

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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BRIEFING ON THE NRC STAFF'S RECOMMENDATIONS TO  
DISPOSITION FUKUSHIMA NEAR-TERM TASK FORCE (NTTF)  
RECOMMENDATION 1 ON IMPROVING NRC'S REGULATORY  
FRAMEWORK

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PUBLIC MEETING

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FRIDAY

JANUARY 10, 2014

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ROCKVILLE, MARYLAND

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The Commission briefing convened in the  
Commissioner's Hearing Room at the headquarters of the Nuclear  
Regulatory Commission, One White Flint North, 11555 Rockville Pike,  
at 9:00 a.m., George Apostolakis, Commissioner, presiding.

COMMISSION MEMBERS PRESENT:

KRISTINE L. SVINICKI, Commissioner

GEORGE APOSTOLAKIS, Commissioner

WILLIAM D. MAGWOOD, IV, Commissioner

WILLIAM C. OSTENDORFF, Commissioner

## EXTERNAL PANEL:

ANTHONY PIETRANGELO, NEI

ROY LINTHICUM, PWROG

EDWIN LYMAN, UCS

JAMES LYONS, IAEA

## NRC STAFF PRESENT:

MARK SATORIUS, Executive Director for Operations

RICHARD DUDLEY, NRR

GARY HOLAHAN, NRO

MICHAEL JOHNSON, DEDR

DAVID SKEEN, Japan Lessons Learned Directorate

JENNIFER UHLE, NRR

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

(9:00 a.m.)

COMMISSIONER APOSTOLAKIS: Good morning.

Unfortunately, the Chairman is ill today. She has asked me to chair this meeting/briefing for her.

The Commission meets today to discuss the NRC staff's recommendations regarding the disposition of the Fukushima Near-Term Task Force's Recommendation 1 when improving the regulatory framework.

Following the accident at the Fukushima Daiichi Nuclear Power Plant in March of 2011, the Commission established a senior level task force known as the Near-Term Task Force, to conduct a systematic and methodical review of NRC processes and regulations and to make recommendations to the Commission.

Near-Term Task Force Recommendation 1, proposes establishing a "logical, systematic and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations."

On December 6, 2013, the staff presented their recommended approach for addressing Recommendation 1 in SECY-13-0132. The Commission is interested today in hearing from staff on the results of their review of Recommendation 1, but first we will hear a variety of perspectives from industry, the International Atomic Energy Agency, and nongovernmental organizations on this topic.

I ask that each panelist keep his remarks to ten minutes. We have a great deal to talk about today, so please be respectful of the timing lights in front of you. I also ask you to consider avoiding the use of acronyms to the extent possible, so the public can better understand the complicated issues we are discussing. Following a short break, we will then hear from the NRC staff.

Would any of my fellow Commissioners like to make any comments? Thank you.

So our first presentation is by Mr. Tony Pietrangelo, senior vice president and chief nuclear officer of the Nuclear Energy Institute. Tony?

MR. PIETRANGELO: Commissioners, good morning. Belated Happy New Year. Chairman, if you're watching on the webcast, I hope you feel better soon.

Let's go to the second slide. Just before we get into the meat of the presentation on Recommendation 1, just a few observations on what's transpired over the last, almost three years since the accident at Fukushima.

Substantial safety benefits have been made since March 11th. We've implemented a lot in the industry. We're doing a lot of heavy lifting this year with the implementation of FLEX, the spent fuel pool instrumentation. In fact, all of the Tier 1 and most of the Tier 2 recommendations we've already made substantial progress on.

Point being that when this Commission decided to defer the consideration of Recommendation 1, and all four of you were a part of that decision, I think it was absolutely the right thing to do so we could move forward in concert with the staff as far as real safety enhancements at the plants. Recommendation 1 is very important. It's a very interesting topic, but it's more, I think, philosophical than the actual safety improvements we get at the site. So again, putting those other recommendations first in line, I think, was again a good decision by the Commission.

Let's go to the next slide. The real finding behind Recommendation 1 was the observation that issues in the past that had been characterized as beyond design basis had ad hoc regulatory treatment and that's a fact, so that finding we agree with.

Station blackout, ATWS, severe accident management, even the aircraft impact things that were done after 9/11, all of them had slightly different regulatory treatment. That doesn't mean the whole framework's broken, however, but that there were different treatment regimes for each of those, different regulatory footprints for each of those.

You know, our conclusion when we look at this is that there is a significant benefit with establishing a better definition of what the regulatory treatment for beyond design basis because that would enhance regulatory stability.

And I think as we've worked through issues with the staff on the implementation of the Tier 1 and some of the Tier 2 recommendations, we're struggling with what's really design basis, what's beyond design basis. So I think we've learned a lot. It's opened our eyes to what some of the differences are. A lot of my presentation is focused on that.

So I think in the final analysis, some Commission policy statement on the difference in treatment, the principles behind what we, we already know what we do for design basis, but establishing a policy for beyond design basis would enhance regulatory stability and I think make the process work a lot smoother. Next slide, please.

Improvement Activity 1, which was to establish the design basis extension category that was the first recommendation in the SECY, we, I think are very close with the staff in terms of the general intent of what that improvement activity is intended to accomplish.

Our only disagreement would be with the proposed design basis extension terminology or category and it's more than just a name of what we call that category. And I want to get into some of the differences about why we think it should be called, just stick with beyond design basis.

We aren't specifying the stylized design basis events and accidents like were done in the past. This is not the double-ended guillotine break of the largest pipe in the reactor coolant system commensurate with loss of offsite power. That's not what this is about. This is about specifying a condition, not an event.

In the conditions, for example, loss of all AC power, loss of the ultimate heat sink. That's different than looking at a stylized event and designing specifically to mitigate that event.

There are other differences though, I think that are maybe even more profound. By calling it a design basis extension, do you really intend to extend what we do for design basis into this other regime? We think not.

The operational response that we're implementing now in FLEX per the order of the mitigating strategies order and later in the rulemaking, is different from design basis. It's a whole different approach, and I'll get into some more specifics in a second. And we can't continue to perpetuate this design basis thinking into this beyond design basis area.

And I want to read a paragraph from the letter we sent, the attachment. On our own we took a shot at beyond design basis principles and criteria, and I just want to read one paragraph.

"The design basis is predicated on a defined set of events and accidents, specific design criteria and clear treatment requirements. It is not feasible or appropriate to simply extend those requirements indefinitely for conditions beyond the design basis.

"The events must be considered in the context of their low likelihood, and treatment methods applied commensurately in accordance with risk-informed concepts such that plant attention is focused on matters most important to safety. Further, the scope of these conceivable beyond design basis conditions is essentially unbounded."

So traditional, conservative practices to provide margin are not possible. Thus, a fundamentally different approach must be taken to establish a consistent set of principles of treatment for these beyond design basis requirements." Let's go to the next slide.

I think we've shown this in different forums, but just to contrast the difference between what we consider in the design basis and what we look at beyond design basis in terms of treatment. In design basis you have defined events and beyond design basis boundary conditions.

We have all the design basis SSCs, the safety related SSCs that are credited in the accident analysis, in beyond design basis we're looking at FLEX equipment. All the safety functions are considered in design basis.



We're really concerned about the key safety functions in beyond design basis, and those are core cooling, containment integrity, and spent fuel pool cooling. We have very detailed procedures for implementing our design basis requirements.

In beyond design basis space we're more in guidelines, playbooks, plug and play, et cetera, rigid validation and analysis of the design basis accidents where we're taking a more rational, practical, reasonable approach with using redundancy and diversity.

And where we have very highly qualified personnel to execute the design basis procedures, we're looking more at the capability of people in beyond design basis conditions, and again using things like instruction cards, plug and play methods to address those events. Next slide, please.

In the paper we provided I think there was, I wanted to again emphasize that with the current design basis requirements, what we're really after is providing that high level of assurance of design capability to address a defined set of conditions. And there's a paradigm shift when you go to beyond design basis requirements where we're really looking at reasonable confidence and a flexible, operational capability. And there are some design aspects of that certainly, but for responding to an unbounded set of event conditions, so that's the main difference. Next slide, please.

I picked this regulatory framework example from some work we had done about a year and a half or two years ago. That's why you still see the old NEI logo on that. This is an old slide. But I think it captures in one picture, kind of how a regulatory framework might work.

And when you apply this to what we have in place now, it doesn't exactly fit but it's more of an ideal. And I would note it's very close to what was put in the risk management framework NUREG that Commissioner Apostolakis led.

And there are some very practical differences. First, the licensing basis extends out to both design basis and beyond design basis. Basically for things that are of adequate protection, staff does a regulatory analysis but does not do cost-benefit analysis. That is done on things that are not considered adequate protection but that provide substantial additional protection and that are cost-beneficial.

Once you get beyond that and that licensing basis ends, really it's at licensee's discretion whether to implement new, or change their plant. And they have different reasons for doing different things, whether it's asset management or asset protection on the turbine side, et cetera.

You could characterize the adequate protection as design basis. You could characterize the beyond design basis as things that go beyond that and that you need to perform cost-benefit analysis, but there's many examples that are in both boxes that don't comport. For example, station blackout was done as a beyond design basis, was deemed cost-beneficial when it was promulgated in the 1980s.

When this Commission looked at extended loss of AC power, the first order on this, you did it as an adequate protection measure, and that was even beyond where station blackout was that was substantial additional protection 20 or 30 years ago.

That's okay. We didn't argue with that. That's because that's your prerogative, things change over time. You don't melt three cores and not have a different sensibility about what you're looking at.

So the point here, and that's the next slide, is that we're always going to have new information, operating experience, changes to the external hazards that will pose questions about whether those are adequate protection or should be considered adequate protection, or is a cost-benefit analysis necessary.

My point is that's your decision. And this Commission was very thoughtful in reviewing the Tier 1 requirements and whether they were adequate protection or substantial additional protection and what category they fell in that you got feedback from all the different stakeholders and you came to a decision as a body. That's the way it should be done. That's, I think, what your prerogative is.

Let me turn to Improvement Activity 2 on Slide 9.

Obviously defense-in-depth has been around a long time. It permeates every aspect of our design operation.

I have some disagreement with how the Near-Term Task Force characterized the seeking appropriate balance of risk in defense-in-depth considerations. I think the ACRS, when I read their letter, had a very similar concern. These aren't things that are one or the other. These have to be considered simultaneously.

And it's really similar to what adequate protection is, is what, you know, the FLEX in the order was promulgated on another layer of defense, which was defense-in-depth, okay, but you called it adequate protection. Didn't matter. That was a defense-in-depth thing that the Commission considered at the time and went ahead and promulgated.

So again, it's what the Commission considers necessary, whether it's in adequate protection space or cost-benefit analysis space.

Turning to Improvement Activity 3, and I think we're all on the same page with it. Industry initiatives are not a substitute for justified regulatory requirements. If there's a safety issue that needs to be addressed, we want the Commission to address that issue. That's not our job as an industry to self-regulate on justified regulatory requirements.

I think the point in question, however, is what should be credited in regulatory analysis. And we think that regulatory analysis, if there's a commitment on the docket or an obligation via a rule or order, then those can be credited regulatory analysis.

But things we do that are voluntary nature, they have no NRC oversight, okay, and we're not saying you should be overseeing those implementation of voluntary industry initiatives but that are controlled under some NRC program, at least a docketed commitment to have a management program that the Commission has endorsed and that you have a footprint over those, those are fair game that consider in the regulatory analysis. But simple voluntary industry initiatives that have no regulatory footprint should not be credited.

So in conclusion, we would support a Commission policy statement on beyond design basis principles. It could have a policy statement as well as some NUREG that provides more detailed criteria.

We do not believe additional work on defense-in-depth at least in the context of Recommendation 1 has much value at this point. Maybe under the risk management framework activity there could be some value in further defining defense-in-depth, but again my own personal perspective is that's a Commission call on that.

And finally, we don't support regulation of voluntary initiatives unless they're somehow docketed on each licensee's docket. Thank you very much.

COMMISSIONER APOSTOLAKIS: Thank you. Next we will hear from Mr. Roy Linthicum from Exelon Nuclear. He's the chairman of the Pressurized Water Reactor Owners Group Risk Management Subcommittee. Please.

MR. LINTHICUM: Oh, thank you, Commissioner. Now our subcommittee represents PRA practitioners throughout the PWR community so we have representatives from all utilities that attend. So the information I'm providing is pretty much a consensus opinion of people that would actually practice and actually go forward and implement any new regulations. If you go to the next slide please.

So as Tony mentioned, you know, we also agree with the general concept of Recommendation 1. We feel that a well implemented risk-informed framework will provide the greatest safety benefits. However, we do want to make sure that we can leverage our limited resources to provide the largest safety benefits.

So we need to focus on seeking a risk-informed method that appropriately balances defense-in-depth principles as Tony also mentioned. And the problem we have with the current proposal on Recommendation 1 is that we do not really see how the risk insights will be used to support the initiative. Next slide, please.

Now also as Tony mentioned, we also see that the current framework we have that uses risk-informed regulation as well as defense-in-depth may actually tend to treat those independently and separately, and typically, the more conservative position wins.

So if the risk argument will tell you that you should be doing something different and focus on a different area, we would go forward and do that even if you could justify not doing anything from a defense-in-depth perspective and vice versa. Next slide, please.

What we'd like to see is a move more towards an integrated approach to balancing risk insights with defense-in-depth and actually treat them in an integrated manner. And I think Tony's previous slide actually had a good illustration of that concept. Next slide, please.

We also feel we actually have a fairly good framework in Reg Guide 1.174 that describes how to actually do integrated decision-making that considers meeting your current regulation or making changes to it to ensure that you are consistent with any changes with defense-in-depth. However, make sure that it's also appropriately balanced with any increases in core damage frequency or benefits in reducing core damage frequency or large early releases.

So I think it's important that we maintain that balance. We think it's been working well and we just need to fully integrate the concepts of risk informing the defense-in-depth.

Next slide please. When we look at the impacts of Improvement Activity 1, as written it would only apply to new activities or regulations moving forward. We feel that to be valuable to the industry we actually need to look at existing initiatives and regulations as well.

We also feel we need to allow the use of plant-specific risk insights. There is a large difference in plant capability across the fleet, even similar plants that have a very similar design, they may be shared sites, actually can have significantly different risk profiles and we need to be able to use those risk insights on a plant-specific basis, not just look at generic risk insights.



And though we do acknowledge that as written Improvement Activity 1 would not require a full scale PRA, not really looking at the risk insights and allowing the use of plant-specific insights and allowing the use of plant-specific PRAs, we feel only increase the burden on our staff by adding new regulation and not allow us to get relief on regulation that's not providing additional cost-benefit.

And we think that an appropriately implemented Recommendation 1 would give us the incentive to build PRA models in order to move forward and apply those risk insights on a plant-specific basis. Now if we can move on to the next slide, please.

With regard to the impact of Improvement Activity 2 with expectations on defense-in-depth, once again it's written that say that there is no need for full scale PRA models. However, we feel that inherently to implement what's been recommended for Improvement Activity 2 would actually require us to build full scale PRA models. So if there's any criteria that we're going to meet on a defense-in-depth basis we'll need those PRA models to do that.

And as I think Tony mentioned, we don't see a need necessarily to implement Improvement Activity 2 by itself, though we do think that additional definition with regards to defense-in-depth could help as far as moving forward with Improvement Activity 1.

We do have one large concern when you do look at defense-in-depth and you look at full scale PRA models, and that's how do you aggregate risk and apply quantitative criteria across the wide range of internal and external events?

The large uncertainties that are associated with external events and a lot of the bounding analysis that's been completed to date really does not allow us to simply add numbers together and come up with one set of criteria.

So we feel that if we're going to develop criteria related to aggregate risk, we need to look at each hazard independently and see what insights we gain from each independent hazard and rather than try and aggregate those results together, because that's beyond this scope of what we currently are able to do in a realistic manner. Next slide, please.

As far as Implementation Activity 3 with the role of voluntary initiatives, we agree with what Tony said with regard to voluntary initiatives. There is no need to have any regulation for voluntary initiatives. They are voluntary and should be treated as such.

And as Tony mentioned, if we make specific commitments on a site-specific basis then we should be able to take credit for that, but in general we should not have any specific regulation related to voluntary initiatives.

I do have in here on the next slide, the cost of developing a full-scope PRA models. That's something we had provided, so I think with wherever we had, you recognize that as we move forward a lot of plants are still developing PRA models and we are putting in a significant investment in these PRA models.

They are costly. It's going to take a significant amount of time especially as we move forward into things like the seismic PRAs where we have limited expertise. We've been dealing with fire PRA models which have the same problem.

So it does take time to develop these models, but we'd like to make sure we have an incentive to continue to develop them so we can use the insights to both improve efficiency as well as improve safety and address any vulnerabilities we may identify as a result of these plant-specific models.

My last slide, in conclusion, we do believe the existing regulatory structure provides an adequate level of safety with regard to, but is overly conservative with regard to some safety issues and especially for some plants. Like I said, we recognize there are significant differences in capability between the plants even of similar designs.

We do think a risk-informed regulation should be applied to both current and future regulations so we have a balanced approach. We believe risk-informed regulations should use generic risk insights to focus regulatory control, but allow a plant-specific option for PRA specific insights to prioritize safety issues. And this would allow us to leverage the large cost of developing and maintaining full-scope PRA models. That's all I have.

COMMISSIONER APOSTOLAKIS: Thank you. Next we will hear from Dr. Ed Lyman who is senior staff scientist with the Union of Concerned Scientists. Ed?

MR. LYMAN: Good morning. It's good at least from my point of view to see you all again.

COMMISSIONER APOSTOLAKIS: You're a frequent visitor.

MR. LYMAN: May I have the next slide please? Actually, may I have my presentation. Yes.

COMMISSIONER APOSTOLAKIS: Is this it?

MR. LYMAN: No, this is the IAEA. Anyway, while we're waiting, I hope that you do detect a consistent theme in our presentations to you this week, which are essentially that we support better focus on uncertainties, more safety margin and more attention to defense-in-depth. Next slide please.

So our framework for looking at all these issues with regard to severe accidents is that our position is the fleet is vulnerable to severe accidents and that vulnerability remains unacceptably high. That in too many cases flawed risks and regulatory analyses have been used to paper over these problems.

That the NRC over the decades has squandered multiple opportunities to try to address this problem in numerous junctions. There was the opportunity to do a systematic and thorough review using consistent criteria to systematically look for severe accident vulnerabilities and that was never followed through.

After TMI, the Severe Accident Policy Statement which essentially waved a magic wand at severe accidents and said, you know, there's no generic concern, in the individual plant examination and the individual plant examination of external events which were essentially voluntary initiatives without consistent criteria did not provide the kind of basis that we think is necessary.

And in license renewal, again another opportunity to review plants on a design basis to make sure that it's consistent with its original licensing and is up to date with regard to current severe accident understanding, that the Commission never went to the next step in license renewal to ensure that those plants were up to date fully with regard to all that information.

So we ask now after Fukushima, is the NRC again going to avoid doing what needs to be done to protect public health and safety in a consistent and understandable manner? Next slide, please.

So as far as our overall view in Recommendation 1 is that we do believe that a comprehensive overhaul of the flawed regulatory patchwork that was highlighted by the NTTF, Near-Term Task Force, is needed.

And I don't use the word "patchwork," Commissioner Ostendorff, just to antagonize you, but that we really do believe that's an accurate characterization. And so we disagree with the staff's rejection of an option which would lead to more comprehensive reform as we believe the NTTF recommended. Next slide, please.

In the staff's paper, they state that maintaining the existing framework is a viable and acceptable alternative, and we think that undermines the NTTF's conclusion that the safety approach is incomplete without a strong program for dealing with the unexpected, including severe accidents.

We don't think the framework is working well today, and all you have to do is look at how generic issues, like upstream dam failures, have been dealt with over the decades, and we ask if the current process really gives commensurate attention and respect to the severe accident issues. Next slide please.

So with regard to the staff's proposal, we disagree with many of the decisions that they made in fleshing it out. We support a rule that would create a design basis extension category that would mandate retrospective site-specific application of regulatory framework reforms.

We think without a retrospective view, the NRC is going to be merely fighting the last war and responding to events and information as they come up in a random basis and we don't think that's the systematic framework that's needed.

And we believe that the NRC should provide the resources necessary for this activity so it doesn't detract from focus on known safety risks. The staff warned about that but we don't think it's a zero-sum game here. Next slide please.

In our revised framework, and you may recognize some of this from the spent fuel presentation on Monday, we think the guidance should be revised to regulate severe accidents more tightly, perhaps a 95th percentile rather than the mean that the geographical extent and the regulatory analysis should be increased where appropriate.

Qualitative aspects like land contamination should be treated more consistently. More weight should be given to defense-in-depth in a formal manner. That risk analysis should only be used when high quality, full-scope PRAs are available and treat uncertainty effectively.

And it should result in logical outcomes. For instance, if you are going to rely on equipment to mitigate a particular event, that event should be qualified to survive, or that equipment should be qualified to survive the event that it's supposed to mitigate. Next slide please.

So what would a retrospective, comprehensive site-specific review look like? Well, we think the IPEEE program was the right idea, except it should be done in a mandatory sense with a consistent methodology that all sites need to follow.

I'd point out in the EPRI report that was referred to in the Monday briefings that it said the IPEEEs did not identify any flooding related vulnerabilities across the fleet. Now I think that shows in itself the flaws of how that program was executed.

Every plant that's applied for license renewal, plus Limerick and Watts Bar 2, have a severe accident mitigation alternatives analysis. That's a more or less systematic hunt for ways in which severe accident vulnerabilities could be reduced.

But we know that the SAMA analysis is not a forcing function that if any SAMA that's not related to a license renewal or aging management is not required, and we think that the SAMA analysis should form the basis for a list of safety improvements that should be required provided the revised regulatory analysis we propose determines them to be beneficial.



So any cost justified, significant safety enhancements determined under this new process should be required. To understand them better, we propose that stress tests to assess margins and identify cliff edges should be conducted.

This is where we disagree from the NEI's concept of an infinite unbounded set of events that you don't need to consider specifically. Well, we agree that you need flexibility. FLEX needs to be flexible. But you also need to have some basis for ensuring that your strategies are going to work in some selected set of circumstances. So we think that there needs to be at least some category that gives you confidence that you are flexible, strategies will work when they're executed, and the stress test approach is one way to do that. Next slide please.

So in summary on Improvement Activity Number 1, we, like I said, do believe more comprehensive reform is needed. That we don't agree that the current Fukushima actions other than Recommendation 1 would fully address the concerns we've raised with regard to Recommendation 1. Next slide, please.

You just need to look at the way some of those activities are being carried out. Now with the recent discussion about guidance for flooding walkdowns on Monday, rather than beat that dead horse I'd like to point out even if there is guidance that that guidance is not being carried out consistently.

The NRC staff pointed out in August that the audits of the walkdowns found that there were inconsistencies from site to site with respect to evaluation of available physical margin and consideration of what potentially significant safety consequences mean.

These are the kinds of things that Recommendation 1 framework would presumably be able to resolve. And the Request for Additional Information to settle this issue in December went out to over 80 percent of the licensees.

The staff, I believe, has also not resolved what adequate or reasonable protection of FLEX equipment and maintenance and testing programs are needed, what that actually means. Another issue which presumably that overarching framework would help to resolve.

And we don't think that putting adequate protection and safety enhancements in the same design basis extension category is the right idea as the staff has proposed. That may only increase confusion. Next slide, please.

So with regard to Number 2, we do agree with the NTTF that we think there is too much reliance on risk calculations without appropriate attention to uncertainty and that needs to be balanced with more defense-in-depth. That would help to make better decisions with regard to issues like hydrogen control and mitigation, filtered vents, spent fuel transfer, emergency planning and security. Next slide please.

And so with regard to Improvement Activity Number 3, I think we're in violent agreement that NRC should not credit voluntary industry initiatives to meet regulatory requirements full stop. However, I'm not sure what Mr. Pietrangelo meant talking about voluntary commitments with a regulatory footprint. That, I think, only furthers the ambiguity.

So if it's not a regulatory requirement it shouldn't be credited in a regulatory analysis. Next slide, please.

And so in conclusion, we think the staff's proposals have merit, but they only address certain pieces of the problem outlined by the NTTF. And we're afraid they may exacerbate the patchwork nature of the regulations if not conducted in more comprehensive manner to adequately address all the severe accident risks post-Fukushima that have come to the attention of the public and the Commission. Staff should have provided an option for a more comprehensive reform to the Commission.

And I will conclude. Thank you.

COMMISSIONER APOSTOLAKIS: Thank you. So now we come to the time of questions from the Commission, and we start with Commissioner Magwood.

COMMISSIONER MAGWOOD: Thank you, Chairman.

COMMISSIONER APOSTOLAKIS: Wow. Thank you, George.

COMMISSIONER MAGWOOD: I should note that having my esteemed colleague chairing this particular session smacks of the lunatics running the asylum, but I guess we could consider this being an accident of history.

Well, I appreciate the comments from all three of you today, because it's quite interesting to listen to you for me, because, first, let me say I'm still staring at this issue. I've been talking with the staff about this issue for more than a year.

Commissioner Apostolakis and I met with the staff three or four times to go over this as the thinking evolved, and during all this time I'm still not sure what to do with this one because it's very complicated.

On one hand, I look at the staff's proposals and I hear what all of you say, and all of you seem to be saying almost the same thing in very different ways. On one hand, I think there is an instinct that perhaps, you know, it's not really so broken that we have to do a lot of things to advance the implementation of post-Fukushima requirements.

On the other hand, on a broader, more philosophical level there are serious questions that were raised by the NTTF as Ed highlighted that require a lot of thought and raise a lot of very important questions.

So I think we are torn between this instinct, you know, it's working, we're getting things done, we're advancing safety, but on the other hand, you know, we have these questions and concerns about how defense-in-depth is used vis-a-vis the risk analysis.

So I appreciate the conversation today because it's very helpful, but let me ask a few questions. This issue that Tony highlighted about the design basis extension category, I think what I hear from you, Tony, is not so much a disagreement with the types of activities one would take in that category, it's just simply in your view there's no need to have that separate category.

That you have design basis or you have beyond design basis, and for beyond design basis you have a certain set of responses such as FLEX. And I think that what I hear you saying is you don't really see a need to draw a distinction between something that's simply an extreme event, like a flood, versus some far beyond design basis event such as, you know, a once-in-a-million-year earthquake, an asteroid collision, something like that. Is that a fair characterization?

MR. PIETRANGELO: It is. And I think, you know, part of what we've been working through in the implementation of the Tier 1 recommendations is how we treat the different activities, whether it's FLEX or spent fuel pool instrumentation or the hazard reevaluations.

And FLEX, even though the Commission termed it adequate protection, I think it probably would have passed under a substantial additional protection criteria as well. But it's just to highlight there's a big difference between what we do in that regime well beyond the design basis for any what-if scenario. Even though our state of knowledge is improving on the external hazards, there's always going to be uncertainties.

And really that mitigating strategies FLEX program is designed to address these unknowns with a diverse, redundant flexible approach. Because if you postulate new design criteria in some design basis extension category, I can always top it with something more severe, right, if I look a million years versus 500,000 versus 100,000. I can always postulate something worse.

So we needed something more durable to be able to answer that question going forward, and I think the flexible, operational response is the correct response, but if we try to drag the design basis treatment into that arena it just won't work very well.

COMMISSIONER MAGWOOD: I think that was clear. Let me ask Ed to react to that a little bit, because you didn't really speak to it as specifically as Tony did. From your perspective, does this middle category matter? Is this something we should really be worrying about?

MR. LYMAN: Well, I think actually the reason for a middle category would only be to maintain the kind of historic structure, but I think it's certainly cleaner if you just have two categories. But I think if you did, our design basis would be a lot different than what Tony's described.

So sure, we're all for that but we'd probably put the asteroid in a beyond design basis, but the credible floods and other severe, you know, natural events, I think, if you're going to have to choose we'd put it in the design basis.

COMMISSIONER MAGWOOD: And I think part of what's complicated about this is we're dealing with that exact question right now. I mean, I've talked with the staff about this very recently and the question about, you know, where do you draw the distinction between beyond design basis and design basis with floods and earthquakes and that sort of thing, that's an active question before the industry and the staff right now.

So it's not as though that the question you're posing isn't being asked, it's being asked as we speak. Looks like Tony wants to react to that.

MR. PIETRANGELO: And we're working through that now, and I think we made a lot of progress at the end of last year on trying to draw that line better.

But Jim Scarola has a chart that shows kind of design basis things and FLEX responses and the time elements associated with it. You know, in Phase 1, a FLEX is with permanent plant equipment to which actually has a rooted design basis.

So when your time response on certain events, when you look at them, get more towards what the design basis time response is, that is, kind of within an hour, then you're going to start treating that a lot more like design basis and maybe we should categorize them as design basis.



But these other things that are, you know, tens of hours or days out don't get the same kind of response or action, or should they, as the design basis responses. So I think we're finding out where that point is, and I think the response times will be an important element of that.

COMMISSIONER MAGWOOD: Let me jump in and talk to Roy for a moment, because I thought your comment, the comments of the Owners Group was actually quite interesting. First, you've specifically advocated a retrospective approach in not just looking at future regulatory activities, looking at past regulatory activities. Is --

MR. LINTHICUM: That's correct. Like I said, there's a lot of previous regulatory activities that we feel could have benefited more from a risk-informed approach and not necessarily a more bounding approach.

So things like ATWS mitigation and even station blackout, those station blackout, they didn't initially start it as a risk-informed initiative. The implementation was more along the lines of a deterministic look at how you implement that.

COMMISSIONER MAGWOOD: So it's worth going back and looking at those things.

MR. LINTHICUM: We feel it's worth going back and looking at those things and appropriately binning them, you know, whether or not you have two categories or three categories.

And the other problem we see is when you try and differentiate between design basis and beyond design basis, where do you draw the line? From a risk perspective there is no line. It's really just a continuum of responses. But somewhere you need to get to the point where enough is enough.

COMMISSIONER MAGWOOD: Yes. Tony, you didn't really speak to that point very specifically. Do you agree with that?

MR. PIETRANGELO: We've tried that in the past with minimal success, quite frankly. In fact, when we tried to risk-inform the design basis, the biggest example of that is the double-ended guillotine break, the large break LOCA. And that research was done over almost a decade, rulemaking was promulgated, and the Commission sent it back to the staff.

So while it's not dead-dead, I mean we've tried that and unsuccessfully. So at least the reactor oversight process risk informs the findings in the inspection process. That's at least on the tail end we're getting it right from a risk perspective. But trying to go back and risk-inform all the Part 50 requirements is very, very difficult, would take a long time, and quite frankly, the success rate for doing that is not good.

So while I'd like to see us do that more, maybe as the PRAs evolve and get more comprehensive it'll be easier. But arguments have been made and they haven't gotten anywhere. So I'm sympathetic to it, I just know how hard it is to go back.

COMMISSIONER MAGWOOD: Right.

MR. PIETRANGELO: But again, as long as there's an element in the process, like the ROP at least risk-informs the outcomes of the inspection and that's a good thing.

COMMISSIONER MAGWOOD: I want to ask you one question, Tony, before, and then I want to get back to Roy. But in the time I have, you know, you're familiar with this document, the EPRI document Ed referred to, Identification of External Hazards for Analysis and Probabilistic Risk Assessment. Yes? Have you not seen this?

MR. PIETRANGELO: I haven't read it.

COMMISSIONER MAGWOOD: Well, it's interesting, because we had an EPRI representative earlier this week and I asked if he was involved in some of the efforts that you're currently engaged in, and he indicated he was aware of it but wasn't really engaged. There's a lot of good thinking in this, and I would think it would be more integrated with the activities that you folks are pursuing. So I recommend you take a look at that.

Roy, you essentially mentioned, since we raised PRA, you highlighted how the PRAs could be used in the cost of developing. I'm not sure I heard a clear position from the Owners Group as to, are you saying that we should develop these full-scope PRAs? These are just worth doing? Is it something that the Owners Group is intending to do, or how do you look at that?

MR. LINTHICUM: Yes, our goal as part of the Risk Management Subcommittee is to continue to develop PRA models for our entire fleets. We do recognize though that there's some plants that have limited lifetimes where the investment may not be warranted.

But for plants with some remaining life, we definitely support moving forward with developing realistic PRA models, expanding the models into external hazards. You know, as a community of risk engineers, we feel it's important to be able to use those to identify insights and safety enhancements that we can make.

COMMISSIONER MAGWOOD: Okay. We appreciate that. Well, my time is up. Thank you.

COMMISSIONER APOSTOLAKIS: Thank you.

Commissioner Ostendorff?

COMMISSIONER OSTENDORFF: Thank you, Chairman. Thank you all for being here today. I'm going to provide a little editorial comment at the beginning to refer to Dr. Lyman's comment.

You know, you and I have seen, if not, we've agreed to disagree on this patchwork use and what it means and so forth, but I want to tell you, when you present at these meetings, and you were here earlier this week and I think we value your perspectives.

And what's always impressive to me about your presentation is it's not just knowledgeable and well informed, but you always are able to communicate in a manner of civility and respect even when you strongly disagree with either the Commission or the staff. And I greatly appreciate that and I know my colleagues do as well.

So I wanted to say that. Sometimes we don't see that from an external panelist. We always see that from you and your colleagues at the UCS, so I appreciate that.

Yesterday I had a chance to spend some time with Mike Johnson. I think Mike was, I saw him here earlier. Yes, okay. And he'll have a chance to clarify when he's up here, the next panel if I get this wrong, but I want to use that discussion contextually to ask a question or two.

And I was asking Mike yesterday in his office about Recommendation 1, a question in what's the value of this Activity 1, trying to further define this design basis extension category, because I've been somewhat skeptical about this. And I agree with Commissioner Magwood's comments early on that this has been a very difficult set of issues to wrestle with.

So I completely agree with my colleague. And I've not accepted or agree with the use of the phrase "patchwork," so I was asking Mike, what's the value here? And as a former operator for many years of propulsion plants in submarines, the operations/maintenance perspective has been something I've lived for many years before coming to the NRC.

And so Mike said, Commissioner, let me give you a couple of examples of where if we'd had this in place, this design basis extension category, we would have had an easier time. And he used two examples. One of it was how to figure out the spent fuel pool level instrumentation, how do you actually implement this?

I think, Mike, is that -- you're nodding your head -- that the absence of some body of work to describe or capture how we have dealt with these issues before has caused some struggling on the staff side and, I think, on industry as well.

Another example, I believe, has been the context of FLEX implementation, specifically, where do you store this equipment? And what kind of building do you have to have? Does it have to be seismically qualified?

For some this stuff, my personal view is put up a tent and tarp and cover it. That's what I've seen in the military for many years, and the building's not going to collapse on top of it if you have an earthquake.

So oversimplification, but what I got from Mike in both cases was that the existence of that body of work in outlining what a design basis extension category really is would be helpful.

And then the taxonomy to include in that exists in ATWS, excuse me, Anticipated Transient Without Scram -- sorry, Chairman -- station blackout, combustible gas control, loss of large plant areas, and aircraft impact as well as the ongoing rulemakings for station blackout, onsite emergency response capability, containment/filtering strategies.

That grouping together a set of issues that kind of fall in this category provides at least an experiential approach to say, hey, we've had experience in dealing with those even though they've been dealt with, treated, and I agree with Tony's comment, in very different ways.

So I was somewhat convinced by Mike's statement yesterday to me that hey, implementation-wise we would have been better off with having something to define what we're talking about and what has fit in that from a historical regulation standpoint.

And I'm curious if anybody here wants to comment on that and it's open to any of the four panelists to react to that. Disagree? Agree? If you have any response? Maybe I'll start with Dr. Lyman and see if you have anything.

MR. LYMAN: Yes. I think in the paper itself they outline numerous examples where they think decision-making would have been improved. And I'd just like to highlight GSI, or GI-189 which is the combustible gas control and ice condensers, which was an issue where I do not think the process worked. And had there been a mechanism for evaluating that issue in a different type mechanism then it would not have come out the same way.

And that's a particular, this is an issue where it fell through the cracks. The staff accepted a voluntary initiative incorporated into the cost-benefit analysis in a kind of odd way, and so they found it was not cost-beneficial based on a voluntary initiative. And we think that was kind of the worst of this, I won't say patchwork, but not having a consistent safety basis for making that decision.

COMMISSIONER OSTENDORFF: Before we go onto other, I want to ask you one particular question but it's related to the point you're making. You may not agree with this, but I've highlighted one example in the mitigating strategies order where on the FLEX equipment installation and storage requirements that the staff has struggled and industry has as well to figure out what makes sense going forward.



So we accept that there's some problems and some challenges in the interpretations and what kind of guidance to use currently, but that would be somewhat mitigated by if the Commission approved Activity 1 as proposed by the staff what would be the delta between that level of clarity and what you're proposing by the more comprehensive Near-Term Task Force Recommendation 1 body of work?

MR. LYMAN: Well --

COMMISSIONER OSTENDORFF: As it applies to mitigating strategies order implementation.

MR. LYMAN: I think that depends on how, I mean some of the objections we had to Improvement Activity 1 had to do with retrospect versus prospect of site-specific first. So take site-specific in particular, I think that really is an issue that is highly site-specific in nature.

So I don't see how coming up with generic design basis extension events and trying to apply them to whether, you know, I mean everyone uses the example of getting a flood at Palo Verde or something, right. So that category should really have some thought put into what are the site-specific challenges.

So, you know, appropriately modified, Improvement Activity 1 could go a long way, but I just think some of the recommendations the staff made and how to shape it are not the right choices.

COMMISSIONER OSTENDORFF: Okay. I

understand that. Mr. Pietrangelo, do you want to talk about that at all or do you have any comments?

MR. PIETRANGELO: Just one thing. I'd just again reiterate why we think a Commission policy statement would be a good thing here. Because it would enhance regulatory stability, and licensees value regulatory stability to be able to make decisions about where to store the equipment and things of that nature.

We have worked through a lot of these issues and FLEX implementation and some of the other activities. I think we're getting on the same page now with that.

But absent some, I think, codification through a policy statement, you can put some criteria in a NUREG or some other document, but to give it the standing. Because what we're seeing is, both on the NRC staff side as well as on the industry implementation side, is absent defining that we revert back to design basis principles, which is not the right thing to do here.

So it has to have some standing. I don't think just putting it in a NUREG as suggested in the Improvement Activity 1 is sufficient. We'd like to see a policy statement. If you need a NUREG to put additional detail in, fine. But I think the Commission has to weigh in on it and this is a policy decision in our perspective.

COMMISSIONER OSTENDORFF: Thank you. Mr. Linthicum, do you have anything to add to that?

MR. LINTHICUM: I'll just add that I actually, I think, agree with both Tony and Ed. I think we do value regulatory stability and we do like to know what the rules are. But I do think that more of a site-specific hazard look and having that laid out in a more structured manner would have helped with the mitigating strategies implementation.

COMMISSIONER OSTENDORFF: Okay. I've got limited time here. Let me quickly just seek clarification from Mr. Linthicum on your Slide 6. Your design basis extension category comment said that in order to be valuable this needs to apply retrospectively. Is that your position?

COMMISSIONER OSTENDORFF: That's the position of the committee. Yes, we need to look back at the previous regulatory activities and see where we may be able to move some of those into this other beyond design basis type categories, the design basis principles.

COMMISSIONER OSTENDORFF: Is that a different position than NEI has, Mr. Pietrangelo?

MR. PIETRANGELO: I mean, I'm all for risk informing some of the current Part 50 requirements, I'm just saying it's very difficult to go back and do that. We have experience with that. It has not been successful. We're willing to try it again.

I completely agree with using site-specific insights so that, yes, you can't broad-brush the whole industry on a given issue because of the site hazard differences, design differences, et cetera. So we're not against going back and looking at it, but we've got to be much more efficient at it if we're going to do it.

COMMISSIONER OSTENDORFF: Thank you.

Thank you all.

COMMISSIONER APOSTOLAKIS: Thank you. Mr. Lyons joined us, due to whatever reason, late. So what I propose is that we finish this round of questions, then give Mr. Lyons an opportunity to make a presentation and we'll see whether the Commission has any additional comments. Any objection to that? So Commissioner Svinicki?

COMMISSIONER SVINICKI: Well, thank you. And welcome to all of you and thank you for your presentations here today. And I appreciate the questions of my colleagues. I hope that as you listen to us you're getting a sense of how complex we find the issue and how deeply we're looking at some of the history. And this is an issue that has a lot of affiliated subsidiary issues and things attached to it.

So I know myself as I began to try to read documents of a historic nature and you find further citations so then you pull and look at those documents.

And so along the lines of that I do want to make knowledge in the record, and I'm not sure if Dr. Lyman will appreciate this or not, but I think that he should certainly have some original rights over the use of the word "patchwork." Because I ran across occurrences of his use of the word "patchwork" going back to, I believe, as far back as the year 2000 and some correspondence coming into NRC with which he was affiliated.

So I don't think that he should have to confine himself in the use of that word, because I think that his use of it and invocation of it long predates the Near-Term Task Force. So I just wanted to mention that. I had run across that in some of my preparatory work for this meeting.

A lot of areas have already been covered in the Q&A. I had some specific items I wanted to return to or ask about. Dr. Lyman had mentioned, and I'm paraphrasing a bit, but he was talking about acknowledging the need for flexibility, but I believe he stated you also need a set of cases in beyond design basis space where you're assured of your capacity and capability for taking action.

And I wondered, Mr. Pietrangelo, if you had a reaction you could offer to that statement.

MR. PIETRANGELO: There is an overlap with, as I stated before, with FLEX. Phase 1 of FLEX is permanent plant equipment that usually is part of the plant's design basis.

If you don't have enough time to cope you may have to make some changes to the design basis in some of the Phase 1 equipment, whether it's putting stiffeners on a condensate storage tank because that's your source of water for auxiliary feed on a pressurized water reactor, or some other change. It depends on your coping capability and response time.

So that's part of this. That's looking at the reevaluation of the hazards and how they impact not only that stuff you need in Phase 1 for those three key safety functions, but also where you place the FLEX equipment around the site and how you protect it.

COMMISSIONER SVINICKI: Related to that point, could you react to whether if you see some benefit in establishing clear criteria for defense-in-depth, or do you think that having a more fact-specific case-by-case determination is preferential?

MR. PIETRANGELO: I don't see it. I think, you know, to try to lay out very prescriptively how you determine what defense-in-depth is necessary, I mean you did it as a Commission with the mitigating strategies order. That is defense-in-depth. That's an additional layer of protection.

You didn't have all this criteria laid out to determine whether you needed to do it or not. You made a decision as a body. We stood by it. We didn't argue with it. It was the right thing to do.

So again, we could argue what defense-in-depth is for the next, or try to define it and put criteria around it for a long, long time. And what the staff proposed is a pretty significant effort, I think, in here.

But I think again, to me it's a lot like adequate protection. That's not defined anywhere either. But, you know, you as a body, and that's your prerogative, decide within your process when you would implement those kind of things.

And I don't think we would, I'm not against trying to look at it maybe a little bit more within the context of the risk management framework. Just to describe how it better fits in with the decision criteria of 1.174 might be useful. I'm open to that suggestion. I don't think it belongs in the Recommendation 1 arena.

COMMISSIONER SVINICKI: Would anyone else like to react to that?

Well, you mentioned now adequate protection, and Mr. Pietrangelo, you took that on very directly in your presentation. And as I'm looking at this issue and associated issues, it's hard not to be looking at it through the prism of a potential redefinition of adequate protection.

Tony's presentation talked about that or characterized it as, you know, a Commission determination, and I think on this side of the table we all now have experience with fact-specific case-by-case determinations or basically looking at adequate protection on that very fact-specific basis.

And so I wonder if anyone has an opinion or a reaction to how either the Near-Term Task Force recommendation as you understand it or what the staff now proposes in these improvement areas in the paper that's before the Commission, to what extent are those at the end of the day about taking that Commission very internalized, deliberative case-by-case threshold on adequate protection and making that less of a pure prerogative for the Commission on a case-by-case basis, and basically redefining it and making it not something that, you know, is in the hearts and minds of five people determining it on record by record, issue by issue and somehow mechanizing it in some ways or taking some part of the pure deliberative nature of it and making it less of that?

Does anyone else think that that's somehow embedded here? Dr. Lyman?



MR. LYMAN: Yes. Actually, now that you mention it, I read, Commissioner Ostendorff had this paper in the Nuclear Law Bulletin which I thought was really good. But he talks about this issue and how you don't want to, if you came up with some sort of automatic process that that would tie the hands of the Commissioners. And I think that's a good point. You don't want to have anything that's automatic.

But I think if you had a more systematic process for making a determination a more transparent process that if the Commission deviated from that at least the public would understand it was a deviation. So that would take a little bit of the subjectivity out of it and at least you'd have to explain why you're not accepting the numerical outcome. So I think that, from their point of view, would be an improvement.

COMMISSIONER SVINICKI: Does anyone else want to offer any reaction to that on that topic? Yes?

MR. LINTHICUM: Yes, I'll offer. I do agree with that. I think there would be benefit from a more structured approach, but I think you still need to make the decisions on a case-by-case basis, and we would not really be supportive of numerical risk criteria.

I think there's just too many issues associated with the large uncertainties that you need to take a step back and not just have hard and fast numerical criteria when making that type of decision.

COMMISSIONER SVINICKI: Okay, thank you.

MR. PIETRANGELO: I think the quality of the inputs you'll get in making those decisions will improve with our state of knowledge and you'll get different perspectives from your stakeholders. But it's still at the end of the day your decision to make, but hopefully that'll be done on a more transparent basis in the future.

COMMISSIONER SVINICKI: Thank you. And Roy, if I could ask you. You presented some information about costs of full-scope PRA. And my question wasn't so much about the costs themselves, but did you develop your overall costs? You priced it out by, say, you know, here's the seismic model and the fire model and all of those things, and I know that there is development of various types of individual models.

Is there any efficiency to the overall cost of a full-scope PRA if you were developing all those pieces at the same time? And I guess what I'm asking is, is there any chance that the number you have presented is high because you have priced out each of these individual components separately and then added them up?

MR. LINTHICUM: I don't believe so. In fact, we actually may be a little bit on the low side. Developing a PRA model is always an iterative process, and as we move forward we all have internal events models and that model then actually gets modified to some extent to be able to accommodate the other external hazards and even the low-power shutdown models. But there's really not, we don't really see a --

COMMISSIONER SVINICKI: A synergistic cost effect or anything, okay.

MR. LINTHICUM: Right.

COMMISSIONER SVINICKI: And then could I also ask you, this is something that as I've sat on this Commission we've struggled with having clear insights into how the community of practitioners of risk analysts, is that a growing field? Do you see interests of students at universities in specializing in that?

It seems that this type of analysis, not just for nuclear safety issues but across the board, is becoming something that will be, you know, a growing area, but do you see that we're kind of investing in the pipeline as a country in having enough practitioners of this that we're bringing along, given what I think might be a growing call for this type of skill set in the future?

MR. LINTHICUM: My perspective is, I mean, there's a growing need for the practitioners but we're not really getting a lot of people in the pipeline. There are very few colleges that I'm aware of that would offer, you know, really in-depth studies in Probabilistic Risk Assessment. Even, in fact, in our community we're struggling with knowledge retention.

A lot of us are getting near retirement age and struggling with how we pass on the information that we've learned to the newer staff which is actually very few. We are making some strides, but part of our challenge is we don't have enough practitioners to meet the current workload.

COMMISSIONER SVINICKI: And my sense is that it is also, to be good at it, it's not purely an academic learning. It is very much a stylized thing to basically mentor under a skilled practitioner. Is that accurate?

MR. LINTHICUM: It is. And along those lines, as you say and I've mentioned before, I think, is you can't be overly focused on the numerical criteria and one value of core damage frequency, for example. I find it may be an interesting number but that's not, you know, your risk insights. There's a lot more in the models that you can extract, and that's more of an art rather than a science to how to learn to use those models to gain those insights.

COMMISSIONER SVINICKI: Okay, thank you.  
Thank you very much.

COMMISSIONER APOSTOLAKIS: Thank you, Kristine. First of all, let me start by saying that I was very pleased to see the document from NEI that Mr. Pietrangelo referred to. It was submitted to the Commission maybe a month or so ago.

MR. PIETRANGELO: That was a different document, but I know the one you're referring to.

COMMISSIONER APOSTOLAKIS: Well, I was pleased to see both documents. I think that particular document I'm referring to is a very good step towards --

MR. PIETRANGELO: Thanks.

COMMISSIONER APOSTOLAKIS: -- having a plan for where we want to go with risk-informed regulation, because we are always discussing individual issues, Recommendation 1 or others that involve risk and we don't seem to have a plan where we want to be and when.

Do we want to have good site-specific PRAs by the year 2019 or do we want to do something else? And I think that was a very good letter that you sent us. And speaking of site-specific PRAs, I was very pleased to hear those words used a lot today in your presentations, because I do believe that the evidence strongly suggests that the risk profile is site-specific, okay.

Now a few easy questions first. Dr. Lyman talked about flawed risk assessments and arguments, and you talked about how expensive PRAs are. We, the agency, and the industry spent considerable resource. Well, first of all, before that, a PRA to be used the way that you gentlemen are talking about not only has to be good in whatever sense we mean good, but it also has to be perceived as good by, for example, Dr. Lyman.

So he referred to flawed PRA arguments. So as an agency and the industry, as I started saying, we spent a lot of resources several years back developing standards, regulatory guides, you know, the American Society of Mechanical Engineers, the American Nuclear Society, the Regulatory Guide 1.200 and so on.

But then I get the sense that the industry feels that we don't really have to comply with those standards. That a lot of the PRAs are good enough for some regulatory applications, and in fact that Mr. Pietrangelo has said in the past that there are bells and whistles that we don't need in those standards. I believe you used those words.

So what do we do? What's your view? Are the standards asking for too much? Remember, we're making regulatory decisions here. We're not again doing academic work. Should we go back and revisit the standards and make sure they're more realistic? Because otherwise you're going to keep hearing, you know, arguments about flawed risk arguments and so on and so on.

There has to be some objective or semi-objective way you're making sure that the risk assessments are valid for the application they're being used. Tony?

MR. PIETRANGELO: Let me start, and Roy, I'm sure will weigh in on this. The technical adequacy of the model you use, your PRA, has to be high. And what we proposed was to do industry peer reviews of those base models, also now we're doing them in the fire models, et cetera. And that that when you do an application to a la Reg Guide 1.174 that the technical adequacy was addressed through the peer review.

The other thing I'd point out, and Roy has the slide exactly on this point, is it's not just the model input that goes into the decision-making process. There are other considerations. And even though you may not have a full-scope PRA, that doesn't mean you do not consider the full scope of those other initiators in your analysis and decision-making.

So we've addressed that from day one as part of Reg Guide 1.174. That has been a very successful application. We got a lot of mileage out of it. I think as the applications have gotten more difficult we've had to raise our standards in terms of the adequacy of the models. That's a tough thing to do. The peer reviews are more difficult now.

But we're working through that. It just takes time, and as we noted before, you know, there's not like a stream of practitioners coming in to help do that. But, Roy, add your perspective on this.

MR. LINTHICUM: Yes, I agree with everything Tony said. I would offer that from an internal events PRA model perspective, I think the standard is very robust. It's been vetted for many years now. The entire industry endorses it and strives to make sure we have adequate quality.

When you move into the standard for when you talk about external events -- fires, seismic -- those standards are fairly new, still under development. A lot of us are still working on our first models whether it be a fire PRA or a seismic PRA, and it's going to take some time to work the wrinkles out of that then to make sure that we understand what the standard is saying and revise the standard as need be. And that's an evolving effort. We've got industry groups that meet consistently to help evolve those standards.

COMMISSIONER APOSTOLAKIS: So what you're saying is that the ASME standard, mechanical engineer standard for internal events is good enough to be actually used. And regarding peer reviews, it seems to me when the peers would need some guidance as to what to look for, so a standard has a role to play there. But I don't want to spend my whole time on standards.

The issue of the design extension category, and Commissioner Ostendorff also talked about as a result of his discussions with Mike Johnson, gave some examples of where it could have been useful or it would have been useful to have some guidance regarding requirements and so on.



But it seems to me that a fundamental question is when is something going to be treated as belonging in that category? I mean, even if you do what the staff is proposing, having some generic or even site-specific or methods for doing it, requirements for treatment, if I come up with a crazy sequence from a PRA, go down to the .99999th percentile and pick one, will you have to apply those treatments to that one? Don't you have to make a decision first whether you are in that category that requires those treatments?

So unless the question is answered, what is it that belongs to that category, it seems to me everything else doesn't make sense. It's impractical. You cannot implement it. Any thoughts on that?

And let me complete my thought. Now your argument, Tony, was that with the FLEX equipment we're addressing the fundamental question or issues of whether we have an ultimate heat sink, right, and --

MR. PIETRANGELO: It's condition based.

COMMISSIONER APOSTOLAKIS: Yes, it's condition based, which I think Mr. Lyons is going to use the same words later. So that appears to me to be similar to the large LOCA approach of earlier decades where the community felt that, you know, if you protect against a large LOCA you're protecting against everything, and then it turned out not to be true.

So after all this, do accident sequences have to play a role here if we are going to go beyond design basis, and how do we decide which ones?

MR. PIETRANGELO: We had to have a starting point for the implementation of the mitigating strategies response, so we took those conditions. And you're right, it's similar to postulating in a large break LOCA.

But since that time, then you work backwards and say, well, what coping duration do I actually get from the permanent plant equipment in Phase 1 of FLEX? And if it's very, very small, i.e., within the time frame that we've done a lot of our design basis analysis, guess what, you're making physical modifications to the plant, changing the design basis to increase your coping time.

Because you can't rely on some flexible plug and play thing when the response time is 15 minutes to a half an hour or an hour. You've got to have more prescriptive treatment of the guidance procedures, training, et cetera, where it looks a lot more, in fact, as de facto design basis.

So I think it's within the site-specific and design-specific context of your coping duration and response to those postulated events or conditions that your strategy comes out of that. And that's what the staff's reviewing in the safety evaluation reports now.

COMMISSIONER APOSTOLAKIS: So there will be again postulated accidents.

MR. PIETRANGELO: You have to start somewhere. You have to start somewhere. And you can work back from that to risk-inform it, if you will.

MR. LINTHICUM: I would say that I think you need to have a structure to help define that. I think it shouldn't be on a specific numerical criteria. Because let's just say if you look at a sequence that's a very low probability sequence and all you look at is the probability, there is going to be a difference as to why that's low probability.

If it's low probability because the initiating event is very low and you have nothing to mitigate and just solely relying on a low probability event, that's going to be significantly different than if you have five or six failures that would get you there. So looking at the accident sequences and determining how to factor that into a defense-in-depth structure, I think, is the right way to go.

COMMISSIONER APOSTOLAKIS: Dr. Lyman?

MR. LYMAN: Yes, two things. One, on selecting the events, I agree that I don't think the technology's available to come up with a strictly numerically based criteria, so you need to use engineering judgment. But that's a very hard question, I agree. But on the issue of whether it's condition based or event based, again, I don't think, I agree that the process should just stop at condition based. That if you have an extended loss of offsite power it matters whether that was caused by an earthquake or a flood or anything else.

So you need to do a reality check, and that's why I keep stressing that you're not going to get every element of this unbounded set, but you're going to do a better job if, or have confidence if you work through a number of set examples where you've defined all the initial conditions. What is the surrounding infrastructure, you know, and the impact of this external event, et cetera? You need to have all that information.

COMMISSIONER APOSTOLAKIS: Okay. By the way, I never said strict numerical criteria so, okay. So maybe we can have Mr. Lyons now give his presentation. He's the director of the Division of Nuclear Installation Safety in the Department of Nuclear Safety and Security at the International Atomic Energy Agency, and he's a former member of our staff. So we'll treat you with special respect.

MR. LYONS: Yes, thank you. Maybe more respect than I just demonstrated this morning. I have to apologize for being confused about this time.

MS. VIETTI-COOK: Yes, I think I should apologize. I think we introduced some confusion about the start time when we were doing contingency planning for the possible late government opening.

MR. LYONS: I truly apologize.

COMMISSIONER APOSTOLAKIS: So condition based guidance.

MR. LYONS: So my slide is up there. Good morning, it's a pleasure for me to return here to the NRC and represent the International Atomic Energy Agency.

Today I would like to focus my comments on the recent developments in the IAEA safety standards to extend the design basis of nuclear power plants to include severe accidents. I believe these changes are relevant to the discussions you're having on Recommendation 1 of the Near-Term Task Force report. So let me begin by putting the IAEA safety standards into context. The IAEA statute authorizes the agency to establish or adopt standards of safety for protection of health and minimization of danger to life and property. These safety standards reflect an international consensus on what constitutes a high level of safety for protecting people and the environment from harmful effects of ionizing radiation.

The process of developing, reviewing and establishing the IAEA safety standards involves the IAEA safety secretariat, all of our member states, many of which are represented on the four safety standards committees that we have, and the Commission on Safety Standards that oversees that process. The NRC is actively involved in all of the committees and on the commission.

So if you look at the diagram, the safety fundamentals present the fundamental safety objectives and ten principles of protection and safety which provide the basis for all of the safety requirements. An integrated and consistent set of safety requirements established the requirements that must be met to ensure the protection of people and the environment and are expressed as "shall statements."

The safety guides provide recommendations and guidance on how to comply with the safety requirements and are expressed as "should statements." The safety standards are applied by regulatory bodies and operators around the world to enhance safety in nuclear power generation, and in nuclear applications in medicine, industry, agriculture and research. Of course, standards are only effective if they are properly applied in practice, so at the IAEA we provide many safety services to assist our member states in the application of the safety standards.

Let me turn to the topic of today's meeting. The concept of defense-in-depth as used in the IAEA safety standards is based on the International Safety Group's report on defense-in-depth in nuclear safety, commonly referred to as INSAG 10.

The concept was incorporated into the 2000 version of the Nuclear Safety Requirements number NS-R-1, Safety of Nuclear Power Plants Design. In 2012, the Safety of Nuclear Power Plants Design was revised to reflect the feedback and experience in the area of nuclear power plant design.

The numbering of the requirements document, I hate to say, has been changed to now this document is identified as Specific Safety Requirements number SSR-2/1, and that reflects our new structure to the safety standards and probably just there to help confuse you as I go through my presentation.

But the main difference with SSR-2/1 is the introduction of a requirement to address design extension conditions in the design basis of the plant. It is interesting to note that this concept of design extension conditions was developed prior to the Fukushima accident.

As shown on this slide, the 2000 version of NS-R-1, the design basis included normal operation, anticipated operational occurrences, and design basis accidents. Anything beyond the design basis accident that could lead to a severe accident, that is, significant core damage, was to be addressed using a combination of engineering judgment and probabilistic methods to determine those sequences for which reasonably practicable prevention or mitigation measures can be identified.

Acceptable measures did not need the application of conservative engineering practices used in setting and evaluating design basis accidents, but rather could be based on realistic or best estimate assumptions, methods and analytical criteria.

The 2012 revision to the Safety of Nuclear Power Plant Design, or SSR-2/1, introduced a requirement to address design extension conditions which states a set of design extension conditions shall be derived on the basis of engineering judgment, deterministic assessments and probabilistic assessments for the purpose of further improving the safety of the nuclear power plant by enhancing the plant's capabilities to withstand, without unacceptable radiological consequences, accidents that are either more severe than design basis accidents or that involve additional failures.



These design extension conditions shall be used to identify the additional accident scenarios to be addressed in the design and to plan practicable provisions for the prevention of such accidents or mitigation of their consequences if they do occur.

The extension of plant states to consider in the plant design should also include multiple failures potentially leading to severe accidents. Enhanced consideration of defense-in-depth provisions based on strengthened independence of different levels of defense is an essential component of the new requirements.

In accordance with the new requirements, the design should either address the necessary provisions for coping with all plant states and mitigation of severe accidents, or it should be convincingly demonstrated that the plant states not addressed by the design are practically eliminated.

By practically eliminated we mean if it is physically impossible for the conditions to occur or if the conditions can be considered with a high level of confidence to be, considered to be extremely unlikely to arise.

For design extension conditions that cannot be practically eliminated, only protective measures that are of limited scope in terms of area and time shall be necessary for protection of the public, and sufficient time shall be made available to implement these measures.

As I showed before on Slide 4, the design basis in the 2000 version of NS-R-1 includes a postulated set of design basis accidents that are addressed by the safety systems and accident procedures.

The safety systems are designed with a set of conservative prescriptive rules and criteria. For example, the application of the single failure criteria that provide high confidence that they will successfully meet the relevant acceptance criteria and safety limits.

In the current SSR-2/1, the design basis is extended to include the design extension conditions. This provides assurances that the plant design prevents accident conditions not considered design basis accident conditions or mitigates their consequences as far as reasonably practical. This might require additional safety features for design extension conditions or extended capability of the safety systems to maintain containment integrity.

These additional safety features or this extension of the capability of safety systems shall be capable of managing accident conditions in which there is a significant amount of radioactive material in the containment including radioactive material resulting from severe degradation of the reactor core.

The plant shall be designed so that it can be brought into a controlled state and the containment function can be maintained with the result that the significant radioactive releases would be practically eliminated. And finally, the effectiveness of the provisions to ensure the functionality of the containment can be analyzed on the basis of a best estimate approach.

This concludes my presentation on the recent revisions to the IAEA safety standards regarding design extension conditions that I believe would be helpful in the discussions here. So I look forward to your questions.

COMMISSIONER APOSTOLAKIS: Thank you, Jim. What I propose is that we'll go around, maybe take two, three or four minutes each if we have any questions.

Commissioner Magwood?

COMMISSIONER MAGWOOD: Thank you, and Jim, welcome. It's always a pleasure to have your thoughts in matters like this.

First, let me do a couple things first. First, Commissioner Svinicki asked a very good question about the human pipeline that we have for the development of PRA expertise, and it's something that has come up from time to time as we've considered the future.

And the future seems, I agree with you, seems to be one that will require more and more PRA expertise, not less. Just, it may be worthwhile to include in the meeting SRM for the Commission to discuss further, some consideration as to whether there's more we could do with our university grants program to encourage universities to develop these capabilities and programs. So I think it's something that's worth some conversation, so ask we do that.

But for Jim, you know, it's interesting, because your chart on Slide 9 seems to capture exactly what Tony Pietrangelo hates most about the term "design extension conditions." And because as the IAEA has characterized it, you still basically have two categories, you're either in design basis or you're beyond design basis. The difference is you've widened design basis to capture --

MR. LYONS: Exactly.

COMMISSIONER MAGWOOD: -- things like extreme floods, for example, and that's certainly an approach one could take.

But the question I have for you about that is the distinction the staff has been trying to draw with these beyond design basis events is the types of maintenance programs, the procedures, the training for things beyond design basis are different than they are for things in design basis.

In this framework, would you recommend that the preparation for extraordinary events have the same level of training requirements, maintenance requirements, procedural requirements as you would for anticipated operational events, leaks, transients, things of that nature?

MR. LYONS: I think the safety standards are coming out on that and we still have to develop additional guidance for the implementation of this concept, you know, just so you know we're still working on that. And in fact, we're doing a lot of work on exactly what design extension conditions we would consider to be used in developing these.

And then the next step would be to do more in that area of just what you're asking is, well, then what kind of criteria are you going to apply to the maintenance procedures, to the operations? And so that is still something that we are still working with our member states to try and develop some consensus.

COMMISSIONER MAGWOOD: Okay, so in other words, the fact it's included in design basis doesn't necessarily define the level of pedigree for equipment -- okay. That's interesting.

So in a way it may actually be, I can see the nervousness here because that's not how -- one last thing. And I want to just to -- first, let me thank Commissioner Ostendorff for his commentary on Ed's participation in our discussions.

We often talk about Ed and UCS, actually more generally, when we're discussing these matters and often make observation that Commissioner Ostendorff has made that, you know, the quality of the participation is always very high. So, you know, I wanted to add my voice to that.

But I just had a very quick question for you. Tony Pietrangelo had recommended a policy statement to look at the application of the treatment of beyond design basis conditions. Is that something that makes sense to you? Is that something you would agree with? And not in exclusion of what else you've talked about, but does that activity make sense to you?

MR. LYMAN: I'd say we would like to see, ultimately, a rule clarifying, codifying all this, so as long as it wasn't an exclusion of that goal. But policy statements I know in the past, I think, generally have been actually pretty unsatisfying looking at the history of NRC policy statements. So I guess it would depend on how specific and prescriptive it was within the bounds of what a policy statement could be.

COMMISSIONER MAGWOOD: Great. Thank you.  
Thank you, Chairman.

COMMISSIONER OSTENDORFF: Commissioner  
Ostendorff?

COMMISSIONER OSTENDORFF: Thank you. I add, Jim, I welcome to that of others here. We appreciate the work you're doing in Vienna.

I wanted to ask a question. Is there member consensus, or what are the feelings about whether or not the new 2012 standards should have applicability to existing nuclear power plants and facilities retrospective of application? Can you comment on that?

MR. LYONS: Certainly. And in fact, one of the things is we developed this new requirements document and it was put out. There was an acknowledgment in the document itself that talks about that for existing plants, implementing this design extension condition would actually, could be very problematic.

That it could be very hard, and that it should be used in the context of trying to do that to the extent practical, to the extent that they can do that. And it was really meant to be more forward looking on new plants on how they're going to be designed.

So it specifically talked about that within the requirements document that it's, we would like people to look at that. And I think that's what a lot of the post-Fukushima work is being done is looking at how do you deal with these issues to prevent cliff-edge effects and that sort of thing. And so I think that that was acknowledged.

COMMISSIONER OSTENDORFF: So let me make sure I'm clear. So if one takes your statement and compares to our staff's recommendation to the Commission that the Activity 1 beyond design basis extension category be forward looking, it's similar in that it's not necessarily mandated as a retroactive, a retrospective.

MR. LYONS: Exactly, yes.

COMMISSIONER OSTENDORFF: Okay. Thanks for that clarification. Thank you.

MR. LYONS: You're welcome.

COMMISSIONER APOSTOLAKIS: Commissioner Svinicki?

COMMISSIONER SVINICKI: Jim, I'll just welcome you here, and I don't have any additional questions. Thank you.

COMMISSIONER APOSTOLAKIS: Thank you. I think, first of all, as I hear all the discussion, we have to make sure that we all understand what we mean by the terms. Design basis extension category, design extension conditions and then the design enhancement category of NUREG 2150 which doesn't deal with design basis. So let's make sure that we all understand those things. I don't want to get into that now.

But Jim, has this design extension conditions approach been implemented anywhere? Do we have an example of how one would do that using judgment, deterministic and probabilistic assessments?



MR. LYONS: I don't think we have an actual application of it at this point. This just came out, like I said, in 2012. In fact, we're also updating it with further information from the lessons learned from Fukushima.

But one of the things we are doing is working on a technical document to try and develop the technical basis behind how we would develop any guidance documents to implement this. So yes, at this point it's, if you would, a broad policy statement that we want people to do this, but the actual details are still being worked out.

COMMISSIONER APOSTOLAKIS: And again, this would apply to future designs?

MR. LYONS: To future designs. And, you know, to the extent that people are doing their reviews and looking back at existing designs where this can help them deal with those conditions that are beyond design basis that help prevent you going over those cliff edges.

COMMISSIONER APOSTOLAKIS: They're beyond design basis but then you're bringing them back into design basis.

MR. LYONS: Right.

COMMISSIONER APOSTOLAKIS: Yes. Tony, do you want to say something?

MR. PIETRANGELO: Yes, I do. I mean, I think we're looking at this way too narrowly. And even your, with all due respect, your risk management framework does the same thing. When you say design enhancements, why are you just limiting it to design? Shouldn't it be a broader look at how you can respond to those conditions?

COMMISSIONER APOSTOLAKIS: We're open to better knowledge.

MR. PIETRANGELO: That's my comment is that let's broaden the thinking here. And in fact, what we're implementing now is not a, I'll say, design based response. It has elements of design, but it's more of an operational response that incorporates flexibility.

There are elements of design in terms of where you put the stuff, where you connect the stuff, et cetera, and under what conditions. But it's entirely different thinking than what we did before on the design basis thing.

That's why I say we should not limit ourselves to just, and we're not smart enough to do that. I mean, there's always going to be your unknown unknowns. Our state of knowledge will improve. Let's not think we're smart enough to design our way out of every potential adverse event or condition that comes up. That's our point.

COMMISSIONER APOSTOLAKIS: Yes. But all I wanted to say was that design enhancement is very different from design basis extension and all that, very fundamentally different.

Coming back to Commissioner Svinicki, and I would comment about educating people. Commissioner Svinicki made a comment and you guys agreed that it's really the practice of PRA that's important. But I would like to make a comment.

In my experience, because most of the engineering departments around the country never ask their students to take a course in probability or statistics, professional engineers have difficulty dealing with probabilistic concepts.

And that's the main benefit of having one or two courses at the university, to get more familiar with probabilistic thinking, but certainly you don't learn how to do a PRA. And I would certainly agree with Commissioner Magwood that maybe we can do something about it in the SRM.

Commissioner Svinicki?

COMMISSIONER SVINICKI: I thought perhaps you were going to comment that if the government didn't pull our preeminent thinkers and educators in this area into government positions we would have more people out there who could be implementing what you just suggested.

COMMISSIONER APOSTOLAKIS: I don't know why this meeting is becoming a love fest. There is the beginning of a beautiful friendship between Commissioner Ostendorff and Dr. Lyman. Now I have -- so I'm very pleased.

I think we're done with this session unless -- so thank you very much, gentlemen. I appreciate you coming and presenting your views. I found them very useful. So now we will take a break whose duration will be a lot normal distribution with a median of five minutes and a defense-in-depth backstop of ten minutes.

(Whereupon, the foregoing matter went off the record at 10:42 a.m. and went back on the record at 10:50 a.m.)

COMMISSIONER APOSTOLAKIS: Okay. We're back in session. We will now hear from the NRC staff.

Before we begin I would like to thank those at the table and the rest of the working group for the significant amount of effort that the staff has put into addressing this particularly challenging recommendation from the Near-Term Task Force.

I know that there are many diverse opinions on this topic and I appreciate the opportunity to discuss some of the details of your analysis. So we begin with Executive Director of Operations, Mr. Satorius.

MR. SATORIUS: Good morning, Commissioners.

We're here today to discuss the activities associated with Recommendation 1 of the Near-Term Task Force review of insights from the Fukushima accident. Recommendation 1 is an especially challenging issue because it deals with the overall regulatory framework and how we address various events within the original design bases of plants and increasingly how we are addressing events or concerns that go beyond the traditional assumptions and analyses for operating and new nuclear power plants.

As you may recall, although the Near-Term Task Force might have envisioned Recommendation 1 as a vehicle to help resolve and ensure consistency between our handling of all the recommendations, the Agency determined that it was more appropriate to avoid delaying actual safety improvements while we worked through possible changes in the regulatory framework. So as directed by the Commission, we have focused on Tier 1 issues working with this Recommendation 1 activity in parallel and progress is being made in terms of improving plant safety.

The NRC and the licensees have performed various inspections and made sure any identified problems have been resolved to ensure that all plants continue to pose no undo risk to public health and safety even while we work to further improve the safety of these plants by working through the lessons-learned activities. Improvements include interim measures at some plants to address flooding issues, improve communications and assessment capability for emergency situations and plants are now making modifications and procuring equipment to support mitigating strategies.

We will be providing you with a brief status on the Fukushima lessons learned later in this presentation, but for now I'd like to turn things over to Mike Johnson who will lead the discussions on our paper and recommendations on Recommendation 1. Mike?

MR. JOHNSON: Thanks, Mark. Good morning, Commissioners.

For today's meeting, as Mark indicated, we've got two topics that we'll touch on, that will be Recommendation 1 and the status of Tier 1 activities. I'll provide a discussion on background and conclusions.

Dr. Jennifer Uhle, who is the deputy director of the Office of Nuclear Reactor Regulation, will provide an overview of the improvement activities. Mr. Richard Dudley, who is really the lead project manager for the working group, will provide details of the improvement activities. And I ought to mention just briefly that we've got a number of the working group members seated to my right in the audience and they have provided a considerable amount of work over the last two years on working on the topic. Mr. Gary Holahan, who is the deputy office director of the Office of New Reactors will provide a Near-Term Task Force perspective. He, as you are well aware, was a member of the Near-Term Task Force. And then I'll conclude the Recommendation 1 presentation with a discussion of next steps. And then we'll turn over to Mr. Dave Skeen, who is the director of the Japan Lessons Learned Directorate for an update on the status of Tier 1 activities.

Slide 3, please. Recommendation 1 of the Near-Term Task Force is to establish a logical, systematic and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations. Of course in August in the Staff Requirements Memorandum on the Near-Term Task Force report the Commission directed that we undertake the short-term items, or actions, that is, in response to Fukushima using the existing regulatory framework and then that we separately independent of those activities look at Recommendation 1 and provide options to disposition Recommendation 1.

And we focused on the term "disposition." We considered that that meant, in terms of direction from the Commission, that you wanted us to look at the wide range of actions including the no-action alternative. And we've done that in terms of the product that we delivered to you.



Of course there were a spectrum of views. Just as you heard with the previous panel, the spectrum of views existed among the staff. And I'll just tell you consensus was difficult. I'm reminded of a nursery rhyme, "Goldilocks and the Three Bears," Commissioner Svinicki, because you made reference to that I think in a previous Commission meeting. Some believe that the proposed revisions don't go far enough. That we ought to establish a category for beyond-design-basis events and associated requirements, that the framework ought to be forward looking with respect to and have entry criteria and provide for standard treatment, that we ought to also revisit and revise potentially past decisions that we've made based on what we find, and that we ought to feature as a part of that a requirement for PRA, and that absent those features we stand vulnerable as an agency.

Others believe that we go too far. In fact, they argue that our current processes work just fine. In fact 54(hh) and potential like requirements that require that a licensee be ready for potential aircraft impact and be able to provide protection for loss of large areas of the plant, the mitigating strategies work that we've done so far, all of those kinds of things illustrate that we can work through issues for beyond-design-basis and arrive at the correct place. And in fact, every one of those issues require case-by-case consideration and no amount of process or prescription would obviate the need for having that, and therefore expenditure on any of this stuff would distract from focus on other safety-significant activities. So go too far.

In our proposal we sought to offer balance. We sought to offer something that looks just right. We recognize that there are over 100 plants that are already licensed and are operating and that we need to ensure that benefit associated with new things, new activities, if you will, in the requirements, other than adequate protection are -- those things that we do, the benefits are commensurate with the cost, or the costs are commensurate with the benefits. And so our proposals are restricted. They're bounded. We didn't go as far as we might go.

But we also recognize, for example, the challenges that we face even today as we try to establish appropriate consistent effective expectations for mitigating strategies as, Commissioner Ostendorff, you talked about in a previous panel. And therefore, we did find areas where we think it does make sense in some people's perspective to offer some limited improvements, some improvements I would say to put the staff in a better position.

Slide 4. After completing our review of the possible actions to the disposition of Recommendation 1, we have concluded that the current regulatory framework is robust and flexible. It's not broken. It can effectively maintain the safety of nuclear power plants and implement the Fukushima actions and other actions going forward. But nevertheless, we are recommending three improvement actions to enhance the clarity, efficiency and effectiveness of our regulatory processes.

Now Jennifer will discuss the process that we used to develop the recommendations and provide an overview of the recommended improvement activities. Jennifer?

MS. UHLE: Thanks, Mike. Good morning.

Slide 5, please. I'm going to first focus on process and start by saying that the staff working group for this effort included members from all NRC program offices as well as a member from the Officer of General Counsel. And oversight was provided by office directors which comprise the Japanese Lessons Learned Directorate Steering Committee and then later it was turned over to a smaller steering committee composed of the deputy office directors. I'll say that both the staff as well as the steering committees worked diligently for over two years on this initiative. And like Mike said, a variety of the staff are here today in the second row.

The recommendations were developed with substantial public outreach. The staff published three white papers and regulations on regulations.gov and provided two opportunities for written public comments. The staff responded to those comments in the SECY paper that we provided to the Commission. And of course those are publicly available. We also had three public meetings and six meetings with the Advisory Committee on Reactor Safeguards, which is of course a publicly available meeting as well.

As noted by Mike Johnson, there was a diversity of views amongst the panel members, or the working group members, and through our substantial public outreach it became very clear that the same situation existed with the external stakeholders. And there are a number of differing views on the subject. I think what you heard today from the previous panel substantiated that claim.

So slide 6, please. So with regard to the improvement activities there are three. They're listed above. The first is to establish a design-basis extension category of events and associated regulatory requirements. The second is to establish Commission expectations for defense-in-depth. And the staff believes that the best way to do so would be through a policy statement. And then the third is to clarify the role of voluntary initiatives in the NRC regulatory process. So Richard Dudley to my right will be providing more details on these activities in his presentation coming up.

So slide 7, please. So the recommended activities are not mutually exclusive options. The Commission could of course approve none of these activities which would maintain the current regulatory framework or they could approve one or more of the activities in any combination. The staff recommends in the paper approval of all three activities because their implementation we believe would be synergistic. What I mean to say is that Improvement Activity 2 on defense-in-depth may increase the effectiveness of Improvement Activities 1 and 3. So in selecting these activities the staff tried to maximize the potential benefits while minimizing the impacts on both NRC and licensee resources.

Although the improvement activities are not needed to maintain safety, the staff expects that implementing them now would result in modest safety enhancements in the future from using the improved regulatory practices. The main benefit will be the enhanced efficiency and consistency of the regulatory process. Initial resources costs to licensees from these activities would be minimal but could increase depending on the Agency's final decision on implementation of Improvement Activity 3 which focuses on the voluntary measures and of course a level of NRC oversight that we ultimately deem is appropriate.

So slide 8, please. So of course we're all aware of the RMTF, or the Risk Management Task Force. When evaluating the regulatory framework approaches for Recommendation 1 the staff considered the power reactor regulatory framework recommendations in NUREG-2150. Those were made by the Risk Management Task Force led by Commissioner Apostolakis.

Two of the three Recommendation 1 improvement activities, specifically new design base extension category and defense-in-depth; those are Activities 1 and 2, are closely related to the RMTF recommendations. The SECY paper addressing the RMTF recommendations is due to the Commission six months after the SRM on Recommendation 1 is received by the staff. The staff will consider Commission direction received on Recommendation 1 in developing its plan to address the RMTF recommendations.

So now at this stage I'd like to turn it over to Richard Dudley, who's the project manager and staff lead for this effort.

MR. DUDLEY: Thanks, Jennifer, and good morning.

Slide 9, please. First I'd like to discuss Improvement Activity 1, which will be to establish the design-basis extension category of events and associated regulatory requirements.

Slide 10, please. The graphic on slide 10 shows the current regulatory structure at the time of the Fukushima accident. Taken together, the green, yellow and blue boxes represent our current requirements for design-basis accidents and transients for nuclear power reactors. These requirements all have clear existing criteria for all the necessary regulatory attributes including treatment requirements, which would be like design criteria, quality assurance and environmental qualification.

But there are other regulatory attributes such as analysis methods and acceptance criteria, training requirements, documentation and reporting requirements and having a change process for licensee-initiated changes to the ways that we mitigate some of these events. But over time the NRC has issued additional requirements exceeding the design-basis addressing these beyond-design-basis accidents. And we've done those in response to concerns that were identified by operational experience or by probabilistic risk assessment.



These requirements are shown graphically in the white space underneath the blue box for design-basis accidents. And as you can see, some of these requirements like the 50.54(hh) rule on strategies for loss of large plant areas, some of these rules were issued as adequate protection rules. And you can also see from the graphic that adequate protection extends beyond the existing deterministic design-basis and includes some of these additional beyond-design-basis requirements.

And other requirements are cost-justified substantial safety enhancement requirements that were justified under the Backfit Rule. The ATWS Rule on anticipated transients without scram and the existing Station Blackout Rule are examples of safety enhancement requirements that exist in this white space, but they're also in our regulations.

At the time of the Fukushima accident licensee efforts related to hardened vents and Severe Accident Management Guidelines were voluntary initiatives, and voluntary initiatives are shown in the graphic as purple. But the key concern for beyond-design-basis accident requirements is that our existing clear criteria for regulatory attributes for design-basis regulations, those clear criteria do not typically apply to requirements for beyond-design-basis accidents. So over time when we issued these additional regulations for beyond-design-basis accidents one by one generally on an ad hoc basis, some of these regulations did not have specified clear criteria for all the regulatory attributes that we should be addressing in each of these rules.

On slide 11, please. Slide 11 shows how establishing the design-basis extension category would provide some additional structure for our beyond-design-basis accident requirements. And as you can see, the white space from the previous slide would become the new design-basis extension category of regulations. And this category is graphically illustrated as the gray box in the graphic. The new category would be populated with the existing regulations for beyond-design-basis accidents which would then become or be called design-basis extension requirements.

And the orders that we issued on hardened vents and mitigating strategies, which were both adequate protection requirements, also fit nicely into the new category. And you can see where we've listed the orders at the top of the gray box just above the line, the dotted line for adequate protection.

And to update you on the status of the voluntary initiatives on the previous slide, as I already said, the hardened vents initiative has been converted to an adequate protection requirement, but the initiative on Severe Accident Management Guideline is still voluntary. And the rulemaking on on-site emergency response capabilities is not completed, so the final disposition of the Severe Accident Management Guidelines initiative hasn't yet been determined.

And before I go on, I will mention a previous speaker said that the risk-informed ECCS Rule was essentially dead having been sent back by the Commission to the staff. And that is not the case. It was sent back to the staff for reconsideration after the Commission provided its guidance on Recommendation 1.

And you can see that the current 50.46(a) Rule, the draft final rule, the ECCS requirements for beyond a transition break size breaks would fit into the bottom half of the design-basis extension category. They would be considered design-basis extension requirements and they would have different treatment applied to them.

Still on the same slide, the major benefit of Improvement Activity 1 is highlighted in red to the left of the category, and that's that we would establish clear criteria and internal staff guidance to ensure that the requirements for all the necessary regulatory attributes, treatment requirements, training documentation, whatever -- that these would be included in each of the future design-basis extension rules. And this would ensure that future design-basis extension regulations are coherent, consistent and complete.

On slide 12, we recommend that the new design-basis extension category be established on a generic basis. We would not include a regulatory requirement requiring licensees to perform and maintain PRAs. Both adequate protection requirements and requirements for cost-justified safety enhancements would be included together, as you can see from the previous graphic, in the category. And we would establish guidance for treatment and other regulatory attributes that were needed for the regulations in this category in a publicly-available document.

Now we've said that this will likely be a NUREG, but it could be a NUREG that's approved by the Commission or it could be in a NUREG that's enforced by a policy statement, if that's thought to be a better way to do it. But nevertheless, we would start with a NUREG. And this would include guidance and criteria to assist the staff in writing the future design-basis extension rules. And each rule would have to address all the necessary attributes, including treatment requirements, training, analysis methods, processes for making licensee-initiated changes and processes for updating the documentation in the final safety analysis report.

Now I think I want to make it clear, it doesn't mean that they all have safety-grade treatment. Treatment would be custom designed likely to be consistent with the specific needs of the Design-Basis Extension Rule. We are going to develop a single set of interim-level treatment requirements for the design-basis extension category. So then you have safety-grade treatment on one hand, you have commercial-grade on the other, and then in the middle you have sort of a middle-grade treatment. Now when you have a particular rule, depending on what it is, one aspect of it might be very important. That aspect might be safety grade. Everything else might be commercial grade. So the flexibility of the treatment that we would apply is really the key for how this process would work.

On slide 13, the new category would apply to both current licensees and applicants and the guidance for treatment and all the regulatory attributes should be applied to all new design-basis extension rules and also to some of the existing beyond-design-basis rules if we were to revise them significantly in the future.

On slide 14, under the new framework we recommended continuing to use existing staff processes to identify and address the potential safety issues that could require us to add new regulations to the design-basis extension category. We believe these processes have been well developed over time and that they're now robust and effective. Examples of these existing processes include the Operating Experience Program and the Industry Trends Program, of course the Reactor Oversight Program, the Accident Sequence Precursor Program and the Generic Issues Program. But because we would continue under this proposal to use our existing processes, we do not propose to go back and do a retroactive search for additional design-basis extension events.

Slide 15. The potential benefits of the design-basis extension category are shown in slide 15. We think the new category would promote openness by providing clarity and common terminology for describing the events and requirements that are now characterized generally and inconsistently as beyond-design-basis. It would also provide a consistent, clear and efficient approach to developing future requirements for design-basis extension conditions.

This approach would ensure that the new design-basis extension regulations consistently address all the regulatory attributes including treatment, performance goals, documentation reporting and change processes. And it would also aid the public's understanding to know that NRC regulations do address events that are more severe than design-basis accidents and it would clarify the regulatory controls over those systems, structures and components that mitigate these events.

It would also promote efficiency by consistently addressing all necessary regulatory attributes of a potential requirement early on at the proposed rule stage. And I think this is important, because by doing it early on this would allow stakeholders to come in and comment and fully discuss all the potential regulatory attributes. And you might be discussing whether this particular attribute should be safety grade or it should be commercial grade. All of those issues could be discussed early on in the process. And also, by doing this and getting a lot of the attribute discussion cleared up early on in the process, we think that the NRC would then perhaps be able to estimate costs and burdens of a proposed rule more completely and more accurately.

Also establishing this category would increase alignment between the NRC and its counterpart regulatory bodies and organizations such as the IAEA; you just heard previously from Jim Lyons on how they handle a similar category, and the Western European Nuclear Regulators Association, both of which have adopted similar regulatory concepts for beyond-design-basis events.

On slide 16 now. Next I'd like to discuss Improvement Activity 2, which would establish the Commission's expectations for defense-in-depth for power reactors.

Slide 17. Under Improvement Activity 2 the staff would develop a definition structure and set of principles for defense-in-depth for power reactors. We would also establish the levels of defense-in-depth and a defense-in-depth decision-making process. And finally, we would develop decision criteria for determining the adequacy of defense-in-depth. Now all of these characteristics would be incorporated into a defense-in-depth policy statement for power reactors. And we would also incorporate the defense-in-depth decision criteria into the Regulatory Analysis Guidelines where they would be integrated.



Now they'd be integrated together to the extent that we are able to. We can't tell you how we would do it now because we need your permission to go forward and figure this out and to authorize the resources to figure out how this is going to work. But we're going to integrate them to the extent possible with the existing Risk-Based Guidelines, so we would not be considering defense-in-depth independently from risk. In some cases the risk criteria might predominate; in some cases deterministic defense-in-depth criteria might predominate.

Slide 18. The expected benefits of the defense-in-depth activity are shown on this slide. The staff believes this activity will help us to ensure that licensees perform at acceptable safety levels, and it would do this by providing uniform and technically justified concept of defense-in-depth for power reactors. It would also enhance our existing risk-informed decision-making process by more clearly defining and providing acceptance criteria for defense-in-depth. And Roy Linthicum in his slide showed you the five key principles in Regulatory Guide 1.174 for making risk-informed decision-making.

One of the boxes, the risk criteria, we have very explicit criteria on risk. One of the other boxes, defense-in-depth, we have no objective criteria. We have very subjective criteria for defense-in-depth. And as a result, when we're doing risk-informed evaluations, sometimes the defense-in-depth decision is left to the discretion of the reviewer and perhaps that can result in some inconsistencies in how one should weigh defense-in-depth.

This activity would also promote openness, clarity and reliability because when decision criteria for adequacy of defense-in-depth for regulatory decisions -- when you develop these criteria and you specify them ahead of time and they're agreed upon, the result should be a more timely, efficient and predictable regulatory process. Now the Commission will always have the final say in the decision, but it would help the staff in making the recommendations. But the Commission again would always have the final decision as to how we would finally go forward. And because we would be involved with the international community this activity would improve consistency with and among that community on the implementation of defense-in-depth.

Slide 19, please. And last I will discuss Improvement Activity 3, which would be to clarify the role of voluntary industry initiatives in the NRC regulatory process.

Slide 20. Our current policy on voluntary initiatives was established in 1999 by the Commission's SRM on SECY-99-063. And I'm going to read it, so this is a quote: "Voluntary industry initiatives will not be used in lieu of regulatory action where a question of adequate protection to public health and safety exists." But it goes on to say that "voluntary initiatives are approved as an appropriate substitute for NRC regulatory action for cases where a substantial increase in overall protection can be achieved with the costs of implementation justifying the increased protection." So that means in cases where we could have actually issued a rule the Commission's policy would authorize us to instead use voluntary initiatives to address that particular issue.

The current Regulatory Analysis Guidelines in NUREG-BR-0058 are based on this Commission policy and they specify how the NRC staff will consider and credit voluntary initiatives when performing regulatory analyses. At the time we modified the Regulatory Analysis Guidelines in the late 1990s the NRC envisioned that it was planning to develop guidelines designed to increase NRC's assurance that the industry initiatives will be effective long-term alternatives to regulatory actions. That's actually a quote out of one version of the Regulatory Analysis Guidelines. But these guidelines, these additional guidelines were never put into place. So currently the situation is that NRC's current policy supports the use of voluntary initiatives, but we do not have a uniform review and acceptance process and we do not have a formal verification process to ensure that these initiatives are put into place effectively and remain effective over time.

Slide 21. Therefore, under Improvement Activity 3 the staff proposes to do four things: First, we would issue Interim Staff Guidance to reaffirm the Commission's expectation that industry initiatives may not be used in lieu of regulatory action when there is an issue of adequate protection. And then we would also specify that credit in a regulatory analysis for future voluntary initiatives may be given only when the initiatives are both well documented and when there is a high likelihood that they will be implemented and maintained over time. Then we'll develop guidance regarding what type and level of licensee documentation and oversight is appropriate for future voluntary industry initiatives. And finally, for existing voluntary initiatives, the staff is going to go back and take a look at them.

Now what we'll focus on are not all the voluntary initiatives. There's a wide spectrum of voluntary initiatives. But we're only going to focus on those industry initiatives that were developed in response to a potential generic safety concern that the NRC was considering addressing at one time through a rulemaking or other regulatory action. And for those voluntary initiatives only we'll look at all of them and we'll use risk insights to identify which initiatives are the most risk and safety-significant and then we'll determine if their implementation is already monitored under an existing NRC oversight activity. And the most safety-significant initiative, if they're not monitored, then we would take actions to verify the effectiveness of those initiatives by an audit, inspection or perhaps a request for information. And based on the results of the verification activity we would take further action if it were necessary and follow-up actions could be a rulemaking or perhaps pursuit of a plant-specific backfit.

Slide 22. The expected benefits of this improvement activity on voluntary initiatives are shown on slide 22. The staff believes that the activity would ensure that the safety benefits from future and existing voluntary initiatives would be consistently maintained over time by providing risk-informed regulatory oversight. It would improve the clarity of NRC regulatory processes by setting clear criteria for determining when and how voluntary industry initiatives would be integrated into regulatory processes. It would clarify and make visible to all stakeholders how voluntary initiatives fit into NRC's regulatory framework and it would define how industry initiatives should be addressed within NRC inspection and oversight processes.

Now this completes my discussion of the recommended improvement activities. Next Gary Holahan, who is a member of the Fukushima Near-Term Task Force -- Gary will discuss the thought process used by the task force when it was developing Recommendation 1.

MR. HOLAHAN: Thank you, Dick. First I'd like to thank the Commission for the opportunity to discuss Near-Term Task Force Recommendation 1 from the perspective of the task force itself. I hope to shed some light on the origin, purpose and the thinking that went into Recommendation 1 and how the three proposed individual activities now fit with the original Recommendation 1 and how they can enhance regulatory framework going forward.

I'd like to note that in the task force working each of the task force members took on a specific area, but all of the task force members supported and agreed with all of the recommendations. It was a consensus process, and that included Recommendation 1.

So could I have slide 23, please? So slide 23 indicates that the task force was requested to address the regulatory framework and the regulatory system in the Chairman's Tasking Memo and in the task force charter. However, the real impetus for Recommendation 1 came from the internal task force deliberations themselves in trying to come up with a coherent and appropriate set of recommendations to enhance safety in light of the Fukushima accident. And I'll discuss that further in the next few slides.

Could I have slide 24? So slide 24 indicates the high-level finding based on the task force's evaluation that the current regulatory approach has worked well, but it could be enhanced particularly in the manner in which it addresses potential events, you know, beyond the current well-defined design-basis events.



The task force made only 12 specific recommendations, and 6 of those recommendations apply directly to reactor licensees. And I'm going to talk about the structure of those recommendations. So Recommendations 2, 4, 7, 8 and 9 are structured in a way that Recommendation 2 addresses external events, flooding and seismic events. Recommendations 4 and 7 address both design-basis and beyond-design-basis aspects. And I think Tony Pietrangelo expressed it well this morning. Phase 1 of an extended station blackout looks more like a design-basis consideration and Phases 2 and 3, the longer-term aspects, look like more beyond-design-basis.

The task force also addressed beyond-design-basis accident management by addressing the Severe Accident Management Guidelines and Recommendation 9 addressing emergency preparedness. So you can see both the structure and actually the numbering of the recommendations follows the logic of initiating events, design-basis, beyond-design-basis and emergency preparedness. So the recommendations themselves address four separate levels of defense-in-depth and they are inherently a defense-in-depth way of structuring the recommendations.

So can I see slide No. 25, please? Thank you. So slide 25 presents Recommendation 1. I think you've heard it before. If we had it to do over again, I think there are a few terminology words used in the Near-Term Task Force that have caused either irritation or confusion. I'll leave the irritation. Apparently it was plagiarized from UCS, so I can live with that.

(Laughter.)

MR. HOLAHAN: But I think the word "balance," which is in the task force recommendation for balancing both defense-in-depth and a risk-informed approach has been misinterpreted as recently as yesterday, I saw in a publication. I think the word "integration" is probably a better word to describe the relationship the task force intended for the relationship between risk insights, risk analysis results and a defense-in-depth concept.

I think if you see the way that the wording is in the Recommendation, it is a generalization of the task force's view that safety is best enhanced by strengthening each level of defense-in-depth including a level beyond the traditional design-basis events using the best available current information, both site-specific and plant-specific information.

Okay. Slide 26, please. Slide 26 and 27 summarize the elements that I think the task force was envisioning for Recommendation 1, which would be both risk-informed and in a defense-in-depth framework in an integrated manner that would be systematically address safety-significant issues within and beyond-design-basis events. It would address both generic and plant-specific issues. And it's this addressing of plant-specific issues that implies the need for probabilistic risk assessment. And the task force's thinking also would be that a framework would increase clarity on the role of defense-in-depth and the role of voluntary initiatives.

So I would say that the task force was envisioning a framework that fostered better, smarter, more safety-focused requirements, not necessarily more regulation, but better regulation. And as you heard examples this morning of things that could be moved from design-basis to a beyond-design-basis category, I think those are examples where the task force also envisioned; and it is mentioned in the report, that there could be either more requirements or fewer requirements or different treatment of requirements as the risk-informed and defense-in-depth framework would lead to.

Could I have slide 28? I'd like to give an introduction to slide 28. Remember the task force was created almost three years ago and it in fact disbanded two-and-a-half years ago. In effect, since that time two of the senior managers on that task force have retired, although I believe all other four members of the task force are here today. But the task force was never asked to review or evaluate the three proposed activities, so I can't say that the task force endorses or loves or hates the Proposed Activities 1, 2 and 3. However, I can share my own thinking as part of the task force on how those recommendations address the thinking of the task force in laying out Recommendation 1.

So I would view the proposed activities as both positive and practical steps. They're consistent with Recommendation 1. They certainly address three specific areas raised by Recommendation 1. And as with some past activities, I suspect there's more safety benefit associated with the Proposed Activities 1, 2 and 3 than the task has indicated. The Commission paper says that the task anticipates modest safety enhancements. But I think these could in fact be more beneficial. And some of the discussion this morning you could say there are may be even other currently unknown advantages that may come out.

But most importantly these three activities, although not a substitute for Recommendation 1, and clearly they're not everything that Recommendation 1 had put on the table, they can be steps towards a more comprehensive implementation of the Commission's PRA Policy Statement. They can be supportive of risk-informed regulation and risk management in a general sense. They can support for example the view that ACRS has put forward for a risk-informed performance-based defense-in-depth framework. These three steps could embrace the risk management regulatory framework. They're certainly not steps in the wrong direction. I think they're steps in the right direction. And I think that they can be supportive of the number of the industry and staff initiatives that were discussed this morning.

That concludes my remarks and I think now we turn to

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MR. JOHNSON: Mike Johnson. Thanks, Gary. For the sake of time I want to just touch very briefly on the last slide with respect to Recommendation 1, and it is next steps. And I just want to point out we recognize, you should recognize that there is further development associated with each of these activities. We also recognize that they're ongoing priorities that we don't want to displace. And so what we would propose to do is provide a plan six months from the SRM that lays out the schedule and resources and those kinds of things based on whatever the Commission should decide. That timing should also match up with the paper going forward on the risk management regulatory framework so those activities can be integrated.

With that I'll turn over to Dave Skeen to talk about Tier 1.

MR. SKEEN: Well, thanks, Mike. And good morning, Commissioners, and to Chairman Macfarlane, if she happens to be listening in on the phone this morning.

You just heard the staff discuss the work that has been done to disposition Recommendation 1, and certainly it is an important lesson learned from the Fukushima accident. However, the staff's effort on Recommendation 1 is just one part of the overall lessons learned effort that we have ongoing.

I want to take just a few minutes to give you a brief update on the other Fukushima lessons learned that the staff is currently working.

So I am pleased to report to you that we are making good progress in implementing the activities related to the activities that the Commission categorized as Tier 1, which are those that you directed the staff to undertake in the near term following the accident and that the staff and industry have been working to implement over the past two-and-a-half years. As a result of our efforts, I believe the nuclear power plants in the United States, which were safe before the Fukushima accident, are now better prepared to cope with external events such as floods or earthquakes than they were before March 11th of 2011.

By the end of 2016 many of the safety enhancements that are currently being implemented at all the operating power reactors in the U.S. will be completed and that will make the plants even better equipped to deal with events such as floods or earthquakes that could result in a loss of electrical power to a plant and a loss of access to the plant's ultimate heat sink.

I do want to add, however, a note of caution. While I'm pleased with the progress that we've made so far, neither the NRC nor the industry can afford to lose our focus on completing the safety enhancements that are currently being designed and implemented at each site. As I'll discuss in the next couple of slides there's still a lot of work to do and a long way to go.

Next slide, please. So I'll briefly cover the orders. As you know, the NRC issued three orders as part of the lessons learned efforts. Under the mitigating strategies, I believe that the Mitigating Strategies Order that requires licensees to have a phased approach, to first use installed plant equipment, then additional portable equipment at the site and then finally to bring in the capability to bring in additional equipment from off site in order to cool the reactor core, the spent fuel pool and to preserve the reactor containment, is one of the most important and safety-significant regulatory actions the Agency has taken in response to the Fukushima accident.

As part of the strategy to have the additional equipment brought in from off site, I'm also glad to report to you today that the two Regional Response Centers that are going to be installed in Memphis, Tennessee and in Phoenix, Arizona are currently being prepared and are expected to be fully operational by the end of August of this year.



In addition, we began issuing the interim staff evaluations of the licensee's plans for implementing this order last fall and we will issue all the last of the evaluations by the end of February. The licensees are already procuring equipment and making plant modifications to be ready to implement this order and once they receive the NRC's evaluations. The goal here is to have all the plants in compliance with the order by the end of 2016.

Moving on to the vents, as you know the original March 2012 order requiring boiling water reactors with Mark I and Mark II containments to install hardened containment venting systems was revised in June of last year to require the vents to also be capable of operating after a severe accident that could damage the reactor core. As a result of this revision to the order, the schedule for implementing the wetwell vent is now June of 2018 and the schedule for providing the capability to also vent the drywell or an alternative strategy to the drywell vent is now June of 2019.

Moving onto the spent fuel pool level instrumentation, this order required additional level instruments to be installed in the spent fuel pools for all operating nuclear power plants and is currently being implemented and is on schedule. The staff finished issuing the interim staff evaluations for these in December. And again, the goal is for the licensees to have these implemented by the end of 2016.

Next slide, please. We also issued a Request for Information in addition to the orders and it was to cover three areas where we were trying to figure out if further regulatory action may be warranted. The first request was for reactor licensees to perform walkdowns at each site to ensure that they were adequately prepared for the floods and earthquakes for which they were designed. These walkdowns were completed in the fall of 2012. In addition, we asked licensees to reevaluate their flooding and seismic hazards using up-to-date methods and information that was not available at the time that most plants were licensed.

The flooding evaluations were split into three groups with the first group providing their evaluations in March of last year. And we've been working on those. We expect to complete most of the NRC reviews for these plants by the end of May of this year. The second group of plants is due to provide theirs in March of this year. And again we will take the time to review those. And then a third group will come along in March of 2015. And we'll do the reviews on those as well.

Turning to the seismic, the seismic evaluations were split into two groups: The Central and Eastern U.S. and the Western U.S. plants. The Central and Eastern U.S. plant evaluations will be submitted to the NRC this March. And then the Western U.S. plants will provide their submissions next year, in March of 2015.

We also asked licensees to provide information on the staffing and communications that are needed to deal with multi-unit events. The staff is finishing up the reviews for that and we expect to issue those in the next few weeks. So that's very close.

Next slide, please. So the final three are the rulemakings, and there are three underway. And I'll start with the Station Blackout Mitigating Strategies Rulemaking is currently under development and the proposed rule is due to the Commission this June. And then a final rule would be provided to the Commission by the end of 2016.

The rulemaking on coordinating of the on-site emergency response is also underway and the proposed rule is again still scheduled to be submitted to the Commission in July of this year. And the final rule would be coming up by the end of 2016 as well.

Then the third rulemaking, which is the Filtering and the Containment Strategies Rulemaking, this was the one that was directed by the Commission last year. It is under development as well. And the proposed rule date there to the Commission is by the end of 2015 with the final rule expected by mid-2017.

So that completes my brief update and I'll turn it back over to Mark for some closing remarks.

DIRECTOR SATORIUS: Thank you, Dave. I know we're close on time. I just have a minute or two. I'd like to take a moment and thank the staff for all its hard work on the Fukushima lessons learned activity. I think it's been demonstrated by the presentations today that we've been busy and at work. Especially for the assessments and recommendations related to Recommendation 1 I think we've ended up in the right place, at least for the time being in regards to proposing changes to the framework and making sure that enhancements have not delayed the actual improvement of plant safety.

We will continue to look for possible ways to do things better and where we can find changes that achieve the right balance between improving safety, maintaining regulatory stability and justifying impacts on the regulated industry and public and we will pursue them when necessary bringing issues and proposals to the Commission.

With that, we would invite any questions that you have. Thank you.

COMMISSIONER APOSTOLAKIS: Thank you very much for the excellent presentations and we'll start again with Commissioner Magwood.

COMMISSIONER MAGWOOD: Thank you. First let me echo Mark's acknowledgement of the staff's hard work. So often we get complaints that these things take so long and people are never entirely happy it seems with anything we do from one side or the other. But the fact is; and I think this was highlighted by comments made in the earlier panel, that a tremendous amount of work has been done following on the Fukushima disaster and we have increased safety. We have enhanced safety. There's simply no question of that. And that doesn't get stated clearly enough, regularly enough and is something the staff should be very pleased about.

Let me also, you know, thank the working group that responded to Recommendation 1. As I indicated, you know, Dick and his group and Commissioner Apostolakis and I met on multiple occasions and talked about this in great detail many, many times. And so I thank the working group.

Hi, Mary. How are you? It's good to see you.

And it's a lot of good work. So let me just sort of say up front that however the Commission decides to proceed with this, it's in no way a reflection on the quality of the work that the working group has done. This is simply a matter of considerable complexity. There's a lot of differing views and a lot of ways to approach this and it remains to be seen how it all comes out.

I do appreciate Mike's Goldilocks analogy. It does have that character to it, because there are valid arguments to make on both sides of it, you know, that it's both too hot and too cold. And I can probably argue both quite persuasively if I tried.

But one question that comes to mind as I look at this, and this came out a little bit in the first panel, I agree that there are some benefits to the steps proposed by the staff; and let's focus on Activity 1 to start, to lay out a process to clearly make decisions on how we proceed with these things. But we're doing it now anyway without that guidance. So it wouldn't be accurate to say that we couldn't do without this. This would clearly give us more of a format and it would make the questions easier to approach and you wouldn't have to think so creatively.

But the fact is we've done it and we've learned lessons through having done it. And I suspect that if we had to do something like this again, the people who have gone through this exercise with mitigating strategies and other things would say, well, you know, last time we did it this way. We'll probably do it this way again and we'll ask the same kinds of questions.

And so I guess one question I have is in your view, while there clearly would be benefits, is it something that if we just simply decide not to do any of these things, do you see any downside for safety in the future?

MR. SATORIUS: Well, let me just start, and I know Mike has something to say as well. I think that there will be benefits. I think it would give us structure. But you're right, we think our framework is not broken. We don't see that there's a problem. We've demonstrated we can work through these issues. But moving forward on Activity No. 1 and others will give us an opportunity to add structure such that it's more explainable and repeatable and fungible.

So, Mike, did you want to --

MR. JOHNSON: Yes, I would just reemphasize or just add emphasis to your point. I think it was Jennifer who said the main benefit was increased efficiency and effectiveness. From a staff perspective, even though we've done it, we could do it more easily. We could do it with greater consistency. As we were listening to the first panel we were thinking about defense-in-depth, for example, and not -- again, this is one of these balance issues where we would be sensitive to trying to be overly prescriptive with respect to defense-in-depth because we recognize that at the end of the day the Commission has to decide. But every day the staff struggles with issues regarding defense-in-depth as they execute, for example, Reg Guide 1.174, which deals with the change process for license amendments, risk-informed change for licensing actions, for example. So anything that we can do to make it better is something that we think would be worthwhile.

MS. UHLE: And I'll just add a quick note. I was recently in Region III at the Resident Counterpart Seminar and was discussing some of our activities in NRR, including the Fukushima actions and Mitigating Strategies Orders and had several questions. Is this in the design-basis? Well, it's beyond-design-basis. Well, does that mean 50.59 doesn't apply? Is it in the licensing basis? So it's there. I think having a structure would help in the communication, not only to the public, but also internal to the NRC and externally to the industry for those people who aren't intimately familiar with the development of these activities.

COMMISSIONER MAGWOOD: Let me ask Dick a question on this, because you said something I don't think I quite heard you say before, and perhaps I missed it. But you mentioned that a policy statement could be part of Activity 1 specifically. And, you know, Ed's colleague David Lochbaum had made several comments about us having a habit of putting the cart before the horse, I think was the phraseology he used. Is this a case where perhaps the policy statement should come first before you start to delineate the process on how these things should be applied? Because, you know, the questions about how you balance -- excuse me, integrate; I agree with Gary on that point -- integrate defense-in-depth and risk-informed analysis, that's something where there's still debate about that. So is that not putting the cart before the horse to start the NUREG before you have the policy statement?



MR. DUDLEY: That's hard to tell. It's hard to answer that question. You know, the devil is in the details, too. We might get approval of some policy that seems clear and implementable, but yet when you try to work out the details you can't specify, you can't determine -- you can't really implement what it was that was approved. So I'm really not sure what would be the best way to do that.

MR. JOHNSON: And just to add, we're continuing to think about these things. Obviously, we've done a lot of thinking about what the activities would look like, a little bit of thinking about how we would implement them. We'd have to go back and do more thinking in terms of in addition to, you know, how would you sequence them? Do you need a policy statement first? But we thought it would be beneficial to get Commission direction before we take that level of effort.

COMMISSIONER MAGWOOD: Gary, part of your commentary was that what the staff proposes is practical and appropriate but more could be done. Can you opine on this issue about whether a policy statement might be an appropriate step to take either before or after this work is done?

MR. HOLAHAN: I think having a Commission expression of their desires and expectations is actually a good thing both for the industry and for the staff to -- especially in an area where there is a lot of uncertainty. I can imagine a number of different Commission policy statements, right, whether it's on the specific Activity 1 or a more general one setting expectations for moving forward with risk-informed regulation. But, yes, I think some kind of expression out of the Commission of what it expects could be a good thing.

COMMISSIONER MAGWOOD: Let me bounce back to Dick for a moment, because we spent less time talking about the voluntary initiatives part of this. But one question I have about that is sort of similar to the first question I asked, which is how much does this really buy us? Because can't we do most of what the staff has recommended under Activity 3 now? I mean we have lots of different ways of judging and assessing voluntary initiatives. I mean through inspections, through the ROP, can't we inspect whether licensees are implementing things they've promised to implement today?

MR. DUDLEY: The inspection capabilities on voluntary initiatives are quite limited. You could perhaps find deviation. If a licensee had committed to a certain program, the licensee could address that deviation by withdrawing the commitment. So there are a number of problems with continuing the current path.

MS. UHLE: I would also add; and Dick alluded to this, but it's the enforcement aspect that really ties the Agency's hands.

MR. JOHNSON: Can I just also add? I talked about the level of consensus, level of work that we needed to do to reach consensus. It might surprise you to know that the most energetic discussions we had were around voluntary initiatives. And, you know, there was a high sense on some parts, some steering committee members about the fact that, gee, you know, we relied on some of these voluntary initiatives and when we finally got around to looking, we found things that weren't being implemented. So I think there was a strong consensus that we need to do something different than we do today.

Now there was a disagreement. Some folks said don't ever allow them ever. Other folks said allow them, but make sure that when they're implemented -- okay. And that's the way we came out with respect to the recommendation. But there was not a feeling that today is where we ought to leave voluntary initiatives on the part of the steering committee.

COMMISSIONER MAGWOOD: My time is up, but since you said that I will ask you one last question. And that is, one thing that you didn't seem to spend much time on though is what a voluntary initiative? Which initiatives actually ought to be voluntary initiatives? And I think, you know, Ed Lyman sort of highlighted that in his commentary. Isn't that something that really needs to be part of this conversation?

MS. UHLE: Yes, we spent a lot of time on that, and in general there are some voluntary initiatives taken by the industry that we would not choose to regulate. And, you know, we can talk a little bit about groundwater treatment. And of course we remain abreast to ensure that the public health and safety is ensured. But the industry is doing more than what we feel we could have required either through the cost-benefit or the adequate protection, or even if you chose to disregard 51.09, but there are some that as we start formulating what the technical issue is. And we're getting comments not only from the industry but from the public. There may be cases where we're not sure if it would be cost-beneficial. You know, we think that it meets the improvement in safety, but we don't think that it would be a slam dunk with regard to the cost-beneficial aspect. And industry can choose to implement that voluntarily. And it saves us resources provided we can ensure that they are in fact meeting those commitments.

And so that is what we're trying to focus on is instead of going back and looking at all those voluntary initiatives that would take a lot of time and a lot of staff resources, but instead those that are safety-significant we're going to look at more closely and ensure ourselves that they are implementing them. If they're not, then we would promulgate a regulation provided of course that it meets our guidance, our regulatory analysis guidance.

COMMISSIONER MAGWOOD: Thank you very much. Thank you, Chairman.

COMMISSIONER APOSTOLAKIS: Commissioner Ostendorff?

COMMISSIONER OSTENDORFF: Thank you, Chairman. Thank you all for your presentations. I would start off kind of in reverse order. I want to go to Mr. Skeen first, because this is an important point and I don't want you to be left out.

I just want to echo my strong agreement with your second bullet on slide 30 that plants are better prepared today for beyond-design-basis events than they were three years ago, and I don't know that that fact is getting sufficient visibility nationwide.

And I just appreciate you making the comment and appreciate the work of the JLD, but I think that is an important message for this Agency to communicate externally. And like you say, there's a lot of work to be done, but a lot of great work has already been accomplished. And the Tier 1 progress I think is very admirable given some of the complex challenge issues both for the regulator and for industry. That's not a question, but just a comment.

MR. SKEEN: Well, thanks, Commissioner. On behalf of the staff and the industry working groups that have been working on this, that's where the real work is being done.

COMMISSIONER OSTENDORFF: Yes.

MR. SKEEN: So we appreciate that.

COMMISSIONER OSTENDORFF: The Commission notes that.

Let me turn back to the body of work before us. This is kind of towards a comment, not a question for a Mark and for Mike. I just want to add my comments to those of Commissioner Magwood and Commissioner Apostolakis; I know Commissioner Svinicki feels the same way, that the staff has just done a very professional job here on this body of work for the Near-Term Task Force Recommendation 1.

And I've seen, I think as my colleagues have seen and some other agencies -- sometimes you see activities and bodies of work die on the vine because they're too hard. And it's a great credit to the staff over here and others who are not here today the perseverance and professionalism, the doggedness to keep moving this forward and not only to continue to evolve their thinking, but also I think to very credibly keep the Commission well informed of where this thinking was evolving.

So I know we all appreciate that. But I think you have more than done your job. Now it's up the Commission to make a decision. And irrespective of how we come out -- and there will be different viewpoints among the five of us, I'm sure, but irrespective of that, I think we all agree that you've presented to us, you've teed up to us a very appropriate set of recommendations with the supporting background to make a decision. So we thank you for that.

Gary, I want to go to you next. I want to thank you for your thoughtful explanation of the architecture of the recommendations. I will note that you carefully avoided of what I'll call the P-word.

MR. HOLAHAN: Yes, sir.

(Laughter.)

COMMISSIONER OSTENDORFF: And while I sometimes am irritated, I'm not often confused, so I appreciate your clarification of that in your presentation.

On a serious note, I did want to ask, going back to the time period of, you know, July of 2011 when the 90-day report was being presented, if one looks at your vision and that of your colleagues at that time of what the Recommendation 1 looked like, if that had been in place as Dave Skeen's team and the steering committee were doing their work; let's just talk on the Tier 1 Fukushima recommendations, would we be in any substantively different place as far as the regulatory requirements and enhancements that have preceded to date?

MR. HOLAHAN: I think it probably would have clarified. It wouldn't have made a major difference, but I think it would have helped let's say at the boundaries, issues like what should the qualification of the equipment be? Right? How should I treat it? What are the change requirements? So I think there would have been additional clarification.

Issues like is this an adequate protection issue or is this a cost-justified safety enhancement I think probably could have been clarified. And I think there's been a lot of struggle over some of those issues. Hardened vent, for example, I think would be an easier issue to work through after more guidance was in place.



But I think Commissioner Svinicki asked the hardest question this morning actually, which is you can't make your guidance so stringent that you have no flexibility in making decisions. And that's the boundary that is most difficult to define. Right? You want to improve the guidelines, you want to improve the process, you want to improve the structure and the thinking, but not take all of the decision out of the hands of the Commission.

COMMISSIONER OSTENDORFF: Well, thank you for that point.

Jennifer, let me ask a related question to you. I asked Gary that question with respect to Near-Term Task Force Recommendation 1 as it was envisioned almost, you know, two-and-a-half years ago. With respect to the SECY paper before us today and the staff's recommendations, same question with a little bit different construct for Recommendation 1 and these three activities. If those three activities had been accomplished, would you see any substantive change in the outcome of the Tier 1 activities that the staff has been pursuing?

MS. UHLE: I don't think that there would be differences in ultimately what we require. I think we would just be further along because of the efficiency gains.

COMMISSIONER OSTENDORFF: Okay. Mike, you want to add anything to that?

MR. JOHNSON: (No audible response.)

COMMISSIONER OSTENDORFF: Okay. Very good.

Dick, let me go to you for a few minutes here. I wanted to ask you just to maybe spend a moment or two commenting on -- you used the phrase "middle ground treatment in between safety-significant and commercial-grade equipment." Can you give perhaps either a real example or a hypothetical as to how you might see that clarification being provided as we implement some of these task force recommendations?

MR. DUDLEY: Well, it would be a middle ground for all of the different regulatory attributes. I mean you would have to define a change process that would fit for a generalized design-basis extension rule. You would try to find some less-stringent training requirements. It's hard to define really.

In the case of the 50.46(a) Rule what we did for reliability, we said you had to do a risk assessment to make sure that you didn't change CDF unacceptably. So based on the reliability you assumed in your risk assessment, that was the reliability you had to show that the equipment that you would use under 50.46(a) to mitigate beyond DBS breaks -- you had to show that it would meet the reliability assumed in the risk assessment. So those are a couple of examples.

But each of the regulatory attributes we would have to come up with some interim set. And that's our commitment, to come up with a single set of interim treatment requirements.

COMMISSIONER OSTENDORFF: And maybe this is a question for Mike Johnson. Well, please add to that, yes.

MS. UHLE: All right. Yes, I'd like to just complement what Dick has indicated. And I think you're aware of Dr. Budnitz' -- I guess it was a letter or memorandum addressed to the Commission. And in it he cites, you know, his belief that certain components are more important in a plant than others, and of course we know that by looking at the risk worths of the various components. But some components are used in different systems. And so if you were to in some way locate and say this one system is very more important than another, then that system should all be safety-related.

Okay. So now you'll have a component that is used in multiple systems and if the other system isn't as important in reducing risk, then perhaps, you know, the component that's of the other system will be safety-related, but then the other aspects of that less-risk-significant system can be commercial grade. Or you can look at just an individual component. It is composed of, you know, pieces of different components together.

And if there's one that is less robust as far as handling seismic accelerations, then maybe that component needs to be safety-related and the rest can be commercial grade. You know, things like that. There is a look to see what components are most important in terms of the risk profile of the plant. And then of course adjusting the treatment requirements to I would say optimize what is necessary for safety.

And we allow that in 50.69 already and licensees have taken advantage of that -- South Texas project. And we have another submitter for Vogtle.

COMMISSIONER OSTENDORFF: Thank you.

Thank you all.

COMMISSIONER APOSTOLAKIS: Commissioner Svinicki?

COMMISSIONER SVINICKI: I will begin as my colleagues have begun by acknowledging the tremendous work that has been done, and I want to specifically call out Mr. Dudley and the working group. As they met with me and briefed me as they continued their work in this particular paper we took a moment to step back and talk about what it was to be assigned to this working group and basically be handed off this recommendation, which was very complicated. Some aspects of it are deeply philosophical.

And I just want to compliment NRC because it is the practice here that one group may come up with a concept or an idea, in this case a recommendation, but what NRC will do is take a group that is perhaps not comprised entirely of, you know, fierce advocates for that idea. And I think by making that group take the work of another group and then put it through a systematic evaluation -- I think that we vastly improve the rigor of our understanding of issues, our analysis of options and alternatives. And I think the Commission really benefits from the staff taking that type of a very disciplined approach to looking at issues.

So I know that the members of the working group had to at times define and redefine what it was that they were being asked to address. They also had a Commission SRM that gave them instruction and I think they've done something -- produced a work product that they should be very proud of.

That being said, I want to comment on a couple of things that have been stated here today in terms of possible benefits of the Commission approving one or all of the improvement initiatives.

Frequently folks have invoked the fact that openness would be improved. I don't know whether I agree or disagree with that, but to the extent that commenting on openness leaves the impression that somehow the decisions we've made to date or the decisions that Commissions have made historically on things outside of the design-basis -- if it leaves any impression that those were conducted in a way that was not the product of a thorough analysis recommendation by the staff and a deliberation by this Commission that again has, according to our procedures, the ability for the public to understand what individual Commissioners and the Commission as a whole weighted heavily or were not heavy or important factors in their decision, I think that NRC has unprecedented levels of openness in the way it goes about its business. And I don't want to leave an impression that these improvement initiatives are necessary to create openness. They may or may not enhance the Agency.

MR. SATORIUS: And that certainly was not our intent

--

COMMISSIONER SVINICKI: Okay.

MR. SATORIUS: -- in presenting it in that manner.

COMMISSIONER SVINICKI: The other thing that I'm not certain I could establish a fact pattern to support was the answer to Commissioner Ostendorff's question of if we approve these improvement initiatives, if the Commission agreed to that, would it have any substantive difference in terms of the actions we've taken today post-Fukushima and where we are?

Jennifer, you indicated that perhaps the outcomes would not be different, but we would be further along because of efficiency gains. I think implicit in your answer would be the fact that we would have had to take up the philosophical issues imbedded in Recommendation 1 prior to and absent any Fukushima-type of initiating events. We would have had to have taken it up for some other trigger, have done all the work and have it in place.

So I think that if the Commission had not moved it to the back, I disagree. I think we would be on the important matters that Dave Skeen has presented to us. We would be I think substantially further behind. And those are real on-the-ground safety improvements. So I don't want to lose sight of that or have an implication that the Commission should rethink the fact or have some sort of sense of regret over moving this consideration of Recommendation 1.

MS. UHLE: Yes, if I can add. And what you just said I 100 percent agree with. If we had this done before, then we would have gained efficiencies. But we, in my opinion, did the exact right thing and focused on the safety at the plant first before any kind of process improvement.

COMMISSIONER SVINICKI: Okay. And that brings me to another thing that I would complement, which is the candor of the staff's assessment that is in the paper before us now where they've been very clear that safety is not -- and I'll quote directly: "Safety is not the main focus of the improvement initiatives." And the primary goals of the improvement activities are to basically enhance what I'm going to call some process things.

I don't say that to diminish their importance, but I just say that again, and I credit -- it was not my idea to have a status update at today's meeting on the other implementation of the recommendations. And I think I agree with my colleagues that that is a very, very important complement to what we're talking about today, less the public or anyone else think that we merely took on these more philosophical questions and that we've spent precious time working that at in any way the expense of these important improvement initiatives that we've done.



Which kind of brings me now -- all of that is a prelude to, you know, a real practical consideration. The working group was assigned its task. It has come up with three improvement initiatives. But I want to ask; and maybe this is most principally directed to Mr. Johnson and Mr. Satorius who have a span of issues and responsibilities at NRC that are much broader than what we're talking about today.

If we say that we have the potential for improvement initiatives or enhancements to our processes that have a set of benefits that do not have a direct correlation in the moment to safety enhancement and that if we take as a predicate it is not legitimate to assume that we can have vastly expanded resources as an agency to take on these activities, when you look across the span; and, Mr. Satorius, you're responsible for the entire span of NRC's responsibilities, is now the time to take resources and put on this set of improvement initiatives which may have enhancements that are modest in character?

MR. SATORIUS: Let me get started. And I think that we're going to keep our finger on the pulse as we move forward. We're still going to follow Commission direction that says we need to focus on the safety of the plants and continue our efforts in that area under the schedule that we have right now. If something interrupts that schedule, we may have to come back and ask for more time as far as making these improvements -- to taking up the improvement activities within Recommendation 1.

We've looked at it carefully. We think we can do both in the same manner that we kind of worked them both parallel with the major focus on the safety enhancements to the plant. So I'm confident we can move forward, but if the landscape changes, we're going to have to be nimble. And if it involves consulting with the Commission on changing dates, we'll have to do that.

Mike?

MR. JOHNSON: Yes, I agree totally. And I was sort of touching on next steps rather quickly, but the point I was trying to convey was we do have a lot on our plate and we would have to propose plans. These are not things that need to be done imminently and we have to factor in all of the other priorities.

You know, so it's an investment in the framework. We could scale it, shift it out. The Commission could decide at what pace we propose a plan based on resources and make adjustments accordingly.

COMMISSIONER SVINICKI: Well, and it may have sounded like a very leading question, but I think the point is very important, at least to me, and it's perilous ever for me to indicate some future position I might take, but I feel confident enough to say that if these activities were to come at the expense of resources of this agency to be devoted to implementing Tier 1 activities, I feel pretty confident in saying I just don't think that I could support that.

And I have to go on to say that it's real easy to forget we issue something like orders one year after the event. And in Japan we issued the initial set of orders. Many people see that and say, well, done and done. Okay. Wonderful. That's behind NRC. It is not. And I will tell you that even almost two years after issuing those orders the complex bulk of our work, if you look at any activity or resource loading as a wave, we haven't hit the hardest part of what we need to do on making certain that the implementation of the orders we've already issued is everything that we're going to demand that it be on the ground at licensee locations.

So I know we publish schedules. I know we're monitoring to those. I would not want to wager to you that we're going to have 100 percent ability when we hit the tough complex issues associated with that. So I think that our absolute proof of the fact that we're going to be able to adequately resource that is we've not demonstrated that yet. And so that's why, you know, people may say, well, you're just speculating that undertaking these improvement initiatives will be resource-intensive and will be a distraction. I appreciate that the staff has been very candid about the fact that we do have a lot on our plate.

And the other thing, by the way, is we need to remember that Tier 1 activities were Tier 1 because we agreed with you that those were the important activities. That was your collective expertise and wisdom and recommendation to us. We agreed with you. That work is not done yet. Mr. Skeen has reminded all of us of that. And our bow wave of where we're most busy does not always line up with where the regulated community is. We issue. They get real busy. They work on stuff. They resubmit. Then we become very, very busy again. So I appreciate that what I'm hearing from you is the sensitivity of really keeping your eye on that.

And with that, I yield back. Thank you.

COMMISSIONER APOSTOLAKIS: Thank you. I think your slide 11 is a good one. So that I can make a point, if we can project it.

First of all, the gray box, I will come back to my earlier comment about terminology. I really think it's going to be confusing to call of that design-basis extension. You may want to keep those terms for the top part and rename the bottom part enhancement or something.

But the more important comment I think is on the left. It says established criteria for regulatory attributes. In my view what is missing -- and it would not be just something that is related to efficiency. It would truly improve safety. What is missing is criteria for getting into the box and getting out.

Now, in the present -- well, you expected that, Dick.

(Laughter.)

COMMISSIONER APOSTOLAKIS: You don't have to smile. And if you don't have those criteria, then I think the value of the box is diminished. And I'm very glad that Mr. Dudley brought up the Emergency Core Cooling System Rule 50.46(a). Well, for those who don't remember, right now we assume that the largest pipe breaks and that defines the more severe accident. This proposed rule will say, no, there is a smaller size which we call transition break size, so we will keep everything that involves breaks below that in the design-basis adequate protection and everything above we might move to this new category.

And I ask you, how do you decide that? You decided because the Commission said the size of the pipe should have -- the breaks should have a frequency of 10 to the minus 5 per year. You had the criterion. It's not an arbitrary decision. You don't say, well, gee, I think, oh, this kind of thing should go into this category. The Commission directed you to define that break using a frequency. So it is essential if you want to have a category like that to be useful, to have criteria guidelines or something that will tell you what goes in and out. What goes in and how does it get out? So that's my fundamental disagreement here. And as I say, if we do that, it will not just improve efficiency. That will really have an impact on safety.

By the way, I've noticed not just today but in other meetings, too, that any time there is a proposal to do something, there is an immediate sensitivity that what we're already doing is not maybe good, will not be perceived as good enough. I fully agree with your statements that the current system, and the Near-Term Task Force said that, too, has served the nation well. The plants are safe. And I remember when we were doing the report that you guys referred to -- I got a lot of questions. Why are you doing it? What's broken? We don't do things only when things are broken. The state of the art advances. We have more insight. So we have to see how we can improve.

So in terms of resources that Commissioner Svinicki raised, I'm wondering whether we should submit the three activities to a cost-benefit evaluation. And in my view Activity 3 would be worth the resources, Activity 1 would not, and Activity 2 can be deferred until we know what we're going to do with the risk management regulatory framework.

This is just my view, Jennifer, but you're welcome to comment.

MS. UHLE: (No audible response.)

COMMISSIONER APOSTOLAKIS: You don't want to comment? Okay.

(Laughter.)

MS. UHLE: I think my expression provided you some input.

COMMISSIONER APOSTOLAKIS: In fact, since you have the floor now, you mentioned earlier in response to Commissioner Ostendorff -- you and Dick, but I think you talk about the importance of components and this and that. Well, as you very well know, in PRAs that are importance measures, right, that one could use for these things, but somehow you have to be using the PRA. And we're saying, no, these documents -- unless I'm misunderstanding, that we don't need to do that, that it will be used in an ad hoc manner without really requiring anything. So again, there goes this benefit. I mean unless we do it on the side and then we look at it and say, well, this is good enough, the importance of the system structures and components will have to be based on judgment.

Is that correct, Dick?

MR. DUDLEY: I mean you would use generic PRA information. We're proposing a generic category, so we would --

COMMISSIONER APOSTOLAKIS: Activity 1?

MR. DUDLEY: Yes. Yes, it's a generic category. We would put generic requirements into it. We would use generic PRA information, or PRA information for types or classes of plants. PWRs, BWRs, Mark Is, Mark IIs, that sort of thing.

COMMISSIONER APOSTOLAKIS: Without addressing the fundamental issue what goes in and out.

MR. DUDLEY: Right.



MS. UHLE: Well, I can add to what Dick has indicated and the idea of addressing the criteria about what goes in and out. With this paper before you we will be getting hopefully permission to do some more work in this, depending of course on the resources available. And so what we've proposed here today is not the final answer. We expect to be spending, you know, three to four FTE over a period of time further fleshing out what those perhaps criteria are if we deem it necessary to have more distinct criteria.

COMMISSIONER APOSTOLAKIS: I think you triggered something in my mind. I think it's important to appreciate that we don't have to act immediately and resolve these issues. I view Recommendation 1 just as the risk management regulatory framework as longer term.

MS. UHLE: Yes.

COMMISSIONER APOSTOLAKIS: And in that context, again I'll come back to the letter from NEI that gave us a plan. Maybe we need to have our own plan, because I think the resources and other things -- you know, it scares people when you say I will establish a design-basis extension category and I will do A, B and C. And of course people think in terms of normal activities. They say, okay, my God, we'll have to do it in three years or in four years. I think it's important to bear in mind that we're talking about longer-term improvements to the regulatory system here. And that's important to be emphasized in terms of resources, in terms of activities, in terms of burden on the staff, which is very important.

So, you want to say something?

MS. UHLE: Well, I was just going to try to answer the question that you posed about the ability to do plant-specific changes, you know, what's in the category, what's out. And we do have that ability now. Licensees are free to come in under 50.12, which is the Exemption Program, and can use risk insights if they so choose to reduce I would say the level of safety significance of a particular regulatory requirement. So they are free to do that.

Now, 1.174 provides that ability also if it's not a regulatory requirement. If it's a regulatory requirement, then of course they have to put that in with a 50.12 exemption or petition for rulemaking. So that's already available to them, to industry, and very few licensees use that at all. And I can point to 50.69 also providing that. And we've only had two utilities attempt to do that. And that rule has been on the books for 10 years. So there is I think a reluctance on the part of the industry to take advantage of these tools that we are talking about here today, the plant-specific nature of revising their design-basis.

COMMISSIONER APOSTOLAKIS: Let me make one last point: So again, on slide 11, I think I made it clear what I think is missing there, but if you look at what is there, establish criteria for regulatory attributes, I have doubt; may be wrong, but I have doubt that you will be able to come up with something very useful if you look at only attributes and potential requirements without having in mind actual accident sequences or initiating events. But that's my personal view. Everything I said was my personal view.

I will come back to my fellow Commissioners if they have any follow-up question.

COMMISSIONER SVINICKI: No, I don't.

COMMISSIONER APOSTOLAKIS: No?

COMMISSIONER SVINICKI: I just wanted to point out, Jennifer, you had used an example of being up at a Counterparts meeting, or being over in a Counterparts meeting in Region III, I think you said, where folks who do inspections in the region and also the resident inspectors were asking you questions about the Mitigating Strategies Order. I would just note that whether or not NRC were to pursue any of these improvement initiatives, we will need to establish the guidance and structure for those folks. And I would also indicate is it not true that even if the Commission approved all of these initiatives tomorrow you still couldn't do it under this rubric in time for those folks to have that? So that's not possible? Thank you.

COMMISSIONER APOSTOLAKIS: Bill?

COMMISSIONER MAGWOOD: Let me just address a question to this side of the table and you can comment if you want.

COMMISSIONER APOSTOLAKIS: He means the left.

COMMISSIONER MAGWOOD: One of the interesting comments that we heard from Tony Pietrangelo this morning was his objection to the concept of design-basis extension, and the point being of course that maybe we don't need a middle category. When you respond to a beyond-design-basis event, it's beyond-design-basis whether it's really beyond-design-basis or just with -- or -- yes. Can you react to that, because it's actually an interesting point? I wonder why we need to have something in the middle when everything could be just beyond-design-basis. Can you -

MR. HOLAHAN: Let me react first, because the task force report actually speaks to this, and in fact it probably encourages the use of the terminology borrowed partly from an IAEA concept.

I think the task force struggled with the phrase "beyond-design-basis." And the task force met with a lot of people and got insights and what people thought about various things and there was a lot of confusion over the phrase "beyond-design-basis." First of all, it's a negative thing. It doesn't say what to do. It says what it's not. It says not what it is.

And the other aspect that was problematic of the phrase "beyond-design-basis" is it's open-ended. Everything that's not the design-basis out to infinity, right, is beyond-design-basis. And what the task force was trying to get through, like the gray boxes, those things that are not in the design-basis but are truly worthy of regulation. Whether it's cost-beneficial or adequate protection, they're surely worthy of regulatory treatment of some kind. And what do you call that? Right? And clearly it's not the same as design-basis, and everyone has said that.

Now, I think there are three terminology problems both in the task force report and in this area in general: One is the patchwork word, which some people understand fabricly and some people understand otherwise. Right? I think it's the balance word and I think it's the design-basis extension where the design-basis words are still in this category. And does that mean this is the same as that or does it mean it's different from that? So I think whatever you do with that gray box, you need a name that is meaningful to it.

COMMISSIONER MAGWOOD: Well, let me say, I mean I appreciate that when the task force first proposes -- it made it a lot of sense to me when I first read it, but I think now that we've gone down the path of developing mitigating strategies, I think Tony's point is well taken, which is your response to extreme events doesn't change depending on how extreme the event is. Your response is your response.

And I guess now that we've come back and we've now looked at what we would practically do in response to any beyond-design-basis event, it doesn't change that much. So I guess I'd give this side of the table a chance to react to that.

MS. UHLE: Yes. Well, if I go back to your first question; and I'll follow Commissioner Apostolakis' lead and say this is my personal opinion, but I think we can spend a whole lot of time trying to figure out the perfect term, and I don't think we're going to be pleasing everybody. I think we eventually should just identify a term and just do a very good job at describing it and communicating what that means to the stakeholders.

COMMISSIONER MAGWOOD: It's not so much a question of the term. The question is do we need the term at all?

MS. UHLE: I think we need the term personally because of the idea that beyond-design-basis doesn't have an end. I also think that having the term "extended design-basis" provides people I think a little bit more understanding that it's in the licensing basis, which is important. So ultimately I think we'll try to figure out the appropriate term but I think we're again going to be more focused on communicating what that means.

COMMISSIONER MAGWOOD: Okay. Great. Thank you.

COMMISSIONER APOSTOLAKIS: Commissioner Ostendorff?

COMMISSIONER OSTENDORFF: (No audible response.)

COMMISSIONER APOSTOLAKIS: Okay. I will finish by saying that I'm very, very pleased that we started discussing these concepts seriously, given a lot of thought to it and I agree with my fellow Commissioners that the staff has done an excellent job. Even though I disagree on some issues, I do appreciate the -- I guess David doesn't. I do appreciate all the work you have done, and reasonable people can disagree, right? I think it was a very good piece of work.

And on that, thank you all.

(Whereupon, the meeting was adjourned at 12:33

p.m.