -- who has not internalized a risk-management approach to the way they run their plant, and has a very sophisticated capability.

MR. BECKNER: And I think one thing too, we've dealt with -- we've talked about expectations. We'll also -- this will be enforceable. We will have commitments to things that industry is doing right now, but this will be a tech spec required program, mostly likely with certain attributes.

MR. LEITCH: So if I understood what was just said a minute ago, I just want to hear it again and make sure I heard it right, where you have a particular system out of service and you calculated an allowable out of service time which is longer than that nominal time that's in the tech specs, and then something else -- several other things go out of service, and you redo your calculation. And you come up with an allowable out of service time that is less

than that number in the tech specs, than that is still governing in the situation.

MR. ROSEN: You may find yourself in the position where you have -- you're in 3.0.3.

DR. SALTOS: Well, the risk calculation you make doesn't make -- it's mechanics here. Right? Unless many systems, very important systems come out at the same time, that will jump out --

MR. DENNIG: Right. But if it turns out in the emerging condition that the restoration time for a high importance piece of equipment is going to be longer than the time that you show is acceptable, then you're going to have to come down in power. You're just going to have to give it up and come on down.

MR. ROSEN: Well, yes. And I think but if you step back for a minute and think about that circumstance, that's the right thing to do. Your analyses have now actually reflected the fact that the plant is a degraded and an up condition that the prudent thing to do is to take it out of the modes of operation where that degradation can have a significant impact on its ability to withstand the effects of an initiating event.

MR. DENNIG: Yes, that's the -- right.

Instead of having a set of limiting conditions for operation that have conceptualized individual component states and limited actions for a limited set of configurations, we have the ability to use a system that looks at many configurations and adjusts completion times based on those configurations, so we've gone from pre-scripted scenarios for a limited number of configurations, to the ability to look at real-time --

MR. ROSEN: This is fairly sophisticated dynamic regulation.

MR. DENNIG: Yes. Well, Bob was using the term --

MR. LEITCH: That very point though, some critics may say that risk-informed regulation is really just a euphemism for relaxing things, but in that example, for example, to use that as an example, that's a case where the risk-informed regulation matches the situation at-hand, and actually may prescribe a more severe action than what might otherwise be required.

MR. DENNIG: Yes. I don't have any proof of this, but the general idea is that tech specs are only very -- they are conservative and limiting for one component at a time situation.

MR. LEITCH: Yes.

MR. DENNIG: And (a)(4) in multiple component-out configuration assessment is more limiting than the tech specs for multiple components.

MR. ROSEN: Right. So this will more clearly reflect that.

MR. DENNIG: Right. So this brings the tech specs --

MR. ROSEN: A degraded plant could continue to operate through this, potentially, under the existing tech specs, would not be allowed to operate under these new rules. Well, it's this two-edged sword business.

MR. DENNIG: Okay. Initiative 5. This is somewhat separable from the other initiatives. It works in another area. This is the first time --

DR. KRESS: I'm still a little confused. Let's go back to 4. If I want to extend an outage time for some piece of equipment and I go to my PRA and calculate -- what do I calculate, an absolute CDF or a delta CDF?

DR. SALTOS: Calculate the core damage probability and early release probability.

MR. DENNIG: But you're going to do the delta CDF and then apply a time to that.

DR. KRESS: Those are deltas.

DR. SALTOS: It is conditional times AOT.

DR. KRESS: Times AOT.

DR. SALTOS: We will have a limit on that. If you list that --

DR. KRESS: Okay. You're --

DR. SALTOS: And that limit cancels the configuration of the plant.

DR. KRESS: So you're actually limiting the delta.

MR. DENNIG: Yes.

DR. KRESS: Which goes back to an old issue we had, that tends to penalize the good plants more than the poor plants if you could have the demarkation.

MR. ROSEN: No, I don't think so.

DR. KRESS: If we're only dealing in deltas.

MR. ROSEN: I don't think so. If you're really using the PRA to calculate the delta, then the PRA, if it's a good PRA, reflects "good plant's" more robust configuration, and the incremental risk for unit time is less for a plant with more robust systems than one that's not as robust.

DR. KRESS: Yeah, but you might want to

reward him for that by letting him have a bigger delta because his absolute status of risk is so much lower than these other plants. Whereas, this restricts him to the same delta, even though maybe he'll meet that delta, but --

MR. ROSEN: Yeah. I think that's where the benefit comes in. And maybe all plants have the same maximum delta, but when a plant with only three tires gets there quicker than a plant with four tires, and so with less allowable time in that configuration.

DR. KRESS: Yeah, I still think there's a penalty there for the good plants. There is a little offset doing that.

MR. DENNIG: Initiative 5, Relocation Surveillance Test Intervals. The concept is one where the surveillance requirement, the requirement to perform the surveillance in its nature to the extent it's described in the tech specs, stays in the tech specs and the frequency column then just says in accordance with licensee's program to determine surveillance test interval. And there is a program that's described in Section 5 of tech specs, that would describe the attributes of that program for calculating those surveillance test intervals.

DR. KRESS: What does this do for the licensee, give him the ability to change it --

MR. DENNIG: Well, certainly it does that, and that it does not require license amendment to adjust the surveillance interval.

DR. KRESS: Yeah. He gets away from --

MR. DENNIG: Right. It's my understanding that the Maintenance Rule adjusts surveillance or testing intervals, maintenance intervals in general to keep equipment healthy and minimize the number of maintenance-related failures. And in essence, this would allow a licensee using approved reviewed methodology to merge the adjustment of surveillance intervals in the same way that they can adjust maintenance intervals under the maintenance program.

DR. WALLIS: Can they cherry pick here? Can they just sort of pick the intervals where they think they're going to gain something by using risk insights, because some of these risk insights might actually lead to shortening of the interval, but they may choose not to adopt those, or not to apply for those. Do they have to do it across the board, or can they just cherry pick the ones that benefit them?

MR. DENNIG: Well, the history of the program is that we allow selective implementation.

That's a good question.

MR. TJADER: But I think if they adopt the program, that the program would have to be applied consistently to all surveillance test intervals.

DR. WALLIS: You would say that? Okay. That's okay.

MR. TJADER: Yes. You wouldn't adopt a program and say it only applies to half your surveillances.

MR. ROSEN: Well, I think in practice what happens, Graham, is you start going down this road. You set up a committee or a system to do it --

DR. WALLIS: You do the whole thing.

MR. ROSEN: -- and those folks do it system by system, and they adjust it, and some of them get longer, and some of them get shorter. And that's just the way it is.

DR. BONACA: And this is, you know, a great initiative anyway, because I mean, long time ago used to be some of these intervals, they didn't have a reliability-base or anything. I mean, they were just picked from other tech specs at some other plants, and so there was not -- and now this is an opportunity to risk-inform it truly.

MR. ROSEN: And performance-base them, as

well.

DR. BONACA: Yeah. Performance-base too.

MR. ROSEN: The committee that decides this is also looking at the experiences that there's no risk, and every time we go take them apart it's been fine. We're really hurting the reliability of the component by taking it apart. You should leave it alone. That's one way to reduce risk, is to recognize that fact.

MR. DENNIG: Okay. This is another initiative where we have CE Owners Group is active and others are going to benefit from their experience. This addresses those situations and technical specifications that we refer to as 3.0.3. shutdown situations. The general spec for -- where 3.0.3 is invoked is -- there are a number of way it's invoked, but the shutdown track itself is to begin an orderly shutdown within an hour, be in mode 3 in seven hours, and mode 5 in 37 hours. And owners groups, in particular GE Owners Groups believe that for -- and this is for situations where there's a loss of function as defined -- as bracketed by what's in the LCO. And in those situations, they feel that they can provide an argument for why there should be longer times provided to repair that equipment before

proceeding to mode 5. And the underpinning for that, I understand is fairly quantitative as provided in the CE Owners Group topical, and Dr. Saltos is looking at that right now. But that's the gist of it, that particular aspect.

MR. ROSEN: Well, it's still a little puzzling, I guess. Maybe Nick can talk about it, but the way you get into 3.0.3 is like an all-encompassing spec. There's a lot of doors into 3.0.3. You can get into 3.0.3 from a lot of different circumstances, so how are you going to do some sort of bounding oh, it's okay. I can extend 3.0.3, when what gets you into 3.0.3 may be an individual circumstance is what really matters. See what I'm saying?

DR. SALTOS: What we have here is a generic analysis and is applied to specific cases. In other words, we know that most HPCI problems are found to be inoperable, so we -- according to current regulations we're supposed to start shutting the plant down within an hour, so what this is going to do, it will go from one hour to four hours, so they can give some time. Many, many times they believe that the plant -- the system is not really inoperable. They want to find the paperwork or something, that they one more time to -- before they start shutting the plant

down. And that will avoid, of course, the transition risk to having to shut the plant down. That's an example. There are some other systems also that are involved. Most of them are systems for radiological control that don't impact the CDF or LERF.

DR. WALLIS: You assume that giving more time and gathering more information might lead to not having to shut down, and therefore, that would be a less risky course of action.

DR. SALTOS: Basically what they do, they use the risk-informed regulatory guides, like 174, 4177 to assess the risk, and using those, and they show the risk is not significant, and then they consider defense-in-depth and some other systems might be performing the same function. And based on that, they recommend a certain extension of the time to start shutting down. From one hour up to twenty-four hour period.

MR. ROSEN: So when we're talking about risk-informing 3.0.3, you're talking about in the context-sense of the --

MR. DENNIG: Yeah. I'm going to have to reword the way we portray this. Basically what it is, is those places where this "LCO 3.0.3 shutdown track" is invoked, they're being examined and replaced with

a shutdown track that is analyzed in the context of the affected equipment. This is not a monolithic let's change 3.0.3 to be forty-eight hours before you shut down.

MR. ROSEN: Right. As long as its context sets that --

MR. DENNIG: Right. We've got to change the way we do these slides.

DR. BONACA: And there are cases where you're better off not to shut down.

DR. WALLIS: Well, this risk has to be evaluated ahead of time. This is a pre-evaluation, so you don't do it on the fly. You say oh, now let's do a risk-analysis, you're not quite sure if you want to shut down or not.

MR. ROSEN: No. I think in this case what I understand you're talking about is doing all that analysis up front and allowing it for certain context-sensitive situations, but not for others.

MR. DENNIG: Right.

MR. TJADER: But if there are multiple systems out again, the risk-assessment would take that into consideration.

MR. ROSEN: Right. There's always got to be the emerging circumstance where you allow someone

to stay out of 3.0.3 because the context is okay. Then something else happens, changes the context.

MR. DENNIG: Seven - Risk-informing support equipment impact. This one is kind of tied up in the way tech specs are done, and where the boundaries are drawn between equipment covered in tech specs and equipment outside of tech specs that affects the performance of the equipment in tech specs.

The basic thought is that there are some features like snubbers that provide seismic support, and barriers that provide flood protection, that in a strict interpretation of operability as it applies to tech spec equipment cause you to declare tech spec equipment inoperable, and enter completion times, action statements and completion times. And that under the circumstance, the degradation represented by the lack of the barrier, the removal of a snubber, that the provided completion time for the supported equipment in tech specs is too severe. It's not appropriate. It's not commensurate with the risk posed by the degradation of the supporting equipment, and so industry is proposing a -- basically so far just an approach that attempts to parse the risk looking at initiators that are involved and the importance of affected equipment, to demonstrate that

there should be additional time permitted with supporting features outside of tech specs that are degraded beyond that what's just allowed by the completion time that's in the spec for the support equipment, so we're still working on that.

One way to think about this is that it is in some sense a risk-informing of operability, which is something we are conceptualizing for capital operability for stuff inside of tech specs, and this kind of starts with operability as it relates to supporting functions outside of tech specs. Sort of risk-informing that notion.

DR. BONACA: Those are the conditions that are normally called functionable but not operable. They're using that --

MR. DENNIG: That's part of the picture, is how to make those distinctions, and what does that -- and to better define that distinction.

DR. SALTOS: Basically, they are functional, except for very low frequency conditions, like a fire is going to start in the next room and propagating here an earthquake is going to --

DR. BONACA: Then the probability is tied to the --

MR. SIEBER: External flood or something

like that.

DR. BONACA: Or a seismic event.

MR. LEITCH: So this would strike to the definition of operability then. In other words, I mean, there's a very sharp line now between systems that are operable and systems that are not operable. And this is sort of a quasi-operable status defining that, if I understand what you're saying.

MR. DENNIG: We've broached that subject before in this notion of degraded but operable, in terms of the equipment that's in specs, and as I said, we have, in another area we're revising some guidance on operability, and this is part of that whole re-review of what operable means, and how could one risk-inform that concept, should one risk-inform that concept.

MR. ROSEN: I think that's very good.

MR. DENNIG: Initiative 8 - Risk-informing tech specs. Comes in two flavors, short-term/long-term. One portion of this initiative seeks to look at systems that are, or LCOs that are currently in specifications, and refine arguments about whether they are or not risk-significant. There are certain things that are in tech specs, that as a result of the final policy statement in `93 were declared to be

risk-significant, and are in technical specifications. That's RCIC residual heat removal, standby liquid control, recirculation pump trip, and remote shutdown instrumentation, that one might with refined risk-analysis somehow argue that those things are not risk-significant, and then have them relocated out of technical specifications. And as I say, that's a short term issue, but it does get into providing a better understanding of what it is -- how it is we decide if something is risk-significant or not in accordance with Criterion 4, which says that, "A structure, system or component which operating experience or Probabilistic Risk Assessment has shown to be significant to public health and safety." And this is where the coherence aspect comes in with the categorization schemes based on risk, and we want to make sure that we interpret risk in this venue as far as determining what equipment has to be in specs in a coherent way with how similar decisions are being made elsewhere. And that thought carries over into the more ambitious aspect of Initiative 8, which is where we conform the scope of tech specs to be the risk-significant SSCs. And somehow get away from the other criteria that are currently in 50.36 that relate to, I hate the term, but deterministic or design-basis

reasons for why things are in technical specifications, installed instrumentation for detecting leakage, process variables, operating restrictions, and primary success paths that rely on some risk conceptualization to draw the boundary around those things that have to be in tech specs. And that's a rule making thing. And that's what I have.

MR. ROSEN: Very interesting.

MS. WESTON: I have a basic question, Bob. I assume that these initiatives have a starting point at the standard tech specs, that the assumption is that the licensee has the standard. Is that a fair assumption?

MR. DENNIG: No. That's an assumption for the formulation of the generic translation from the concept end of the specs.

MS. WESTON: Okay.

MR. DENNIG: Okay? But there is no prohibition on a plant that hasn't converted to picking up these initiatives. There's just additional work that we have to do. For example --

MS. WESTON: You will treat it on a --

MR. DENNIG: -- Initiative 2, we have -- yeah. We have non-converted plants coming in to pick

up Initiative 2, Missed Surveillance Flexibility. And we look at their formulation of how it's implemented in their specifications to make sure it has the attributes, the supporting attributes that are found in the standard. And if they don't -- if it's not there, then we tell them they've got to put it in, and Bob Tjader can speak to that. We look at every one of those and advise the PMs, Project Managers, on whether or not this particular plant's formulation of that is acceptable. And so yeah, there's more work. There's just more work if you don't have a standard.

MR. ROSEN: Now I understand, Mag, is that we're going to be asked to write a letter on this. Is that right?

MR. DENNIG: We weren't looking for one.

MS. WESTON: They aren't looking for a letter.

MR. DENNIG: No. We're just --

DR. KRESS: Is this on next week's agenda?

MS. WESTON: Yes, it is.

MR. ROSEN: Just for me to brief the rest of the Committee.

MS. WESTON: No. It's on for presentation from them.

MR. ROSEN: Okay. So there's no letter,

and no briefing by me. It's just you guys come back and kind of shorthand this thing for the Full Committee.

DR. KRESS: Bob has to go every initiative. Question on a slide submission. Option 2 uses risk-importance measures to determine risk-significant SSCs. In the past, the ACRS has had a little bit of difficulty with that. For example, how do you set the threshold, and do you thresholds, and how do uncertainties enter into that. You figure that that will get ironed out under Option 2 somehow, and then you're all right by using the same SSCs here. Is that --

MR. DENNIG: Frankly, the degree to which we've pursued that line of thought is - somebody else speak up if they're thought about it more than I have - is just that there has to be some conceptual coherence between how we're doing it in one place, and how we're doing it in the other, so we're not --

DR. KRESS: Oh, I understand that. Yeah.

MR. DENNIG: You know, that's really important, and you have to have special treatment for that. But oh by the way, it doesn't have to be in technical specifications.

MR. BRADLEY: I'll take a shot at it

maybe. We are aware of -- we've had considerable dialogue with the Staff and with ACRS on the 50.69 Guidance, sensitivity studies, importance measures, all of those issues. And we do believe in the course of finalizing that, we will resolve all those issues. And we see no reason that, you know, once that's done that the Guidance of 50.69 and the guidance for categorization wouldn't apply here, and that there's no need to go reinvent the wheel in tech spec space. We think we're going to have every aspect you need to consider for categorization in there by the time we're done with that.

MR. ROSEN: I think trying to do other than what this suggests wouldn't make any sense at all. It would create questions about the approach. Okay. Well, I see that the time is ten minutes after ten.

MS. WESTON: For our Full Committee we would ask that you limit the background information and introductory kind of information because we have limited time.

DR. KRESS: How much time?

MS. WESTON: One and a half hours.

MR. DENNIG: What we did -- we've done this before. We -- I don't think I mentioned at the

beginning, but we briefed -- on April 28th, 2000, we briefed the combined Subcommittees on what we were doing in this area, and we came back on May 11th and reprised for the Full Committee. And what we did there was we reflected on what we had heard from the Subcommittees and fed that back to the Full Committee.

DR. KRESS: You know, this Subcommittee didn't take much longer than an hour and a half. But you know, you don't have to show it in this version.

MS. WESTON: No, we're still --

DR. KRESS: Because we've already asked our things. Now we just --

MR. ROSEN: Now Dana and George could take up as much time as this whole Subcommittee.

MS. WESTON: Right. You still have the same amount of time.

DR. BONACA: Is there a portion of that full meeting session in case --

MS. WESTON: No. The Industry Trends Program will not be presented at the Full Committee. No.

DR. WALLIS: I think they should.

MS. WESTON: Sorry.

MR. ROSEN: So you have to come back, and we'll look forward to seeing you again. Now we'll

stay on break until 10:25. Thank you. 10:30.

(Off the record 10:16:53 - 10:42:49 a.m.)

MR. ROSEN: We are back in session now. I remind you all that a transcript of this meeting is being kept, and will be made available as stated in the Federal Register notice, and it's requested that speakers use one of the microphones available, identify themselves, and speak with sufficient clarity and volume that they can be readily heard. And we are here to discuss the Industry Trends Program, and Integrated Industry Initiating Event Indicator, I guess. Mr. Tom Boyce.

MR. BOYCE: Good morning. I'm Tom Boyce of the Inspection Program Branch of NRR. With me today is Cindi Carpenter, my Branch Chief, and David Gamberoni, my Section Chief of the Office of NRR. I'll be opening up the presentation, and then turning it over to Dale Rasmuson of the Operating Experience and Risk-Assessment Branch of the Office of Research. And with Dale is Pat Baranowsky, the Branch Chief in Research.

The main focus of this presentation is on a developmental effort that research is doing in support of the Industry Trends Program. And what we're attempting to do is look at the most significant

initiating event indicators and bring them together at the industry level into a single index. And we've tried to settle on an acronym, and I think we came up with IEP, although I think Dale's got another I on there, but that's the acronym you're going to see.

I thought I'd open up with an overview of the Industry Trends Program. You've seen this pitch before in the May time frame, and I've shrunk it down a bit, but it's to refresh your memory on where we are with the Industry Trends Program, and then I was going to turn it over to Dale to describe the IEPI.

Just keep in mind that this is a developmental program. We anticipate coming back to you on this and other aspects of the Industry Trends Program in the future. We've covered that slide. If I had more time, I was going to replace the eagle with a Jack-O-Lantern, but I couldn't do it.

MR. ROSEN: That's all right. Next year.

MR. BOYCE: Next year. Right. Well, it was going to be on -- the briefing was going to be on October 31st, and I got pushed back by one day so we'll do it next year.

Just to give you a frame work of where we are, I picked one of the indicators that we're using in the Industry Trends Program, and if you recognize

this, it's one of the indicators that was used by the former office of AEOD as part of their PI program. The Office of Research picked up the indicator program, and it was in the Office of Research for a couple of years in Pat's branch, and then it shifted over to NRR, and I'll get to that in a second. But what you're looking at is automatic scrams while critical, and we've kept good data since about 1988. And as you can see, it's a downward trend. This would obviously not be an adverse trend. An adverse trend would be one that would be sloping slightly upwards.

This is what we're going to cover today. I'm going to give you some background. I'll go over the purposes and role of the Industry Trends Program, how we communicate with our stakeholders, some of the concepts that we used in developing the Industry Trends Program, our process for industry trends, and give you a snapshot of some of the development efforts that are currently ongoing.

MR. LEITCH: Back on the first slide, there's some equations there. Do those equations -- does that describe the line?

MR. BOYCE: It describes the trend line, and I think it's simple linear regression.

MR. LEITCH: Uh-huh.

MR. BOYCE: And the R value tells you the goodness of fit for the line on the data.

MR. LEITCH: Okay. Thanks.

DR. KRESS: Is there any reason why you've chosen exponential --

MR. BOYCE: Actually, I think you can.

DR. KRESS: It's because it'll never go zero. Is that one reason?

MR. BOYCE: Well, not explicitly, but --

MR. RASMUSON: If I could answer that for you, basically it's the model that fit the data the best.

DR. KRESS: Okay. You've got the best R out of the process.

MR. ROSEN: I think besides the fact that things are getting better, I think the other thing you should realize is they haven't gotten any better since 1997. It's been five years.

MR. BOYCE: Yeah. Actually, that kind of jumps to one of the points I was going to make later in the presentation. But the point that was just made is if you look at about 1997, you could almost if you wanted to draw two lines. A line from here to 1997, and a line from 1997 on, and from 1997 on, you could draw a flat line. And I'll come back to that in just

a second.

DR. SHACK: It's just the way the report has it.

MR. BOYCE: Oh, the research report? It gives you -- well, as background, improving industry trends contributed to the decision to revise the Reactor Oversight Process in 1998 and 1999. As you recall, we initiated the revised Reactor Oversight Process in April of 2000.

At that same time, the NRC Strategic Plan was revised, and it incorporated a new performance goal measure of no statistically significant adverse industry trends in safety performance. The NRC reports on these performance goal measures annually to Congress as part of its Performance and Accountability report, so partially in response to that, NRR initiated a formal Industry Trends Program to make sure we could report against that Performance Goal Measure, and also to monitor how conditions were continuing under the current Reactor Oversight Process.

We built on the work that was done by the Office of Research, and as I said, it was kind of a descendant of the work that was done by the former Office of AEOD as part of their PI program. NRR and

Research provided an initial report in the first SECY listed, and we've provided our second annual report in SECY-02-0058, which I believe you've all been provided a copy of.

We briefed you in May. We also briefed the Commission as part of the Reactor Oversight Process in May. And the bottom line is we've identified no adverse industry trends to date.

MR. LEITCH: Over what -- it seems to me you have to have a time period which you're examining. Is there one particular standard time period that you looked at?

MR. BOYCE: Well, we report to Congress. We reported each of the last three years, I believe, and so we've looked at each fiscal year. And so we've made the call, there's been no adverse trends in each of those fiscal years. And what we use as our basis, if I could go back, and I'll be jumping ahead a little bit. We have eight indicators that we use to make the call of no adverse trends, and we draw that trend line. And if we're here, and we're looking back at fiscal year 2001, we would still -- we would say that in fiscal year 2001 there were no adverse trends identified based on the long-term downward slope of that trend line.

MR. SIEBER: What if in 2002, the number came out .7. That, to me, over the last five years would be an adverse trend. Would you report it that way, or would you say well, you know, fifteen years ago we were really terrible, and so we look good now.

MR. BOYCE: Another really good question. What we did was define trends to be over a long period of time, and in this case, 1988 using this indicator. But what we were concerned about was if we do that, we will miss those short-term up-ticks, but we didn't want to get into knee-jerking to indicators that went up slightly, and so we actually developed a concept, a statistical approach where if it went above a prediction limit, as we call it, a statistical approach based on 95th percentile prediction, that if it went above this limit, something was occurring beyond random variation in the data. And that was articulated in both of those SECY papers.

In fiscal year 2001, we did have two indicators that did go up above the prediction limit, that turns out automatic scrams while critical was one of those. I think the prediction limit was 0.55 and we were at 0.57, so we did do an investigation. The results are in the SECY paper, but we concluded after going through it that there was nothing that was

significant that we needed to comment or, or report to Congress. So I guess to rephrase that, we used a short-term approach called "Prediction Limits", but it's not an adverse trend. It's just a means to detect short-term up-ticks and detect them before they manifest themselves as adverse trends. Okay?

MR. SIEBER: Well, I think it's good that you're doing something about the short-term anomalies that occur. You know, I think that's the right thing to do.

DR. WALLIS: I think to define an adverse trend as deviation from the historical trend, which is not necessarily adverse. I mean, this is going to level off at some time, so you may at some time have to draw a horizontal line instead of the exponential, and use that as the baseline.

MR. BOYCE: I think you're correct. Let me try and walk through a couple of more slides, and we'll tell you how we're trying to approach that problem. This slide outlines some of the purposes of the ITP and how it fits into the existing framework of NRC process. It provides a means to confirm that the nuclear industry is maintaining the safety performance of operating power reactors, and we hope that by clearly communicating that performance, we will

enhance stakeholder confidence in the efficacy of the NRC's processes.

It's not intended to replace the plant-specific oversight that's provided by the reactor oversight process. That really is how we're looking on a plant-by-plant basis at how safety is being maintained, but it is the picture from 10,000 feet. And if we see a problem at 10,000 feet, we would turn it over to our generic communications process, which includes a cost benefit-type of look at whether we need to expend resources on it, or we would turn it over to the generic safety issues process in the Office of Research.

MR. LEITCH: What concerns me is that you may not see a problem from 10,000 feet and draw the wrong conclusion. In other words, what we're really looking for I think in most cases is not the average, but the outliers, for example, just to use this data. And if you had one plant that was having ten scrams per year, the industry average might not be affected by that yet, but yet it is a significant issue, but it wouldn't be revealed with this program.

MR. BOYCE: That's right. And that's why this program actually compliments that plant-specific oversight. Assuming your example of ten scrams per

year, Reactor Oversight, that would have tripped the green-white threshold, at least for the ROP, and so it would be addressed under the ROP on a plant-specific basis. And we are just trying to see okay, even if everybody's below all thresholds, do we still have a problem, and that's what this program is trying to pick up.

MR. LEITCH: Would you say that this is primarily directed towards outside? I mean, it seems to me it's -- I'm not real sure what the value of this program is with respect to internal NRC actions. I mean, so you make a report to Congress based on this data.

MR. SIEBER: That's a good reason to do so.

MR. LEITCH: Yeah. It's a very good reason to. Yeah. What I'm saying is, does this initiate any internal actions by the NRC?

MR. BOYCE: Well, we're still feeling our way through the issue. I mean, the Office of AEOD did not tie the indicators to specific actions. We are attempting to do that, and what we've said is that we would look at using generic communications. It may be something as easy as an information notice. You know, we would do some initial research on our own, and try

and see if we could come up with some contributing factors. And if they were significant, we would publish some form of generic communications. We haven't done that yet. And the example that we've done so far is the investigation where we exceeded the prediction limits.

MR. SIEBER: Uh-huh.

MR. BOYCE: And that data is in, I believe, Appendix 3 to that SECY paper. And we took automatic scrams while critical, which went up slightly, and we broke it down into its constituent components, and we looked at whether it was manual or automatic scrams were changing. We looked at the causes of the scrams. We looked at the plant conditions at the time of the scram, you know, whether they were start-up, shutdown, at-power, low-power, high-power, that sort of thing. And then we tried to graph all those and look for trends there. And the bottom line is we didn't find anything, but that's the approach that we would take. And if we did find something, then we would probably consider publishing that information in an information notice. But we haven't gotten there yet, and so I don't have a good example to point to to say this is exactly how we'd approach it.

MS. CARPENTER: This is Cindi Carpenter from NRR. That's one of the things that we need to be looking at as we continue the development of this program, is what action when they exceed different limits or thresholds, what action should the agency take, so that's going to be part of the development of those.

MR. LEITCH: Okay. And I guess really what concerns me is not so much -- well, that's one issue, what action do you take when you see a change, but we also have to be careful that we don't infer that everything is okay when we don't see a change, because the view can be lost in the many here, is what concerns me. But there are other programs, as you quite properly pointed out --

MS. CARPENTER: Exactly.

MR. LEITCH: -- that should focus on the few.

MS. CARPENTER: Right.

MR. BOYCE: And one of the things -- I'm actually well ahead of my slides now, but one of the things that we were looking at doing was although we have a subset of indicators that are at a high level that we're saying where we're going to make the call and report to Congress, there's nothing stopping us

from taking a look at numerous indicators. And if we see something in those numerous indicators, we could pursue it. And you'll see that we are developing additional indicators, and we haven't, as we call it, qualified them for use for reporting to Congress. But I think we're up to on the order of 25 to 30 indicators, so we hope that we have a relatively robust set of indicators by the time we're done, and we're always looking to develop additional indicators. Hence, the initiating event performance index that you'll see here, and also the sequeing a bit, in that SECY paper 02-058, there were ten indicators for initiating events that we included in one of the appendices, and we're rolling that up into a single indicator that we would hopefully foresee as our report to Congress, although we would monitor at the lower level.

MR. LEITCH: Thank you.

MR. BOYCE: Okay. This is how we communicate with our stakeholders. We communicate in a variety of ways. We provide status of ongoing development efforts to industry as part of an NRC industry working group on the Reactor Oversight Process. And I guess we've done this about quarterly, but I'd also characterize those discussions as still

in the early stages. Every time I brief, I get a little bit more feedback, and a little bit more help, so I think we've got a ways to go there too.

We published the industry indicators on the NRC's website. They've been there for the past year. We've provided an annual review at the Agency Action Review Meeting, and we also provide an annual report to the Commission. I already told you we reported to Congress annually, and many of our senior managers use these indicators at various presentations at conferences with industry.

I've alluded to a lot of what's on this slide.

DR. WALLIS: I'd say I have used these in courses in university.

MR. BOYCE: Well, I just -- let me add that bullet. Well, thank you for that feedback. That's -- Senior Management. All right. We started by --

DR. WALLIS: It's the public, not management.

MR. BOYCE: Okay. To develop our initial set of indicators, we used the indicators in the former Office of AEOD PI Program. There are seven indicators. We also are using one of the indicators

out of the ASP Program. To refresh your memory, what we're using is total counts of significant ASP events as our indicator, and that's also in that SECY paper.

We're developing additional indicators, which I alluded to before. We're trying to aggregate the information supplied by all plants as part of the ROP, and do single indicators. And that amounts to nineteen additional indicators that we're currently developing. We're developing PIs from operating experience, and you'll hear more about one of those in just a second.

I already alluded to this hierarchal approach, that means we have a qualified subset of our indicators we use for reporting to Congress, but if we do see a problem, we would break it down into its constituent components, and look for problems.

This is our current process for industry trends. Basically, we're trying to identify whether any adverse trends exist. If any did, we would evaluate the underlying issues and assess the safety-significance, and then we would take appropriate agency response in accordance with existing processes. And finally, the program is reviewed annually at the Agency's Action Review Meeting.

To come back to Mr. Wallis' question I

think earlier, the way we identify adverse trends right now is we apply a statistically fit trend line to the data. I showed you that graph before on scrams. We apply that trend line. If the trend line is, as we call it, improving or flat, there's no adverse trend. And we don't say declining, but sometimes an improving trend could actually be going up, but we call it improving or flat. There's no adverse trend, and you're done as far as reporting to Congress.

However, if there is a degrading trend line, meaning the trend line in general would be sloping up, that is considered adverse, and we would report that to Congress and initiate an evaluation.

DR. KRESS: Now just a sloping up is all the criteria you need? You know, I would have thought you did this statistical analysis to get rid of some randomness, and require it to see a certain threshold or something.

MR. BOYCE: Yeah. And I think what we're saying is, is you've got to -- it's got to be a good fit. And I think we said like at the 95 percent confidence level, you can draw that trend line. Some of the indicators, not the ones -- some of the ones even in the AEOD PI Program, you can draw a trend

line, but you won't get a 95 percent fit. And so actually, for that case, even if you had a trend line that would have been sloping up, if you could draw it, it's not an adverse trend because it's not statistically significant. Okay? But that's only one part of the answer.

If it's going up by .05, you know, degrees or something, whatever the right value is there. If it's only going up by .05, the quandary we find ourselves into is that's nearly flat, so how do you report to Congress that it's just that slight upward slope? And so what we're trying to do to solve that problem is go away from a trends-based approach into more of what we're calling a thresholds-based approach. And again, a description of that is in both SECY papers, but for scrams, for example, in 1988 we were at about 2.4 scrams per plant per year, automatic scrams per plant per year. And in 2001, we're at .57 automatic scrams per plant per year, so even if the trend went from .57 to 1, which would be adverse, it still may not be significant from a safety perspective, so our challenge is to try and come up with a threshold below which - I hesitate to use the term it's below regulatory concern because of the connotation that that brings up - but below which we

would not -- we would monitor, and we would look for emerging trends so that we could correct them before they became safety significant. But we wouldn't necessarily take action until it crossed that threshold, so we're trying to get to a threshold-based approach rather than a trends-based approach, and I hope that answers your earlier question about we're approaching it as --

DR. WALLIS: Well, that's very different though. I think that thresholds for agency action are one thing, but trends that you show the public are different. I mean, showing that all these indicators are improving exponentially is a very good thing for public relations, and if you start now saying ahh, but if it's going to go up to 1, which would be an adverse trend in that sense, we're not going to do anything because we have a threshold, that's changing your purpose of your trends program.

MR. BOYCE: Well, you're correct.

DR. WALLIS: In other words, changing this particular public use of the trends program.

MR. BOYCE: You're correct. We would have to consider the presentation, and hopefully, the trend line that we drew. And I'm jumping to where a threshold might be, but I hope the threshold might be

at say three scrams or higher.

DR. WALLIS: Yes.

MR. BOYCE: Okay? And so any trends that we show would be underneath the threshold. I hope when we develop thresholds, we --

DR. WALLIS: Well, I think you need to have a trend which has a message, and then you need another message which is when do you take action, and that means where you bring in thresholds.

DR. BONACA: Well, as you pointed out, I mean when you look at the number of scrams, three probably would be the threshold because right now the ROP would suggest that. But the point is that if you didn't try to have a trend from 0.52 in 2000, and .057 in 2001 to one and a half over a couple or three years, that would be very significant in so far as the trend. And I think if you go to the concept of thresholds, you should go into -- base what -- an amount of information?

MR. BOYCE: Well, again, the fact that you had a three year, or even a five year trend, we could still be monitoring that, and we could still be putting out information notices, but you still have to make some judgment as to the safety significance, or you should. Otherwise, you know, you're putting out

information notices, and perhaps spending resources where it wasn't appropriate. So if it's possible to draw that threshold, you would do it.

DR. BONACA: We had examples of previous presentations of a number of I think risk-informed relaxations in the tech specifications, and there we all supported those kind of initiatives. This present concern about safety culture consequences of, for example, not reporting any more surveillances or whatever. And this -- the trending system to me is very significant, in that it's giving me some warning or some information that I know is comforting, that says, you know, we are going to risk-inform approach by using the ROP. We're always expressing some concern about look, the trends are good. There are no increasing trends, so the trending, I guess, is very significant to me, so I guess I'm making a pitch for the approach we're following right now.

MR. BOYCE: Okay.

DR. SHACK: There's this question of whether we're measuring safety or performance.

DR. BONACA: I understand.

DR. SHACK: I think the thresholds may tell you something about safety, but I think the trend lines tell you much more about performance.

DR. BONACA: That's right. And, you know, it tells you something about the way you regulate the industry. It speaks about how the industry is being regulated, it seems to me, because if you go to, as we're doing now, a performance-based risk-inform approach, and you still have trends that actually are improving, that's a significant statement regarding the regulatory approach we have chosen. And conversely, should you have regular trends, then maybe you should question whether or not something that you are doing as you're regulating the industry is wrong, so I think this is a significant piece of information coming from that.

DR. SHACK: And you've also stacked the deck with 1988. I mean, your screenings are going to have to go up an incredible amount before you're ever going to turn that negative exponential expression.

DR. KRESS: Yeah. I think you've got to be careful with the exponential expression, but I think you shouldn't have instead is have a flexibility on the number of years you look at.

DR. SHACK: Just sort of a five-year rolling ---

DR. KRESS: Well, it doesn't have to be five. You can't do it with two, because you can't get

a trend out of two, but three possibly. And what you can do is establish -- you can use statistics to establish the statistical significance of any line you draw through there. And the more data points you have, the better off you are but, you know, you can have flexibility --

DR. SHACK: Well, statistical significance is one -- but there's still a choice of periods over which you use it.

DR. KRESS: Yeah.

DR. SHACK: I mean, you should examine statistical significance of any slope, whether it's three or five.

DR. KRESS: Yeah. And the more data points you have that express a trend, the more years, the more confidence you have in the statistical significance of it. I mean, there's -- just use standard statistics to do that, but I think that's what they ought to do. I wouldn't look at a trend going all the way back to using that exponential item, because that's not a trend that's current. It's a trend that happened a long time ago, so you need to limit the number of years you look at, I think.

MR. ROSEN: Certainly, one year to me doesn't make a trend.

DR. KRESS: One year doesn't. Two you can't do it. Three you might, but the statistical significance is only --

DR. BONACA: Five you really do have a trend.

DR. KRESS: Five would be much better.

DR. BONACA: Especially if you have a confirming trend in one direction or the other.

MR. BOYCE: Actually, again, where we started with the program is, we picked the year where we had good data that we thought we could rely on. Okay? We actually had data that preceded `88, but we weren't as confident that it was good data. So what we decided was, that'll be the year, and we'll make it uniform. And then as we get comfortable with the program, we'll take another look at it. And that's the thinking that you're seeing, at least in Dale's paper, where in 1997 it looks like there's a break point. And so what we're trying to do is perhaps go to, for that indicator, two different curves, and you can do that for each of the indicators. But it's not nearly as satisfying just to do it by looking, and do it by inspection almost, or even a statistical approach, because it doesn't have a physical basis in reality. It would be much more comforting if in 1997

I could point to something in industry and said that is why that data is changing. Okay? And that's the -

- that's why we're a little hesitant just to change based on a statistical approach, but our thinking is moving along those lines that you're describing.

MR. RASMUSON: If I could just interject here for just -- you know, looking at all your data in all of these, if you looked at the report there, you'll notice that some of the things we tried to -- in there we defined the concept of a baseline, and I'll go through this in my presentation a little bit, but what we wanted was a period of time where the performance was basically flat, that we could call a baseline. And if you have something that's decreasing there, and you have a lot of data, you know, as you get down here to the end, your uncertainty limits here, you know, tend to be narrower and narrower, and that tends to penalize you. Where if you were taking a period where it's quiet, and so there's a lot of these different issues you have to look, and you have to weigh in the proper perspective of looking at all of these things. If we take some -- if we take the scram data, and I did this, you know, before, if I take that flat period, you know, then my prediction

limits come out here, and I'm not penalized, you know, right here. You're talking about two scrams, you know, and --

DR. KRESS: That's not a trend.

MR. RASMUSON: And that's not really a trend. And that's one of the reasons you want to move to a threshold-type thresholds, you know, in a way that you can set up here, and there's ways, you know, lots of different ways of looking at these things here, but it's -- but, you know, you want to get things that characterize the baseline performance. And that's one of the issues that we need to discuss or, you know, that we're wrestling with, is do we use a period back here like in the ROP process where they use 95 to 97 as the baseline, or should we use the whole period here? Well, in some of these cases where we have the initiating events that don't occur very often, you know, you really have to use the whole period.

MR. ROSEN: The data is only useful to me if it imparts some information to me.

MR. RASMUSON: Right.

MR. ROSEN: And so when I look at something like this, what I'm trying to deduce is what's the information being imparted? And something

that was changing from `88 to `96, stopped changing in `97.

MR. RASMUSON: Uh-huh.

MR. ROSEN: What was that something? Something was changing and improving the outcome between `88 and `97, and basically whatever that forcing function was that was improving the outcome abated in `97.

DR. KRESS: I don't think you can make that inference from here.

MR. SIEBER: Well, maybe they were just too good in `97 and `98.

DR. BONACA: Well, I mean, you can see the implementation of symptom-oriented procedures in the late 80s/early 90s, for example, and that could be the reason why you have less scrams, and you have much detailed and accurate trending positions.

MR. ROSEN: Well, Tom said well, you can't make that judgment. What I'm trying to say is that the data is more interesting to me, because I agree with him, I can't. The data is more interesting to me if someone offers me an explanation.

DR. KRESS: Oh, certainly. Certainly. But I --

MR. ROSEN: Rather than just showing me a

piece of data.

DR. KRESS: Yeah. I would consider looking at something like a five-year rolling look at this.

MR. SIEBER: Let me offer a note of caution. I think the ROP has taught some of us, at least me, a lesson about thresholds, the use of thresholds for initiating events. If you look at the delta risk for initiating events, you have to have a massive increase in the number of initiating events to make a perceptible change in the safety risk of the plant. And so if you base the threshold on that delta risk, you're going to come out with a number that makes it look like we have very low standards as to what we will accept and not accept as a regulator, and as an industry. And I think that's a concern from a public perception standpoint, and particularly with Congress, so I think that you need to approach thresholds on initiating events performance indicators with that issue in mind. And so, as you move forward and try to decide what it is you're going to do with the data that you have, I think it's something we ought to think about.

MR. RASMUSON: I agree with you if we're just looking at scrams in general, but if we break

scrams down into their constituent type, such as loss of feed water, loss of an AC bus and so forth, and we risk-weight them, then you get a different perspective on that.

MR. SIEBER: Perhaps, but then the indicator becomes so complex, that it's not useful for a report to Congress. Mitigating systems, however, I do think have a stronger basis for the use of thresholds, you know, because they play a more active role in the contribution towards --

MR. BOYCE: Well, let me try and use that as my excuse to get to the last slide here.

MR. SIEBER: All right.

MR. GAMBERONI: Tom, before we get to that, this is Dave Gamberoni from NRR. I had some information for Dr. Kress. Tom is not fundamentally saying to change the program so that we're not caring about the direction changing. What Tom is attempting to do with the changes to the current program are to evaluate the significance of the trends in the other direction. We don't want to call Congress and tell them hey, the scrams have turned around. We did the arithmetic. They're going in the other direction but, you know, they barely moved off of that asymptote that they got to. We want to know when is it significant,

so Tom's use of thresholds is proposed to determine when has it moved enough in the negative direction such that somebody might want to take some action. And we've had preliminary discussions that you might allow it such that you've reached a certain threshold, like ROP, maybe industry is responsible to, you know, initiate action in that amount of change. When it gets to another level, NRC might have to take generic actions, and when it gets to another level, maybe you contact Congress.

The purpose for this is to give them a chance, if there is a major overall -- you still have ROP. You're dealing with all the plant-specific issues, did industry deregulation have an overall impact on safety and affect scrams? You know, we don't know now. If the graphs turns and changes, and changes, and changes, we want to use the thresholds to help measure significance, so don't we call Congress every time we just mathematically verify we have a change in direction.

That's what Tom is talking about current program. The next part of the presentation is going to cover, you know, different -- you know, sort of that same philosophy but a different way of doing it, as opposed to using, you know, the good old Pis that

we've been using. Is there a better way or not to do it? So he's not proposing doing away with the methodology to tell whether it changed direction. He's proposing now how do I determine how significant it is.

MR. ROSEN: Just because you use the industry deregulation as an underlying cause of all this, as an example, I'm sure you don't mean to imply that. There are lots of other underlying causes that could be responsible if you found the trend. You don't get any information about the underlying cause, aging plants, aging people in the plants, retirement of the people.

MR. GAMBERONI: Exactly. That's why we would want maybe multiple thresholds such that you go verify that it is reasonable, and it's some other factor before we --

MR. ROSEN: You have to first establish that it's significant.

MR. GAMBERONI: Sure.

MR. ROSEN: That there has been a change before you start looking for what caused it.

DR. KRESS: Yeah. I basically have no problem with the use of thresholds the way you said. My main concern was I don't see a firm definition of

what a trend is up or down. I think you need that. And if you're going to talk about trends, you need to define what you mean by trend, and what you mean by statistically significant trend. I just haven't seen that firm definition yet.

DR. BONACA: I have a curiosity, in fact. In 1999, what did you do with scrams that went up from .48 to .64?

MR. BOYCE: Well, that was before the Industry Trends Program so I defer to Research for their answer. I don't believe that we did anything in terms of hard action. I mean, what we're trying to do in this program is actually tie -- it's not enough just to look at indicators and, you know, we're actually trying to tie it to actions.

DR. BONACA: So, I mean, you wouldn't have called it a trend.

DR. WALLIS: Well, whatever you do, I don't think you should stop publishing this kind of picture. It's very useful to the public, and they can make the arguments that we've been making here and say is it significant or not, what does it mean? So don't, just because you've got a five-year average or something, just forget about this picture, because I think that's very useful --

DR. SHACK: Show the bar graph, but don't put the exponential in.

DR. WALLIS: Well, we will fit the exponential in, in a homework assignment anyway, so it's --

MR. ROSEN: It's not much of a homework assignment now. Excel will do it for you if you push the right button.

MR. BOYCE: Well, here's a snapshot of what we're doing, and we're going to come back and talk to you about this. We talked about thresholds. We're going to try and do risk-informed thresholds where it makes sense. It might make sense in initiating events and mitigating systems. Right now the other cornerstones of safety, it's a lot tougher to get risk-informed thresholds, but we're trying statistical approaches to come up with those.

If we're successful, we're going to go to the strategic plan, and our performance plans and look at modifying the performance measure to one that's threshold-based vice trends-based. We're deriving additional indicators for the cornerstones of safety from the data we have from the ROP. We're going to be coming up with a framework guidance document, and if we still don't have a good definition when we develop

that, shame on us.

We're going to try and lay out some -- with more specificity the sorts of actions that we take in response to an adverse trend in our process there. If the MSPI for the ROP, which you've heard about before, is in a pilot phase, if it's successful, we would look at aggregating that MSPI into an industry-level PI. And by analogy, what you're about to hear is, we're jumping right to an industry-level performance index for initiating events. Okay? So we're actually moving ahead of the ROP in this regard. So if there's no further questions, I'll turn it over to Dale.

MR. RASMUSON: Okay. Thank you. I'm here to discuss our Integrated Industry Initiating Event Indicator that we are developing. Tom has told you about the Industry Trends Program. We will talk about the characteristics of performance indicators. We'll talk about the integrated indicator itself. We'll talk about its philosophies, what it is, give some examples of it, some other things like that. And then we will have some conclusions, and then describe what we feel are the next steps that we need to go through.

This slide contains characteristics of an integrated indicator, or of an indicator, and these

are taken from the -- are basically taken from the SECY papers that have been written. We need something that can be used as a performance measure for our annual performance report to Congress. We need something that is complimentary to the plant-specific ROP. It provides industry information for an ROP cornerstone. It uses data that are available from current NRC programs. It's related to or tied closely to risk, and what we're looking at is CDF or delta CDF, and in some way we can utilize some risk-informing measures for assessing their significance, such as the Safety Goal or Reg Guide 1.174.

Currently, we have a lot of indicators that are floating around. In the first column, we have the cornerstone for safety. Then we have the ex-AEOD indicators and how they get into the various cornerstones. Next we have where the ROP Pis are and one of the things that Tom has been doing is he's starting to trend this now just to look at them, not necessarily to report to Congress. And where we are right now, in the last couple of years we've provided Tom or NRR with the ASP trend, and also we have provided trends for fifteen risk-significant initiating events, and you'll find those in one of the appendices in the SECY paper.

DR. KRESS: Do these correspond to the initiating events that a normal PRA has?

MR. RASMUSON: They correspond so the most risk-significant.

DR. KRESS: The risk-significant ones.

MR. RASMUSON: Right. The real risk important ones. Right.

MR. BOYCE: Commenting on that. Research did a report which was briefed to you a year or so ago on risk-based Pis.

DR. KRESS: Oh, yeah.

MR. BOYCE: And the approximately ten to fifteen that contributed most to core damage frequency were in that report, were the ones that we used and pursued here, so there is a nexus to core damage frequency.

MR. RASMUSON: And here's the list of the ones for BWRs, we'll just go quickly through. And here's the one for the PWRs, we'll let you read that there. And those are coming from the risk-based performance indicator report.

Well, what's our philosophy for looking at this? If I'm trending items, it doesn't capture their risk-significance at all. I don't -- there's nothing in there that I -- you know, in the trend that relates

to risk. And the other thing is, the more items I include in trending, the probability of seeing something significant increases. You know, my chance of seeing something that could be risk-significant or statistically significant, you know, it increases, you know, and so just by chance. So that's one of the things that we want to try to avoid.

The mitigating system performance indicator has provided a way for combining risk information and operating experience in a logical way. And that MSPI approach is applicable to initiating events, and so we have chosen to pursue that, and to explore that approach to see if it's feasible, and if it's worthwhile.

Pictorially what we're doing is we're taking operating experience in the forms of those initiating events that we showed you, breaking them down, classifying them in that way, taking appropriate risk information from PRAs and combining them into an indicator.

What is the integrated initiating event indicator? Well, it's nothing more than it's the average of the sum of products of the current operating experience value of the industry for each initiating event, and the appropriate risk-weight

obtained from PRAs. It's related to core damage or delta core damage.

DR. WALLIS: I think it is the sum of the product.

MR. RASMUSON: It is the sum of the product.

DR. WALLIS: It's not the average of the sum, it's the sum itself.

MR. RASMUSON: Well, we're also taking an average of that.

DR. WALLIS: But you just duplicated the words there. The average is the sum of -- the weighted average is the sum of the products.

MR. RASMUSON: I am taking the --

DR. KRESS: No, they divided by N and that makes it an average.

MR. RASMUSON: We're dividing by the number of plants. But I'm also multiplying by a risk major and another term, so --

DR. WALLIS: You happen to average a lot of sums of products.

MR. RASMUSON: And this allows for combining an infrequent initiating event with the appropriate risk measures, and the risk measures on these things are different. And we are coming -- we

are proposing to use one indicator for BWRs and another for PWRs because core damage frequency for PWRs is larger than that for BWRs.

MR. SIEBER: Is that just because of steam generators? That's the only difference --

DR. KRESS: It's because BWRs have a lot of sources of water.

MR. RASMUSON: There's a lot of ways of getting water to the core for the BWRs. This is our indicator then here.

DR. KRESS: Let me -- while you're on that one now, let me tell you a problem I have with it. Maybe you can think about it as you discuss it. It's related to the problem pointed out by Graham Leitch over there. This indicator is basically the average CDF for the whole fleet of plants. That's what it is.

Now you've got -- say it's PWRs. You've got 50 plants out there, just as a guess. There may be a few more, but each plant then is going to contribute at the most 2 percent to this average, so you've got a lot of plants that are doing nothing in terms of changing their status. And two or three poor plants that may be degrading considerably, which you'd see in the individual trends, but you wouldn't see this very -- this thing would not be very sensitive to

those changes.

And what I think my problem with that is, and as a regulatory agency -- and in fact, what you're doing is letting the good plants that are decreasing say in CDF over time because of changing initiating event frequency, you're letting those compensate for plants that are increasing, and I don't think you want that as an indicator.

What you're -- in my mind, what you ought to be interested in, those plants like Graham said, that are degrading at points, so I would say a better indicator might be the number -- just ignore the ones that are decreasing, and say the number of plants that are increasing beyond a certain level, like a threshold, or the number -- or the sum of the rated change of those that are increasing as an indicator, just ignoring the decreases.

DR. WALLIS: But, Tom, you're addressing a different question. If I, as a member of the public, wanted to know how are the plants doing in general, what's the level of safety in the country, and I want an average of all the plants, and for regulatory purposes you may want to do some of the things --

DR. KRESS: I'm concerned that this loses

the regulatory concern that you have.

DR. WALLIS: This will confuse the public.

DR. KRESS: No, I think what we're after is, is my regulatory system properly keeping things safe? And safe is an individual plant issue, not a fleet of plants. It's both.

MR. BARANOWSKY: Dr. Kress, could I address that?

DR. KRESS: Yeah.

MR. BARANOWSKY: This is Pat Baranowsky from Operating Experience Risk-Assessment Branch. You're right, but remember, this is -- since it's complimentary to the Reactor Oversight Process, we have essentially a corollary measure for each one of these cornerstones on a plant-specific basis. And what we're trying to do here is talk about what is the industry-wide perspective?

If you think back to the safety goal discussions that went on years ago where the safety goal was meant to be more or less an industry-wide measure, if you will, to judge the industry performance and generic issues against, we're really back to that thing again where we're saying how is the nuclear industry doing in general, and that's what this is meant to talk about. Are there generic

performance things that we can't see on a plant-specific basis because we're focused so much at Davis-Besse that we're missing some bigger picture trend and some other things. We can get the Davis-Besse things because we've got a process in place that's working pretty well with regard to the reactor oversight, but what we don't have is, what can we say about the general industry trends in safety? So what we're trying to get away from is, every once in a while one of our sample of 110 plants has a problem in describing the industry's safety in terms of one of those sample, or two of those samples.

Every year we have 110 plants to sample from, and if we trend this information over a period of years, we get a bigger picture of what reactor safety is. That doesn't mean that the individual instances aren't looked at for their own risk-significance, much like we would look at an accident sequence precursor. We have individual precursors, and we have certain levels of precursor values that we think are so important we take actions on by their own. The other thing we do is we trend the occurrence of those things.

DR. KRESS: I understand all that, and I recognize that there are different programs looking at

different things, but if I wanted an industry trend and let's say I had 50 plants I was concerned with. I don't know how many there are. And if 25 of them were decreasing in CDF, and 25 of them were increasing in CDF this trend would show no trend, but that's a trend to me.

MR. BARANOWSKY: Okay. I think I agree with what you're saying there. What you don't see and we haven't presented here is, but if was mentioned, decomposition of this information. This is meant to be the highest level of reporting that we would go to Congress with, say how is the industry's safety in general. We're going to decompose this down into different categories, and it could be there's a suggestion. We could look at how would we group plants together? It doesn't have to be by PWR and BWR.

DR. KRESS: Or I would have said, you know, you needed another measure like the number of plants that are the product of the sum of the number of plants that are increasing. How much of the sum, you know, some measure like that as a compliment, that captures this thing that I'm worried about.

MR. BARANOWSKY: Okay. So it could either be a complimentary indicator list or a disaggregation,

but it would have -- and I don't think our intent is to hide that, by the way.

DR. KRESS: Yeah, I know it.

MR. BARANOWSKY: Okay.

DR. SHACK: It's just an issue of the slope. Show the whole damned thing.

MR. BARANOWSKY: Well, our plan is to show --

DR. KRESS: Well, that might be one thing, because --

MR. BARANOWSKY: -- is to disaggregate this down, and then probably to cross it with the ROP and see what that looks like, so that this whole thing would be covered.

MR. BOYCE: Yeah, and jumping in with perhaps an alternative approach, analogous to the MSPI where we're trying to get to each plant and looking for, you know, how each plant is doing. If this -- if we're successful at the industry level for the IEPI, we would look at implementing on a plant-specific basis, which would pick up what you're saying. Assuming we could get thresholds on a plant-specific basis, we would pick up the phenomenon you'd like, and there would be a parallelism to the ROP, without generating a new indicator like you're describing.

DR. KRESS: Yes. I just didn't want to lose it in the integrated industry indicator, because I think --

MR. BOYCE: I understand the concern, and I appreciate the input. We're actually ahead of like automatic scrams or complicated scrams, which is our current indicators of initiating events. This is, you know, we're trying to be pretty ambitious here.

MR. ROSEN: Well, you could use for all Bs. You could use this expression for all Bs. You could use it for all Ps. You could use it for Region One plants only, Region Four plants only.

MR. BOYCE: Absolutely.

MR. ROSEN: You could create subsets of this.

MR. BOYCE: Absolutely.

MR. ROSEN: Which would be of interest to different stakeholders.

MR. BOYCE: Right. Agreed.

DR. WALLIS: It's just like -- this is a Dow Jones average, or an S&P, you know, and if you want -- if Kress wants number of advances, number of declines, you could get that too.

DR. KRESS: I want to know what my stocks are doing, not just the Dow.

MR. RASMUSON: Okay. Back to the equation here.

DR. SHACK: I'd change the order of the sums.

MR. RASMUSON: Well, what we're doing is summing up overall the Birnbaum importance measures to get an industry total, multiplying that by the industry average, and then summing up over all those sums of products, and then dividing by the number of plants to get an average value.

DR. WALLIS: The intense of notation BUI Lambda implies the sum anyway.

DR. SHACK: So wouldn't you sum over the plant first?

MR. RASMUSON: No, because my initiating event is -- if I'm going to put parentheses, I'd put parentheses there, and do the sum over the -- it really doesn't matter. I can do it either way.

DR. SHACK: It doesn't matter.

MR. RASMUSON: It really doesn't matter, because I mean, I could calculate an average Birnbaum importance measure for the -- you know, for that particular initiating event an industry average, you know.

DR. SHACK: Mathematically it's the same.

MR. RASMUSON: Yeah.

MR. ROSEN: Mathematically it's the same. Yes.

MR. RASMUSON: Right. And N is the number of units, the BUI is the plant-specific Birnbaum importance measure, M is the number of initiating events, and lambda sub i is the current industry average for that, and however we define current.

Just for a sample calculation, suppose we have two initiating events, and I just picked two here, loss of a vital DC bus and general transients. And the integrated indicator for this would be the Birnbaum importance for one times the industry average, plus the Birnbaum importance for the other, times the industry average for that, and it came out in this case, divide by the number of plants, and here are the values.

This provides here an idea of we get a lot of general transients, but notice that, you know, the Birnbaum is very small compared to the general transient, or the loss of a vital DC bus, which does not happen very often, and so that has become more important.

And you can also go in and analyze which plants are contributing to some of these. Like for

instance, for a loss of DC bus, most of the contribution is coming from four plants, and that's because of their design, so there's things that we're learning out of this.

Okay. The relevant risk information is what we would propose doing, and what we would be, to use the Rev. 3 SPAR models to generate these Birnbaum importance measures. What we've done right now in our study is we've used all the Rev.3 and the Rev.3(i) models for our -- but we know that there are problem -

- the Rev. 3(i) models haven't all been -- aren't QA'd yet and so forth, and I don't want to get into that discussion, because we're not here discussing the SPAR models. But the approach is very feasible, you know, and it is -- we can do that.

MR. SIEBER: Would you define for me what a Birnbaum importance measure is, to bring me up to speed.

MR. RASMUSON: It is the partial derivative of the initiating event with respect to the core damage frequency equation. It's basically a partial derivative.

MR. SIEBER: All right.

MR. RASMUSON: Okay?

MR. SIEBER: Okay. Thank you.

DR. WALLIS: It's a kind of measure of the influence, an influence factor or weighting factor.

DR. SHACK: Why didn't you use your Definition I in your report, your Equation 2, where you have the plant-specific frequencies, and the plant-specific important measures, and then you sum them up over --

MR. RASMUSON: Because one -- well, the main reason is, is we're focusing on industry trends, not plant-specific trends. That is a way of doing it, and my reason is, I don't want to get in -- there's a lot more working in trying to estimate those plant-specific frequencies. I mean, we can do it, you know, initiating event frequencies and so forth, but we were asked to do things for the industry trends, and so I'm doing it -- we chose that formulation.

DR. KRESS: Actually, that first definition is a true CDF average.

MR. RASMUSON: Right

DR. KRESS: These other things are not true CDFs. They have a one-to-one relationship with the CDF, and I don't know how you make that --

DR. SHACK: Plant-specific Birnbaum, and then --

DR. KRESS: Yeah, I would have gone with Definition 1, because this is a true CDF, and I know what it is. These other things, I'm not sure what they are. They're related to CDF, but not exactly CDF, and so I would go with 1. But, you know, it may be easier to get these numbers. And I think there is a one-to-one relationship between each one of these.

MR. RASMUSON: But the reason we did it was because we're focusing on industry trends. I mean, there are those different formulations.

DR. SHACK: But I can certainly see why you do the average. There are different averages.

MR. RASMUSON: There's different averages too.

DR. WALLIS: Well, the problem is B is really plant-specific, where lambda is industry-wide, so you've got just a little bit inconsistency.

DR. KRESS: There's a weighting factor that comes in there that you're missing.

MR. BARANOWSKY: I think this issue is really still something that we're going to study, to make sure that looking at it one way versus the other doesn't have some significant difference, and understand why it might be different. If we can implement the simpler way and get what we need to know

out of it, that's what we'll do. If we don't, and we have to go a more complicated route --

DR. SHACK: It seems that you have -- the information that you need is the same in either case, and when you get the industry average by summing up the individual --

DR. KRESS: Absolutely. It's the same information.

DR. SHACK: It's just a matter of how I do the sums, what order I do them in. And the one seems, as Tom says, I mean you understand exactly what it means, and the other one I sit here and I try to think of what does it mean to take the industry average initiating event and the Birnbaum plant-specific.

DR. KRESS: It's like trying to take the best estimate for the inputs --

DR. SHACK: Well, if I ran every plant with the industry average, I'd have this. And maybe that's interesting from some perspective, but --

DR. KRESS: Yeah. It hides information.

MR. BARANOWSKY: Yeah. I'm sympathetic to your point, so we'll look at it, because we're still in the phase of looking at a lot of things, and I don't know what the plans -- you're going to talk about the plans for when we're going to complete this.

It's down the road.

DR. WALLIS: Well, in any case, I'm sympathetic to use of rigorous mathematics to reach conclusions.

MR. ROSEN: It has a certain appeal.

DR. SHACK: But then in the first one, I know why the sums are in the order that they're in.

MR. RASMUSON: Exactly. We can formulate this in two ways. We can do it in terms of an absolute value, or we could do it in terms of a base, you know, a deviation from some baseline period. And we sort of looked at it in both ways, and some people like the absolute formulation better than they do the other. That's one of the questions that we have, do we use the absolute formulation or do we use deviation from our baseline initiating event frequency, and what period do we use for our baseline initiating event frequency? If we do -- we don't need a baseline if we're doing the absolute formulation, but if we do a delta calculation and delta CDF-type, then you do need a baseline. And how should the initiating event, the current performance be estimated? There's lot of different ways of doing that. We can do a Bayesian update, you know, decide on a prior or which you would

need a baseline performance in that case. We can use maximum likelihood estimator. We can use a one, two, or three-year period of time, and there's a lot of issues. And we're going to look at those things, and see what difference it makes on them, and things like that.

DR. KRESS: It's essentially the same issue as the trend and the --

DR. SHACK: If we use the absolute value we can still draw a trend line through them.

MR. RASMUSON: We can still draw a trend line through them. Right. So the trial baseline periods that we used in the -- we wanted to define the baseline over which performance was basically constant, and so it depended on the initiating event, and in some cases, you know, the period was short, in some cases it was the whole period where we didn't have very many occurrences. And so the intent was to get as short an interval as possible, you know, where we had a lot of event, but get one that would fit there. And we would use the P value.

The technique that we're using for our trends here is Poisson regression really. We're not

-

- since we're using counts data and time, we're using

Poisson regression, not simple linear regression, which assumes that the data is normal and so forth, and so we are -- this is a very standard technique in statistical package nowadays, and so we're looking at -- and we looked at the significance of it. We also would look at the fit of the data, you know, if we overlaid it for different ones for the period of time you know, some of them -- you may have, you know, to get a starting time on some, the starting year.

DR. SHACK: So what you're really doing is a maximum likelihood estimate assuming these things are Poisson distributed. Is that what --

MR. RASMUSON: That's basically what it does, yes. For current performance, we discussed this already here. We can do that in a lot of different ways. And here are some results for using a three-year Bayesian update using the baseline periods that we did as a prior distribution, and then using the previous three years to -- so we would use `95, `96, `97 for this one, and the next three years updating that. Here's sort of what the trend looks like.

Here's what's going on here for the PWRs. If we look at these in terms of deltas, this is sort of the -- for the BWRs, and the PWRs.

DR. KRESS: Not very sensitive.

MR. RASMUSON: Well, it is sensitive to certain things.

DR. KRESS: Well, you know, what you're actually looking at is a CDF, and I don't expect it to change.

MR. RASMUSON: No, I don't --

DR. KRESS: So it's not a very -- it doesn't seem like a very sensitive indicator. An average CDF at a plant is --

MR. RASMUSON: This is one of my backup slides, but if we take our baseline values and plug them in, this gives you sort of DC bus and small LOCA are the -- those are rare initiating events. And if we do get these things occurring in the same year, and if you get more than one in these areas, you know, these things then can influence that quite a lot. So these are the types of considerations we need to look at, and you need to understand the behavior of this. But, you know, this is giving us some insights into some of these things.

DR. SHACK: You know, if you do it this way, you're looking at the safety trend in a sense, but you mitigate a bad performance by saying okay, my performance is bad, but I've actually got mitigating systems that say well even though my performance is

not good, it doesn't make all that much difference.

MR. RASMUSON: Right.

DR. SHACK: And if you really wanted to evaluate performance, you know, unweighting it, not taking into account, you know, all my mitigating systems might be a way to highlight the performance.

MR. RASMUSON: In our presentation back in May, we talked about having sort of a two-pronged threshold. One is, is that we're -- we want to have something that is simpler in concept, you know, reporting one or two numbers to Congress. This would be what would be used for reporting to Congress. We would still be doing the individual trends down here, and using those as a tool.

DR. SHACK: Well, to my mind, it's more a conceptual thing.

MR. RASMUSON: Okay.

DR. SHACK: Am I looking at trends in safety, or am I looking at trends in performance?

MR. RASMUSON: Okay.

DR. SHACK: And I might want to pick measures that sort of magnify the affect of performance.

MR. RASMUSON: Okay.

DR. SHACK: And not sort of hide

performance changes, because I've got -- you know, I really designed these systems to try to make them sensitive to performance.

MR. RASMUSON: Okay.

MR. BARANOWSKY: Just to answer your question, for reporting to Congress we're looking for trends in safety. For the regulatory program, we're interested in both. Okay? So we -- I think we need to put together a conceptual picture which shows how you unroll some of these things and get both the performance and the safety information, and how it potentially fits into not only say the generic communications, or generic issues, but it could even fit into the inspection program, because there's a baseline inspection program which has some flexibility. And this information could be used to adjust that so that as Tom was talking, we get an early investigation into some of these things.

MR. BOYCE: Yes. And what I was struggling with is if we go with two different approaches, performance-based or safety-based, if I can call it that, you end up having two sets of indicators. And then people are confused because you've got two sets of indicators, and so I was just mulling over what the right approach was, and I'm not

sure we can do that here, but I appreciate that input.

DR. SHACK: Well, even on the Committee you'll have differences of opinion.

MR. ROSEN: We actually have an n-plus-one opinion.

MR. LEITCH: If I was thinking about trends in safety with respect to scrams, I would be looking at the trends in the worst performing plant. How many scrams per year did the worst performer have? That's what the safety is, it seems to me.

DR. KRESS: Or the five worst performers.

MR. LEITCH: Yeah, maybe the five worst performers.

MR. GAMBERONI: And just another clarification too. We do have reports to Congress, abnormal occurrences, which is that significant thing in an individual plant, so this is a different, you know -- like Pat said, this is the overall safety report to Congress.

MR. BOYCE: Just one more comment on that. We also -- at NRR we track significant events, and one of the indicators from the AEOD program was a count of significant events. It kind of gets to what you're saying, and the problem is, we're at one to two, maybe three per year, and so we're very much, we think as an

asymptote.

MR. ROSEN: That's not a problem. That's an outcome that's been muchly desired.

MR. BOYCE: That's true too. There is a lot of judgment involved in that, so at least one of the indicators tries to get at the count issue that you were describing. As an aside, we're looking at whether or not we should be changing the definition from the more qualitative to something more quantitative, such as, you know, the number of occurrences that exceed thresholds in perhaps the SDP, something consistent with the ROP to get a consistent definition of significant events. And that thinking is going on in NRR, but I can't tell you more about it than I just did today.

MR. RASMUSON: Okay. Of course, there's uncertainty in the indicator, and there's lots of uncertainties in the baseline frequencies, in the current frequencies. There's uncertainties in the Birnbaum measures. There's plant-to-plant variability, and there's the uncertainty in the plant-specific values themselves, and we certainly want to take these into consideration when we're looking at things.

DR. KRESS: Do you have a thought in mind

of how you will incorporate those into the process?

MR. RASMUSON: Uh-huh.

DR. KRESS: Oh, you have some ideas then.

MR. RASMUSON: WE do have some thoughts, and we have actually done a little bit on it.

DR. SHACK: When you average over 100 plants it gets better.

DR. KRESS: Yeah.

MR. RASMUSON: So there are some -- but our indicator significance, Congress has requested that we use performance goals and performance targets. And the performance goals and performance targets come right out of the GPRA, and --

DR. SHACK: What's that, GPRA?

MR. RASMUSON: The Government Requirements and Results Act. GPRA, and as I read that, targets really are thresholds. I sort of -- and a lot of them are -- in a lot of these agencies it's the other way around. Our's is safety, and we don't want to exceed something, but they want to get up to a certain point, you know, in their's. You know, they're below it, but they're trying to reach that, and that's why it's a target in a sense. But we don't want to exceed these things, so -- and the Commission has told the Staff that we should try to develop risk-informed thresholds

as soon as practicable.

Thresholds for the integrated indicator, we can use the safety goal, or we can use Reg Guide 1.174. We certainly want to look at the behavior of the indicator from the uncertainties and so forth, using simulations, looking at the contributors like I've showed you to understand what sort of -- going to contribute to that. Looking at the maximum values of things that come out of some simulations of things, and look at the consistency with the ROP, and use an expert panel where logical relationships and/or parameters are difficult to derive, or where pragmatic issues arise.

For instance, you know, the safety goal is ten to the minus four, you know, per reactor year. Well, what if in our simulations we show that maybe ten to the minus four is maybe like a 63rd percentile of our uncertainty distribution. Well, then maybe, you know, there needs to be people that come in and make a decision in setting that threshold. That, to me, is sort of like a pragmatic issue.

DR. KRESS: The safety goal says that ten to the minus four should be a mean. So the question I have is what confidence level do I need to have in that mean itself? That's basically what you're saying

now.

MR. RASMUSON: Yeah. Well, we have described to you an industry-wide performance measure that has a logical relationship with CDF or delta CDF. It's relatable to the safety goal, or to Reg Guide 1.174. It allows the rational combination of events with different risk importances and frequencies. We can establish early warning and agency action thresholds for it. Early warning are those that I prescribe to the individual trends themselves, and it's complimentary to the plant-specific performance indicator.

MR. ROSEN: Well, before we get too enamored of this goal, this industry-wide performance measure, I think you need to recognize that this is more an average of a number of shots on goal in any given time frame. It has nothing to do with the performance of the goal. The goalie is still there and he's, you know, the mitigating system. They're still there, and it's really the result of both of those --

MR. RASMUSON: That's right.

MR. ROSEN: -- that is from a policy standpoint is important. We want to know how many times we are challenged with the systems we've built

and put in plants, but at the bottom line, we really want to know -- you know, we want to assess the value of the whole system, which is the shots on goal and how many times the goalie caught the shot, didn't let it get into the net. So it's really only half the question.

MR. RASMUSON: That's true.

MR. BARANOWSKY: In some regards, we get that more integrated picture from accident sequence precursor trends, which involves initiators and mitigating systems, but it's not as complete a picture as you could get if you took this indicator along with one, for say, mitigating systems, which by the way is down the road somewhere, but that would be where we would go perhaps in the future.

MR. ROSEN: Some day we'll have a presentation where you'll bring one guy in with the first one, and one guy with the second, then you multiply the two, and then you'll have a number or something --

MR. BARANOWSKY: We'll at least use Boolean algebra.

MR. BOYCE: That's where we'd like to get to, I mean if the MSPI at, you know, the pilot program succeeds, we could roll it up and then we would have

two industry --

MR. ROSEN: If Dan Rather asks the chairman what does this number mean, when he tells them the number, the chairman, Chairman Meserve says something like well, have you got a day or two, Dan, to answer the question.

MR. BOYCE: I'm sure he could handle it. He's pretty good.

MR. ROSEN: Yeah, he wouldn't say that. But in reality, at a technical level, it would take a long time to describe what that all meant.

MR. BOYCE: Or as you described, using your hockey goalie analogy, that would work.

DR. KRESS: Good to use a football analogy so I'll understand it.

MR. RASMUSON: Well, my last slide here just sort of outlines our next steps, sort of what we want to do. We have developed an initial concept. We have a preliminary draft report. We're going to refine that report a little bit more, and release it for review to people. We'll get back comments, just as our normal process is within our branch of getting back comments. We'll resolve those comments. We'll develop a -- then go in and develop the trial product more. We will actually run a trial case on it, look

at it and so forth, document that, and get comments on that. And then develop a final report, and issue it so that it can used. And we're shooting to have our final report in September of this year, of `03, next year.

DR. KRESS: You wouldn't really have to use real data to see how this thing worked. You could just make up your own data, and plug it into the formulas and see how the trends would go, and how sensitive it is.

MR. RASMUSON: Uh-huh.

DR. SHACK: But you've got real data, why not use it?

DR. KRESS: If you got real -- yeah, but you have to -- I mean, you have to wait for -- you could do this over five years and change things arbitrarily, like the sensitivity analysis.

MR. RASMUSON: Right.

MR. BOYCE: We do have real data. I mean, there's initiating events NUREG that Research did, 5750 I think it is, and NRR tasked Research to bring that initiating event study up-to-date, so I know we've got -- I think that had five years of data, and that was in 1995, so I think we've probably got ten years of data to work with as a rough estimate.

DR. KRESS: Yeah. What I had in mind was, those are -- you know, if you were doing a sensitivity or uncertainty analysis, you vary your independent variables over particular ranges in such a way. And real data has got specific points, and you may not get -- and they varied simultaneously, and you may want to look at individual variations, how sensitive they are. You may want to vary over ranges that you never see in that data that you might expect to see, so that's why I say the real data is really interesting, and you've got to do that. But you may want to just make up some data and just --

MR. BOYCE: Does that go back to your earlier comment that the initiating event PI is not a sensitive enough indicator?

DR. KRESS: Yeah. Exactly. That would be one way to -- how sensitive is it?

MR. RASMUSON: We plan to run some simulations and --

DR. KRESS: Simulations is what I would want.

MR. ROSEN: Well, our agenda right now says that we've got about thirty minutes for something called general discussion. I've think we've been talking about general for some time now, but I would

like to go around the table and ask if any of the members have any comments that they haven't already made that they would like to, Bill, Jack?

MR. LEITCH: Well, I realize you have this charge to develop risk-informed thresholds and so forth, but I guess my concern is that it violates, in my mind, the KISS principle. I don't know if you know about the KISS principle. Keep It Simple, I can't imagine what the last S is for. But I mean, I think it's an excellent mathematical treatment of the issue, but I think where the prime purpose of this is a report to Congress and the stakeholders, in my mind it just unnecessarily complicates what -- the message we're trying to convey here.

Like, for example, I can see scrams, you know, I would see two points, industry average and worst plant, and have bands, like lines that would say here's three scrams per year, and this is green down here. And then between three and whatever the right number is, that's white, and some other number, you know, for what the numbers are. I don't remember those numbers but they're pretty high, thirty or something like that for the next transition. And then down here I'd show here's what the industry average is, here's what the worst plant is.

I mean, I think in a moment looking at that kind of a graph says to me how we're doing. This is certainly a more rigorous treatment, but it seems to me it really complicates the understanding by the average person as to what they're looking at.

MR. BOYCE: I appreciate that feedback, because that is, as you know, one of our purposes is to try and enhance stakeholder confidence. So, you know, what we could do is use a parallel. It doesn't mean because we have this initiating event performance index that we throw out the current indicators, which are scrams, complicated scrams and general transients. It would give us something else to look at that is perhaps more risk-informed. Like scrams is -- there is only a subset of scrams that are truly risk-significant, and so it gives you that -- it gives you operational level performance, not necessarily safety performance. Whereas, complicated scrams or scrams with loss of normal heat removal is considered much more risk-significant, that subset. So, you know, what we're doing, I think, is developing something in parallel that doesn't have to replace the current set. Scrams is just so well understood, I personally don't see us throwing that out, but just to give you the current thinking. I appreciate the feedback on the

too complicated.

MR. SIEBER: I guess I should say that I disagree a little bit with Graham's situation, because I think the ROP singles out individual plants. And that's probably the appropriate place for that to occur, as opposed to a report to Congress with the media saying, oh, where is that plant?

DR. KRESS: Yeah. I think I agree with Graham, because if I'm a Congressman or even somebody else, I want to know what the trends are. And to me, a trend is not only this index with averages on plants, but I want to know if half of them are going one way, and half of them are going the other way. I want to know that too, and that's --

MR. ROSEN: Especially if one of them is in my district.

DR. KRESS: Yeah, especially if one of them is in my district, so that's a trend, that's an overall trend also, and it ought to be reported. And so I'm looking for another use of that index in a different way.

The other things I've already made some comments on, but I did want to say, least you think I'm negative on this, I think it's an innovative approach, and I'm glad to see you guys doing some good

thinking along these lines. And I'd encourage you to keep going with it.

Not only that, the -- what was I going to say? Give me a second.

MR. ROSEN: Well, I'll give you another chance after Mario.

DR. KRESS: Okay.

MR. ROSEN: Think about it. Mario.

DR. BONACA: I think in general --

DR. KRESS: I know what I was going to say. Let me say it before I forget it again. Graham Leitch thought this was overly-complicated and I think part of that is because we're obfuscating a little bit with the Birnbaum thing, times this, times the summation, when all we're really dealing with is average CDF. And I think you would say this is an average CDF, and from that same standpoint, I would go back to Equation 1 or the first equation, rather than use the one you're using here. That's what I wanted -

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DR. BONACA: I think in general I can -- I could criticize, you know, the approach taken and whatever, but that wouldn't be the point. I think I see value in having some integrating mechanism by

which you can pass a judgment on the average performance of the industry, because we're always confronted with situations where we question the ROP, so we are left with a question, you know, are we really measuring right? What's the trend going on? And we are confronted with a situation like Davis-Besse, for example. That came in as a surprise to all of us. Is that the picture of what the industry is all about? When we have some integrated measures of this type that give us, you know, a measure of what's happening in average, I think that's meaningful. Because again, they add a dimension to what additional information we already have from the LOP and everything else. So we have a lot of information, and it's a good question, Graham, will the Congress look at the additional information? I think probably they do. I mean, certainly they asked questions about Davis-Besse, and I think, you know, this data here puts situations for an individual plant into context.

And I think also, to me it's an important measurement at a time when we have had a significant shift in regulatory approach. And I keep asking myself over the past two or three years, you know, is it degrading plant performance, average industry performance or not, the fact that we have so

significantly changed the regulatory approach that we're taking right now. And I think these measures have to give me some insight into that, and so I think it's a valuable effort.

MR. ROSEN: Not right away obviously, because in my view, the fact that we changed the regulatory approach, which we certainly have, has a very long fuse on it.

DR. BONACA: Oh, I understand that.

MR. ROSEN: It's going to take a long time before it shows up. This is a good way to try to monitor whether it is showing up or not.

DR. BONACA: This may not be the best, but there are ways, but I think it's a way to look at it. And to me, I would be looking more for a judgment from the regulatory process than on the industry itself.

MR. ROSEN: But you recognize, Mario, that there are confounders in that analysis. If the performance goes down, you say therefore it's the regulatory approach, you can't make that judgment.

DR. BONACA: No, but I'm saying that then I would really like to jump into it, and then begin to question much more the ROP, and see if the ROP is continuing, or if for example, there's relaxation of the tech specs.

MR. ROSEN: Well, risk-informed regulation may not be the cause. It may be deregulation.

DR. BONACA: Absolutely.

MR. ROSEN: And maybe some of the other factors.

DR. BONACA: I agree with you.

MR. ROSEN: Just because you see performance goes down, and during that time window we incorporated this informed regulation, doesn't mean it was risk-informed regulation.

DR. BONACA: But, you know, we came back from Berlin and we heard some of the criticisms that are being leveled to us indirectly as a -- even directly. And I think, you know, at a time in which you -- I think is important to have indicators that put Davis-Besse in context. You know, if we could confirm, for example, an improving trend for the whole industry average at a time when you have an event like that, that would say look, you know, again we make the point that stress corrosion cracking is not --

MR. ROSEN: If we could guarantee --

DR. BONACA: It's really that particular performance on a unit. Something happened there, and you know, the rest of the program is in good health.

MR. ROSEN: If we could show an improving

trend to the industry, we could say imagine how good this industry could have been if you had not gone to risk-informed regulation. On that note, let me try and make a couple of points that I've been thinking about. One of them I just want to repeat, was the idea that this is an important indicator, but it is an indicator of shots on goal. It's a challenges indicator, not the whole picture.

DR. KRESS: It's the whole picture.

MR. ROSEN: Why do you say that?

DR. KRESS: It counts the shots.

MR. ROSEN: Well, not without the mitigating system performance indicator.

DR. KRESS: It's in there, because that shows up in the Birnbaum --

MR. ROSEN: Well, because of the PRAs. Okay. Let me think about that. I'd like to go on to the question that Graham Leitch raised earlier about it getting too complicated. I've also, you know, heard some threads that this over-simplifies, so what that debate raises in my mind, the old communication principle that you can understand what's going on on a number of different levels. And so to really communicate about what's going on, you really have to speak in the language of the listener, or else you

don't get information transferred across the interface. So if you're talking to Congress, you have to talk in the language that Congress understands. If you're talking to technical people, well you have to talk about Birnbaum importance, but you have to always couch your message, if your interest is communication rather than obfuscation, you have to communicate in the language of the listener. So you think about your audience first -- you think about your subject matter, and then you think about your audience, and then you think about your vehicle across the interface. So I don't think there's one answer to the question of whether it's too complicated or it's over-simplified. I think it is what it is, and communicating you have to think about your audience.

MR. SIEBER: I think a corollary to that is that since the Congress asked for this information, you have to read exactly what they asked for as a refresher.

DR. KRESS: Yeah, but they didn't ask for NRC. They asked all the agencies --

DR. SHACK: I also assumed they weren't going to tell them anything about Birnbaum importance.

MR. SIEBER: Well, the question is --

DR. SHACK: You can take the Birnbaum with

the SPAR models. I mean, that's the only way you have of getting to those --

MR. SIEBER: The question is, are they asking what's the effectiveness of the agency, or what's the effectiveness and safety in the industry? That's two different questions.

DR. KRESS: Yeah, I think they're asking the effectiveness of the agency.

DR. BONACA: There are two different questions in there now. I mean, they are, and they're not different questions, because I mean the two things are so complimentary. I agree they're different, and yet one is a window on the other.

DR. KRESS: The measure of the effectiveness of NRC is whether or not the plants are safe.

DR. SHACK: Well, as long as they're safe, in spite of the NRC, you get to the bottom line.

DR. KRESS: I know, but if they're not safe, it's the NRC's fault.

MR. ROSEN: Right. I think it's time for us to declare victory, unless there's anyone who wants --

DR. BONACA: Or declare defeat.

MR. ROSEN: We have one member in the

audience.

MR. DUBE: Don Dube from Research. I think one of the strengths that maybe wasn't discussed with this, is that this can be a very powerful early warning on industry trends, in the sense that if you think about it, there's probably ten initiating events that occur every month. And with the licensee event reports coming in in thirty to sixty days, in a period of a very short amount of time, let's say thirty, to sixty, to ninety days, one could begin to detect a trend. Granted it won't be as accurate as having plant-specific initiating events, and plant-specific mitigating system performance as you have with the ASP, but the ASP does have a time lag of twelve to eighteen months, perhaps. Whereas, this can be probably the most powerful early warning detection that one can have. And it will look at industry trends and initiating events in combination with the performance of the mitigating system, so granted, it will not be as accurate as say an ASP or a mitigating system performance index, and it's not intended to substitute for that, but it can compliment it, and can be probably the best industry average early warning detection. Just some thoughts.

MR. ROSEN: Thank you.

DR. SHACK: That's where the rubber meets the road.

MR. ROSEN: Right. We are -- any questions? Adjourned.

(Off the record 12:21:12 p.m.)