Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Public Meeting of Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements

Docket Number: (not applicable)

Location: Rockville, Maryland

Date: August 17, 2004

Work Order No.: NRC-1647 Pages 1-132

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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PUBLIC MEETING

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RISK-INFORMED CHANGES TO LOSS-OF-COOLANT ACCIDENT

TECHNICAL REQUIREMENTS

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TUESDAY, AUGUST 17, 2004

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The meeting was held in the Auditorium, Two White Flint, Rockville, Maryland, at 9:00 a.m., Richard Dudley presiding.

PRESENT:

Richard Dudley	NRC
Brian Barrett	NRC
Suzanne Black	NRC
Brian Sheron	NRC
Gary Hammer	NRC
Mark Rubin	NRC
Brian Thomas	NRC
Jennifer Uhle	NRC

C O N T E N T S

P R O C E E D I N G S

(9:19 a.m.)

MR. DUDLEY: Good morning, ladies and gentlemen. We're going to go ahead and start the meeting. We're still working on the telephone bridge, but we're going to go ahead and start the meeting. We do have this transcription working.

I'm Richard Dudley. I'm a rulemaking project manager in the Office of Nuclear Reactor Regulation. I'm working on the risk-informed alternative to the current requirements for emergency core cooling systems in 10 CFR 5046.

I'd like to thank everyone for coming here today. I apologize again for the late start.

Today we're evaluating the costs and benefits of an early draft risk-informed revision to our ECCS requirements, but before we go on to the staff's presentations on this topic, I need to mention a few logistical items and go over some ground rules for the meeting.

First of all, this is what we consider a Category II public meeting. That means we have designated times throughout the meeting for stakeholder discussion. So at the end of each speaker's presentation, we'll ask you to give us

your comments or questions. But would you please hold your questions and comments until each speaker is finished?

Today please try to focus your comments and questions on the issues that relate to the costs and benefits of this draft rule concept. The rule concept is described in our conceptual basis document, and we will also review it in today's staff presentations.

Today we don't plan to have a significant discussion, however, on the rule policy or the technical issues.

You'll notice that today's meeting is being transcribed. So please use the microphones whenever you provide us with comments or ask questions.

Also, please identify yourself, give your name and affiliation before you speak. That way you can be identified on the transcript.

Also, we will make the meeting transcript available to the public. We'll put it into our ADAMS document system.

If any of you have cell phones, please turn them off or put them on silent, please.

And also what you should know is that

the microphone system is trying to be connected to a telephone bridge. That way we hope that interested parties can call in on the telephones and listen to the meeting. Then they could speak with us, ask us questions, and give us information also. We're still working to try to get that system to go. We're still having some technical difficulties.

Back to the auditorium. There are a number of things that were on the table in the foyer as you came in. First we had attendance sheets that we hoped everybody signed. If not, please go back and do that and give us your E-mail address. Then we can E-mail you a copy of the summary of this meeting.

And in the meeting summary we'll give you the accession number of the meeting transcript in our Adams document system. We have copies of the agenda and the schedule for today's meeting out in the lobby. We also have copies of the slides that our staff will be using in their presentations. We may have one set of slides that's not there yet. We'll let you know when it's available.

We have copies of the Federal Register notice that we published on August 2nd, and finally, we have public meeting feedback forms on the back

table.

Towards the end of the meeting if you'll please pick up a form and fill it out and let us know how effectively we conducted the meeting.

Also at the back of this room on the table over that way, we have a few copies of our conceptual basis document and the draft rule that we posted on the NRC Web site for public review several weeks ago.

We will not be providing written responses to the questions or comments made during today's meeting. This information that we received today will be used to prepare a regulatory analysis. The regulatory analysis and the proposed rule will be released for public comment late this year or early -- well, will be released early next year.

All public comments submitted on the proposed rule, however, will be formally addressed by the NRC when the final rule is published.

Now I need to talk a little bit about building security issues. We're currently in an orange alert status. So the security and escort rules are stricter than usual. Everyone who leaves the auditorium level will need to be escorted by an NRC employee. There is no problem with access to

the restrooms on this level, but anyone wanting to go upstairs will need an escort.

That means during breaks and at lunchtime you'll need to be escorted to the lobby level where the cafeteria is, but once you're on the lobby level, you will no longer need that escort, except when you wish to return to the auditorium, and you'll be escorted back down here.

Are there any questions on anything that I've gone over?

(No response.)

MR. DUDLEY: Okay. Seeing none, I'd like to introduce Brian Sheron, and Brian will give the opening remarks.

MR. SHERON: Good morning. The first thing I did is I grabbed Dick Feather's talk here. Everything looks alike here.

I'm Brian Sheron, and I'm the Associate Director for Project Licensing and Technical Review in NRR.

I'd like to thank everybody for coming to this meeting. We're going to do our best to make it efficient and productive as possible and to hopefully walk away with a successful meeting.

The purpose of the meeting is to discuss

the potential costs and benefits that might result from implementation of a rule that provides a risk informed alternative break size for large break loss of coolant accidents at power reactors.

Just in case we have anyone here or anyone listening in who is not familiar with the rulemaking process, let me explain how this meeting is going to fit in. Whenever NRC wishes to modify the regulations, it is required to demonstrate by analysis that the expected result of the reaction is either necessary for safety or is cost beneficial.

Okay. So that's one of the underlying principles of our rulemaking process. Okay?

Now, I hope you had the opportunity to carefully read the concept paper that has been up on our Web site for the past couple of weeks. We're going to use the first half of this meeting to go over the concept with you and to answer any questions which might clarify the staff's intent.

If you take a look at the meeting agenda, you will see that following my remarks we will have a presentation on a conceptual framework for the revised rule, the selection of the transition break size and the ECCS analysis requirements applicable for each of the two break

spectrum regions.

A time for questions will be included during each of these presentations. After lunch, we will continue with the process of adopting the alternative break size requirements and the process for subsequent changes to the plant design or operations. After that, we will solicit responses to the questions on cost benefits that were published with the meeting announcement and are shown again on the agenda.

Please remember during these presentations that the focus of today's meeting is on costs and benefits of the regulatory analysis. It is not for comment on the concept paper or the rule language. The rule language included in the concept paper was provided only to facilitate your evaluation of possible changes to your plants and the associated costs and benefits.

The actual proposed rule will be out for public comment early next year and will be discussed in another meeting. We do not intend to address comments or questions on the concept today except for the purpose of clarification of the concept paper.

Let me try and explain that, for

example, we're going to talk to you today about a transition break size. All right? And it's going to be a number. All right? We don't intend to get into a technical debate on that number, okay, whether it's ten inches or 14 inches or whatever, okay? We're going to tell you how we reached that number, the basis for it.

What we would like is feedback on what you believe that means to you from the standpoint of your plant. Okay? If you come in and you say, you know, "Hey, you picked a break size that is not going to affect, you know, anything in my plant. In other words, I'm still going to have to keep all of the same equipment to mitigate all of the breaks below that," okay, that's something we need to know. All right?

Whether you agree or disagree that that break size, that transition break size is an appropriate number, okay, that's the subject of another meeting. That's the subject of your ability to comment on the proposed rule.

Right now we are just trying to solicit information on cost and benefits. Okay? Based on what we've put out on the Web, how do you think you would be able to implement this rule? Okay? Is

this something that is beneficial to you? In what way do you think you would be able to take advantage of it? And what are the costs associated with doing that?

As far as the rule itself goes, this action is the third risk-informed rulemaking undertaken since the Commission issued the PRA policy statement in 1995. The first risk-informed rule change was the hydrogen rule, which was 5044, and the second was the treatment rule in 5669.

We consider the current rulemaking to be the most significant risk-informed action thus far in that 5046 is one of the more far reaching regulations that impacts many aspects of plant design and operation.

Just as an aside, as we developed this proposed rule, I think one of the biggest subjects that ate up most of our time in our internal debates was an animal we referred to as tentacles, which is that when you start looking at 5046 and anyone that has dealt with this regulation realize that it basically permeates every aspect or most aspects of the design of a plant and the way it affects equipment qualification, you name it, sump design.

Everything -- well, I won't say

"everything" -- but a lot of things, a lot of design aspects of plants, okay, can really be traced back to the ECCS analysis. So this is a very important regulation.

The NRC's approach to the rule revision is to divide the break structure into two regions based upon the estimated frequency of occurrence of breaks. Breaks in the more likely region will be subject to the same regulatory requirements as today, as well as other qualitative factors. Break areas in the less likely region are judged to be low in frequency and will be addressed by less rigorous requirements.

Licensees will, however, still be required to demonstrate mitigation capability for all break sizes up to and including an area equivalent to the double ended break of the largest pipe in the reactor coolant system using the less rigorous requirements.

Basically what we're saying is that we are going to relax the requirements for analyzing breaks above this transition break size. However, from a risk standpoint, okay, we don't expect that if you did get such a break it would automatically lead to a core melt accident. In other words, you

wouldn't be able to mitigate it.

We believe that you need to keep equipment in the plant that is sufficient to mitigate it, albeit not with the rigor and conservatism that is currently required.

A licensee that wishes to adopt the alternative ECCS requirements and make changes to the plant design or operations will be required to submit a risk-informed license amendment for staff review and approval. The amendment must use a PRA to demonstrate that any resulting change in risk is small.

The amendment must also show that the safety margins are maintained, that defense in depth is maintained, and that a monitoring program is in place that assures that that the basis for the proposed changes will be maintained.

We believe that licensees who adopt the alternative will also be required to periodically update their PRAs to insure that the cumulative changes to risk are not significant.

Note the treatment of loss of off-site power coincident with a LOCA, which is the LOCA loop issue, is not part of this action at this time. We are addressing that separately. Our plan is we have

a topical report that has been submitted by the BWR Owners Group, and we intend to address that issue separately through the review of that topical, and then at some point we would either fold that into this rulemaking or guide a separate rulemaking.

As we will discuss shortly, part of the basis for this rule is an estimate of the local frequencies developed by an expert elicitation panel, and our Office of Research sponsored that.

The staff plans to periodically update these estimates as we get new information, new data. Should the estimates of LOCA frequency change in the future such that the licensee's basis for changes made under the rule are invalidated, the licensee would be required to make changes to the plant or operations such that compliance is restored.

In such cases, the backfit rule would not apply. This was direction from our Commission. What this means is that if we were to pick a break size, for example, if the break size was eight inches or ten inches based strictly on a frequency assessment, frequency of the break size, and then say you made changes to your plant and several years down the road we get new information that says, no, that break size really is ten inches or 12 inches.

If you took equipment out of the plant, okay, or made changes to equipment such that now you couldn't mitigate a new transition break size, then you would have to go back and refit your plant in order to basically mitigate.

Now, you'll hear in these further discussions we've picked a break size, a transition break size that provides some margin for these uncertainties. So our thoughts right now are that we do not believe that any future assessments of break size, if we keep the one that we've proposed; we do not think any future assessments would necessarily require us to impose these kind of revisions to your plant.

As the staff will discuss shortly, part of the basis for this rule is an estimate of LOCA frequencies -- oh, I'm sorry. I already went through that part, I think.

Yes, just as a reminder then, please try to focus your comments and questions on issues related to the costs and benefits of the concept rule described in the staff's paper and the presentation.

And as I said, we really don't want to get into a debate on the rule, the policy, or the

technical issues. There will be other forums for that.

With that, unless there's anybody that has any questions to me on the overall approach that we intend to take on this, I'll turn it over to the staff to start their presentations.

MR. DUDLEY: Thank you, Brian.

I'd like to check to see if the conference call operator -- if we were successful there.

Operator, are you there? Okay, fine. Can you ask the people on the bridge to introduce themselves and their affiliation, please?

(Presentations made from unmicked location.)

MR. DUDLEY: Okay. Thanks very much.

Next I'm going to talk about the structure of the draft rule. Can you hear me? Now this is working.

Okay. Basically what we've done is we've added a voluntary alternative section to 5046. We've called it 5046(a). There was a previous 5046(a). We've redesignated that as 5046(b).

But basically we've left the remainder of 5046 unchanged, except that we've put words that

would allow you to meet either 5046 or to choose to meet the alternative 5046(a).

In order to use the alternative, it was necessary to make some conforming changes to the general design criteria. We found GDC 35 as one of the GDCs that needed slight modification.

We also made some other conforming changes to other regulations, 5034, 50.109, the backfit rule, and some other minor changes.

And as Brian said before, the 5046(a) alternative addresses LOCA redefinition only. It does not address the issue of LOCA with the coincidence of loss of off-site power. That will be done separately.

Basically what we've done in 5046(a) is we have taken the entire LOCA break spectrum from the smallest breaks to the double ended break of the largest reactor coolant system pipe and we've divided that into two regions by the definition of something that we call the transition break size or TBS.

The selection of TBS is based upon estimates of LOCA frequencies. The breaks in the lower region are estimated by the NRC to be much more likely than the breaks in the higher region.

The breaks in the smaller break region now must meet current 5046 ECCS analysis requirements and acceptance criteria, whereas the breaks in the larger break region will be allowed to meet less stringent analysis criteria with less stringent assumptions, but licensees still must maintain mitigation of a rupture of the largest reactor coolant system pipe in the system. But that mitigation is done with as conservative a set of assumptions as is done with the smaller breaks in 5046.

So after licensee selects this voluntary option and they do their new ECCS analysis, they may find that some plants are no longer limited by the large break LOCA. So they have some design flexibility.

With that design flexibility, licensees may propose changes to the way they operate the plant or other changes to plant design, and all of those changes that licensees would propose under this option must be reviewed and approved by the NRC as a license amendment.

The license amendment submittals must be as risk informed license amendments. They must meet criteria similar to the criteria in Reg. Guide 1.174

for risk informed license amendments, and they must show that the risk associated with the change is acceptable. They must have a monitoring program. They must show how defense in depth is maintained, and the probabilistic risk assessment used to show that risk is acceptable must meet PRA quality and scope requirements, and these will be defined in 5046(a).

And finally, as Brian has already told you, if in the future the industry and NRC estimates of LOCA frequencies change, if they increase, we may change the transition break size. We may do that by rule or order, depending upon the severity or the significance of the change, and plant changes that licensees have made under the new rule must continue to meet the acceptance criteria. So licensees might have to reverse some of the changes they've made or make other compensatory changes to their plant designs to bring risk back down to the acceptable level.

And in the case of changes in LOCA frequencies, the formal backfit rule or the backfit process described in 50.109 will not apply.

Okay. Are there any questions on the things that I've gone over?

MR. PIETRANGELO: Tony Pietrangelo, NEI. Just a couple of questions.

Is the transition break size the new design basis?

MR. DUDLEY: We'll go over all of that later. I'm just kind of summarizing things, but we'll go over that all into detail later, but we would consider a break at the transition break size to be the largest break that continues to be as a design basis LOCA.

Okay. However, it's a little tricky because equipment necessary to mitigate the double ended break would still remain in what we call the design basis of the plant, but, yes, the transition break size would be the largest design basis LOCA.

MR. PIETRANGELO: So does that mean that like other general design criteria would not apply beyond the new alternative break size?

MR. DUDLEY: It all depends. We'd have to look at the specific words, but if it said "design basis accident," it would not apply. I believe that's correct. OGC, correct me if I'm wrong.

But if it said "design basis accident," other rules in other GDCs would not apply to

accidents or LOCAs greater than the transition break size.

MR. PIETRANGELO: Thank you.

MR. DUDLEY: Are there any other questions?

(No response.)

MR. DUDLEY: Okay. On the telephone bridge, are there any questions on anything I've gone over?

(No response.)

MR. DUDLEY: Okay. I'm going to take that as no further questions, and next Gary Hammer how we've arrived at the transition break size.

MR. HAMMER: Okay. Good morning. I'm Gary Hammer. I work in the Division of Engineering at the Office of NRR, and we've been working together with our counterparts in the Office of Research on selecting transitional break size for the new 5046 rule.

And as way of a little background, currently 10 CFR 50.46 requires postulating LOCAs of different sizes, locations, and other properties up to and including the largest pipe in the reactor coolant system or, as it is called, the double ended guillotine break, or you'll see this initialism

DEGB, for evaluating ECCS performance, and Brian and Dick have both touched on that a little bit.

The NRC believes that the current ECCS performance requirements are based on very unlikely scenarios, especially for these largest breaks, and result in design and operational constraints that may be inconsistent with risk insights.

The approach being pursued by the Commission for risk informing the 5046 requirements is to establish a transitional break size, or as it's called, a TBS, which is a new concept for the design basis LOCA break size, and that would involve two regimes, as Dick and Brian have mentioned.

Up to and including the TBS, the current 5046 evaluation requirements would continue to apply and above the TBS, a less conservative evaluation would be permitted consistent with a risk informed approach up to the double ended break of the largest pipe in the reactor coolant system, and this no longer design basis but mitigation capability must be demonstrated.

And now we establish the transition break size. We're going to base the transitional break size on break frequency and some other considerations. The NRC has performed several

studies over a number of years which estimated the frequency of occurrence of various size LOCAs in the past, and those are listed there over a number of years.

WASH-1400, the reactor safety study in 1975, estimates of LOCAs were mostly based on other industrial experience. Little nuclear plant data was available at that time, and that's a very old study now.

And then the next sort of landmark is NUREG 1150, which was a study of severe accident risk in 1990, and this updated some of the WASH-14 -- actually all of the WASH-1400 estimates were updated, but they still had little experience with actual breaks.

And then later in the 1990s NUREG CR-5750, which estimated frequencies of various initiating events, including LOCAs, took a little more comprehensive look at actual LOCA frequencies and developed a database based on several operating reactor years of experience which had accumulated by that time.

And as I said, these studies were based on a limited amount of actual pipe break data, but we took into consideration several precursors of

breaks, including various amounts of degradation that had been found.

But we would like to have as good an estimate as we can, and more recently we've convened a panel of 12 experts knowledgeable in piping, degradation and failure issues to see if we can't refine and come up with some better frequency estimates for breaks, and we've called that the expert elicitation process, which you'll see written in the concept paper and in several other documents, and it's a process which generated estimates of degradation related failures for boiling water reactors and pressurized water reactors, and it has been documented in a Commission paper in some detail, 04-0060.

And the staff has used the elicitation results more or less as a starting point for establishing a TBS, and we used a frequency of one in 100,000 years, since it is complemented by mitigation capability for LOCAs greater than the TBS, and this is discussed in the Commission's staff requirements memo on the Commission paper 04-0037 a little earlier this year.

But it is recognized that the elicitation process included breaks that were caused

by degradation related phenomena, and we wanted to incorporate some other considerations, which are listed there.

Top on the list is the significant and uncertainty that exists in the elicitation process, and the elicitation process resulted in its own estimation of uncertainty, but then there are other uncertainties that involve the aggregation of the results and coming up with uncertainty bounds and confidence levels and things of this nature.

And then there were some things that are really in addition to degradation related phenomena which are active system LOCAs, such as stuck open valves, things that occur in active components. There are additional considerations due to large loads, such as seismic or large pressure loads, and that’s in addition to the degradation related estimates in that the degradation related estimates were for just normal operating conditions that you would expect.

And then there are some other considerations having to do with the specific operating experience that might be found in some specific piping or configurations, and including what pipe size is attached to the main coolant loops

and possible variation in plant design and operational characteristics that exist over the spectrum of 100 or so plants, and there's, you know, a lot of environmental and operational variables there, including fatigue and corrosion and things like that.

So we went through that process, and we came up with some preliminary transition break sizes, one for PWRs and one for BWRs, and it's 14 inch for the PWRs and 20 inch for the BWRs. These estimates provide a significant level of confidence that the ten to the minus five per reactor year frequency of occurrence for degradation related breaks is not exceeded, and we still have some work to do to finalize these estimates, including the seismically induced contribution and some other considerations, but these are the preliminary numbers.

And the staff plans to periodically update the pipe break frequencies, as Brian mentioned, to determine if the bases for the selection of these sizes remains valid.

And then I was going to provide some examples of how we think this might work, and what we've chosen is the example of PWRs. You could go

through a similar exercise for BWRs, but this is just to give you some idea.

For LOCAs up to and include the TBS of 14 inch for PWRs, you would postulate a couple of different things there, and what you would have is -- I've got a graphic here which might help. On the right side of the reactor vessel there, we're showing example of design basis LOCA which would be up to and including the TBS, and then to the left you would see some depiction of beyond design basis up to the double ended guillotine break.

So for up to and include the TBS what we're showing there are you would postulate the complete failure of this pipe since it is a 14 inch pipe, and then you would also postulate an equivalent double ended area at these other locations, wherever that limiting location might be, and that would basically be the extent of that part of the analysis.

And then for the beyond design basis, greater than 14 inch, what would be postulated would be things like the double ended rupture of the largest pipe, as we show here, or a partial opening greater than 14 or larger than this TBS area over here, and that's just an example.

And like I say, you could go through the same thing, but you know, for BWRs.

That's basically my presentation. Do you have any questions?

(No response.)

MR. HAMMER: Okay.

MR. DUDLEY: Yeah, are there any questions from the telephone bridge?

(No response.)

MR. DUDLEY: Thank you.

At this point -- oh, I'm sorry.

MR. DUNN: Bert Dunn, Framatome.

I was curious, two things. It may just be a clarification. On the work for establishing the transition break size, you listed uncertainties: LOCA caused by inadvertent actuation, degradation, et cetera. Have you already included those?

I was a little confused in the basis document as to whether the applicant was going to have to provide evidence that those are included or is it your intent to include those in your 14 inch or whatever break size you had come up with?

MR. HAMMER: If I understand the question, we're still in the stage of trying to narrow it down, what the size actually is, and we're

trying to take into consideration some other things, such as active LOCAs and things of that nature. So we're not quite there yet.

MR. DUNN: Am I out of order, Brian? If I'm out of order, I'll --

MR. SHERON: No, no. The basis was that we went to the expert elicitation. You don't have those charts up there with the frequency, but we picked a break size that was, I think, ten to the minus fifth based on that. That was a smaller break than, say, for the PWRs for 14 inches. It was smaller. Okay?

Then we looked and we said what other kind of breaks can occur that weren't factored into the expert elicitation, and I think Gary listed some of those, some of the initiators.

And so the question was: how do we take that into account?

And then we also looked and we said from a practical standpoint what are the largest pipes that attach to the primary system. I think 14 inches is about the biggest one we came up with. I think it's a South Texas search light.

Based on all of that, we said that if we picked 14 inches, okay, we are providing a margin

above the ten to the minus fifth frequency to account for these other uncertainties.

We also pick up from the standpoint that we bound all -- you know, from a practical standpoint all piping net attaches to the primary system of BWRs. So that was basically how we arrived at 14 inches, okay, and it was a similar process that we went through for the BWRs.

MR. DUNN: So at this point there's not any additional justification to be provided by the applicant for that break size once it gets settled, whatever it is.

MR. SHERON: Yeah, our plan right now is that we would not like to have a plant specific break size for each plant.

MR. DUNN: Okay. The second thing is you mentioned 14 inches nominal break size. You're intending this to be actual pipe area as opposed to 14 inches.

MR. SHERON: As an equivalent diameter, yeah, of the pipe.

MR. DUNN: Yeah, which is smaller than 14 inches.

MR. SHERON: Right.

MR. DUNN: Okay. Thank you.

Are there anymore questions?

(No response.)

MR. DUDLEY: Okay. At this point on our agenda we have a break. We're a little bit ahead of schedule. So let's take a 15 minute break and come back here at 10:20.

Please keep in mind the escort requirements for members of the public that are going off of this level.

Thank you.

(Whereupon, the foregoing matter went off the record at 10:03 a.m. and went back on the record at 10:25 a.m.)

MR. DUDLEY: Our next speaker will be Jennifer Uhle, and she'll speak about the emergency core cooling system requirements under this revised voluntary alternative rule.

Jennifer.

MS. UHLE: Thanks.

Again, my name is Jennifer Uhle. I'm a Section Chief in Reactor Systems Branch in NRR.

Although his name is not on this particular slide, I'd like to acknowledge that Dr. Ralph Landry over there in the front row contributed greatly to this piece of work that we're doing here.

So I didn't know if he didn't want his name on this slide because he didn't want to be blamed or what, but at any rate, thanks, Ralph.

What I'm going to be talking about today is the elements of the rule that we are proposing to change. For those of you who are familiar with 5046, pretty much these four elements comprise the rule.

So the first thing we're going to talk about today is the evaluation model. I'll give you a definition of what that is. We are using the same word "evaluation model" in the greater than transition break size region, but it will have a bit of a different meaning in that particular region, and I'll talk about that in a bit.

Also, the single failure criteria, there will be different requirements for the assumptions pertaining to the single failure between the two different regions. The acceptance criteria we're proposing to modify, and we're also having different reporting requirements.

Just to give you a bit of a background, as far as a typical PWR LOCA response, in general, we don't expect BWRs to be able to perhaps take advantage of this rule as much as PWRs, and let me

tell you why.

First, a typical PWR LOCA response of the peak clad temperature versus the break area, and in a PWR the general curve that you would see for all PWRs is sort of a double humped curve, indicating that there's two PCT peaks, one in the small break LOCA region, which of course is from here to about one square foot or so. That's because in the smaller break size you're not uncovering the core. As you increase that break size you're starting to uncover, but you're at a higher pressure so you can't get the low pressure injection in as fast.

So there turns a period where the larger the break size you're getting more depressurization and getting more injection in. So the PCT turns around.

Around one square foot is where you really get the transition between small break phenomena and large break phenomena, and again, you'll get another peak indicating the larger the break size, the more you're uncovering the core in the large break, and again, you turn back around because the larger the break size, then you get all of your low pressure injection in faster.

So the transition break size coming from DE came out to be roughly somewhere in here, and that corresponded to be in the large break range such that the small break range here, we're proposing to keep all of the same requirements, and the greater the in transition break, which for PWRs at any rate typically is where PCT is limiting and, therefore, power is limited by the PCT response for a large break such that PWRs will most likely be able to up rate power based on the relaxed requirements in this greater than transition break size region.

Now, in particular, BWRs, it's really difficult to define a PCT versus break size spectrum. That is because the automatic depressurization system, if a break is detected because of pressure level, you blow your ADS and you get the pressure to reduce quickly. That, therefore, allows a lot of capacity through injection to come in through the core sprays.

So at any rate, the break sizes are typically in the BWRs, they're more equalized and you won't get the typical double hump curve, and the PCTs are not as different between the large break in the small region as they are in a PWR. Because of

that, we don't expect that BWRs would, say, be able to up rate power across the board or across the fleet as PWRs may be able to.

However, there may be other aspects of the rule that would be of benefit to BWRs.

So my next slide is the definition of evaluation models. Again, I think people are pretty familiar with this. That is, there's two different models that are allowed to be used for LOCA analyses. One is what's called a realistic model. It has also been described as a best estimate model. That is, again, more of a realistic analysis of the particular phenomena that are occurring in all breaks in LOCA response.

With that is the requirement that the licensee must also analyze and calculate an uncertainty value. So a realistic model with the assessment of certainty is, again, deemed the best estimate model that is allowed by NRC to be used in meeting 5046. That, again, is not going to be changing for the less than break size region.

Another model option is the Appendix K type of approach. That is a more conservative modeling approach. There's no need to and there is no requirement to analyze the uncertainty in that

provided the prescriptive modeling options are followed, again, the point of that being where the evaluation model dealing with more of the realistic approach, you have to define uncertainty. In the Appendix K instead of having the uncertainty value, there's this tendency to have a conservative value. Therefore we don't require the extra analytical work there.

So the evaluation models in the proposed rule. Up to and including the transition break size we are proposing to maintain the current requirements. In the greater than break size region, if you had read the Web narrative we say that it's going to be a model acceptable to the staff. That doesn't tell you a whole lot.

It is our intent to put down in a regulatory guide what exactly we mean by that, but with this whole philosophy of analytical rigor commensurate with the risk posed by these particular breaks, you know, in the greater than break size region, that we would propose to have less rigor in the modeling capabilities of the code that is used in that area and also in NRC's evaluation of acceptability of that particular model.

Now, it may turn out that a licensee

because they have input decks already for the large break region, they may choose to use a best estimate model that they've already been reviewed and approved by NRC because, again, they have the input deck. They've got the code that is already reviewed and approved.

If it has been reviewed and approved for the traditional 5046 analysis, the more rigorous, then of course it would automatically by default be applicable for use and acceptable to the staff to be used to analyze the breaks in the greater than break size region that would be of benefit as far as regulatory review required, but also because it's a realistic model, would hopefully if the intent was to increase power, would allow the licensee to increase power more than what would be allowed if more of a less accurate calculation were to be done.

We think that the biggest benefit really of the analysis work involved -- we don't expect really to be all that beneficial to the licensees. We think that it would be the intent to up rate power whenever possible and gain more margin.

And the single failure criterion, how we are dealing with that in the analysis would be we think the most beneficial to the industry while

maintaining safety. And that is up to and including the transition break size region, the current requirements for using or requiring the use of the worst single failure in the analysis or the assumption that the worst single failure were to occur coincident with the LOCA.

That would be the same in the less than transition break size region. In the greater than transition break size region because, again, of the risk posed by these larger breaks being less, that we would not require the worse single failure to be assumed.

We also are proposing to allow credit for non-safety systems.

However, with this analysis, you would also have to insure that some risk-informed metrics are met, and Mark Rubin will be discussing that in the presentation following me.

The acceptance criteria we're also proposing to modify up to and including the transition break size region. Everything is going to be the same as is. A PCT of 2,200, a maximum local oxidation limit of 17 percent, a hydrogen generation of one percent, coolable geometry, long-term cooling.

In the greater than transition break size region, if again you read in the narrative, the point is to make sure that there's long-term cooling and that a coolable geometry is insured. Okay?

But if a licensee were to come in and justify that their particular clad design could handle more than 17 percent/2,200, then that could be used as an argument to say that coolable geometry can be maintained with temperatures and oxidation values in excess of those in the less than transition break size region.

But at this point in time, until further information is provided, it would be the technical staff's view that the coolable geometry is imposed or is met by the 17 percent/2,200.

And the last bit of 5046 would be the reporting requirements. In the current rule, and we're going to maintain that in the less than transition break size region is the reporting requirement on the 50 degrees, and also we would have that in the greater than transition break size region.

The point of the reporting requirement is to make sure that the particular analysis of record at a plant is, in fact, representing the

current plant configuration. So if there were changes to be made to either the model -- the input deck is what I mean by "the model" -- or the analysis methodology itself that come out to be greater than 50 degrees, that NRC would want to be contacted and the licensee discusses within NRC what the schedule for reanalysis would be.

There are times where if all of the changes are essentially gaining margin, such as the PCT is reducing because of errors found in the code, we're not as concerned about this 50 degree change. So the acceptable amount of time that a licensee has before they come in with a reanalysis is certainly larger than if a licensee were to come in and indicate that they have an error in their code and 75 degrees is the result, and that is in the positive direction. So they're getting closer to the 2,200 limit.

That type of philosophy would still be maintained. However, because -- and you'll see it's underlined and bolded -- we're adding requirement, the maximum local oxidation such that a licensee would have to report in schedule re-analysis when the oxidation were to exceed .4 percent.

That number doesn't come out of the air.

It's the same fraction. Fifty degrees out of 2,200 is about two and a half percent, and .4 degrees is about two and a half percent of the 17 percent. Okay?

The reason why we're proposing to add this is that powers will be upgraded most likely for plants that were large break LOCA limited. They're now going to be operating in a regime that are tending to be more small break LOCA limited.

With that, with PCTs we're worried about meeting the requirement of coolable geometry. The 17 percent on oxidation is to insure that the clad remains ductile for after the quench is to occur. So what we're indicating here is that in the small break LOCA region that the ductility in the oxidation is not just a function of PCT. You can be maintaining a 1,500 degree Fahrenheit peak clad temperature, but if you stay at that value for hours, you can eventually get to the point where you're coming closer to the 17 percent and, therefore, losing ductility even though you haven't exceeded 2,200.

Now, in a large break sense, and the reason why we're not adding requirement in the large break is because in general the oxidation value is

pretty much hand in hand with the PCT. The time at temperature really doesn't come into play in a large break because the transients are so fast.

But as we're moving to small break LOCA dominated or small break LOCA is dominating the risk, again, we see the need to insure coolable geometry by also the PCT value as well as the oxidation, and that's why NRC would like to be kept informed of any change to the oxidation values that are calculated.

Again, in the greater than transition break size region we're not proposing to have that requirement in the oxidation reporting requirement, and that is because pretty much if you've calculated your PCT and that hasn't changed in general because time at temperature is important in the large break, you're not going to have much of a change in your oxidation. So we're comfortable leaving that off there, but we are adding that to the smaller breaks.

So on the summary slide, if I go back to my introduction, the evaluation models, I don't think we're changing much here. We're proposing to have less rigor in the greater the intermission break size regions, less rigor needed for analysis, as well as NRC review of the methodology.

Single failure criteria, we're proposing to relax that in the greater than transition break size region, allowing some credit for non-safety system if appropriate, but at the same time risk metrics will have to be met. to make sure that the submittal is, in fact, acceptable to the staff.

The acceptance criteria, everything is staying the same for the less than transition break size region. The greater than transition break size region, we're making it more performance based, insuring long-term cooling, and coolable geometry.

And finally, in the reporting requirements, we're enhancing the requirements in the less than transition break size region to add the oxidation value, again, to get to the point that we are concerned about the oxidation levels that can occur as plants are up rating power more than they would be otherwise, relating to a small break LOCA risk-dominated way the plants are operating and, therefore, we want to be tracking the oxidation.

In the greater than transition break size, we're not concerned about that. Its time at temperature isn't the factor there, and we're not proposing to add that oxidation value but just report on the 50 degrees.

So that pretty much summarizes the ECCS requirement or the analysis methodologies. Are there any questions?

MR. BUTLER: John Butler, NEI.

I have a question on the single failure criteria. It's pretty clear how you're applying the GDC 35 single failure criteria for breaks greater than the transition break size, but I'm wanting a clarification on how the single failure criteria for GDC 17 electrical power systems are 44 for cooling water system would be applied for breaks greater than transition break size.

The effect of a single failure for dose systems is, in effect, the same effect as a single failure for 35, and so if you don't also provide the same type of consideration for those GDCs, you are in effect losing the benefit of the single failure relaxation for 35.

MS. UHLE: Our thinking when we say "single failure" was really talking about looking at the analysis, both trains injecting. I mean, typically the single failure that's imposed is you only have one train injecting. Okay? That was our thought process behind that, saying looking at the reliability of the ECCS systems, that we're

proposing to not take that single failure and allow both trains injecting.

That was the extent of our thinking. Because of that GDC 35, we're proposing to modify to indicate -- you may have seen that on the Web narrative.

MR. BUTLER: I understand.

MS. UHLE: Anything further than that we haven't, you know, thought that through at this point.

MR. BUTLER: Then I would ask that there be some thought given to the broader set of GDCs. For example, in GDC 17, if you have to assume a loss of one train of diesel generators, the effect of that single failure is a loss of one train of ECCS injections. So you'd lose that benefit.

MS. UHLE: Well, I mean, I think that -- and this is my view or my understanding, and it's not going to be NRC policy certainly -- but that is in that case the single failure of the diesel, you would in the analysis for the LOCA assume both trains are injecting. Okay? But anything else that the diesel were to have prohibited from functioning would have to be excluded.

So, I mean, because the analysis -- when

you're running the analysis, essentially you're just going to multiply the injection by two versus just having one train injecting. So you would have both flows coming in when doing the deterministic evaluation.

But any other -- so it's a fluid train that you're assuming to be operating, but if the diesel loss were to take out any other components that were used in the mitigation of the accident, then those would be assumed to be lost.

So when I say "single failure," it's assumed both trains are injecting, and we've been calling it single failure. Does that make sense?

MR. BUTLER: That could get very complicated because the electrical power system is going to change some valves that you need for ECCS. You'll get caught up by GDC 44 on cooling water systems that are needed to cool the ECCS system, the pumps.

So I'm just asking that there be some broader --

MS. UHLE: Again, if it's cooling to the injection jumps, you assume that those are functioning. So you're having both trains fully functional, injecting, but if -- okay. For

instance, if you have a core that you had made safety or a valve of some sort that you had defined as being safety related, all right, and you needed to have diesel to drive that valve, you wouldn't be able to drive that valve. Okay? You would have to take that single failure.

However, the injection pumps are free to operate. That was what Reactor Systems' thought process was. Now, again, this hasn't been fully vetted. So I may be completely wrong in my view because again, both trains are injecting. So you assume it's injecting. Anything else, it is affected by another GDC in the loss of the diesel. You'd have to assume that those -- I would think you would have to assume that those are not functional.

MR. BUTLER: All right. I think I understand that.

MS. UHLE: So we maybe perhaps should have said credit for both trains injecting and not said single failure.

MR. BUTLER: Okay, and so there would be no change to containment criteria, GDC 38 or 40. You still have to assume a single failure of your containment heat removal capability for the full spectrum of breaks.

MS. UHLE: Yeah, the single failure at this point in time -- again, this is my view -- is only pertaining to the ECCS. It's a single failure regarding injection capability.

MR. BUTLER: Okay. Part of my reasons for asking the clarifications is obviously the impact of this change and the benefit is affected by how broadly the supplies.

MS. UHLE: Sure, right. And Mark Rubin may be able to, you know, further clarify what I've said.

Are you consistent with my thinking? I mean, that's what we had discussed.

MR. RUBIN: Well, we do have a --

MS. UHLE: No, no, no, not that that was what we agreed to. That was we've had this discussion before back and forth about how broad the single failure credit should be applied.

MR. DUNN: Bert Dunn, Framatome, again.

Some, I guess, six, maybe nine months ago the industry met with the staff relative to the requirement for retained ductility, and at that time the industry proposed that a strength based test was, in fact, now the basis for the rule based on what happened in the mid-'80s and the best estimate

rule.

At that particular time the staff rejected the industry position. Could I assume that perhaps with this rule we're talking about going into a partial severe accident space, that that might be reconsidered? At a basis other than retained ductility for the ability to show or demonstrate coolable geometry in the long term following the accident would be considered.

MS. UHLE: I mean, I can't speak to that. I'm not a materials person to any extent or a fuels behavior person. I would say that any new information that you had would be submitted to the staff to justify coolable geometry, and because of the lower risk associated with the greater than transition region --

MR. DUNN: It seems like --

MS. UHLE: -- that perhaps we would be more open minded in the review of that particular information.

MR. DUNN: Okay, but you're deferring it to --

MS. UHLE: Yeah, I can.

MR. DUNN: -- a submittal by either industry or as opposed to any considerations you

might be making to try and open up that criteria a little bit based on current research projects.

MS. UHLE: Well, now, the research, we originally discussed with the fuels behavior people in NRR and Research about being performance based in this rule. Could we change it to get rid of the 17 percent/2,200?

And the work wasn't finished to the point where we could do that. So the particular research effort would be completed fall 2005. We would have more information at that point in time. So that might be a point where, again, we can have the conversation.

MR. DUNN: Okay. Thank you.

MR. DUDLEY: Any more questions?

(No response.)

MR. DUDLEY: Okay. Are there any questions from the telephone bridge? Operator, do we have any questions on the line?

OPERATOR: Are there any questions?

MR. DUDLEY: Okay. Thank you.

Thank you, Jennifer.

We're a little bit ahead of schedule. So I'd like to instead of going to lunch, I'd like for Mark Rubin to come up and he's going to talk to

you about the determining plant modifications, the adequacy of them and also a little bit about the design change licensing process and LOCA frequency reevaluation.

MR. RUBIN: Good morning. I'm Mark Rubin. I'm a Section Chief in the PRA Branch in NRR. I'll be talking about the plant modifications.

I'd also like to acknowledge the staff, my staff, who worked on developing the majority of the PRA guidance and the risk informed approach, which is Glen Kelly and Steve Dinsmore in the PSA Branch in Division of System Safety and Analysis.

As Dr. Uhle indicated, the thermal hydraulic analysis evaluation will be complemented by a risk evaluation, and changing the large break LOCA size in itself has no impact for -- large break LOCA design basis size itself has no impact on risk. It's when you make plant modifications arising from that change that there's a potential for changes in plant risk.

And that's where the PRA methods and the PRA impact assessment comes into play as a complement to the thermal hydraulic analysis that was just mentioned.

Slide one.

The basic approach that we'll be using for implementation in assessing the changes arising from 5046(a) will basically follow the principles as derived directly from Reg. Guide 1.174. So there shouldn't be anything really surprising here. Any differences will be the differences inherent in going from a voluntary licensing initiative, license based applications, to rule language, rule implementation.

But basically I'll touch very briefly on the high level 174 requirements showed on Slide 2. Basically any plant modification arising from the redefinition will meet current regulations or as modified. So essentially all of the regulations must be met unless they're exempted or changed from the details of the 5046(a) rule.

Appropriately balanced risk and the impact for any change, that means prevention and mitigation be properly balanced and you're not tilted too heavily in one direction or the other.

Sufficient defense in depth and safety margins be maintained, and we'd like to emphasize that because getting into a risk informed application that has this potentially extensive breadth of impact, defense in depth issues are

certainly significant and we'll highlight them, as well as the assessment of the actual risk.

Some potential change, power up rates were mentioned earlier. There could be some other changes to the plant in addition to thermal hydraulic analysis just discussed. A risk assessment must be calculated, must be done to show that at most small increase in risk would be the end result from the plant modification.

And as mentioned by Dr. Sheron and others earlier, licensees must monitor the SSC performance to insure that the assumptions going into the analysis remain valid.

I'm going to skip Slide 3. This is just the steps to making a submittal and a plant modification assessment. This is straight from Reg. Guide 174.

But I would go to page 4, the last bullet just to highlight that in making the evaluation, all of the 5046(a) related changes have to be evaluated as a single change compared to the risk acceptance criteria that will be developed as part of this rule. So it's not that you can implement, say, 15 or 20 changes, calculate each one separately, show an adequate risk impact against the

acceptance criteria and say, "Well, okay. We're finished."

In fact, as 174 indicates, related changes must be grouped and evaluated together and, of course, the same is very true here, and I'd like to highlight that.

The evaluation process, again, is the same as 174. So I'll skip to Slide 6 and focus on defense in depth. Again, we're in a more severe accident assessment space than the traditional thermal hydraulic evaluation against Appendix K or relaxed Appendix K methods that were just discussed.

And in the defense in depth area, again, we're following 174 principles, but we'll highlight them here. As I mentioned in the beginning, reasonable balance between prevention of core damage and prevention of containment failure, both early and late, and we'll highlight that.

Even though our performance metrics will remain delta DCF and delta LERF, certainly late containment failure is an issue, a concern, and is being done in current risk informed applications. What we'll be looking at is not developing a late containment failure method per se, but looking for containment integrity.

So long-term containment failure should be considered, and if there are any significant changes in that area, should be highlighted and compared against some containment, defense in depth, and bare isolation considerations just as is done right now in the risk-informed applications.

There should not be an over reliance on programmatic activities to compensate for design weaknesses, such things as having operator actions to respond to high likelihood failures, short time frames, depending on extensive training programs to justify very high operator performance reliability, HRA assessments. Again, no over reliance on programmatic activities. And certainly we don't want to create the independence of the barriers.

I'll go ahead to Slide 7.

Again, just as we currently are focusing on in our risk-informed applications, we want to retain system redundancy, independence in adversity, commensurate with the risk. That doesn't mean there can't be changes. It doesn't mean that there may not be some small increases in risk, perhaps some reductions in defense in depth, but adequate defense in depth, redundancy independence still needs to be maintained and assessed against the changes being

proposed.

Certainly we want to continue to defend against common mode failures, preserve human error defenses, and meet the general design criteria, and the issue that was brought up earlier is certainly one that's very germane that we have to consider in developing the details of the rule.

Now, on page 8, we'll be getting into an area that is certainly supportive of Reg. Guide 174, pertaining to defense in depth through accident mitigation, but it's amplified a little bit with respect to the specific issues germane to redefinition of the large break LOCA size.

And what we want to do is in addition to the thermal hydraulic analysis with a relaxed acceptance criteria, assuming no single failure at all, we also want to have a demonstration of defense in depth showing severe accident mitigation capability, even assuming that there may be a failure or piece of equipment unavailability.

And going to Slide -- not numbered -- it will be Slide 9 in the package. Ah, there's the number. Rode over it.

What we're trying to do here is show that for the plant changes being proposed, breaks

larger than the transition break size up to a full double ended guillotine break at the limiting location, an offset would not result in significant challenges to the reactor vessel and the containment, even given a loss of an injection train, and why are we doing this?

The concept here is that in severe accident space, the reality is equipment does fail. It's calculated in a PRA, and that calculation will show with the assumed unavailabilities and the assumed failure rates that the risk impact will be small, and that's the previous calculation that I mentioned. I'll go into a little more detail on it later.

But in addition, the reality is with the changes in the allowed outage times of some safety injection systems and given that there are failure rates, there will be some periods of time when the full mitigative system sweep that Dr. Uhle spoke of may not be available.

Now, we have done a calculation that shows that the risk impact is quite small. At the same time, in a defense in depth space, we want to have confidence that if a double ended guillotine break were to occur when equipment was

unavailability, the plant response would be adequate in a severe accident sense. I'm not talking about Appendix K calculation or even a relaxed Appendix K calculation.

But given that there are severe accident analysis evaluation methods, such as MELCOR and MAAP, we like to have confidence that the reactor vessel would not be challenged and consequently the containment would not be challenged.

Now, this is obviously in severe accident space, and we're not proposing any numerical severe accident criteria. What we're looking at is using current methods to show a level of confidence that given this low frequency event, very low frequency event, there is still confidence that the vessel would not be challenged. Consequently, public risk impact would be inconsequential.

We think this is an important confidence calculation, important defense in depth calculation. But, again, it won't be to the traditional Appendix K criteria.

MR. PIETRANGELO: A quick question, Mark. Tony Pietrangelo, NEI.

MR. RUBIN: Yes, Tony.

MR. PIETRANGELO: If loss of an injection train occurred, tell me why that's different from single failure.

MR. RUBIN: It essentially is a failure.

MR. PIETRANGELO: Okay. So you are going to look at single failure for the mitigation for break size?

MR. RUBIN: For severe accident mitigation and vessel integrity, but not against the evaluation methods or the relaxed evaluation methods being done to show that you still meet the Appendix K criteria with reduced confidence.

MR. PIETRANGELO: Thank you.

MR. RUBIN: It's a very different calculation using very different methods, and we could certainly talk about it a little more.

Going on to Slide 10, let's get into the basic risk calculation.

This will be very similar to what's currently being done, essentially identical to what's currently being done for risk-informed applications, the only difference being it will be codified in the rule and the specific reg. guide for implementation on the large break LOCA redefinition.

We will be using numerical criteria

based on the principles for that 174. It's our expectation that the impact of the changes will be assessed quantitatively and in a realistic manner, and this is with the recognition that there may be some aspects that cannot be quantified, but certainly on an application potentially as significant as this one with the plant changes that could derive from it, that we would have a quantitative assessment to the greatest extent feasible and practical.

For changes that are not modeled in the PRA, just as now, issues beyond scope; perhaps there's not a full sizement PRA. Perhaps there's a five analysis rather than a full fire PRA.

The evaluation has to show that the unmodeled element's shutdown period might be an example would be demonstrated to have only a very small impact on either CDF, containment failure frequency or, in fact, at a higher level you could just look at the impact on the system reliability, on the systems expected to respond.

Again, it has to be a full scope assessment, and we'll be talking about PRA quality issues in just a moment. Again, this is consistent with 174.

Going on to Slide 11, these criteria are applicable for both full power, low power, shutdown, internal/external events, full scope, just as now where we get a quantitative assessment to either the greatest extent that's possible or to the extent that the plant has the quantified evaluation methods available to them, and then do either qualitative or screening evaluations to show that the issue has no impact in the other areas that may not be fully modeled.

Areas that could be impacted that aren't modeled will require supplemental evaluations.

In addition, licensees must determine that these changes that are being implemented following to 5046(a) rule would not impact previous risk informed applications, namely, a change being made now from 5046(a) would not cause a previous risk informed plant change to be acceptable due to the changes in plant equipment or operating limits.

Going on the Slide 13, just some general areas, these are areas that we would not expect changes to be allowed. They're just at a high level right now. As I mentioned, we certainly don't want to eliminate the capability to mitigate LOCAs larger than TBS in a severe accident sense, and also as

discussed by Dr. Uhle in looking at the relaxed Appendix K calculation using approved methodology.

We certainly don't want to simply increase our frequency or uncertainty in LOCA frequency. Some changes being implemented could undercut the basic assumptions that went into the elicitation process that developed these revised LOCA frequencies, and we certainly wouldn't want to implement a plant change that would undercut those.

Going on to Slide 13, Dick, again, to be more specific in the area I just mentioned, we don't want to introduce new degradation mechanisms that could affect the reactor coolant system boundary and the likelihood of failure of that boundary through modification or other plant changes arising from either 5046(a) or other plant initiatives.

We certainly don't want to reduce the likelihood of detecting RCS pressure boundary degradation, such as eliminating the ISI program in this beyond TBS space.

Going on to Slide 14, Dick, talking about PRA requirements, there's not really new information here, but this is just to highlight that this is one of the newer, more extensive applications of a risk-informed implementation

rulemaking activity, and PRA adequacy and PRA quality certainly will receive close attention both from us and should receive close attention from the people implementing the changes here to make sure that the quality of the risk evaluation and the baseline PRA is adequate to justify the modification and the calculation of the impact being made.

Certainly all initiating events should include internal and external, as I mentioned before. All modes, CDF, leisurely release calculations will be the acceptability metrics that will be determined, in addition to qualitative issues, such as maintaining defense in depth.

MR. PIETRANGELO: Excuse me, Mar. Tony Pietrangelo.

MR. RUBIN: Yes, Tony.

MR. PIETRANGELO: So the rule says full scope PRA for doing 5046(a)?

MR. RUBIN: The rule follows the phased PRA quality initiative, and hopefully it will be well linked with that by the time it's finished. It says that you have to have an adequate evaluation. Certainly full scope is very desirable.

Evaluation of full scope is the requirement, namely, if there are unmodeled areas

that can have a significant impact on the change -- from the change, that will have to be evaluated. It's in tune with the phased quality initiative.

MR. PIETRANGELO: I guess what's only confusing about this slide is it's under PRA requirements. I agree with what you said about evaluating all sources of risk.

MR. RUBIN: Right.

MR. PIETRANGELO: But not necessarily having a PRA for all sources of risk.

MR. RUBIN: Well, in PRA requirements, what I mean is the risk assessment of the proposed change rather than the baseline PRA model, and again, it's very desirable to have full scope here, and we hope people will be moving in that direction.

But what's important is that there's an adequate quality evaluation of all the potential risk impacts. So if it's beyond the scope of the PRA, supplemental evaluations will have to be done. Perhaps it can be a screening evaluation to show it has no significant impact, or it may show it has potential impact, and then supplemental evaluations will have to be done.

It could be qualitative. It could be semi-quantitative and qualitative, similar to what's

doing now, but certainly this is an application that pushes PRA quality initiative to a high importance.

Going on to Slide 15, this is consistent again with the quality initiative in 174. The PRA should, of course, represent the current, as operated, as built plant. Sometimes we have PRAs that are a cycle old when we have a risk-informed submittal, and we often go back to the licensee and ask them to assess against the now current model. I think there's nothing surprising there.

Adequate technical quality, technical adequacy is the key. This, again, will be an area where PRA adequacy is certainly of high importance.

Consideration of uncertainty is something that just cannot be ignored. Quantitative, full propagation of uncertainty is always desirable. You'll hear that from the Advisory Committee. I think the reality is we'll have a mix of quantitative and qualitative uncertainty evaluations.

The challenge and the key is to insure that the determination of the impact of the proposed change and the evaluation against the matrix is a robust case for the acceptability of what is being proposed to be modified in the plant, namely, that

if there are areas of uncertainty, the bounds of the uncertainty, if they're being dealt with qualitatively wouldn't challenge the robustness of the decision, and this is consistent with what's being done now.

Going on to Slide 16, we certainly expect a monitoring program. That was mentioned by Dr. Sheron at the beginning of this workshop. We certainly would encourage use of existing programs wherever possible. There are assumptions on performance that go into the risk evaluation model. Certainly those assumptions on reliability, availability need to be followed. Changes that are made from the plant, from the 5046(a) rule could cause changes to operation, power, some changes to equipment availability.

The model that's used to assess the risk impact of those needs to be maintained as true, as accurate. So the assumptions that go into it do need to be tracked.

Of course, one way of doing that will be the PRA update program, which the rule also addresses.

Going on to Slide 17, as I mentioned in response to Tony's question, we are trying to be

fully in alignment with the current PRA quality initiatives, both the ASME standard, the NS standard, the peer review efforts. DG 1.200 now is out for trial use in PRA phased quality initiative.

We're going to be, as I said, consistent with all of these. As consensus standards become available in other areas, right now shutdown is being developed by NS. Fire is being developed. The Reg. Guide 1.200 will be updated.

It's certainly most desirable that the PRAs, plant PRAs be updated in these additional areas of scope and that they follow the standards, but what is actually essential even in advance of the standards being put into place and endorsed by the NRC, these initiators still, of course, must be considered as they are right now in a risk-informed application and as mentioned in the phased quality initiative for Phase 1. If it's a significant contributor or initiator, it must be evaluated as part of the plant change. It's again fully consistent with what we're doing now.

Going on to Slide 18, we're going to track cumulative risk monitoring. Plant modifications made under this rule, as I mentioned at the beginning, have to be evaluated as one single

change, and the plant PRA models have to be updated per the thoughts of the draft rule that's currently on the Web, once every second refueling outage, and the impact of the 5046(a) related changes has to be reassessed to make sure that model update now doesn't result in an impact that would be unacceptable if it was evaluated using the new model.

If it by any chance would not meet the acceptance criteria by the model update, perhaps an error was found in the model or another plant change was made that could impact the conclusions from the risk informed LOCA size changes. The licensee must propose steps to remedy the situation and bring the impact back into tune with the acceptance criteria.

Going on to Slide 19, plant design change licensing process. The changes related to 5046(a) must be submitted for staff review, will be reviewed and approved as a risk informed evaluation, a risk informed application in accordance with the existing license amendment process.

So these will be submitted and reviewed. In addition, impact of changes on security, plant security should be made as part of licensee assessment and will be part of our evaluation.

And the submittal requirements for 5046(a) related changes are highlighted as Step 4 in the current Web posting of the proposed rule.

Yes, Tony.

MR. PIETRANGELO: This one has a lot to do with the cost-benefit on the reg analysis. Is the staff considering any kind of threshold with respect to submittal review and approval by the NRC on changes?

MR. RUBIN: What do you mean by threshold?

MR. PIETRANGELO: Is it all or those that may be risk significant or beyond some threshold that would require regulatory review and approval, or is it all?

MR. RUBIN: I believe at this time it's all.

MR. PIETRANGELO: Okay. So license amendments would be expected for any change that impacts any part of the ECCS analysis.

MR. RUBIN: That's my understanding of the current thinking.

MR. PIETRANGELO: Okay. Because that makes a big difference on cost benefit analysis, as well as for the staff resources.

MR. RUBIN: Yes, certainly it does.

MR. PIETRANGELO: Okay.

MR. RUBIN: Going on to Slide 20, Dick.

As more data is obtained on pipe breaks, there may possibly be changes to the LOCA frequency estimations, whether it's done by an extra elicitation process or another analytical method. We will periodically evaluate the LOCA frequency information, and it's possible that the transition break size may be changed based on updated information.

If so, this revised size will be incorporated either through rule language or perhaps an order, and licensees implementing changes must reassess against a new transition break size. At this time it's not known, you know, what information may be available or what changes may be made, just to highlight the potential that there may be reassessment of the size in the future, and if so, agencies must reassess and it would not be a backfit.

Going on to the last slide, number 21, to emphasize a little bit what I just said, if the changes no longer meet the acceptance criteria due to the change in the transition break size as well

as, of course, PRA model update changes which could occur, the licensee must restart design and make compensatory changes to meet the acceptance criteria, and by that I'm talking about the CDF, delta CDF and delta LERF calculations. Again, this would not be a backfit.

Yes?

MR. HARRISON: This is Wayne Harrison, South Texas Project.

Does the staff have any idea of what would be the threshold that they would regard as significant for a change to the transition break size, if it's a risk threshold?

MR. RUBIN: Dr. Sheron? Does anyone have a comment on that or the Division of Engineering?

MR. SHERON: Your question was what significant change?

MR. HARRISON: I was asking for this 50.109 of these reversible things for significant changes to the transition break size. How would the staff or what would the staff's criteria for significance be for a change to the transition break size?

MR. SHERON: I don't think we've

actually defined the specific criteria, but I think if you heard what I said before about how we came up with the transition break size, it does include margin right now for a number of uncertainties.

So, for example, I think for the PWR if one looked strictly from a frequency standpoint that the ten to the minus fifth break size is, say, an eight inch break and we chose 14 inches to account for a number of other factors and uncertainties, if that transition break size, the frequency number, say, were to go to nine inches, we may conclude that there's still sufficient margin, okay, covered by the 14 inch number. Okay?

So even though that the frequency went up, we might say that the transition break size is still adequate.

Now, if that started to approach for some reason 14 inches, you know, and, again, I would have a hard time trying to say we've thought through what the actual criteria are, you know, if it was 13 inches, we may want to think twice about whether 14 is an adequate number for transition break size.

Somehow I can't envision that this transition or this ten to the minus fifth type of break frequency number, which right now I think for

the PWRs was like around eight inches, is going to change that much. Okay?

So one of the reasons we picked the 14 inches was that we don't want to see a lot of changes. You know, we want stability in this whole process. Okay? We don't want to have every couple of years somebody comes up with some new data points and it changes that eight inches a little bit, and all of a sudden it throws us into a tail spin. That's not what we're looking for. Okay?

The idea is that we put enough margin in there that we can accommodate some changes that might occur as a result of new data or something. Okay? But the intent is we don't want to see this thing changing. It's a lot of work for us. It's a lot of work for the industry, and it certainly doesn't promote stability in the regulatory process if it's changing all of the time.

MR. HARRIS: Thank you.

MR. RUBIN: I would just like to mention from Dr. Uhle she's pointing out that there are changes licensees can make, such as pump flows, for example, without review and approval to the relaxed Appendix K criteria if the change is less than 50 degrees without submitting in that area.

However, a risk informed evaluation still must be submitted as part of a change for the delta risk calculation part of the amendment.

Yes.

MR. BUTLER: John Butler, NEI.

The defense in depth analysis, do you anticipate there need to be a review and approval of the methods or the codes that are used there?

MR. RUBIN: Not a formal review and approval of the methods. We expect that the current methods should be adequate. However, there is a staff initiative with the industry to look at the basis and the user guidance for MAAP that was initiated about, oh, ten or 11 months ago, and we would like that process to continue to make sure that there is a good basis package put together for the methods that are used.

In addition to MAAP, we have codes ourselves. Of course, MELCOR, but no, we're not looking at a formal review and approval process, but we certainly would like to continue the initiatives.

Now, this is directly in line with the ASME PRA quality initiative for analysis methods for PRA in DG 1.200, which points out that adequate analysis, quality basis must be provided for all

methods and codes used in the PRA.

So we would expect that process to continue for a better documentation of the user guidance and adequacy of the other methods used.

MR. BUTLER: Maybe this is the wrong time to ask the question. I should have asked it earlier, but there is a statement in the conceptual rule package about looking at the potential impact of power up rates on the basis for the elicitation work and that you're still looking at that. It implies that there may be some limit on the power up rates that could be considered under this exchange.

Is that still ongoing or has that been completed?

MR. RUBIN: I really would need to defer that to our materials and pipe people from the Division of Engineering because it has to do with degradation mechanisms and the pinch wind pack (phonetic) from the up rates against flow temperature issues.

Would anyone like to comment from the Division of Insurance? Gary? Where is he? Ah, there he is. Hi, Gary.

MR. HAMMER: If I understand the issue, I think, that's being brought up, it relates to how

the degradation effects may be affected by power up rate, and I think the elicitation results looked at some variation in parameters in that regard and extended it beyond the 40 year life into the license renewal area effectively for a 60-year life, and they did consider some of those kinds of things.

But with that it's recognized that we may have to reevaluate and see just how plant operation may affect the break frequencies, and that's why we built in this reevaluation step as we go along. I don't know if any -- Bob, did I state that correctly?

We've got Rob Tregoning here with the Office of Research who is a little more familiar with the elicitation process.

MR. TREGONING: I apologize for the tag team effort.

We did not explicitly consider the effect of power up rate during the elicitation develop frequencies. It was too difficult to postulate possible changes, and then the extent that those possible changes may be.

So that's why the rule language is as it is now. Now, with regard to any specific limits, I don't know. I'm certainly not at liberty to discuss

because I don't know if the staff has really considered if there would be potential limits.

I know from the Office of Research what our plans are to continue to monitor operating experience, and if we see changes that have resulted in increased precursors or things like that, these are things that we need to stay vigilant on and be concerned about and look at when we update our LOCA frequency estimates.

A prime example of effective power up rates on potential LOCA frequency estimates is playing out now in the BWR community with respect to the steam dryer problem and mechanical vibrations that they've had.

So if similar problems are experienced due to up rates, we obviously want to stay on top of that because if they are significant they could undermine the entire basis of the LOCA frequency estimates that we've developed.

So I don't think I've fully answered, but at least I've tried to provide more information to let you know at least where the staff is -- where our position is being developed from.

MR. BUTLER: I was more coming it from the standpoint of if that's still being looked at,

will that be concluded before the end of December. Will that become part of the rule package that that will be an ongoing process?

I'm again asking the question from the standpoint of consideration of potential benefits of the rule change.

MR. TREGONING: Okay. At least from RES, we're going to evaluate operating experience. So we obviously would need to get some operating experience under power up rate conditions so that we can assess the effect.

So our plans are that once the changes are enacted and we start getting some operating experience, to see what the effects are. So it's not something that we're currently evaluating now. This would be evaluated as we have information that we can bring to bear on the analysis.

MR. SHERON: John, I think I would just add that, you know, the intent was that if the licensee makes a submittal for a power up rate and addresses all of the parameters, for example, that Mark talked about, you know, and demonstrated that they met all of the Commission's rules and regulations, you know, we would act favorably upon such a proposal.

You might get a question or, you know, if the licensee chose to proactively address the issue by at least saying that based on their assessment they don't see any aspects of a power up rate that might affect, for example, a break frequency, just like it might not affect, you know, a question that might come up on whether it would affect stress corrosion cracking if some temperatures went higher or something as a result of it, which may increase the likelihood of some other kind of failure.

Okay. So again, depending upon how a power up rate has manifested itself in the plant design, whether it results in increased flows, increased temperatures, whatever, higher steam flows or so forth, we would obviously expect the licensee to address how those parameters might affect their plant. Okay?

MR. TREGONING: That makes sense.

MR. SHERON: Okay.

MR. HILL: Rick Hill, GE.

I have three questions in the risk assessment and reporting requirements area. The first one is on the impact of changes to the PRA model, that it needs to be reassessed. Are you

speaking only of internal events there or does that apply to the periodic review of external events, fire, et cetera?

MR. RUBIN: No, it applies to the full scope work that would impact the acceptability of the change.

MR. HILL: Okay.

MR. RUBIN: But often it's only the internal event model that's updated in the normal cycle, but if you get some information on external hazard that wasn't in the original model, you find an error in your scoping, in your bounding fire analysis. Of course it must be considered.

MR. HILL: Okay. The wording is "the PRA model," and so that's why I raised the question. You may want to look at the words there.

MR. RUBIN: Yeah.

MR. HILL: Another one is on the 20 percent increase for reporting on delta CDF and delta LERF.

MR. RUBIN: Correct.

MR. HILL: I'd like to understand your basis for 20 percent given the uncertainties that we're dealing with, especially for external events and fire.

MR. RUBIN: Obviously there's no mechanistic development of that 20 percent. We're trying to capture an increase that should be brought to our attention. Our first cut at it was a 20 percent increase.

Certainly, you could be well within the bounds of the uncertainty with that assessment, and we recognize that, but we want to make sure that model changes may be due to an error that was discovered. It may be due to another plant change unrelated to this, if captured, and we would like to receive assurance that we don't sort of end up with creeping increases.

So our first thought was the 20 percent threshold.

MR. HILL: It's subject to change?

MR. RUBIN: Sure, subject to development.

MR. HILL: Okay.

(Laughter.)

MR. HILL: The last part of my question in this area is, again, in reassessing all the changes -- the words are in the second paragraph -- and the thought occurs to me that you can have a risk informed application with your MOVs where you

run your inspections in the MOVs, risk informed. You have implemented maybe the new INEL time and cause (phonetic) database, and as a result of that, your CDF is going down, but an MOV in the past which was of low safety significance now becomes high safety significance, but it really hasn't changed its function, and it's a lower CDF.

How do you see those kinds of things being reportable or changeable in terms of 5046 rule change?

MR. RUBIN: Well, the picture will be delta CDF and delta LERF for the 5046(a) related changes. When you change your -- there are a lot of other plant changes that are affecting risk at greater levels. We recognize that. When you change your model, you need to do a baseline calculation again.

When the 5046(a) change is out, put it back in because the new model should reflect the as built, as operated plant. Look at the delta. It meets the acceptance criteria, doesn't exceed it by 20 percent right now. It's not reportable.

But, again, the issue is to follow the guidance from our PRA policy statement as realistically as practical, and when the model

changes, it's because you have newer, better information on the plant risk profile, and so you should revalidate that the 5046(a) related changes still meet the criteria.

The other programs and the changes in them are affecting the new model baseline risk and potentially the delta changes from the 5640(a) related modifications, and those just need to be revalidated against the acceptance criteria.

MR. HILL: Thanks for the clarification.

MR. HARRISON: Mark, this is Wayne Harrison. You clarified it for Rick and now I'm confused. The changes that you're talking about in the draft rule or the 20 percent, that's the cumulative CDF or LERF from all modifications, not necessarily just those associated with the 5046.

MR. RUBIN: No, no, just those associated with 5046.

MR. HARRISON: Oh, okay. Well, that wasn't clear to me from what I read in the rule. That helps me. thank you.

MR. RUBIN: We can certainly clarify that. The acceptance criteria applied to the 5046 changes, just as if you were making an ISI program implementation, which from ISI those criteria would

also apply, but separately. It's a different risk informed initiative.

MR. BUTLER: John Butler, NEI.

This may not be a question for you, Mark, but I'm sure you can pass it off as you see fit. There's a new section in 5046(a). It's Paragraph E on imposition of restrictions. If you found that there is something that's not consistent, your analysis is not consistent with the Paragraphs C and D of this section, I'm looking from the standpoint of stability and when plants are considering changes how that will be considered.

MR. RUBIN: I don't have the rule language in front of me. Can you give me the framework of it?

This is ECCS calculation area. Jennifer, do you have any clarification on that?

(Pause in proceedings.)

MR. RUBIN: A tough question. We're working on it.

Jerry.

MR WERMIEL: Yeah, this is Jerry Wermiel. I'm Chief of the Reactor Systems Branch.

If I understand, John, you're talking about an existing paragraph that I believe is meant

to allow the agency discretion if it learns new things about ECCS performance. What it says, and I quote, "Imposition of restrictions. The Director of Nuclear Reactor Regulation may impose restrictions on reactor operation if it has found that the evaluations of ECCS cooling performance submitted are not consistent with Paragraphs C and D of this section."

What that's trying to say, I believe, is that if we find out through some research analysis or some operating events that the assumptions that we thought were valid in the modeling of ECCS performance are no longer valid, we may impose restrictions on operation of the plant consistent with that new information at any time. I think it is meant to be a catch-all for uncertainties basically, things that we think we know that we find out later we don't know, and because they materially affect our understanding of the ability of the plant to mitigate LOCAs we need to take an action.

And what that paragraph is saying is we can do that, and it doesn't change in the new 46(a). Is that clear?

MR. BUTLER: I guess what I'm looking for is--

MR. RUBIN: Here, under the new rule?

MR. BUTLER: With Appendix K and, I guess, to a lesser extent with the best estimate models, there was a good bit of time to become -- they were very specific on how you applied them. They were very, very restrictive in how they were to be applied. So if you applied Appendix K, you pretty much knew that you had applied it correctly because it was very specific.

As we changed to things that have a greater degree of interpretation that would be allowed, how that particular section of the rule is applied becomes a little bit more uncertain.

MR. RUBIN: I think I agree.

MR. BUTLER: All right. So I think you answered my question.

MR. RUBIN: I guess there are no further questions. Do we need to check with the bridge?

MR. DUDLEY: Yeah, let’s go to the telephone bridge. Operator, are there any questions on the telephone bridge?

OPERATOR: Thank you, sir. If there are any questions, please press star.

(No response.)

MR. DUDLEY: Thank you very much.

At this point in time, we are considerably ahead of schedule, and if it's okay, I think we'd just like to continue and complete the meeting before lunch. I think we can probably be done in about certainly no more than an hour, frankly, a little bit less.

So next we'll have Brian Thomas who will come up and discuss with you the information needs we have regarding the regulatory analysis we need to do with the proposed rule.

MR. THOMAS: Good morning. My name is Brian Thomas. I am the Section Chief of the Financial and Regulatory Analysis Section in NRR.

And I'm here to speak to you about the information that's needed for the reg. analysis. Basically, as Brian mentioned this morning, the focus of this meeting is to get some information with regard to how you plan to go about implementing this rule and what are the associated costs and benefits for you to do so.

Basically, I intend us to get information that would support the proposed rule and, of course, we need a reg. analysis to accompany the proposed rule. What we would do with the cost and benefits information that we get, we would, of

course, bin and categorize the information that we get, analyze that information to the extent that it fits into the regulatory framework.

Then we would proceed to integrate the cost and benefits into what we would label as a reg. analysis, meaning that there are other cost factors that would be applied to the information we receive that would then be needed to complete the reg. analysis.

We're currently in the throes of developing a framework for the reg. analysis. So this is really an opportunity for us to get some feedback, get some ideas of some of the things that you're considering, you know, get some data points from you, and based on that, we'll establish that in my terms is a cost benchmark from which we will make a determination as to -- well, the Commission will, anyway -- have a benchmark for making a determination as to what is the -- you know, how is this rule supported from a cost benefit standpoint.

Let me just say that certainly there has been a lot of discussion here this morning. I haven't heard anything that I would say is contrary to proceeding with this rule. I would think that this forum is not necessarily the one where we would

get all of the kinds of information we would need.

So in our view if we were to get information from you, let's say, well into the middle of September, that would facilitate us being in a position to put a good, well informed reg. analysis together.

The date we had in mind is more like September 10th to get any information from you that would be a follow-up to this meeting if you were to provide information to us in writing with regard to a cost benefit analysis.

We had a number of questions that were attached to the meeting notice. They were also posted on the Web site, and those are questions that I'd like to sort of just walk through. As I said, I think they're involved questions, and what I'd like to do is just sort of reiterate each question and give you an opportunity maybe to voice, you know, some of your comments on the questions.

Also, if you think that there are some questions that we could have asked that should be included in our list of questions, and we had seven questions, I believe, if you think there's an additional question that should have been asked, please feel free to suggest those to us and also

you're free to give us your response to those, too.

The first question had to do with your feedback on the number of plants and types of plants that you envision would pursue this enabling rule, this voluntary rule. We also would appreciate cost information pertaining to that, too, and basically, again, we're trying to get some information that would enable us to bin the data that we receive, you know, to develop a framework for the reg. analysis itself.

So that, you know, one of the first things that come to mind here with this question is exactly what is the population of plants in the industry that might undertake implementing this rule. So with that question stated, also, you know, what is the population of plants that would, you know, reanalyze the ECCS performance analysis.

So with that stated, what I'd like to do is just pause and give you an opportunity to comment on this question or to provide us some feedback on this question. So are there any comments on the first question?

Any suggestions for amplifying the question?

MR. HILL: Rick Hill, GE.

No direct response to it, but I did not see any information as to who we send the information to. To whom?

MR. THOMAS: Oh, okay. That, we can take care of that, but I think in the FRN it's cited George Mencinsky.

MR. SHERON: As a contact for this meeting.

MR. THOMAS: But he's also a contact for the reg. analysis data.

MR. SHERON: So the responses due by September 10th should go to George.

MR. THOMAS: Right, and/or you can contact myself.

MR. BUTLER: Hi. John Butler, NEI.

First off, I'd like to really thank the staff for taking the time to step through discussing the conceptual rule package. A lot of the questions that we've asked this morning try to just stick to the ground rules and try to ask the questions that are needed to assess the types of changes that we could consider under the rule, and then use that to assess the benefits that the rule would obtain.

One of the points that I'd like to make as we've looked at this and as we've been looking at

this for quite some time now, it has become very clear that a number of the changes and the safety benefits that come from the changes don't really become apparently until you very clearly identify what the new analysis framework will be, and then start considering the potential changes that could be considered under that framework.

It's clear right now we have a design basis that is focused in on the large break LOCA analysis and doesn't allow you to very clearly look at the changes that could be considered if you were to relax that for the large break LOCA spectrum of events.

Once we start looking at that in more detail with a very clear framework in mind, I think there will be a number of changes that will be identified not necessarily at today's meeting, but in the ensuing months that will have a bigger safety benefit than we've considered already.

Some of the changes that we've already identified that have potential safety benefit may or may not be considered under this rule change, depending upon, I guess, how broadly the change can be applied to the other GDCs. We could easily find that a change that would be considered otherwise

can't be considered because you find yourself limited by some other GDC beyond GDC 35.

So that's why I've asked a number of questions on the general design criteria because I want to be clear on how that will play into this analysis.

As far as answering the questions, I can't address, you know, some of the specifics of the question. So I think Wayne Harrison of STP is prepared to answer some of those questions.

MR. THOMAS: Okay. Let me just say that Question 3, which is a very all encompassing question, but basically that question is aimed at identifying the tentacles associated with making the rule change.

I heard some reference to GDC 44, GDC 17, GDC 35, and as you explained, there may be a wider spectrum of GDCs that may be impacted by this.

MR. BUTLER: Yeah, I'll give you an example of some of our thinking on this, and this kind of plays into the cost aspect of the change also. Currently, the LOCA analyses of record for many plants -- and I'm most familiar with Westinghouse plants -- you have basically three analyses.

You have a small break analysis that covers the spectrum up to, say, six inches, and you have a large break analysis which covers the spectrum up to a full double ended to meet 5046, and then typically there's a third LOCA analysis that's used to demonstrate compliance with your containment heat removal requirements, and it's typically referred to as a LOCA mass and energy analysis. It provides input to demonstrating that you can meet GDC 38 and 40.

So you have three LOCA analysis of record. Depending upon how this new rule is applied, you could easily have a number of additional analyses that have to be performed. You could have your existing small break analysis under 5046. You could have, in effect, an intermediate LOCA analysis that would cover your spectrum of breaks from six inches up to your transition break size that would apply 5046 criteria. Then you would have an analysis that would cover transition break size for the full double ended to demonstrate without considering a single failure that you meet some acceptance criteria.

There would be the defense in depth analysis using severe accident criteria and possibly

a need for an additional LOCA analysis to demonstrate that you meet the single failure requirements of some of the other GDCs, GDC 17 or 40, depending upon how that is interpreted, where you'd have to do a full double ended analysis with a consideration of a single failure, maybe using relaxed analysis methods.

All of that, and then you also have to do the mass energy release analysis that I mentioned before. So you could easily have a number of additional analyses that are necessary, and one of them is going to be constraining your design.

Right now I know the staff has given consideration that's typically going to be the small break analysis, but I don't know that that is necessarily the case, depending upon the methods that are used and how this is applied. So that's why I'm trying to get a lot of clarification on the other GDCs and some of the analysis methods that would be utilized.

MR. THOMAS: Thank you.

MR. HARRISON: This is Wayne Harrison, South Texas Project.

I'll also put on my other hat. I'm also representing the Westinghouse Owners Group. I'm the

Chairman of the Large Break LOCA Redefinition Working Group, and we've been following this very closely since this whole effort has started.

Actually, one of the things I think we'd like to take a little credit for actually some time ago helping to get the ball started rolling. Some of the things, what John was really saying with respect to the analyses, it is going to have an effect on the number of plants that would apply this.

We had, for instance, a vision of, well, can we do something very simple at the outset to maybe just stop doing large break LOCA analysis without doing a plant modification. So the plant is still the plant. The plant could still do what it does, but I'm just not going to do a large break LOCA analysis, and that would have an economic benefit on something I don't have to do for each reload or for what have you, but I'm not changing the plant.

The analytical requirements that are associated with this rule seem to preclude that. So we would need to rethink that benefit for that relatively simple change.

As John mentioned earlier, the changes

related to fuel peaking factors or power up rates, we may need to reevaluate that, and we'll take the information that we've learned from this to go back and reevaluate the benefits that we were seeing here.

Safety benefits that were on containment spray, for instance, and actuation of containment spray that could come as a benefit of redefining the large break, there may be less requirement for containment spray, but without, as John says, the accompanying changes to GDC 38 on containment cooling, that might not follow along with this rule change as we had hoped.

Basically what I'm saying, we want to respond to you on these set of questions and get back to you with some additional information. We think that overall there may still be some benefit. We believe we're moving in the right direction, but we need to do some further evaluation based on what information we have here and some of the clarifications that we've gotten.

MR. THOMAS: Thanks.

MR. DUNN: Bert Dunn, Framatome again.

I wanted to follow up with some of the stuff that Wayne said. One of the problems is that

you produced a document that kind of created a basis, and then you produced some proposed rule change in that. In that document that created a basis, you had figure of merit for the larger breaks, which was 70 percent, things you applied that a best estimate model would have to get put together. To do that you did say certain things were accepted.

You've required in that paper, you've required an awful lot of work potentially in an open ended review situation, which is, frankly, scary to certain people to get involved in it. So I'd encourage you if it's possible to be more specific in terms of your expectations for that analysis and stuff have you or to be more -- I don't want to use the word "spiritual," but it would be useful to us to understand how we would go forward, what the spirit of the review process and the things that we're going to get into something like the best estimate LOCA thing, which we marched into thinking we could do a lot of good with and then wound up with ten year review periods and stuff like that.

Is this going to wind up going something like that? Is it going to be more pain than it's worth after you get involved in it?

So that's where I'll go in. Now, a plant that already has a BE LOCA model can probably do what you said pretty easily, but at least about six or seven percent, the B&W design has some aspects about it that haven't been as well tested experimentally as the Westinghouse design plant. And those particular plants would have a little bit more trouble getting a relaxed BE approach, one that took some more faith in the thing, and then maybe the B&W plants could join.

So I'll add that.

MR. SHERON: Let me, if I could, Bert, respond. You know, the approach here was not that we're going to require a best estimate model. Obviously if a licensee wanted to continue to use an evaluation model in a large break region they could. The point is that I don't see any benefit because you're going to be limited.

The whole idea is that if you're no longer limited by the large break, then you could take advantage of margin at other places.

One of the things we plan on doing with this rule is obviously developing a reg. guide to go along with it, to address, I think, some of the things that you raised in terms of analysis. You

know, do we want to really get bogged down with a ten year review cycle on a best estimate model?

And the intent is not to do that. The plan right now is that for a best estimate model in this beyond transition break size region, the extent of the staff review would not be nearly as rigorous as it was, for example, in the previous use of a best estimate model and the like.

I would also propose -- maybe I'm sticking my neck out a little bit here -- is that in the past the industry has taken on the initiative to develop evaluation guidance. For example, in the resolution of GSI 191, the industry took on the effort to develop an evaluation methodology for analyzing sumps. I could certainly see the industry taking on an initiative here to come up with a proposed evaluation methodology for the best estimate, you know, and you take that on as an initiative and work with the staff where we would just be kind of meeting with you and, you know, hopefully at the end we would find what you come up with acceptable, but that's one way we could approach it where at least, you know, you would have some input into that process.

And I think we would be receptive to

that, but again, the plan was that we would try to develop a regulatory guidance document to further define and help clarify how one would go about implementing this whole new rule process.

MR. PIETRANGELO: I guess I've got one more. I want to follow up on this amendment request approach. It seems to me that it has a high potential of not being very risk informed. There could be several minor changes to plant design or operation resulting from the transition break size that really shouldn't rise to the level of high safety significance at all and, in fact, be very low or of no safety significance.

The concept of a regulatory threshold has been around since plants were licensed. I was surprised a little bit that the 5069 type approach wasn't used in 5046, that is, when a licensee opts for this new approach, they would come in, show you their mitigation capability, review their PRA, have that review in place, that the staff satisfied that they can, in fact, demonstrate the mitigation capability and all of the other things and then let the normal change control process take effect, whether it's on the deterministic stuff with regard to the 5046 criteria or perhaps some risk informed

threshold, but to have every change that may be related to that go in as an amendment request.

The licensees process about 12 to 15 amendments a year with the current work load. I think the potential here with this, to have a lot of safety beneficial changes as well as cost beneficial changes, but to add that amendment request thing in without some kind of threshold and perhaps it's something in addition to what's in the current regulatory framework would be beneficial.

To do otherwise I don't think it's very risk informed. I think the staff would be spending a lot of time reviewing trivial amendments and the licensees would spend a lot of time preparing the trivial amendment.

So I think that's going to make a big difference in the viability of the rule as well sa the cost benefit part of this, and it does impact the staff resources as well.

So it's just another thing to think about in the formulation and development of the rule as you go forward.

MR. THOMAS: Thank you.

Let me just, you know, walk through the rest of the questions here, even though I think what

I'm hearing is that to respond to these questions, it's a pretty tall order and it would warrant that you go back and look specifically at the individual specific situation.

Question 2, again, I think we've already touched upon, but it says provide the estimated number and types of plant design changes that would be permitted by the ECCS reanalysis at these plants on a per unit basis, and the estimated cost and decision analyses, meaning specifically as you determine your assessment methodologies, be it PRA, quantitative and/or qualitative assessments, that you would utilize in your development of or your implementation of the rule and your assessment of the design changes that are involved.

Question 3, we talked about that a little bit. That has to do pretty much with looking across the spectrum of regulatory and also physical plant specs, as well as design criteria that applies and assessing what is the full spectrum of changes that would be required there and the different types of analyses that are applied.

Question 4 basically is saying estimate the number and types of plant design changes that would meet the acceptance criteria for any

additional analyses that are needed.

MR. HARRISON: Just a comment on Question No. 3. As you probably know, there are a number of plants that currently are piloting Reg. Guide 1.200 on PRA quality, and there's always some information that can be gotten from those plants relative to Question No. 3 on how much effort that they are expending and costs that they are expending on the PRAs associated with piloting Reg. Guide 1.200 because there's a high degree of overlap there.

And speaking for South Texas Project, I mean, we're probably spending at least a man-year in preparing the information that's required for Reg. Guide 1.200, or a man-year has gone into that, and we have a very thorough and very well documented PRA to begin with.

MR. THOMAS: Thank you.

MR. PIETRANGELO: Just on number four again, a quick comment. The focus here is on plant design changes, and there are a lot of potential changes that could occur that won't necessarily involve design change to the plant. That has to do with additional margin.

A lot of the equipment and components

and systems, design basis parameters are tied to the large break LOCA: valve stroke times, pump flows, est cetera. For these safety systems, typically they are in technical specifications. You're outside of tolerance. You declare the system inoperable. You have to do maintenance on that equipment, overhaul it, whatever, contributes to unavailability of the equipment.

We think a big potential safety benefit associated with this change is if the plant is now recalibrated to the new design basis, taking into account that we still have to mitigate the larger break but with less stringent criteria, that a lot of the things that are calling for additional maintenance or overhaul of these safety systems and components would now be acceptable. If the valve stroke is in 5.1 seconds instead of five, you wouldn't have to declare the system inoperable or you wouldn't have to overhaul a valve. Perhaps now with the new design basis it's six seconds.

That's not necessarily a design change. It's still the same valve, but some of its basis requirements would change with the new design basis, and we see a lot of those kinds of changes being both an improvement in safety with regard to the

availability of that equipment, as well as being cost beneficial in that you're not having to do a lot of extra maintenance to try to get back to what was the old design basis criteria.

So one of the things to think about when you go out with the proposed rule is to broaden this a little bit beyond just plant design changes, to design operational changes taken into account that the bases that a lot of this equipment is calibrated to would be less stringent and that there would be margin there.

I'm just reacting to the language in the question.

MR. THOMAS: Okay. Thank you.

We can move on to Question 5. Estimate the cost of implementing the plant design changes and design changes that meet the acceptance criteria, and specifically we're really talking about Reg. Guide 1.174 criteria for additional analyses.

Question 6, estimate any operational costs and/or savings resulting from implementing the above design changes.

Again, Tony, I think that these questions are sort of unfolding as we go through

them. We tried to specifically detail the amount, but I think you have to look at all of the questions.

MR. PIETRANGELO: I only had Question 4 in my handout. Mine didn't have five, six, and seven.

MR. THOMAS: Okay. And lastly, of course, I heard a lot of talk about this. Estimate the anticipated changes in licensee information, collection, reporting, and retention burden that could result from implementing this rule.

Mainly here we're looking at just that, activities involved on the part of the licensee to make changes to the plant, maybe make submittals to the NRC for NRC approval of such changes, you know, efforts involved in collecting the data pertaining to plant modifications, plant changes, and also efforts involving and reporting it.

You know, that's the total amount of questions that we had in mind. In your submittal I would certainly like to know if there are any other questions that you think we should be asking, and as I said, if you can also provide us with your responses to those questions also.

And also I guess I'd like to know if

September, the date we have here for your follow-up to this, if that's a feasible time frame for us to get the responses from you.

As was said earlier, and I think Brian said it, you know, we have a fairly aggressive schedule that we're pursuing with this rulemaking, and we established that time frame just based on what we see our needs are to provide a well-informed reg. analysis. But if there are any opinions or ideas as to what would be a better time that would work for you to get back to us, we would appreciate it.

MR. BUTLER: John Butler, NEI.

One of the set of changes that have been considered are changes to containment spray actuation that would actually provide a safety benefit for a number of reasons, and the change could be something as minor as just raising the spray actuation set point.

What I'm looking for today is just would that type of change still be considered under this. It affects, you know, one of the non-GDC 35 criteria. So that, again, one of the reasons I wanted to get some clarification on that.

Should that be included in the set of

changes you respond to?

MR. THOMAS: Well, yeah. We envision that any change on a plant specific basis that's determined to be required as a result of implementing this rule would be identified, and if that change involves, you know, some sort of a cost or if there's a perceived benefit from that change, we would certainly want to know about that.

Again, we're down that path of just collecting the data.

MR. BUTLER: To respond to the question, you actually have to make some interpretation of how the rule will be applied in certain circumstances, and I'm just hoping to get enough clarification today so that everyone's interpretation is somewhat consistent in responding to the questions.

MR. THOMAS: Well, yeah. It's envisioned that there's some work ahead in terms of assessing just how you would go about implementing the rule on a plant specific basis.

MR. BARRETT: Let me just see if this helps. It would certainly be interesting and useful for us to get information not only about what the cost benefit of the rule as it is in the Web page, specifically implemented in that manner, but it

would also be interesting and useful to know what would be the implications of alternative use.

MR. BUTLER: I think that would be appropriate. You know, some of the specifics of the rule package really affect the cost benefit. I mean, obviously the selection on the transition break size has a big impact on the cost benefit, and I think there's some input that can be provided there.

But one of the big changes that has been considered in the past would be to modify the start time requirements of diesel generators. That is primarily affected by the loss of off-site power assumption with LOCA, but that's not being affected here. So that's one change that, in effect, is taken off the table with this rule package.

So some of those type considerations can be included in the response, yeah.

MR. DUNN: I'm sorry. Just one more question. I believe right now in viewing this rule as being applied only to existing licensed plants and design facilities, would you at all be interested because I don't want to do this if it's not going to be useful to you or some time in the future of looking at what this would mean to a new

plant. The EPR is what I'm thinking of.

MR. SHERON: Yeah, I think we would be interested. Our Commission in their staff requirements memorandum asked us to look at -- in other words, this rule would only apply to operating plants right now.

We are looking right now at whether or not this rule could be extended to, for example, System 80 Plus or ABWR, AP600, AP1000. But for other plants, for example, ACR 700 or something, the Commission told us to think about developing a rule in the longer term that would apply to those plants as well.

So, yes, any input you want to provide us would be well --

MR. BUTLER: It will be useful to you though.

MR. SHERON: Yes.

MR. BUTLER: Will it be useful to us?

(Laughter.)

MR. BUTLER: Okay. Thanks, Brian.

MR. HILL: Rick Hill, GE.

Relative to the date of September 10th, for BWRs, as you have noted, we have to squeeze a little harder to find the fruit, get the juice out

of the fruit at least. It's going to take us a little while to do that and go through -- we'll probably do it through an owners group process because of the difficulty, and we have a process we have to go through. It will take us a couple of weeks longer.

So the end of September would be a more appropriate date at least for our owners group to respond.

MR. THOMAS: Okay. Thanks.

(Audience member speaking from an unmicked location.)

MR. BARRETT: This is Rich Barrett.

I'd like to ask a clarifying question about one of the comments that was made by Mr. Pietrangelo regarding the requirement here that we have a license amendment for every change that results from this rule, and your proposal was that there be an alternative process.

And if I understood it correctly, your alternative process was that a licensee choosing this option would make a single submittal, and with a description of the mitigating capability and whatever analysis was associated with that, and then beyond that, any changes to the plants would be

handled by appropriate change processes, nd if it met the criteria of 5059, it would be handled under 5059, and if it was some change that could be handled under 5090, it would be done that way, and if it was something that rose to the level of a risk informed process, then it would be handled that way.

My clarifying question is in your vision of this process, would there be a risk analysis submitted with the original submittal.

MR. PIETRANGELO: I think there would be on the demonstration of the mitigation capability. But you're not making any change when you opt to do 5046(a). You're just changing your licensing basis essentially. There's no plant modification that you're necessarily doing.

So I'm not sure whether there's a risk assessment associated with that piece or not that would be done for subsequent mods, operational changes, et cetera. If they rose to the criteria you mentioned, Rich, I think you'd submit it, obviously a tech spec change, a power up rate, something that was more than a minimal increase in risk, and perhaps there's an opportunity here to define that quantitatively and then say that's when I go to a 1174 type submittal versus everything.

Okay?

Because I'm afraid that there will be a lot of minor changes made that really don't rise to the level of an amendment that would take up both licensee and NRC resources on low safety significance stuff, and to me that's not consistent with a risk-informed approach, but I think on the initial submittal we'll have to think about it some more, but if there's no change, physical change to the plant, I don't see where the risk submittal comes in there.

MR. BARRETT: Well, I raised the question because I could see where the licensee's submittal might entail a change to the design basis. In other words, you might be proposing some new set of equipment that would be referenced as being the mitigation equipment for these larger LOCAs vis-a-vis the single failure proof, et cetera, et cetera equipment that's available today.

But I'm probably going into a level of detail you're not prepared to deal with at this point.

MR. PIETRANGELO: Yeah, I think in terms of the safety related equipment, I don't think that's going to change at all. A lot of the same

equipment, especially if the break size is 14 inches, you're going to need the same equipment for that size of break as you are for the double ended guillotine break. The equipment is not going to change necessarily.

Now, there maybe non-safety related equipment that the licensee may credit in the demonstration of mitigation capability, but yeah, we'd have to think about that some more.

MR. BARRETT: Okay. Thank you.

MS. UHLE: Jennifer Uhle from Reactor Systems.

Right now in the regulations with 5046, licensees have an analysis of record with a methodology, input deck and assumption. There comes a time when you find an error in the code perhaps, in your methodology, and you fix it, and you find out, oh, it affected PCT by a few degrees. Okay?

There are times where you pump is derated and that you calculate how much that affects the answer. In some particular licensees' examples they've actually taken out a pump, no longer relying on a charging pump. They're free to do that as well, provided it does not affect the PCT by the 50 degrees.

I'm not sure if that's getting across. I mean, so if you have your 5046, if you're under 5046(a) and you're making changes in that way, I mean, it's no different than is currently done.

Now, I know that when the question was asked Mark Rubin clarified his answer. I think perhaps we internal at NRC have to work through this a little further, but I don't think that every single time something changes in the plant you have to make a submittal. It's --

MR. PIETRANGELO: I totally agree with what you said. You have a threshold. If it's above that threshold, you report it. You come in with it. It seems like we're setting up there is no threshold on risk analysis. In fact, that was the answer to the question.

You don't have to submit this thing if it was less than 50 degrees change in PCT, but I want to see the risk analysis, or if it's for something that's very trivial.

All I'm suggesting is that there ought to be an analogous threshold in risk based also, not just in deterministic space.

MR. RUBIN: Mark Rubin.

What I was saying, sure, we'll give some

additional thought to that, but also I point out that a bunch of these small changes could be bundled in a single application, which would streamline your work and our work, and since this has a cumulative impact which is of interest, it would be a quick way to dispose of a lot of issues.

MR. DUNN: We have extensive experience on bundling through the 5059 process. So to me I don't think we need to reinvent the wheel here on change control processes that already work quite well. If there's something additional we need quantitatively in PRA space that would help establish that regulatory threshold better.

The other thing Brian mentioned in his remarks, when there's an application that has a lot of either safety benefit or cost benefit, you're probably going to see some kind of owners group topical report or industry initiative saying here's how to do that. Let's get it reviewed and approved by the NRC in terms of a reg. guide or whatever, and you'll start seeing a bundle of these things.

And typically those are the ones that are going to require review and approval, and we try to streamline that so that everybody's resources aren't killed by the same application over and over

and over again.

But I think there's going to be a host of others where, again, to go in, let's say, with a ten to the minus delta CDF of ten to the minus seven, that's not a good use of the staff's review resources.

We know you're constrained on your own resources today, and if this rule is, in fact, viable in answer to the first question, you may see 103 units trying to do something here.

So I'm just trying to make sure we're staying true to the risk-informed principles of focusing our scarce resources on safety significant matters, and I think that has to involve some setting of some threshold for regulatory review and approval of changes.

MR. JAQUITH: Hi. I'm Bob Jaquith, Westinghouse.

And just to say something in a positive here, I'd like to point out that the Westinghouse Owners Group did a cost benefit analysis of large break redefinition like three years ago. so the information isn't current to the rule language and so forth, but I'd just like to point it out just to put some positive spin on this whole thing.

Back then it was determined to be overwhelmingly cost beneficial or could be overwhelmingly cost beneficial. The sort of costs that we were estimating were like, you know, less than $1 million per unit total cost to implement the slate of changes, and the benefits could be on the order of $3 million a year of benefit, which is a very good return. You'd pay for the thing in about three months of plant operation.

However, our assumption was that we were basically getting rid of large break LOCAs in the sense of we wouldn't have to analyze them anymore going forward, and we were defining large break LOCAs as being breaks larger than six inches, which is consistent with what PRAs have always assumed. You know, five or six inches is usually the threshold for breaks.

So all I'm saying is that there really is potential for a broad application here among a lot of plants and getting a lot of benefit, you know, as long as there's not too many burdens put on in terms of making the benefits less and making the costs higher.

But I would think that there has got to be room for a lot of application of this going

forward.

MS. UHLE: This is Jennifer Uhle from the staff.

Can I comment on that?

When we were first talking about this, and I alluded to this during my talk, I mean, I think vendors are hoping to eventually have one best estimate code that spans both the small break up through the double ended guillotine as far as what the phenomenon it can model.

So when we were going through this and we were thinking about day-to-day burden as far as re-analyses and computer models and input decks, we thought, okay, you have this one particular computer analysis that does up to the transition break size with this particular set of servitism as far as single failure, use of only safety systems, and then above that you have the same computer model perhaps because we would think you would want to use the most accurate computer model you had because you would be able to up rate power more because there would not be as much conservatism built into that code.

And it has already been reviewed and approved by NRC. So you wouldn't have had that

start-up cost of coming in with this greater than transition break size computer model, and at that point what would be different between the analyses would be, again, the assumption that non-safety systems perhaps are accredited. No single failure from the fluid system ejection component, and if it were a best estimate with valuation of uncertainty, again, the amount of rigor associated with that for the greater than in transition break size region would be far less than, say, the 95-95 that the original methodology would have required.

So the number of analyses that would have to be done as far as number of runs with the Monte Carlo sampling would be far less we thought. I think when we came up we thought, well, maybe something like a 70 percentile, 95 confidence, which equates for about three independent variables about 17 runs in the Monte Carlo. I mean you do that overnight.

So that was our thought process. So we didn't think that this was going to be a lot of operating costs associated with maintenance of all the models and, you know, the day-to-day maintenance of the code sweep.

I'm not sure if that would change

anybody's opinion of the burden associated with the analysis requirements, but computers as fast as they are and automated tools as far as running the analyses, we didn't think that this was burdensome at all considering we estimated for PWRs about ten percent upgrade in power. That was our thought process.

And if you guys choose to do something different and have various codes, that's certainly your own decision.

MR. JAQUITH: You know, over the next month or so or by the end of September, we will be looking in much more detail about the degree of pain involved. Perhaps you're right. Perhaps there's not as much pain as I'm thinking that there is, but we are going to look into that.

MS. UHLE: I was just thinking of I would say an observation, and that is if licensees are going back to discuss as far as the cost benefits, I mean, working directly with the LOCA analysis group might provide some really good input as far as the burden.

We didn't foresee the analysis requirements as being that big of a deal really, but I may be wrong.

MR. IMBRO: Hi. Gene Imbro, NRC staff.

I had a question for John Butler, NEI, a clarification question.

You were speaking before about the GDC and the applicability of a single failure criteria, and I would just ask you a question about how helpful would it be to craft in your estimates if you clarified or do we need to clarify what we mean in terms of GDC and single failure in terms of applicability for you to make a really good estimate or the best estimate you can do at this point on the costs and plant modifications, and all of those other things that we alluded to.

MR. PIETRANGELO: Well, the quick answer is yes. It impacts answering the questions in two ways. It impacts the types of changes that could be considered, and it impacts the cost estimate because you could very easily have addition analyses of record that you have to maintain if there isn't some coherency in the treatment of the single failure requirements.

So, yes, it would help to have some clarification.

MR. THOMAS: Any more questions?

(No response.)

MR. THOMAS: Thank you very much.

MR. DUDLEY: Let's go to the telephone lines -- okay. I'm sorry. One more question.

MS. HANEY: I am Kathy Haney. I'm the NRR Program Director in Rulemaking.

And I'm going to comment on the question for additional time on providing comments on the regulatory analysis, and so I'm more worried from a process standpoint.

We owe the Commission a package about the second week in December on a particular rulemaking. The September 10th date that Brian referenced is what we have in our planning schedule right now that's needed. We need this to meet our December date for the rule to the Commission.

Obviously, the information that you guys are providing is informing not only the regulatory analysis, but also the rulemaking aspect of it.

So from a quick look at the schedule I think that looking at you guys to like the end of September to provide the data to us, I'm not sure whether our schedule accommodate the end of September, but at the same time I would look at the schedule from the standpoint of being able to back off maybe the September 10th date and meet somewhere

in the middle.

So out of this meeting we'll take the request for additional time back, relook at our schedule to see how we can allow for any flexibility in the schedule to provide the meaningful data, and I would say the best place is that we'll post it on the Web site where the conceptual basis was as far as any gives in that September date.

But I wanted you to realize the importance and what that date is built off of, and that we really don't have a lot of flexibility in giving a lot of extra time on that date.

MR. DUDLEY: Okay. Now let's go to the telephone bridge and see if there are any additional questions or comments. Operator, would you see if we have any comments please?

THE OPERATOR: Thank you, sir.

We would like to get your questions or comments.

(No response.)

THE OPERATOR: At this time, sir, there are no questions or comments.

MR. DUDLEY: Thank you very much.

Brian, do you want to wrap up the meeting?

MR. SHERON: Yes, thank you very much.

I think first I want to express my thanks and my appreciation for everybody for coming here, giving us the opportunity to present this approach with the rule. I think a lot of good questions and issues were raised. Certainly it gave us some insights in terms of your perception of the rule, and we'll take those under consideration as we move forward.

I would like to emphasize that the industry had told us once before this was their most important rulemaking on their plate. i think at the last Westinghouse Owners Group that was the lead-off remarks from Ted Schiffley. So we recognize that this is important.

I wanted to point out I don't think this really came out as part of the discussions, but when we decided to move forward with this rule and there was a lot of -- I'll be quite honest -- there was some internal anguish early on in terms of the scope of the rule, whether it was a broad scope, narrow scope or the like.

We sent a Commission paper up asking for some guidance from the Commission on it.

As we move forward on this, and we

created an steering group within the agency. I'm the chairperson o fit. A number of Division Directors from various offices are a part of the steering group.

One of the ground rules we decided upon was that if we were going to be able to develop a rule in a reasonable amount of time -- and when I say "reasonable," you heard Kathy Haney mention that we were trying to get a proposed or draft rule to the Commission by the end of the year -- the ground rule was that we were not going to be able to develop new information and still meet that type of schedule.

In other words, we couldn't go off and get more data on some technical issue or something. We couldn't run experiments or something. Nor did we think that we could really take any radical departures in terms of approach.

We recognized that this rule is one of the most significant rules we have in terms of its impact on our regulatory structure. One of the things that we have to make sure is that we have, I think, a consensus among the staff that we can support whatever rule that we impose.

The intent here is not just to develop a

rule that's going to relax a lot of requirements. Okay? We want to make sure that we're consistent with our safety mandate, okay? That we maintain safety and, in fact, if we can improve it. If this rule does provide an improvement of safety, that's even better.

We put together what we think is a rule that we, the staff, can support at this time based on the information that we have available to us. You know, I'm certainly not saying this in any pejorative sense, but the industry hadn't provided any information or data to support a different approach than what we came up with.

Obviously if there was additional information or data available, we could take that into consideration as part of our deliberations, but at this point there isn't any.

So what we did come up with is what we believe we can technically support, and we believe it maintains adequate protection and safety.

The rule, I want to emphasize again, is a draft. Okay. I know you heard a lot of presentation, and the staff may have used a lot of words that advised that this is somehow cast in concrete. It's not at this point. Okay?

A rulemaking process is designed to solicit comments from our stakeholders. We analyze those comments, and we will make changes to the rule in response to those comments that we believe are appropriate.

So the rule is subject to change. The plan right now is that we will proceed with putting a draft rule in place and getting it to our Commission hopefully by the end of the year. Presuming that they accept it and give us the go-ahead, we would then put it out for public comment.

At that point I think this would be the opportunity for all stakeholders to be able to provide substantive comments on areas. You know, if you have concerns about how we came up with a transition break size, this would be an opportunity.

I would point out though, and I just sort of -- you know, this may be more personal -- if you're going to provide comments, okay, we need technical bases for those. In other words, if you don't like 14 inches, don't come in and tell us, "We don't like 14 inches as the transition break size."

If you have a different break size or something or a different approach, provide the basis on why you believe that's acceptable, okay, or tell

us what's flawed with our evaluation as opposed to just -- because we don't know what to do with a comment like that.

I do want to emphasize also. I'm not sure. I heard some comments before on this. For breaks larger than the transition break size, it's not just single failure. Okay? It's a best estimate approach all across the board.

For example, you don't need to consider infinite decay heat, for example, at the same time that you have maximum peaking factor. Okay? they physically can't occur. So you would use best estimate analysis in a number of other ways, other parameters.

The other thing is that this approach obviously if you used it, you know, you've heard that it could result in licensees being able to propose power up rates, especially in PWRs.

Obviously that's predicated if you're a licensee that either has recently replaced or is planning to replace steam generators, and you have now excess heat transfer are in margin in your generator so that you can do an up rate.

It could, in fact, lead to a small break LOCA becoming your limiting break. We are not

precluding a licensee from developing and submitting a best estimate model since a small break model, which is an evaluation model right now. I don't think anyone has a best estimate in the small break model.

But that would not preclude you from developing a small break model and submitting it for staff approval sine that may allow you to realize some of the margin that you have in your plants.

So I want to point out that this rule is not precluding that approach. Okay? We're not mandating that you use best estimate models. We're saying that for the large break if you use the best estimate model, you can obviously perhaps get some benefit.

We're not requiring the small break model be best estimate, but we're not precluding it, but that's your choice on that.

I think there will be a number of ACRS meetings in the future where we'll be presenting this information to the ACRS. So I would encourage anyone that is still interested in this. those might be good forums in which you can gain more information on where we're proceeding with the rule.

So with that I'm going to ask one more

time if anybody has any last minute questions or comments of the staff.

(No response.)

MR. SHERON: And if not, then I want to thank you, and we'll adjourn the meeting.

MR. DUDLEY: Before you leave, please remember we have the public meeting feedback forms in the back and also remember the escort requirements as you leave.

NRC folks, please don't all run away. Please hang around and help escort these people out.

Thank you very much.

(Whereupon, at 12:45 p.m., the public meeting was concluded.)