

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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BRIEFING ON THE STATUS OF LESSONS LEARNED FROM THE
FUKUSHIMA DAI-ICHI ACCIDENT

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PUBLIC MEETING

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THURSDAY

APRIL 30, 2015

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ROCKVILLE, MARYLAND

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The Commission Briefing convened at the Nuclear Regulatory Commission, One White Flint North, Commission Hearing Room, 11555 Rockville Pike, at 8:59 a.m., Stephen G. Burns, Chairman, presiding.

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ALSO PRESENT:

STEVEN KRAFT, Senior Technical Advisor, Nuclear Energy

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P R O C E E D I N G S

CHAIRMAN BURNS: I welcome our external panelists, the NRC staff, and members of the public who are here today attending today's meeting. Today's meeting is further status on actions taken in response to lessons learned from the Fukushima Dai-ichi accident. Discussions today will touch on the status of the NRC's lessons learned activities, industry progress and implementation of post-Fukushima orders and requests for information, and the perspectives of some of our external stakeholders.

And the Commission will be briefed first by the external panel, who's here at the table with us now: Maria Korsnick, Executive Director, U.S. Industry Fukushima Response Chief Nuclear Officer and Chief Operating Officer, Constellation Energy Nuclear Group; Tony Pietrangelo, Senior Vice President and Chief Nuclear Officer at the Nuclear Energy Institute; Jon Franke, Site Vice President, Susquehanna Steam Electric Station; and Ed Lyman, Senior Staff Scientist with the Union of Concerned Scientists.

And following the panel, we'll have a break before we hear from the staff and proceed at that point.

Would any of my colleagues like to say anything before we begin? All right. Very good. Ms. Korsnick, would you please begin?

MS. KORSNICK: Thank you very much, Commissioner. I'd like to start the presentation with just sort of stepping back and saying what really were the overarching lessons that we learned from Fukushima. And if you go to the next slide in my

presentation, please, overarching, we would say bottom line is we need to be able to provide that cooling water and power under extreme conditions when the station and off-site power are unavailable. We need to retain or regain access to the ultimate heat sink and be prepared to handle multiple units potentially affected by the same hazard.

And in addition to Fukushima Dai-ichi, we want to also ensure that we've learned the important lessons from Fukushima Daiichi who was very successful under very challenging circumstances. And so the portable equipment, high-quality site leadership, and dedicated personnel all were very key to their success.

As we reflect over the items that were requested on the next slide, there were 35 Near-Term Task Force recommendations. From that, of the Tier 1 items, came three orders and two information requests, one on natural hazards and one on emergency planning. From that, 18 industry guidance documents have been worked on. Many of those have been approved by the NRC. And from that, 15,000 discrete plant actions have been required. And as we, as an industry, look at the volume of this work, we calculate that we are 70-percent complete with these items.

The next slide, again, just to reflect for mitigating strategies, overarching was the FLEX program that we put in place, and that's going to be required to be fully functional by the end of 2016. In addition, spent fuel level instrumentation, and that's required also by the end of 2016. And then BWR Mark I and II hardened severe accident capable vents broken into two phases, the first one due by June of 2018

and the second by June of 2019 and, for the most part, all on track for those actions.

As I reflect on the actions from the industry, I would suggest that we have demonstrated a bias for action as we've gone through these, and we've put solutions in place that have positioned us for an indefinite coping strategy during an extended loss of AC power. Compliance with the NRC orders, at least as of the end of 2014, you can see that, for mitigating strategies, we have six units that are complete, 57 more will complete during 2015, and substantially all complete by the end of 2016. And spent fuel instrumentation, 18 units completed by the end of last year with full completion by the end of 2016. And in the BWR hardened vent order, on track to complete both phases as scheduled.

In addition, we have two national support centers that are in operation, adding additional portable equipment that can be made available to any of the sites in the United States within 24 hours. And that we have now processes and procedures and able to allow us to handle natural hazards that are affecting multiple reactors at the same site.

So my reflection on this is the way that we got here was that we worked very well together, the industry, the Nuclear Regulatory Commission staff, to make sure that we stayed focused on the most important stuff and, that way, that we put the best safety benefit in place the soonest. And I'll leave you with that thought because, as we work through our presentation today, I'm concerned in some areas that we have yet to complete.

The next slide goes into seismic and flooding. The seismic walk-downs and hazard re-evaluations have been completed. Likewise, for flooding, walk-downs, and hazard re-evaluation substantially complete. But I have some concerns specific in the flooding area, and I know Tony Pietrangelo will be covering these in his area.

The overarching item here is that we have to continue to work very well together, industry and the NRC, to make sure that we're focused on the most important actions that bring the best safety benefit the soonest. We're challenged in that area.

The next slide talks about BWR containment filtering strategy. Obviously, protecting containment is an important safety barrier for us. That's our primary focus. FLEX and the implementation of FLEX helps us by continuing to ensure that we can keep the core cool and, likewise, protecting containment. If, in fact, the core has become damaged, we have filtration strategies that we've put in place, including severe accident water addition, that will help us manage a damaged core and continue to protect containment, that important safety barrier.

We've done extensive evaluations between the industry, as well as the NRC, on the safety benefit of an external filter and understand that the severe accident water addition will adequately filter releases.

Going forward, our lessons learned from Fukushima are substantial and ongoing. 2015 and 2016 are very significant years for us for implementation. We've been successful when there are both

industry and NRC alignment and accountability for execution. We will achieve significant safety benefit by those actions that will be complete by the end of 2016.

That concludes my remarks.

CHAIRMAN BURNS: Mr. Pietrangelo.

MR. PIETRANGELO: Can I get the balance of Maria's time?

(Laughter)

MR. PIETRANGELO: Just kidding. Chairman and Commissioners, good morning. Let's go straight to the second slide, please. Just a little background. March 2012, the Mitigating Strategies Order was issued by the Commission and employed design basis hazard levels for the flood and seismic hazards. Now, why did we do that? And I think this goes back to Maria's point about bias for action. Had we waited for the flood and seismic re-evaluations to be complete, we would just be starting the mitigating strategies implementation here instead of being in a position to complete by the end of 2016.

So we're still on track to do that. We do have to factor that information back in to those mitigating strategies to make sure they remain viable. But the bias reaction to get the biggest safety benefit out there the soonest was why we moved forward, even not knowing what those re-evaluated hazard levels might be.

At the same time, the 50.54(f) request for information on flood and seismic information went out to the industry using the current regulatory guidance that was used for new plant licensing, not

what was used for the original plant licensing.

These submittals were staggered into three groups on flooding for one year from March 2013 and then March 2014 and 2015. The staggering was to allow a more measured resource allocation such that the reviews could be completed. That's not the situation we find ourselves in today, and I think there's a lesson learned going forward about how we look at these requests for the re-evaluated hazards and what level of review we do for those, what the scope of them are, and transparency in terms of the schedule for completion of those.

The seismic re-evaluations were submitted in March 2014 and 2015, Central and Eastern United States in 2014, and you just received the western plants about a month ago. So on schedule there.

Next slide. Let's dig a little deeper into the flood re-evaluations. I think when you issued the staff requirements memorandum on March 30th, your first paragraph dealt with incorporating the flooding re-evaluations into the mitigating strategy assessments. That's job one from our perspective, and almost my entire presentation focuses on that first paragraph of your SRM. That's what we're really trying to get done by 2016.

The rest of that SRM deals with, we think, longer-term actions in terms of guidance and decision criteria with respect to the entire plant, not just the mitigating strategies. But we were ordered to do these strategies by 2016. We would like to get these assessments done by 2016 and, hopefully, get as many plants through that wicket as possible with the time remaining.

When we say more than adequate for mitigation strategies assessment with the re-evaluated flood hazards, we continue to believe that the re-evaluated hazards and that methodology was very conservative. I think we've demonstrated that with some of the interactions we've had with the staff, as well as information exchanges with the Commission. And you're looking at that, with respect to mitigating strategies, for a very remote beyond design basis scenario. So the question is how good do those re-evaluated hazards have to be?

This is not the time to get out the micrometer on the level of what the flood level is, for mitigating strategies at least. But not knowing how that information was going to be used later on, I think there's a lesson learned for all of us to say we need to know what the end game is, and then you'll know whether you need to have a very detailed, precise analysis versus a roughly right analysis that you can, depending on the context in which it's used should dictate the level of review. And I would strongly recommend that we have more transparency in terms of the scope and level of review, as well as schedules, and context of how that information is going to be used. The more we know up-front, I think -- and this happens on both sides. Our folks start getting very, sharpening the pencils, if you will, and staff is asking for more information, and that's when we get protracted reviews.

We just submitted NEI 12-06, Appendix G, which is the guidance for how to do the use of re-evaluated flood hazard against mitigating strategies. We need endorsement of that to proceed with

the mitigating strategies assessment. We need to expedite the NRC staff's reviews so that we can move forward with those mitigating strategy assessments and get completed in 2016.

To date, three sites have been approved with their flood hazard re-evaluation, seven have asked for additional information beyond what was requested in the 50.54(f) letters. We understand that there's an expedited review schedule to get a batch of plants out by September of this year and another batch by the end of the year. But, quite frankly, we're skeptical about that given the track record that's been established here. So this is going to require a lot of focus and integration to get this done.

And, finally, there's another handoff with not only when we complete the mitigating strategies assessment, giving that back to the staff. Some may have no actions to do after that assessment. Others may have several actions to do, but you want to get buy-in from the staff again before you move forward with those actions. We've always had a principle of do it once, do it right, with all the Fukushima activities.

So I think what I've described is there's a synergism between what we do as the industry and what the NRC staff does. And we use an analogy like a relay race, a long relay race, where there's a lot of hand-offs of the baton. And, quite frankly, there's a lot of people who handed off in 2013 still waiting to get the baton back on flooding re-evaluation. So we've got to fix this problem to meet, I think, our common goal of getting most of these plants done by 2016.

Next slide. During the seismic, both the NRC and

industry agreed that, after the initial screening against the ground motion response spectra that were completed in March of 2014, that several category one or several groups of plants were identified to conduct seismic PRAs, probabilistic risk assessment. But we didn't think, and I think the staff agreed, that just waiting another three years for a seismic PRA to be conducted was the right response to the new information that was received. So we developed the expedited seismic evaluation process and looked at the design basis level, doubled it, and looked at the equipment and the low frequency between 1 and 10 hertz, the equipment you needed for AC power and for cooling, because part of the mitigating strategy involves permanent plant equipment that has to work if you lose all power and lose access to the ultimate heat sink. That's what that ESEP focused on. Thirty-two stations out of sixty were required to do that based on their GMRS review. Those were submitted in December of 2014.

We've looked at the results of those, and we think it confirmed the robustness of the seismic designs. There have been some minor modifications identified, as well as some more significant modifications with respect to flat bottom tanks and how they perform in earthquakes. But all in all, we think the ESEP was, again, the bias for action to get the safety enhancement out in the field before you do the longer-term study of the hazard.

Challenges going forward on seismic, what you do with the rest of the mitigating strategies beyond Phase 1. Is your Phase 2 equipment still able to get to where it needs to be in a seismic event? I think they're still at the conceptual stage of the guidance on this, but

we'll have to develop guidance on how this is performed.

So this is going to require a focused effort. And, really, our ultimate goal is to provide additional confidence and not wait for the longer-term seismic PRA that the mitigating strategy remains viable.

So my final in less than two seconds. There's a substantial amount of work that remains to be done. And I guess, just from reaction to reading your SRM on flooding, just your first paragraph entailed a humongous amount of work to be done. So I don't want to, I want to make sure we're clear about, you know, how much work remains both for the staff and the agency.

We will get the mitigating strategies as ordered done by the end of 2016 against the design basis levels. We will re-evaluate them, hopefully, with the goals to get them assessed against the re-evaluated hazards that have been submitted. But we do need to retain this focus and integration of these efforts in order to get to the goal line here.

We think the rulemaking will help this because a lot of this stuff is codified in the proposed rule you're about to get from the staff. We've had good alignment on that rulemaking, with the exception of the regulatory basis on severe accident management guidelines. But other than that, I think we're pretty well aligned on what goes in the rule.

I've gone over my time. Mr. Chairman, I apologize. Thank you for your attention.

CHAIRMAN BURNS: Okay. Mr. Franke?

MR. FRANKE: Good morning. I'm Jon Franke. I'm the Site Vice President for Susquehanna Station, and I want to thank you for the opportunity to provide a single station's perspective on the discussion around Fukushima and industry's response.

In general, what we've talked about today up to now is a lot of reams of paper associated with regulation and orders and responses by the industry. At some point, this turns into hardware and trained personnel ready to respond, and I think I can provide a perspective relative to that.

If we go to my first slide, I think, in general, where we sit today as an industry, as Ms. Korsnick said, we've had a bias for action, and that has turned into a genuine improvement in the enhanced ability of the plant and staff to protect the health and safety of the public, which is our first job as stewards of this industry. We've got, both at the stations and in conjunction with the industry through the national support centers, we've developed simple standard compatible approaches to dealing with the mitigation strategies and the orders provided by the Commission to provide that cooling and power required to respond to any event that may happen at the station. And at the same time, not only have we taken a standard and compatible approach, I'd say that the approach to date, from my view, appears to have not only addressed an industry-wide response that can be used widely but also address individual needs of the stations relative to their seismic and flooding hazards and the technical requirements. Now, there's still a lot of work to complete in this area, but I think, even today, we're substantially better than we are before.

My next slide provides a little view as to what this actually looks like, what all these pieces of paper have resulted in. What I provided is a couple of photos of the facilities now installed at my station. You'll see a FLEX structure which houses the equipment available within the first immediate after-hours actions following an event. It's 10,000 square feet designed to withstand the worst hazards available, including a 300 mile-an-hour wind projected telephone pole, which drives standards along the lines of what ends up being a 39-ton swinging door to the 10,000 square feet of material inside. And we've got two pumper trucks. We have two one-megawatt turbine generators. We have trucks and debris-removal equipment, the food and water required for the staff, the cables, the material and tools required to implement the FLEX strategies at the station available at the station.

If you go to the next slide, I would say that this visual commitment by the industry so far has matched the importance of the issue. And what this looks like when you get to a plant like Susquehanna, it's turned into a series of over a dozen plant modifications to address the ability to inject water supplied by pumper trucks into the vessel, into the fuel pool, into the cooling support systems required to be successful with that strategy. New instrumentation for our spent fuel pools, the temporary power connections to be able to provide power from external sources and the fuel supplies at the ready to be able to provide both power and cooling to the core, to the spent fuel pool, and provide the instrumentation and communications required to be able to both respond with the control

room staff and as the industry.

This has turned into things like large numbers of new procedures. In the area of staff preparation, we've completed over 5,000 man hours of training to date, and we continue to train our personnel. That includes both operation staff, around-the-clock maintenance staff ready to man the facility and to man the FLEX equipment. Our emergency response personnel have received hundreds of hours of training relative to the new strategies provided by the FLEX equipment and demanded by the orders, including as much as almost a thousand hours of training for the decision-makers that would be involved post-event.

So I'd say that, to date, we have implemented significantly most of the mitigating strategies in a broad way, so that not only has provided the changes to the plant required but the training to the staff and the equipment available at the station to be able to respond.

If I could go to my next slide, the one thing, as a single utility perspective, that I think is important to discuss is that this isn't just a single site or a single utility response but has been well coordinated across the industry. So, obviously, and it's very obvious with regard to the use of the strategic alliance for flexible equipment or the safer response centers, we've pre-positioned for the entire industry equipment available. What may not always be as apparent, however, is the equipment that I just showed you pictures of that are available at my station match the other equipment available for the nuclear plants around me. So a station that may be nearby that may not have

realized the same event that my station provided is available through our coordination with the Institute of Nuclear Power Operations, NEI, and EPRI to respond to my station with that same equipment. Since the equipment is substantially similar, the tools and requirements for hookup are similar, that equipment not only at my station and the safer stations that is available at stations not affected by the same event can respond to my station, as well. So we have layer upon layer of equipment ready and capable of being implemented to respond to an event at any one station.

I also think that the open and collaborative method in which these new rules and orders have been implemented, working with the staff and working through NEI, has provided a stronger and more effective and efficient approach than might otherwise have been realized. And as the back-end of these regulations, the person in charge of implementing it, I've sincerely appreciated that collaborative response.

Going forward, I'd say that the most important things to be able to implement are similar to statements stated earlier. I think it is important to do it once and do it right. We need to make sure that we have certainty going forward with the new requirements. I think that, to date, the response has been commensurate with the safety and substantially has answered the question as to what the industry needs to do in response to the Fukushima events.

You know, as individual companies and stations, we take our responsibility relative to nuclear safety very seriously. We watched Fukushima, and we knew that our response needed to be

commensurate with the hazard that was represented there. Working closely with the staff and the industry, I think we've substantially implemented the safety functions needed in response to that. And going forward, I think we need to make sure that our response is timely and that the requirements from the staff are well understood and commensurate with the safety improvements that would be realized by any additional rules. Thank you.

CHAIRMAN BURNS: Thank you. Dr. Lyman.

MR. LYMAN: Good morning. And on behalf of UCS, I appreciate the opportunity to provide our views on this topic again.

I think, overall -- may I have the first slide, please? Our main comments, overall, I think we have to acknowledge that there's been an enormous amount of work on behalf of the industry and staff to implement Fukushima lessons learned, and that can't be denied and we appreciate that. But as we've said before, the lack of a unifying framework for assessing safety improvements that might have been provided by fully implementing Near-Term Task Force recommendation one has been an impediment to our ability to assess exactly how much safety is going to be improved by the current enhancements that have been approved. And that's a problem for our ability to communicate what's been done to the public.

With regard to FLEX implementation, I'd just like to advise that the Commission should keep a close watch on the schedule relaxations that have been approved and the potential for additional creep. So far, I believe there haven't been any that have actually asked for extensions beyond the end of 2016 and the endpoint three

apparently had requested one but has withdrawn it. So my mention on the slide there, that should be noted. We don't want to see a repeat of what happened after 9/11 where it took more than a decade before all the security improvements were finally completed at the sites.

Next slide, please. So our overall view of FLEX, I think it has to be acknowledged that it does not fulfill the original intent of the Near-Term Task Force vision, and that's clear from the boilerplate language that the staff puts in every safety evaluation report. We think that diverse and flexible are good qualities, but they may not be sufficient. And what the French have done with the hardened safety core, one dedicated set of equipment that's fully qualified to events more severe than what the rest of the plant is subject to may be an important or a necessary compliment to that. And that's clear from the boundary conditions of FLEX that were established by the original Mitigating Strategies Order and the NEI guidance. It's an artificial and stylized event, and I think that the limitations of that original order are not evident in the fact that the flooding hazard re-evaluation issue has come to the fore and may end up causing additional delays.

Next slide, please. So I think the industry position on evaluating FLEX has changed. I provide a quote from Mr. Ford from Entergy where he expressed the view also that the boundary conditions for FLEX were artificial and that you should try to evaluate, you know, real scenarios and success paths, and I think his point of view would be that the conditions may actually be less severe than the damage state in the order. But if you accept that philosophy, it's quite possible there may be conditions where the damage state exceeds what was in the

order and that would have to be followed through consistently. So it cuts both ways.

Next slide, please. We think that any performance-based requirement needs performance testing-based inspections. So we think there should be an additional inspection protocol that would essentially be a stress test supplemented by performance testing where appropriate and that force-on-force security inspections could be a model, although, obviously, there are aspects of that which wouldn't be appropriate. But the goal is to really test whether FLEX will do what the industry says it will do, and that's essentially be able to cope with any situation that comes or a sufficiently broad spectrum that we can say there's confidence that the safety envelope is appropriately large.

Next slide, please. There are some thunder clouds on the horizon that we're worried may cause additional delays, and I just note that NSAL-15-2, which only became public very recently, seems to call into question the timing for time of core uncover for most of the Westinghouse plants, if not all of them, that it could actually be reduced to one and a half to two hours, which I don't think any of the current FLEX strategies could possibly cope with that short time line. So I don't think the current plans have addressed NSAL-15-2 yet, and we don't know but it looks like that could be a problem.

Next slide, please. On flooding, pardon the pun, but I think the agency seems to be at sea with regard to its response. There's still a lot of questions to be resolved, but we do strongly support the Commission's vote on the COMSECY-14-0037. We think that that

is starting to correct some of the problems that we identified at the beginning with the limitations of the original order, and we think the simplest way to look at it is that, if you re-evaluate the hazard because you're using better information, more accurate methodology, and updated site conditions, that that's the true design basis and not a beyond design basis consideration. It's just correcting the wrong design basis.

Next slide, please. And the issue of defense-in-depth, we still think this is a very important consideration in all the activities that we're talking about, and we don't think it's a qualitative factor like the others that have been discussed in the Commission's deliberations on this. Defense-in-depth is a key part of addressing severe accidents, and, in that sense, we think that it is certainly an important and valuable consideration when you consider post-core damage requirements, for instance SAMGs and CPRR, potential actions under a CPRR rulemaking. And we think you can't just evaluate the quantitative effectiveness of mitigating strategies for preventing core damage because they depend on uncertain manual actions. You do need some defense-in-depth considerations to consider post-core damage requirements.

Next slide, please. So in that view, we strongly support that incorporating SAMGs as a regulatory requirement into the beyond design basis mitigation rulemaking is very important. We don't see how they can be effectively integrated with the other emergency procedures otherwise. And there are other potential ways where severe accident guidance may be required, for instance in the Phase 2

of the severe accident capable hardened event order. So we don't think CPRR should be simply limited to that but needs to evaluate the full spectrum of potential activities for reducing radiation releases, including the potential for filters.

I'm running out of time. Sorry. Next slide, please. I'd like to just point out Dr. Stetkar has questioned the technical analysis supporting staff's analysis of CPRR and the lack of quantitative justification for SAMGs, and I'd refer you to the ACRS deliberations on that.

And, finally -- next slide, please -- one of the activities that was not in a tier was re-assessing EPZ size and potassium iodide distribution. And even though the staff continues to maintain they don't see any evidence come out of the Fukushima accident that would call into question the 10-mile EPZ, I just provided some data which supports our view that an extension of the plume exposure EPZ to probably 20 or 25 miles would be justified, according to the quantitative data that's come out, including the dose rates in the litate village which were about 25 miles from Fukushima. We think those people weren't protected and they should have been in the aftermath of the accident.

And I will stop there because I'm well over, and I apologize for that. Thank you.

CHAIRMAN BURNS: Thank you all for your presentations. I'll begin the questioning this morning. Ms. Korsnick, on slide seven, you discussed a containment filtering strategy, and the statement on the slide is that extensive evaluations show no safety benefit for an external filter. It's a pretty strong statement. Is it that

there's no safety benefit or that, at least from the standpoint of the industry from a cost-benefit perspective, there's no benefit?

MS. KORSNICK: Yes, I understand the question relative to the containment filtration. I think you'll see that, all along, the industry's position has been very much one of protecting containment, and the idea of ensuring that we have severe accident water addition was, in fact, a stronger solution to ensuring that you kept containment intact. And that water addition, through our demonstration and analysis, provides equivalent filtration as water filter.

So since our solution involves involving this water, in addition to that, there's no additional safety benefit that a filter would provide.

CHAIRMAN BURNS: Okay, thank you. Mr. Pietrangelo, one question. If you would discuss perhaps the industry view -- we've had a little bit of discussion between your slides and Dr. Lyman's, regarding severe accident mitigation guidelines. But if you could explain, from the industry standpoint, what the concern is with respect to the justification of those guidelines in the upcoming rule that we'll be looking at.

MR. PIETRANGELO: Let me start with saying that the industry has had severe accident management guidelines in place since the mid 1990s. That commitment was looked at after Fukushima occurred. There was a request by the Near-Term Task Force to look at the status of SAMGs in the industry. The summary said that every licensee had SAMGs available. They weren't in all the locations they expected them to have. Not all of them were consistently updated or

maintained. Nevertheless, they were in programs that the owners groups kept to maintain the SAMGs.

So the question is not whether to have SAMGs or not. It's solely about the regulatory treatment of SAMGs. Our understanding, based on the interactions we've had on the proposed rule, is the staff-cited qualitative factor solely is the basis for requiring SAMGs in the rule. We thought the Commission direction on that was pretty clear. We're not adverse to a docketed equipment to have, improve, maintain SAMGs over the longer term. We think that's the right touch for the regulatory footprint on SAMGs. But we're concerned about the precedent-setting nature of citing qualitative factors only as the basis for that requirement in the rule. We think that sets a bad precedent. It goes back to a lot of the discussion that the Commission had at the time of the filter vent decision. So that's where our concern is, Chairman.

CHAIRMAN BURNS: Dr. Lyman, any comment you'd like to make?

MR. LYMAN: Yes. As I said first, we think that, in addition to the industry just having SAMGs, and I think we all know where the desire for regulatory requirement came from was the fact that the inspections of those SAMGs after Fukushima found some problems, but we think that the rule should be regarded as a coherent whole and that you can't really assess mitigating strategies before core damage under regulatory, proper regulatory treatment and then continue to have voluntary actions. First of all, at Fukushima, they didn't even know where core damage started. So it's an artificial

distinction, and the operators may not actually know.

So we think that those procedures have to be fully integrated and the agency should be able to evaluate them from beginning to end whether they would be effective. And I don't think they can do that without having the same regulatory treatment before or after core damage.

CHAIRMAN BURNS: Okay. And, obviously, the rulemaking is coming before -- we'll continue the debate in that context. One other thing, Tony, in terms of you described for, you know, there's a desire, I think, to move forward and get the endorsement on the particular NEI guidance document, the 12-06 Appendix G.

MR. PIETRANGELO: Correct.

CHAIRMAN BURNS: What do you see right now as the push points where, in terms of staff review or evaluation of that, where do you think things need to come together?

MR. PIETRANGELO: Yes, the staff has been aware of the document that we've been working on for a while. We formally transmitted it this past Monday, so we're ready to engage on it, incorporate any staff comments, and move forward with the mitigating strategy assessments. So this takes the re-evaluated flood hazards and says this is how you would look at your mitigating strategies to provide assurance that it's still viable under those kind of flood conditions.

So I think if we can get that guidance endorsed before the letters of adequacy on the re-evaluated flood hazards, we'll be in good shape to conduct those assessments with confidence.

CHAIRMAN BURNS: Mr. Franke, you talked about support or input from other organizations in terms of, you know, your own on-site implementation of some of these strategies. And in particular, you mentioned INPO. What's INPO's role in this context?

MR. FRANKE: Well, INPO, and I don't speak for the institute but as a member, they have several roles, actually. One, they do do assessments of our own strategies against a response. They provided their own, as you likely know, their own event reports with recommendations to respond to the Fukushima disaster. We've had a series of those. And as an industry, we police ourselves through the institute. They come in and evaluate us against the recommendations provided by INPO.

In the case of an event, our processes and procedures would require us to contact INPO very promptly after the event, and they would coordinate the response from other member utilities to our station. So an event at Susquehanna, through coordination with INPO, would get response in both equipment, personnel familiar with that equipment, not only from the safer sites but from member stations, as well.

CHAIRMAN BURNS: Okay. Thanks very much for that. One question I had, Dr. Lyman, I think on one of your slides, I think, speaking of the Commission's SRM on the flooding issue, it seems that, on slide seven, it seems to take issue with the SRM because we direct the staff to be risk informed, and the SRM says risk informed in performing its base to the extent practicable. And I was trying to understand what your concern was, again, as reflected in the

slide and your comment.

MR. LYMAN: Yes, thank you. I think the issue is just that I think one of the problems with being able to do the flooding hazard re-evaluations and incorporate them appropriately is the lack of having probabilistic risk assessment methods for flooding, and risk informed generally refers to having such tools available. And I think without having that, it's hard to assess what, you know, what are the most safety-significant issues in a quantitative sense. And I think that may be, that may cause problems as the industry tries to address the issue of flooding hazard re-evaluations in the context of both FLEX and installed equipment.

So we think that a more conservative approach may be needed at the beginning, more deterministic, and then, as methods improve, the industry could try to secure, you know, some risk-informed modifications to what they're doing. But there may not be time to come up with a credible methodology for judging what's risk significant, you know, or what's highly risk significant on a quantitative basis.

CHAIRMAN BURNS: On another topic, could you elaborate, you suggested in terms of sort of testing FLEX strategies as a stress test type approach, it reminds me of your opinion the EU did in terms of looking at the post-Fukushima. Could you elaborate on what your concept is there?

MR. LYMAN: Yes. I mean, I envision that there would be a, you know, a red team of analysts who would come up with a set of scenarios. And then through a combination of analytical work, tabletops, and performance testing where appropriate, they would

actually see if there are success paths that are plausible. So in other words, you would stress the system with a certain boundary condition and then evaluate the equipment that, you know, if it's qualified to a certain seismic or flooding hazard, you evaluate the manual actions. You just try to assess it in a more realistic way. Instead of just saying we've met the battery of conditions in the mitigating strategies order, you do this, you know, actual scenarios. And, of course, you can't cover everything, but, if the idea of FLEX is it should be able to deal with pretty much everything, you can test that with a certain set of scenarios. So that's sort of my idea.

CHAIRMAN BURNS: Okay. My time is up.
Commissioner Svinicki?

COMMISSIONER SVINICKI: Well, I thank each of our four presenters for your presentations today. I'll give you some warning that I'm not sure I'm going to find a question anywhere in what I'm about to say, so that allows all of you to either tune out or do whatever you'd like.

I was preparing for this meeting last night, and it caused me to really pull back and reflect on where we are right now because, in looking at what the staff is going to present, they're going to both talk about status but give a forward look on other of NRC's Fukushima activities that are underway. And I began to get into kind of a deeply philosophical train of thinking, which is a little curious because I've been here for all of this, and Commissioner Ostendorff and I share that so I apologize for my two colleagues who, you know, weren't here for the journey all along the way. But you would think that I would have

great clarity, therefore, on everything that the staff is about to present. And it's not that I'm confused by the activities or don't remember their origins, it's just -- well, maybe this will give you a sense of my mind set. I texted a friend and said, "What's that science fiction movie we like where they spin that top on the table?" and, if a friend knows you well enough, that's enough that they go, "It's the movie 'Inception.'"

So my thoughts were, as confusing as some of the plot lines of that movie were, I think, you know, I spoke at the Regulatory Information Conference that I think the United States can take a lot of pride in the very measured both political and technical and public reaction to the accident in Japan. I commented, you know, that President Obama had asked us to do a quick look at what were the relevant learnings and asked the nation's safety regulator to come forward with any near-term actions that needed to be taken. And there are other countries that were perhaps not as structured in how they reacted to events. Yet, here we are, this many years later, and we have those who very sincerely believe that we've done nothing. I appreciate that the U.S. industry provided an opportunity for me to bring my counterpart from Japan, a Japanese commissioner from their nuclear safety agency and a number of Japanese technical staff to a U.S. nuclear power plant -- that happened to be Palo Verde -- to look at what's been done. And, you know, that's meaningful to me.

I know that when I was here the orders that were issued on the one-year anniversary seemed like a very substantive body of actions. The U.S. industry is deep into implementation of those actions right now.

And I wondered that there are events where the peril of overreaction or imprudent action I think comes early after the event. But I'm beginning to think to myself that there are events where the danger of engaging in actions that go beyond what is needed actually comes much later after the event, and I think that can be because you're so deep into what you're doing that maybe you lose some perspective on all that you've already done.

So as I look -- and our Commission will have a separate meeting on the mitigating beyond design basis proposed rule that the staff I think is delivering to us today. But as a Commission, of course, we've been following their work along the way, and I think about some of what's creeping into the analysis now and I worry that it is reflective of some loss of perspective. Yes, the SAMGs were inspected under a temporary inspection instruction after the events in Fukushima. And if we reflect upon the fact that, historically, it is a voluntary program, and voluntary initiatives have a place in NRC's regulatory framework, they do not take the place of things for which you have a basis to require compulsory action.

But as I reflect on the proposed rule, I wonder what it is that arose from Fukushima that causes us to say that there was not a basis for compulsory action but there is now? If it's enhanced defense-in-depth, although I agree with Dr. Lyman that that has a very unique role in our regulatory framework, defense-in-depth does, and does need to be looked at as a special case, other than qualitative factors, at the end of the day, if it's not quantified, it is definitionally a qualitative consideration or whatever you want to call it.

So, you know, there were issues with the SAMGs, but when I look at the actual writeup of what were the observations it says in some cases the procedures were not available in all locations, didn't reflect the proper control designations. It says while personnel do appear to be properly trained and knowledgeable, exercises at some sites were not conducted or were not recorded as being periodically conducted.

So, you know, if you're a regulator of communications, you have to decide what it is so objectionable that it can't be aired. So the parlance there is we know it when we see it. If you're a safety regulator, the adequate protection is kind of your version of you know it when you see it. So we do have the authority, as a commission, to deem things matters of adequate protection. But if four years after an accident we have a fundamental view of what is necessary under adequate protection, you know, was there error in our thinking early on that there were not a set of strong and additional actions that were needed? So this is maybe more for the NRC panel, but I think we need to look at that.

I also agree with Dr. Lyman that there, you know, if there isn't a framework for something, it is very difficult as the years go by to say how do each of these discrete considerations of actions fit into the totality of the regulatory response? But the truth is, the Commission has acted on a number of the Near-Term Task Force recommendations here. Here, May 19th, 2014, the Commission has disapproved the staff's proposed improvement activity one: establish a design basis extension category of events and associated regulatory

requirements; has disapproved improvement activity two: establish Commission's expectations for defense-in-depth; and it has disapproved improvement activity three: clarify the role of voluntary industry initiatives in the regulatory process as written.

And it said for activities one and two, the staff should re-evaluate them in the context of the long-term risk management regulatory framework. I believe that work is due to us in December of this year. And for improvement activity three, the Commission has only approved the proposal to evaluate the current status of implementation of the most risk or safety-significant type two initiatives, which are a type of voluntary initiative.

So we've had a lot of turnover on our commission. I don't know if that is another factor in not having a consistency in the overall framework or approach to issues. But it does concern me on something like the mitigating beyond design basis rulemaking, if we take the set of actions that a commission three years ago established and take that direction, if we constantly revisit these threshold issues, I don't think you ever achieve the kind of harmony, coherency, or stability in acting on the Tier 2 and Tier 3 or even the fidelity on the implementation of Tier 1.

So I sit here today, I will say, somewhat concerned about where this drifts from here. And, again, I don't mean to keep talking about Dr. Lyman's presentation, but I think embedded in there is that some concern, maybe from a different vantage point, about drifting a bit and kind of losing your purpose and direction that you set out on now.

I do believe that, in working on the Near-Term Task Force recommendations, we have shaped those significantly. So I acknowledge totally that we are not implementing that set of recommendations as they were published in the months following the events. But still, in all, whatever direction we have set and whatever policy judgments we have made, I think if we're going to, in the more detailed implementation of actions, depart from those, then I think it needs at least to be done consciously.

And so I wish I had a kind of thumbs-up and all's clear this many years after this accident, but I am a little bit concerned at looking, when people in the future look at the set of actions that were taken five to seven years, you know, after Fukushima, it would be nice if they were able to see a kind of coherency and approach throughout them. And I'm a little worried not so much in what we've done to date but some of the proposed things on the horizon that we may drift away from that. And I've been here, so, to the extent it's happening, I bear some responsibility for it. But I think, unless we have the basis of new knowledge to depart from the threshold calibrations that the Commission has set to date, I would hope that we would only do that on the basis of new facts and new information and not constantly be re-setting the standards and making new judgments about what needs to be done after Fukushima. I think there's peril for the regulator and the industry in that.

So, gosh, I rambled on. It's a lot like my speeches, isn't it? I just hit go. But I appreciate the opportunity to reflect on that. I appreciate the indulgence of my colleagues, some of whom have

traveled the journey with me and others who are going what the heck is she talking about? But with it, I yield back.

CHAIRMAN BURNS: Thank you, Commissioner. Commissioner Ostendorff?

COMMISSIONER OSTENDORFF: Thank you, Chairman. Thank you all for being here today and for your presentations. Perhaps like Commissioner Svinicki, my good friend and colleague, I'll provide some perspectives, as well, as the better part of comments because I think you've made some very important points since you and I have been the Commission continuity here since the Fukushima action items.

Let me start out, I'm going to make a couple of comments and I'm going to have one question for Mr. Pietrangelo, but let me start out with Ms. Korsnick. And I appreciate the perspective you've provided on the 15,000 discrete actions that are approximate 70-percent complete. This is a public meeting. Because we have been criticized in the public by members of Congress with respect to lack of action, I think it's helpful to get the facts out on the table.

Along with Commissioner Svinicki, I worry that there are inaccurate statements being made in the press by some members of our oversight committees. And I personally, along with other commissioners here, see a lot of effort and actual discrete actions that have occurred by the NRC staff and by industry. And so I thank you for providing that perspective.

I'll come back to Mr. Pietrangelo later on. Mr. Franke, I appreciate your discussion on the training. You know my

background. I've done hundreds, if not thousands, of drills and have fought real fires and dealt with real flooding on a submarine and I've dealt with some very significant damage control measures, so I'm big into the training operator piece.

And so your comment of 5,000 man hours of training, to put it into perspective, for one site was very helpful, as well as the hundreds of hours in training in emergency preparedness type actions. I believe that the NRC staff, as well as the industry CNOs, when they went to both Dai-ichi and Daini, saw the strong importance of proper command and control and training. And so highlighting that in your presentation is extraordinarily helpful for us. Thank you for doing that.

Mr. Pietrangelo, with respect to -- the Chairman had commented on this. I wanted to make sure I just pull one string. The Chairman had led off in two. On your slide three, you made a comment associated with the need to expedite reviews so the mitigating strategies assessment can be completed by the end of 2016. Does the NEI 12-06 guidance, does that go a long way towards your view providing some more granularity to help us get through those reviews?

MR. PIETRANGELO: Absolutely. 12-06, Appendix G, is taking the re-evaluated flood hazard and assessing your mitigating strategies for viability under those conditions. And you'll either come up with verifying that your mitigating strategy is still fine. You know, for FLEX, we assume the initial condition where you lost all AC power and lost access to the ultimate heat sink. Now that you have an actual re-evaluated hazard, you may find that permanent plant equipment is

still viable, like your diesel generator, so you wouldn't have to employ. That might be an alternate mitigating strategy that you would identify for that condition.

And then if you get to a condition where you're completely flooded up and you're doing more extraordinary measures, that's the targeted hazard mitigating strategy that's referred to. So our guidance would encompass all three of those different potential scenarios, report back to the staff on the results of the assessment, and then, if there's any actions necessary, also try to -- this is the other handoff we were talking about before is, one, to get the flood level acceptance; and then another one, once we complete the assessment, to say we agree with it, as well as any actions you need to take post-assessment. But that guidance contains all we think we need to do for flooding.

COMMISSIONER OSTENDORFF: Okay. I'm going to make a comment, I think also is triggered, I think, by one of Dr. Lyman's points, and I know you suggested table tops to a certain extent, and you discussed this in response to Chairman Burns' question on the stress test, and maybe we did not provide -- maybe the NRC maybe industry has not provided you the opportunity to see this.

I'm going to give you one example I saw just last Tuesday. I visited four plants in the month of April, Arkansas Nuclear I, Grand Gulf, Monticello and Davis-Besse. Two of those plants are on the Mississippi River. I spent a lot of time in particular last Tuesday at Monticello, looking at their flooding strategy, because they're right there on the river. There's an intake channel that comes in.

It kind of goes to the point about a stress test type event, and it goes Mr. Petrangelo's comment on targeted strategies. So that licensee had constructed a bin wall 40 feet tall. So it's about twice the size of maybe -- twice the height of this building, and the linear length of that was perhaps two to three times the width of this building.

What that had done was constructed reinforced aluminum with rebar in there. But it was designed as a site-specific strategy to deal with the fact they could not have passed the time requirement to construct this wall and a earthen levy in the time that we required them to.

So I think some of that may be happening. I want to encourage our staff to communicate that, because I think that as we go through this on a site-specific basis, some of what you're asking for and suggesting, which I don't necessarily disagree with, I believe in the context of targeted strategies, there are significant examples of what's happening around the U.S. nuclear fleet. So thank you for your point on that.

I found the visit very helpful, because that strategy was X number of days to build this bin wall and Y number of days to build an earthen levy, but that was greater than what we required. So they went ahead and built the bin wall now, so that in a rising flood scenario in the Mississippi River, the bin wall's done.

So now we turn to some of your comments. Now I'm going to preface this by saying I think the Commission in my five years here, and Commission Svinicki's eight years here, we have benefitted significantly from the Union for Concerned Scientists' participation in

this, in these sessions, and I have a lot of respect to Dr. Lyman, for you and your colleague David Lochbaum. I think you're knowledgeable and engaged in a very constructive, and I think we benefit significantly from your interface with the Commission as well as the staff.

That said, I perhaps will highlight maybe some different viewpoints. I'm not saying that I'm right and you're wrong or anything. But I just want to highlight again, because we have a public meeting. I think it's important for people to hear if there's a differing view on something.

I do want to highlight a couple of different views that I personally have. I'll speak just for myself on some of the points you made, and your presentation was very thoughtful. Commissioner Svinicki has already dwelled a little bit in a constructive way on Near-Term Task Force Recommendation 1, and I understand your point about the lack of unifying framework.

I am not going to sit here and say that in a conceptual way I disagree with your comment, nor did Commissioner Svinicki disagree. But I think since the two of us are involved in decision-making on this, you know, in the last four years since Fukushima, we saw that trying to get the closure on taking some safety actions in a fairly expedient manner would be significant delayed by waiting for a Recommendation 1 type effort, to go through and do a wholesale review of our entire framework.

So I respect your position. I think we took that into account, decision-making back in 2011, and came to a different point. I've been blessed with Amy Cabbage. Amy, raise your hand there,

who's on my staff, and she was on the Near-Term Task Force report. So I got a lot of indepth knowledge about their thinking. She was one of the authors of that report.

I'd say that since that report, which was a really Herculean effort in 90 days, at the same time there was that amount of time and the amount of time, I can't spread my arms wide enough, for the staff efforts since that report came out. So I just have a different view on the FLEX comment you made, whereas the FLEX does not fulfill the original intent of the Near-Term Task Force.

I think there's no -- I don't agree with that comment. Again, I'm not saying I'm right and you're wrong, but I just have a different viewpoint. But I believe that from a pragmatic standpoint, that trying to get some -- move down the path to address the station blackout scenario in particular, and provide backup means for power and moving cooling water to remove decay heat, those are smart steps.

I saw analogous fairly quick actions taken in my time in the Navy, in response to different events. The last comment I would go to is your comment about the true design basis on the flooding piece, and again, I have a different view. I don't think that the original design basis is wrong.

I think we are the beneficiaries of new knowledge and new data, and I believe that this new information that has been captured by the flooding hazard reevaluation is being acted upon, responded to by our staff, and that's part of the Commission SRM guidance on the individual assessments.

So I think at the end of the day, we'll get to a proper

place on that, and I want at least to comment on your thoughtful presentation, and I thank you for listening to that. Thank you, Mr. Chairman.

CHAIRMAN BURNS: Thank you, Commissioner. Commissioner Baran.

COMMISSIONER BARAN: Thank you, and I'd like to express my thanks for all of your thoughtful presentations. Marie, I want to start by asking about implementation of Phases 1 and 2 of the hardened vent order, which are targeted for completion in 2018 and 2019. Can you just take a minute and walk us through the work that needs to be done to comply with that order?

MS. KORSNICK: I understand your question is around the Phase 1 and Phase 2 for the --

COMMISSIONER BARAN: Hardened vents.

MS. KORSNICK: --hardened vent, and yeah. Just to step us through, actually Steve Kraft, who's sitting behind me, might be a better one, Steve, to answer the details for Phase 1 and Phase 2.

CHAIRMAN BURNS: And if you would, Mr. Kraft, identify yourself and your affiliation.

MR. KRAFT: Yes thank you, Mr. Chairman. Steven Kraft, Nuclear Energy Institute. I'm the industry lead for the vent order. In answer to Commissioner Baran's questions, Phase 1 is the wet well vent. First, I should just say 29 plants that are affected by the order. It was 31, but two have dropped out. One shut down and one will shut down.

So Phase 1 wet well vent, guidance was approved

about a year ago. The plans were submitted to the Commission staff at the end of last year. They are in process now. What's left there are the traditional design engineering installation modification testing verification steps, very much like what's going on in FLEX. Just about a two-year delay on that, because the order was later.

The second phase is a bit more complicated. The order requires either a severe accident-capable dry well vent, or water strategies to allow you to operate under ELAP (phonetic) conditions, to manage water that's being injected, as has been discussed here today, to cool core and protect containment.

That's a very complex set of procedures. To do that, you can imagine the idea of not wiping out a wet well vent, controlling water flows, things like that if a plant should elect to do that. We have just yesterday received an endorsement on the guidance that we wrote to implement that, and then you move forward with that.

It is less about modifications, or there will be some modifications to assure water injection to containment or the reactor vessel under ELAP conditions reliably. That's a lot of words there that drive a lot of requirements. But there's also analysis required.

So it's not just the engineering design steps. There's some analytical steps involved, and some more NRC reviews. The plans for that from the industry are due by the end of this year, and then it's like another year longer to the end of 2019. So it runs very much like FLEX did a couple of years out, but there's more complicated analyses when you get to Phase 2.

COMMISSIONER BARAN: And do you see any

challenges in completing this work by the 2018 and 2019 --

MR. KRAFT: Not at this time.

COMMISSIONER BARAN: And I guess, I think for folks who are just kind of not following everything very closely, or are following it closely, this has -- you know, the hardened vents are kind of the long pole in the tent on Tier 1, right? I mean we have so much that's going to wrap up by I think 2016. This is all the way out to 2018, 2019. Do you see any opportunities for accelerating the schedule?

MR. KRAFT: The schedule is tight as it is, and I have to tell you it took some Herculean efforts on the part of industry staff and NRC staff, to meet the schedule we have been meeting in terms of a document review, document approval. The guidance for the vent is well over 300 pages long, with any number of appendices and white papers.

Let me compliment Raj Auluck here, the project manager handling that. We have worked very closely on schedules. So to suggest that we might be able to shorten that time frame Commissioner, I'm not seeing that.

COMMISSIONER BARAN: Okay, thanks for that. Do you have any thoughts about implementation on hardened vent order?

DR. LYMAN: Yes, thank you. Well, we think that the -- especially the Phase 2 -- well first of all, the fact that some of the FLEX strategies depend on completing that, and so they had to be -- the FLEX compliance deadline had to be relaxed to allow completion of the vent.

That makes sense from our point of view, because if they need the severe accident capable hardened vent for their strategy, then that's something that might have been sorted out sooner if there, I think, had been this more coherent or holistic view at the beginning. But I won't press that point.

On the issue of the Phase 2, we think that there's been a kind of -- this is an example of draft. So instead of simply requiring a severe accident capable dry well vent, the Commission is allowing the industry to pursue these alternative strategies, which depend on manual actions. We don't think that a piece of hardware -- we don't think that that's necessarily an appropriate tradeoff, because you lose something if you rely on manual actions to replace what an installed piece of equipment could do, and it's sort of -- it's similar to the -- what's down the pike with regard to the external filters, and the fact that the idea was perhaps there are manual strategies that would accomplish the same as actually installing a filter.

Now the staff's judgment is that maybe there's no justification doing any of that. We think that's inconsistent with the philosophy of perhaps requiring this post-core damage manual actions as part of the hardened vent order. So we think again there's some incoherence there that would be sorted out, only if the whole package were evaluated consistently, again with regulatory, proper regulatory treatment of all the post-core damage manual actions that are being discussed.

COMMISSIONER BARAN: And so on the containment protection and release reduction proposed rule, I don't

know where they come up with these names, but so your view is that filtered vents should be -- we should take comment on their requiring filtered vents as part of that rulemaking?

DR. LYMAN: Yes. I think the original deal, as it was, the Commission approved severe accident-capable vents, but then said take more time to evaluate whether you need to filter those vents, or whether there are these alternative manual actions that would adequate substitutes.

It doesn't make sense to have severe accident capable vents if you are not also addressing the potential for enhanced radiological releases from those vents after core damage. So we think the Commission's -- there's a commitment to go forward with the rulemaking, and to fully evaluate what it said should be considered, including the option of external filters as well, and there shouldn't be any attempt to walk that back, in our view. You're locked into that.

COMMISSIONER BARAN: Maria earlier expressed the view that water addition strategies would provide an equivalent safety benefit to external filters. What are your thoughts about that?

DR. LYMAN: Well, I'm not completely familiar with all the technical analysis, but I think there are questions about again, we're talking about defense indepth and there's always going to be some uncertainty about the efficacy of that and those kind of management strategies, and those could be -- that uncertainty could be reduced with, you know, with passive approaches like upgrading hardware as opposed to these active approaches.

And but I'd also just point again to Dr. Stetkar's

questioning of the technical analysis that's supporting that -- the regulatory basis, and we'll see if the ACRS elevates that a letter. But at least his concern is that he doesn't think the technical analysis is adequate to support those conclusions.

COMMISSIONER BARAN: And Maria, just following up on that, what further technical analysis, if any, remains to be done regarding water addition?

MS. KORSNICK: In the water addition, I guess let me just comment. I appreciate that Dr. Lyman said he wasn't familiar with the analysis. Just the work that was done relative to the filtration strategy was done through EPRI and through some other external engineering firms. I would say it was very robust, very regressed, and there's a lot of documentation and we invite his review of that.

And in terms of severe accident water addition, you know, each plant needs to have a view of the particulars for their plant. In other words, where things tap off, at what heights things tap off would then tell you basically how much volume of water that you would be able to add, what flow rate that you would want that water.

So whereas the filtration strategy analysis that was done was on a more, I'll just say broad, maybe more generic basis, when you get down to severe accident water addition, each station is going to have to make sure that they have a station-specific look, so that you know exactly what you want designed.

So as we said, I think there's 29 plants that this applies to. So that would be on track on what would be required for Phase 2.

COMMISSIONER BARAN: I'm a little over on time,

but I just want to ask one final question, which is given the research that has been done there and what it's shown, why do you think some of our foreign international counterpart regulators have acquired filtered vents?

MS. KORSNICK: I guess, you know, just my opinion, but I can just conjecture that really going back to what Commissioner Svinicki said, I think in some cases people made some calls very early on to make certain requirements, maybe didn't do the depth of analysis that others have taken time to do.

We have done a very indepth analysis of the BWR Mark Is and Mark IIs. So there might be other containment types that they had a view that that was a better answer for. I feel very confident in the rigor of the evaluation that was done for the statement we've made, and recently attended an IAEA conference where the NRC themselves responded to some questions there, in support of the decision that we were going forward for.

And so again, not only has the industry done very rigorous evaluations, the NRC staff also has done very rigorous evaluations, and they compliment each other well.

COMMISSIONER BARAN: Okay, thank you. It looks like Commissioner Ostendorff might want to jump in.

CHAIRMAN BURNS: Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: I do want to just maybe provide one thought in response to Commissioner Baran's question on the European approach. I'll just say, and others will have experiences as well at the table, so they might want to chime in too.

But when I visited Sweden in October 2012, to specifically look at the filtered vent installations at Oskarshamn, south of Stockholm, and to discuss with the Swiss regulator, excuse me the Swedish regulator, why they'd install this.

I asked what was the analysis from a regulatory standpoint that was done to support the filtered vent installation, and they said very bluntly there was none. It was done strictly as a response to Chernobyl, and it was not pursuant to a scientific or engineering regulatory analysis. So that's just one data point for you.

CHAIRMAN BURNS: Thanks. Any other comments? I thank again the panel for your presentations this morning and answering our questions. With that, we'll take a brief break and try to reassemble at 10:25.

(Whereupon, the above-entitled matter went off the record at 10:18 a.m. and resumed at 10:26 a.m.)

CHAIRMAN BURNS: If we could take our seats again, please, we'll start with our second panel, the NRC staff panel.

Joining us this morning are Mike Johnson, the Deputy Executive Director for Reactor and Preparedness programs, and the Fukushima Steering Committee chairman; Bill Dean, the Director of the Office of Nuclear Reactor Regulation; Jack Davis, the Director of the Japan Lessons Learned Division in NRR; Scott Flanders, Director, Division of Site Safety and Environmental Analysis; and Ray Lorson, Director, Division of Reactor Safety, NRC Region I. So welcome and Mike, please proceed.

MR. JOHNSON: Thank you. Good morning

Chairman and Commissioners. As we sit here today, we're pleased to report on the progress that's been on translating the learnings from the tragic accident at Fukushima into plans and actions that have, as you heard in the previous panel, and will continue to make plants safer.

The scores of NRC staff that have been working on these activities have exhibited great dedication, great determination and technical competence, and I think as a result of that, have significantly been able to advance what was proposed in the Near Term Task Force in the right direction. Of course, the staff's work was benefitted greatly by valuable interactions with stakeholders, including the industry, including the public and including the ACRS.

We have continued to maintain our focus on the guiding principles that we established shortly after we formed the steering committee, that is to not distract ourselves from safety, to be disciplined streamload of things that we would be adding under the auspices of the Near-Term Task Force, the Steering Committee and the JLD.

We don't want to displace from higher priority work, greater safety significance work. We want to make sure that we do it right the first time, and we certainly want a sound basis for decisions. This is a complex effort, and it does continue to demand our continuous attention, to ensure that we get things done in a high quality manner.

We're seeing plants come into compliance, and with respect to the orders, and at least for me, I think that's very exciting.

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Most importantly, in spite of all of the work that's going on, licensees and the NRC have been able to maintain their attention and to ensure that plants continue to operate safely and securely. I think that's particularly important.

We do have work to do, as we will continue to discuss in the panel. We're confident that we'll be able to reach resolution on the 301 items with continued work and focus, and also to move forward in terms of serving up for resolution the Tier 3, Tier 2 and Tier 3 initiatives in a highly effective and efficient manner.

Bill Dean, the Director of the Office of Nuclear Reactor Regulation, will begin our presentation.

MR. DEAN: So thanks Mike, Chairman, Commissioners. Pleased to be with you this morning. Mike's not all that happy about the fact that I'm just getting over some bronchial stuff, so he's probably not pleased to be sitting next to me. But I'm pretty sure my voice will hold out for this presentation.

Chairman, thanks for introducing the panel. That will save me this slide. We can move on to the next slide. So this slide is, I think, a pretty nice graphic that shows on one page a pretty good state of affairs relative to our Tier 1 implementation.

We are on or ahead of schedule of everything, except for the flooding hazard analysis, and we'll be talking about that a little bit more later this morning. I was very pleased that Dr. Lyman noted in his opening remarks the fact that there has been great progress by

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industry and the NRC, relative to pursuing Tier 1 actions out of the Near-Term Task Force recommendations.

I'm very proud of what our staff has accomplished to date. It's been almost four years solid of some pretty substantial effort. I think the staff has shown a lot of resilience, a lot of creativity and innovation, as things have progressed and we've learned more as we've gone through this.

So I'm very proud of the staff, as represented not only by the people in the divisions at this table, but also offices like Nuclear Security Incident Response, the Office of Research, Office of General Counsel have all had major roles on certain aspects of the Tier 1 activities. So it's a true collective effort on the part of the agency in the progress that we've made thus far.

Relative to the flooding, I do want to point out that part of the slide where it shows current projection going into 2019. That would be if we were staying the course with the path that we had been on. Clearly, we haven't made the progress that we, I think, anticipated. I think we overestimated or underestimated the challenges that would be before us relative to doing the flooding hazard evaluations.

I give the credit to -- a lot of credit to Scott and his staff, for taking a pretty hard look at themselves and how they can be doing these reviews in a more effective and efficient manner, and borrowing from a lot of the insights that we've garnered from the SRM we received from the Commission on SECY 14-0037, relative to being, you know,

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more crisper and focusing more on those plans, where really we could see some more benefits to safety from doing a flooding hazard evaluations.

Scott will talk more about this a little bit, but the gold bar in their enhanced schedule for mitigating strategies reflects what they believe to be the progress that they can make in getting information to licensees by the end of the year. Mr. Petrangelo talked about some skepticism that industry has, given past performance.

But I have confidence that Scott and his team will be able to be successful in meeting the projections that they're putting forth. Next slide please.

So the key message on this slide is that there are substantial safety enhancements in place, and substantial safety enhancements that are being put in place. So for example, relative to the mitigating strategies, the slide before noted that were six plants that are currently in compliance with the mitigating strategies order.

By the end of the year, we anticipate 50 percent of the facilities in this country being in compliance with the mitigating strategies order. The previous slide noted 18 plants were in compliance with the order on spent fuel pool instrumentation. By the end of this year, we anticipate 75 to 80 plants will be in compliance with the spent fuel pool instrumentation orders.

So that's real progress, that's real safety enhancement that's taking place, and then I appreciate your comment, Commissioner

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Ostendorff, about some of our external stakeholders that's sitting there promote a message that nothing's being done. There's a lot being done and is being put in place that's enhancing safety.

Relative to the reevaluating hazards, the flooding and seismic, while there's still a lot of work being done in terms of looking at those evaluations, what sometimes gets lost in the dialogue is that all the plants were required to put in interim compensatory measures, both for seismic and for flooding, and we've evaluated, at least for the Tier 1 and Tier 2 flooding plants, the interim actions that have been put in place, and have found those to be satisfactory, and then the same thing for seismic.

So we're talking about things in seismic like anchorages of pumps and tanks and things like that. Relative to flooding, we're talking about enhanced protective measures for spaces or components utilizing barriers, inflatable barriers, sand bags, things like that.

But it is providing enhanced safety and compensatory measures, so that we complete, can complete the longer-term evaluations. Relative to other activities, the Tier 2 and Tier 3 activities, really the majority of the Tier 2 have either been done or integrated into the mitigated beyond design for that rulemaking.

So really there's not much in terms of Tier 2 that remains to be done, and Tier 3 is either on ahead of schedule. We did dispose of one Tier 3 action, that being the expedited transfer of spent

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fuel. That's something that the Commission help disposition earlier or last year. So we have actually done some of the Tier 3 work already.

Next slide, please. So relative to improve deficiencies for threat hazard reevaluations, again Scott will talk some more about that. But I think it's important to point out that we pout ourselves in bit of a conundrum when we embarked on our Near-Term Task Force activities, by doing the mitigating strategies order in parallel with the 2.0 seismic and flooding hazard reevaluations.

So as the Commission is well aware, and as we tried to demonstrate in SEC 14-0037, as it pertains to flooding, it's a very complex interrelationship between what's going on in mitigating strategy space and what's going on in the reevaluated hazards space, both flooding and seismic.

And so I think the Commission certainly appreciates the challenges that we face, in our efforts to try and bring some coherence to these sort of multi-path activities, and trying bringing them together.

We do appreciate the support that the Commission provided us relative to Recommendation 1, which I thought really was the most important recommendation out of that SECY paper, which was that the intent is that the mitigating strategies be protected to the reevaluated hazard.

To me, that was the most substantial piece of that, and then the Commission affirming staff's belief that that is indeed the case

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will, I think, help us move forward with a greater degree of clarity, and also the recognition by the Commission relative to Recommendation 2, that there will be some sites out there because of some very complex environmental conditions for those plants, that will need to rely on targeted strategies to be able to deal with the reevaluated hazards.

So we appreciated that endorsement, and even though our Recommendation 3, which looked to merge the mitigating strategies with the flooding hazard reevaluation integrated assessment activities was not agreed to. I think the Commission really gave us a lot of great guidance and direction, in terms of how to be able to pursue our future endeavors in that regard.

So all in all, I thought that the Commission direction on that SRM was quite positive and very beneficial for the staff. Next slide, please.

So over to the action plan, one of the actions out of the SRM for that SECY was to develop an action plan relative to the Phase 1 and Phase 2 reviews. I'm very pleased to say that we formed a working group that consists of branch chiefs and senior staff from both Scott's division and Jack's division, working hand in glove to be able to develop a plan.

They've had the opportunity to get insights from Mike and I relative to some executive level guidance, and so we're looking forward to the plan that they're going to develop. I think it will meet --

It will meet all the things that the Commission directed

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us to do, relative to providing a more efficient and effective approach towards achieving meaningful safety benefits out of those processes, and I know in talking to many of the Commissioners, there was some disappointment in sort of the lack of information we gave you relative to what the Phase 2 approach will be.

So we will certainly reflect on that guidance as to what's in the SRM, and provide you in our plan our approach to putting a Phase 2 guidance document into place. So with that, that completes all of my remarks. I'd like to turn it over to Mr. Davis. Jack?

MR. DAVIS: Thanks Bill. Good morning Chairman and Commissioners. I'm pleased to report out to you on NRC Fukushima activities and certainly seek your continued insights and guidance and move forward on this work. So with regard to the mitigation strategies and the spent fuel pool instrumentation orders, as you've heard from the previous panel and Bill as well, plants are coming into compliance on schedule, again using existing hazard information, as Tony had pointed out.

I think that while implementation of these two orders certainly provides a substantial increase in the safety margin of the U.S. fleet, against again unknown and extreme natural phenomenon, that's the real thing there.

The magnitude of this investment is extremely sizable, in terms of just safety resources being used by the NRC and by industry, as well as the capital improvements, the modifications and so

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on. It's a sizable effort.

To ensure an efficient and timely regulatory review of such a large magnitude and undertaking, the NRC adapted its review processes by instituting an electronic and on-site audit process in place of the traditional RAI process that we typically use for licensing actions.

The audits have proven to be extremely beneficial to the NRC, in terms of gaining a solid understanding of what the licensee are planning on doing with mitigation strategies, their time lines, the feasibility of the strategies, and also early understanding of any of the barriers or concerns that they were having as they start to implement these particular strategies.

Likewise, we found that the audits have been extremely beneficial to industry, in terms of regulatory risk reduction, because they're hearing from us earlier in the process. It helps with timely and efficient reviews, because you can have a more continuous, if you will, back and forth dialogue on some of the issues.

And then of course the sharing of knowledge and best practices between utilities, and understanding what the NRC has looked at from other plants and how you apply that to the plants going forward. So it's been a huge success, I think, on both parts.

I've personally observed and participated in several of the audits, and I can tell you that each time there was an efficiency improvement in the one from before.

We continue to learn from them as we move forward

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and apply that knowledge going forward. Regional staff have also been actively involved in the audit process, and they have -- not only providing the valuable plant knowledge that they have, but also this is very helpful as we start to move from, you know, the licensing if you will, and going into the oversight, and Ray's going to talk a lot more about that in his presentation here in a little bit.

We've also participated in industry workshops that were designed to share knowledge with the plants that already have come into compliance, with those that are scheduled to come into compliance over the next several outages, and there was a lot of good information sharing, not only from a regulatory perspective but also from licensee to licensee.

So if we talk about specifics, Bill mentioned a few of the numbers there. Specifically, we have six units already in compliance at the start of the spring 2015 outages. Approximately 25 percent will be done by the end of the spring outages. More than half are expected by the end of this year.

The entire U.S. fleet will be in full compliance with both of these orders by the end of 2016, with the exception of the 12 plants that were -- where compliance is tied to the EA-13-109 order. But even with those plants, all of the mitigation strategies requirements need to be in place, other than just the piece related to vents.

And we obviously in accordance with Commission direction on COM-SECY-14-0037 SRM, the staff and industry are

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diligently working towards completion of the mitigation strategy orders, that would also be able to protect against the reevaluated hazard by the 2016 date. You know, as I mentioned the strategies will be in place for the design basis piece, but we think that we'll have a good number of plants that also could have the reevaluated hazards as well.

There may be a few plants, just depending on the complexity of the analyses, depending on if there had to be any mods made or if there's changes that have to be made to their strategies, that likely could go beyond that date. But again, we're striving. We recognize how important this is as a goal, to make that happen.

And Scott's going to report out to you briefly also on that effort, on what we're doing to accelerate those reviews.

If I can have my next slide, please. I think it's important to note that while good progress has been continuously made, there's a sizable amount of work yet to be done, to bring these two orders to appropriate closure. Obviously, we're going to continue to do the obvious to the plants coming into compliance. Staff will also be documenting and completing their safety evaluation reports and making those publicly available.

Then of course staff is -- has been and will continue to be supporting the transition of these plants from our licensing effort, if you will, over to regional oversight. We had a pilot temporary instruction which received diverse stakeholder input. That typically doesn't occur, but we felt in this case it was important to do so.

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We used that TI this past March at Watts Bar to gain some insights. Ray again will talk to you about a lot of the insights that came out of that. Then we have our next inspection is now planned for this fall with the North Anna plant.

And of course we have a good amount of work to achieve Commission direction, again on the COM-SECY-14-0037, not only related to the reevaluate hazard for flooding, but also to look at are there -- how do we adequately treat some of the plants that may require additional amount of regulatory scrutiny, right?

We have to work ourselves through that process in an appropriate way, and then of course there's ramifications to seismic, as Bill had mentioned. And then for the Tier 3 items, which talks about other hazards, we'd have to look at those underneath this position of Tier 3 items.

And then finally on this slide, we continue to work with our colleagues in the Division of Inspection and Regional Support. We work with the regions as well on developing an oversight program, that appropriately treats the beyond design basis nature of the mitigation strategy and spent fuel pool instrumentation orders.

It's going to be informed by the pilot TI. It will be informed by a few additional TI inspections that would go on after the Watts Bar one. The general thinking at this point is that the significance determination process that we develop needs to be informed by the fact that it is a beyond design basis postulated scenario, and of course the

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large amount of redundant equipment that's available and the diverse way in which they can accomplish safe shutdown of the reactor. So we think that has to be factored in, and folks are working in that regard.

Likewise, we're also looking at developing appropriate regulatory oversight for the national response centers, and primarily to ensure that not only the equipment remains available, but that it's also reliable, all right. So you're talking about maintenance and testing, those types of things there.

So if I can have my next slide please? Similar to the progress being made on mitigation strategy and spent fuel pool instrumentation orders, we are also on schedule for the vents order. It was originally issued, as you know, in March of 2012 as EA-12-050, and that required hardened vents be installed on all boiling water reactors using Mark I and Mark II containments.

The Commission superseded that order on EA-13-109, and they added an additional piece that said it had to be severe accident capable. So the additional direction that was provided by the Commission dealt with both pre-core and post-core damage scenarios, and to make sure that those were adequately treated. So it was a good addition.

As part of that Commission direction, the staff was also asked to assess the need for filtering those vents as the previous panel was discussing, and we will directly develop either regulatory basis and associated rulemaking, if it was needed, and then I'll talk about that in a

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little more detail on a later slide, and certainly I'm sure you'll have questions after that that we can discuss.

As part of the EA-13-109 order, the Commission did it in two phases. Phase 1 requires the installation of the reliable severe accident capable hardened wet well vent, and then of course Phase 2 was for any of their installation reliable severe accident capable dry well vent, or strategies that suggest that the dry wall vent is not necessary underneath the severe accident conditions.

The phased approach was really in recognition of the relative effectiveness of the wet well vents. You heard Maria talk about the fact that that provides a lot of scrubbing of the radionuclides, and there was also, I think, to minimize the delays, if you will, in implementing some of the requirements that were already in the EA-12-050 order, so that we didn't really cause unnecessary delay to getting that part installed.

So licensees submitted their Phase 1 plans in June of last year. Staff then did its review. We issued all interim staff evaluations for all plants, and that's several months ahead of schedule. The ahead of schedule piece is both an indication, I think, of an efficient staff review, as well as high quality submittals from the industry.

The Commission directed schedule, as you know, for full Phase 1 compliance has a backstop date of June of 2018. However, I think it's important to note that the NRC and industry are on track to have nearly 30 percent of the plants done by 2016, more than

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two-thirds by early '17, and then the remainder by 2018.

So it's not just we'll all wait until the end. I know you had that comment before, Commission Baran, so I think it's important to point that out.

Next slide, please. For Phase 2, the Commission established backstop date of course is June 2019 for full compliance. We have been working with interested stakeholders to develop acceptable criteria to meet that order. In fact as you know, we issued the interim staff guidance for Phase 2 earlier this week.

There are three alternatives in Phase 2 compliance. One is that you just have a stand-alone dry well vent that's capable of dealing with severe accident conditions. You could also do something where you have a dry well vent and then a combination of water addition, and then of course there's a third option that just has water management, that extends the capability of the wet well vent for a longer period of time.

So they can -- any licensee can pick one of those options, and the obviously they have to develop the analysis that Steve Kraft had mentioned, to show that they have an acceptable path forward. All indications at this point are that we are on schedule to meet the Commission-directed compliance date.

Once again, Phase 1 and Phase 2 are done. Staff will then have to do its safety evaluations and inspections will follow in the regions afterwards. We don't feel at this point, unlike mitigation

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strategies, that there's any need to do onsite audits for Phase 1 or Phase 2 of compliance.

It's just what they have to do onsite is not as complex, if you will, of looking on a strategy from, you know, mitigation strategies standpoint, where we benefit from the onsite audit portion. I'm now going to turn over my presentation to Scott. He's going to give you a status of flooding and seismic, and then he'll return it back to me and I'll talk more about the rulemaking activities and the Tier 2 and Tier 3 status.

MR. FLANDERS: Good morning. Good morning, Chairman, Commissioners. Today I'm going to focus on the schedule, progress to date and the next steps for the flooding and seismic hazard reevaluation activities. As Bill mentioned, we've completed the interim action reviews for the Group 1 and 2 plants, and we've determined that they are all in fact acceptable for their intended purpose.

Again, as Bill mentioned, the purpose for the interim actions is to provide staff with additional confidence that the sites can cope with the reevaluated hazard, while the remaining 2.1 flooding activities are completed. For the 16 Category 1 sites that submitted in March of 2013, we've issued ten staff assessments, and we're near final on two others.

The other four sites that submitted in March of 2013 have recently submitted or plan to submit revised hazard evaluations as a result of RAIs from the staff, or feedback from the staff or other federal

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agencies on certain aspects of the originally submitted hazard evaluation.

The review of the Category 2 plants are progressing. For the 12 that submitted in March of 2014, the staff has issued RAIs for all but two. Those two had self-identified errors and recently resubmitted significant portions of their flood hazard reevaluations.

We expect the RAI responses to be submitted within the next few months for most plants, and we anticipate reaching closure on the remaining issues by the end of this summer for most of the Category 2 plants.

For the Category 3 plants, we just received them last month, all but three, and we're actively redoing the interim actions at this time. Of the sites that have been granted extensions over the years, nine have not submitted their hazard reevaluations as of yet.

Most of these are awaiting reports, dam failure evaluations from the Army Corps of Engineers, and are expected to submit in late 2015 or, in some cases, in 2016.

In light of the SRM, and Bill had touched on this a little bit, in light of the SRM for the COM-SECY-14-0037, that directed the staff to ensure that plants address the reevaluated flood hazards within their mitigating strategies, we had modified the flood hazard reevaluation activities to include feedback on the reevaluated hazards for most sites by December of 2015.

To achieve this goal, we are employing some different

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approaches that will facilitate closure of the remaining technical issues as soon as practical. These approaches will allow us to get access to information needed to reach technical conclusions in a timely way, and we believe that providing this feedback by December is achievable, when we consider the significant portion of the review is already completed for a lot of the Category 2 sites, and we are focusing on -- primarily on those issues that remain open.

For the Category 3 sites, we are leveraging experiences gained by the Category 1 and 2 sites, to focus our efforts on the most critical issues. We also have the opportunity for the Category 3 sites to carry out some preparatory review activities, which should allow us to reach closure on technical issues a little bit sooner.

If you flip to the next slide please. This slide shows the schedule for the reevaluation activities. If you focus on the checkmarks on the slide, those do note the time we anticipate providing feedback on the adequacy of the reevaluated hazards on to industry or to the sites.

We will issue letters to them, informing them of -- that their site hazard reevaluations are acceptable for use in evaluating mitigating strategies. However, for this process to be effective, we will need industry to support technical meetings and audits, in order to expedite the sharing of information with the staff.

We'll need the industry to respond in a timely way to RAIs, and we will also need licensees to limit changes to their current

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submittals to only correcting staff or licensee-identified errors. Based on the input from industry, providing feedback on the hazards by December 2015 would allow licensees in most cases sufficient time to identify and implement any necessary changes to the mitigating strategies equipment installed in response to the order.

These letters we intend to issue in two batches, one in August and the second in December. However, for the sites that have not submitted their hazard reevaluation reports, we estimate that about a half a dozen will not submit in time for us to provide feedback by December of 2015. However, we'll try to provide feedback to them as soon as possible.

If I can have the next slide, please. This slide is a high level schedule for the seismic reevaluation activities. The seismic hazard reevaluation activities continue to be completed on schedule. I want you to focus your attention again on the time line to provide early feedback on the adequacy of the seismic hazards, again denoted by the checkmarks.

The original plan for the seismic reevaluations always included providing early feedback. But for the purposes of supporting the seismic PRA, information for the seismic PRAs. For the central and eastern United States plants, the staff provided feedback on the adequacy of the seismic hazards in 2014, and we intend to provide feedback for the western U.S. plants no later than December of 2015.

This feedback should not only support the seismic PRA

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schedules, but it can also be used to assess mitigating strategies. We are currently working to develop guidance that will describe the analyses that are needed beyond what was done solely for the expedited approach, to demonstrate that the mitigating strategies can protect against the reevaluated hazard.

May I have the next slide please? We are making significant progress on the seismic hazard reevaluation reviews. For the central and eastern United States plants, we've issued -- we issued last May a letter summarizing the results of our screening and prioritization, and our review of the interim evaluations. From the results of the interim evaluations, the staff concluded that there were no immediate safety issues, allowing us to take the time we needed to complete our 2.1 activities.

We've completed our review of the ground motion response vectors for all central and eastern United States plants, and we've completed and issued several staff assessments ahead of schedule. We plan to issue all of the staff assessments for the central and eastern United States plants by the fall of 2015.

The expedited seismic plant evaluation program reports were submitted on time by the industry. Staff is actively reviewing these evaluations. A few licensees did identify minor modifications, such as adding anchor bolts or supports to further enhance seismic safety.

The expedited seismic evaluation program calls for

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these modifications, if the capacity of certain Phase 1 installed equipment cannot withstand up to two times the design basis hazards, and that these modifications will need to be completed by the end of 2016, unless it's needed -- a plant outage is needed to implement the modification.

For the western United States plants, we received the reports last month with some additional information this month. The hazard reports and supporting submittals are thousands of pages long. Unlike the central and eastern United States plants, industry and staff did not have the benefit of fully developed seismic source and ground motion models.

So the level of effort is significantly higher for both the licensees and the staff. We have completed our interim evaluation reviews, and concluded that there are no immediate safety issues. We intend to issue a letter summarizing the results of our screening and prioritization and the results of our interim evaluation reviews by mid-May.

Next slide. In addition to completing our work on the western United States plants and also completing the staff assessments for the central and eastern United States plants, we are also working with industry on further guidance for the high frequency and spent fuel pool evaluations.

Good progress is being made on both of these issues, particularly the spent fuel pool evaluations, where the staff and industry

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are working together to develop additional guidance which meets the original intent of the evaluations. The additional guidance will build off of previous spent fuel pool studies, and likely utilize review methods that can be applied to groups of plants, and focuses on the most risk-significant aspects of the spent fuel pools.

This helps reduce the effort on the part of licensees and the staff, while maintaining our safety focus. Consistent with our May 9th, 2014 letter, we're evaluating certain plants that screen in for further risk evaluations, need to conduct a seismic PRA to inform our regulatory decisions.

We are considering several factors to help assess the likelihood that a cost beneficial safety enhancement would be identified for those plants with relatively minor differences between the design basis and the reevaluated hazard. For sites to screen in for further risk evaluation, the Group 1 plants are expected to submit by June of 2017, and we're actively working with industry to develop a supplemental template to support high quality submittals.

After completion of the seismic PRAs, of course the plants will enter into Phase 2. The staff has identified Phase 2 preliminary decision-making criteria for seismic, and we recently initiated outreach to stakeholders on these criteria. Although stakeholder interactions have been limited and the discussions on the topic has just begun, the interactions have been positive, and it appears that alignment could be achieved relatively quickly.

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With that I'll stop, and turn it back over to Jack.

MR. DAVIS: Thanks Scott. So moving on to rulemaking activities, here again we are on schedule for this activity. The draft rulemaking package will be submitted to the Commission actually today, and it was certainly a significant undertaking by staff of many different offices. It's benefitted from extensive interactions with external stakeholders, as well as the Advisory Committee on Reactor Safeguards.

And we often refer to it as mitigation strategy rulemaking, but it goes well beyond just codifying EA-12-049. The rule includes lessons learned since the Fukushima accident, and then also other regulatory initiatives that I'll address on the next slide.

And I'm not expecting anybody to be able to read this. It's really -- it depicts the scope of the mitigation strategy rulemaking. I acknowledge that it's busy, but it's in large part to the significant number of post-Fukushima regulatory initiatives that are actually included in this rule.

The combination of many of these initiatives, I think was appropriate because a lot of the emergency response type of activities, by necessity, had to be a part of the mitigation strategies, if you will. So I mean that just had to be incorporated, and then there was other efficiencies and effectiveness reasons for combining some of these things.

In addition to the EA-12-049 that it's going to codify in

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EA-12-051, just to point out a few other things. It will also include integrated response capabilities, consisting of strategies and guidelines to go for beyond design basis external events. Large areas of the plant, due to explosions and fires will be included, severe accidents of course.

It does have the requirements for SAMGs, which is currently a voluntary initiative, and then the integration of those SAMGs, which I think is the important part, with existing emergency operating procedures. It also includes enhanced emergency response capabilities that address the multi-unit, multi-source events in a reactor and spent fuel pool at a single site. That's an important piece to it.

It includes training, drills and exercises. You've heard a lot about that in the first panel there, with the concern there. It has change control, a process for new requirements, and then of course it includes issues on decommission activities, just to name a few.

If I can have the next slide, please. Another post-Fukushima rulemaking activity is the containment protection and release reduction rulemaking. This is formerly known as the filtered vents rulemaking. The staff will be submitting an information paper to the Commission here in the near term. We think it's somewhere around the end of May, with the current status and plant path forward for that activity.

The paper won't be seeking Commission approval, but it will notify the Commission that at least our current analysis indicates

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that there is an adequate justification to impose a requirement to install filters on the dry well vent. Again, we talked a lot about the fact of the scrub being with the wet well and so on, and how much benefits you get from that, and I think that's important to recognize.

The staff then will subsequently seek stakeholder input on the draft regulatory basis, and then plans to finalize that by September of this year. We then also plan to codify the severe accident capable hardened vents order, the EA-13-109, including the provisions for water addition, which is a very important piece. Then we plan to provide that proposed rule to the Commission in September of next year.

If I can have my next slide. Now just transitioning quickly to Tier 2 and Tier 3 priority Fukushima activities, I'd like to discuss the progress we've been making here. Again, another busy slide, but the color coding kind of gives you a quick visual on the status of these activities.

I want to remind the Commission, there was a reason why we tiered these things, right. Tier 1 was something that we needed to do without delay. Tier 2 and Tier 3 was either because we didn't have resources available to address those, because they were working the Tier 1, or we might be able to benefit from international activities or we needed some more early insights, if you will, through a couple of studies and so on like that, to determine what their appropriate path would be.

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So staff developed project plans for these activities and provided them to the Commission in SECY-12-0095. Progress has been made on many of the recommendations consistent with that schedule that we provided, and in fact some cases we accelerated the schedule, by either combining some of the lower-tiered items with Tier 1 activities, or actually just accelerating the schedule on certain ones.

You know, for example, the one that you see at the top there, which is on expedited transfer of spent fuel from pools to dry cask, that was done ahead of schedule and pulled up early. So that's a complete item. The blue items that you see on the slide, those have been subsumed into the higher-tiered activities, such as mitigation strategies.

The pink items that are in progress, to some capacity there's a number of components that go along with those things. We just listed the highest item there. And then of course the black items that you see at the bottom, they're still being developed. But they're still consistent with the existing project plans that we provided the Commission previously.

Next slide, please. So over the last couple of months, staff has been actively going back through those project plans, and considering the remaining items that have to be developed, looking at the lessons learned that we have to date. We have had evolved thinking. I've heard Commissioner Svinicki talk about that many times, about how our thinking has evolved over these many years.

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So we're relooking at those things, and determining whether we have adequate information to disposition those, or whether we could take an action sooner, or whether we need more work to be done. And staff expects that we'll have many opportunities for stakeholder involvement, and we know a number of those items are important to a number of our stakeholder.

As we move forward with engaging the Steering Committee internally and the EDO and so on, we'll have opportunity for them to comment on that. And then staff plans to obviously engage the Commission, to either inform you of the results of our evaluations and receive your feedback on our conclusions.

Although not included in the slide that I showed previously, there was an item that we looked at other regulated facilities, to determine if there was any post-Fukushima lessons learned that should be applied to those. These are fuel cycle facilities, irradiators, RTRs, things like that.

There's a paper that's being finalized and we plan to submit to the Commission in the next month or so, to talk about what we think needs to be done there. I'll now turn over the presentation to Ray, and he's going to give you a regional perspective on how Fukushima's been going.

MR. LORSON: Thank you, Jack. Good morning, Chairman and Commissioners.

As you know, the Regions play an important role in the

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NRC's response to the Lessons Learned from the Fukushima accident. Inspectors are the Agency's eyes and ears for verifying plant safety and operational readiness. We have and continue to inspect post-Fukushima requirements to insure that these requirements have been properly implemented. Our insights and oversight in these areas plays a key role to insure the importance of these programs.

Regional involvement also facilitates effective and efficient communications with external stakeholders. We're often the first point of contact for members of the public who want to know what has been done, and what can be done. Our continued involvement in the post-Fukushima activities allows the Regions to provide timely, up-to-date information to all of our stakeholders.

The Regions have been involved in a number of ways, including we participate in many of the audits that Jack had mentioned previously. We've also been involved with the development of key program documents, such as Temporary Instruction, or TI-191 that was issued in October of 2014 to inspect the compliance with the NRC orders.

While these post-Fukushima modifications or activities are ongoing, it's important to recognize that if they're not conducted properly, they can have an impact on operating plant safety. To that extent, our inspectors in the field implementing the Reactor Oversight Program play a continued key role to insure the safety of these modifications as they're being implemented.

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For example, implementation of these modifications involves heavy industrial activities that can involve lifting heavy loads, it can involve the movement of large vehicles, and it can involve breaching or modifications to existing systems. As these activities are occurring, through our Reactor Oversight Program we're insuring that they're being conducted safely.

We have identified some issues as these modifications have been implemented, including a case at one facility where a piping modification led to the exposure of a section of piping to a missile hazard. And another case where installation of a pipe modification led to the partial drain down of the refueling water storage tank. We insure that the proper actions are taken for issues as these, when they're identified. Next slide, please.

As I just mentioned, TI-191 was issued to provide inspection guidance to insure that the NRC orders have been effectively implemented. The TI focuses on three main areas, including verification that mitigating strategies are in place to protect against large-scale events. Secondly, to verify that the licensees have installed reliable instruments to measure the level in the spent fuel pools. And, lastly, to insure that communications, equipment, and staffing have been developed to insure the response to multi-unit and to events that involve an extended loss of AC power.

An important aspect of implementing any Temporary Instruction is to insure that the inspectors are adequately and

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appropriately trained. We have received training from our Headquarters Subject Matter Experts on the implementation of the TI.

In addition, the pilot TI was conducted at Watts Bar back in March of 2015, and we observed that with inspectors from all four of the Regions participated in that TI to understand the inspection requirements, and also to gain insights on any areas where the TI could be further improved.

The last thing I would like to mention in this area is that to insure a consistent reliable assessment of any findings that are identified from the TI, we plan to conduct cross-regional assessment panels so that all findings will be commonly reviewed from inspectors from all four Regions, and from NRR to insure consistent reliable treatment of findings. Next slide, please.

As I noted just a minute ago, the pilot inspection of this TI was completed just a little over a month ago, and while the final inspection report has not been issued, the results are considered to be pre-decisional and I cannot go into great detail in this forum regarding the results, but I can mention a few highlights.

First off, the overall assessment is that the licensee conducted an effective program for implementing the mitigating strategies that were required by the order. Having said that, there were a few items or issues that were identified involving things such as consistency between plant labeling and some of the procedures, and also a question was identified related to how the post-Fukushima

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requirements and mitigating strategies were going to be implemented for all modes of plant operation.

In the picture in this slide we see Jeff Hammond, who is the Resident Inspector at Watts Bar, and he was also a member of the pilot TI Team. Here he's conducting a walkdown to verify that equipment, labeling, and procedures are adequate to support implementation of the mitigating strategy.

As I mentioned, a key benefit by having inspectors from all of the Regions participate in the Pilot TI was to gain insights regarding implementation of the TI. We'll take the Lessons Learned out of the pilot to make the procedure even better. One of the early questions or findings we've got in that regard was should we provide more guidance in the Temporary Instruction to inspect the civil structures, the structures that are used to house the FLEX equipment, so that's something that we're looking at as a method or potential enhancement to the procedure.

Last point I'd like to make is that implementation of the FLEX TI will be completed here in the next few years, but the need to maintain the equipment in a robust and reliable state will continue. To that extent, we will be integrating the TI inspection requirements into our Reactor Oversight Program so that this will become a routine part of how we do business.

And with that, I will turn it back over to Mike Johnson to talk about international involvement.

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MR. JOHNSON: Thanks, Ray.

So, I want to just turn for a minute to provide an international perspective. I would say that based on a lot of interactions that we've had with our international partners, we do believe that the actions that we're taking are generally consistent with the actions that have been taken by other regulators around the world. The world community of regulators and the industry are insuring protection from beyond-design-basis external events, they're strengthening mitigation, and they're strengthening emergency response capabilities.

Of course, the actual specific changes that are being made in any individual country do vary based on the country-specific factors, such as to what extent, for example, they had safety initiatives in place, already in place, I guess I should say, before Fukushima.

The NRC's views are routinely sought by our international partners with respect to how we are proceeding on the Fukushima Lessons Learned, and we also through active engagement with those international partners learn from our international partners, and that informs what we do with respect to our posture going forward as it relates to the Fukushima Lessons Learned activities. Last slide, please.

So, in conclusion, I just wanted to point out that while we are implementing post-Fukushima safety enhancements, we are continuing to maintain a strong focus on operational safety and security. That continues to be our mantra.

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As we've noted, we do continue, we have continued to make continuous progress and safety improvements are in place. We are realizing those safety improvements in the plants today.

We continue to look for ways to, as we go forward to continue to integrate, to continue to improve our efficiency and effectiveness as we move through the remaining activities, and continue to not lose sight on pushing to completion on these very important activities.

That completes the Staff's presentation. We're ready to take your questions.

CHAIRMAN BURNS: Well, thank you. I want to thank the Staff for the comprehensive presentation. Commissioners Svinicki and Ostendorff have been on this journey the last few years. I sort of, as counsel, was involved very early on in terms of helping to advise the Commission in terms of dealing with the Near Term Task Force, and then took my brief sabbatical, but tried to watch from afar. But what I want to express appreciation for to the Staff is for really getting me back up to speed as I re-entered the NRC; because, again, as much as I tried to maintain sort of an awareness while at OECD, you know, it's difficult to do. And, also, you know, sort of the thinking is how the Commission and how the Staff has worked through the various aspects of the recommendations, reformulating thought, and you've given a lot of good thought.

COMMISSIONER SVINICKI: We were busy while you

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were gone.

CHAIRMAN BURNS: I think --- yes. I was, too, but in a different way. But, no, I do appreciate that, because a lot of times, I think --- and don't get me wrong. I think, again, with the extraordinary work that the Near Term Task Force did in those 90 days is something to be commended. But then I think going the next step is thinking through how we proceed, how we look at the various aspects, in some cases adding ideas, or thinking about we need to look at this issue. So, that's been very helpful for me from the Staff in terms of getting me refamiliarized, and also preparing me --- had the opportunity, particularly with the FLEX equipment, to see, go down to North Anna which happened to be the first nuclear power plant I ever went to in 1978, and the first one I did when I returned late last year. But to see it also at North Anna, and also at Watts Bar, it was very valuable for me.

And one of the other reflections again from --- I'd have from sort of my past experience; and, again, most of my experience as counsel to the Staff here and there, is --- and I think it's a real credit to the Agency, to the Commission, and to the Staff in terms of the focus on moving through wisely and smartly on this. I know I worked early in my career on implementation of the TMI Action Plan with the Staff, and there's a --- I'll call it an apocryphal characterization of sort of --- perhaps chaos is the wrong word, but such a bulk of items, and whether --- in terms of the time it took, and the thoughtfulness in terms of some of the things that were added on. And that's something that the

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Staff and the Commission did here, and it is one of those things which is, I think, one of the great things about this Agency in terms of learning lessons from its prior experience, has been very focused in terms of moving through and committed to bringing resolution to the various issues. So, again, I think that's a good appreciation on my --- I want to express my appreciation again for the --- I think the focus particularly the Staff has had on that.

And I know, to echo what Mike said, certainly, you know, one of the things I saw in the three years in Paris with OECD is the real engagement that our Agency has had with our foreign partners through the Committees both through the NEA, but also through the IAEA in terms of working through these issues. Certainly, I mean, that engagement I think has been very valuable. And I think as Mike said, I think we've learned from it, but there's a keen interest in terms of what the United States is doing, why we do it. And I think a very healthy dialogue from --- you know, for example, what I could observe through, for example, the Committees at NEA, the Committee on Nuclear Regulatory Activities, and the Committee on Safety of Nuclear Installations in terms of the --- and the particular projects.

I think Mike may have mentioned a particular project through NEA on hydrogen, which will help inform us in terms of the --- some of our Tier 3 activities. So, again, you know, my own observation, this is, you know -- both our own activities here in the United States, but internationally have been very important. And I think

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really, while we may have differences with some of our foreign partners about approaches, I think the commitment and engagement on safety issues has been really top notch. So, I just wanted to express that as I began.

Mike, since I mentioned the international activity, are there other particular --- you might describe, if you would, some of the other things that we've been doing in that regard.

MR. JOHNSON: Well, I think, Chairman, you hinted at them. We are actively engaged, as you indicated, through the Nuclear Energy Agency, and those activities with respect to the Steering Technical Group in looking at Fukushima, I would say Near Term activities that were Lessons Learned for Fukushima. We continue to be engaged at the committee level in those various committees and working groups moving through those activities.

In a similar fashion, we are engaged in the IAEA activities, both from an understanding of what's going on with the standards from a perspective of participating in missions, for example, and looking at sharing through peer review activities, looking at other countries, so that's an area of active engagement for us.

We are engaged in research that is going on internationally and all of those important activities to make sure that we continue to partner, garner insights, and move forward. So, again, there really is a healthy engagement in the international community to make sure that we move along, all of us, in terms of putting in place real

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lessons.

CHAIRMAN BURNS: Okay, thanks.

I sort of asked this question to Tony Pietrangelo on the last panel, but from the Staff's standpoint, it can be any one of you, what would you say are the really --- the hard points or push points in terms of your continued progress? What --- if you'd highlight for me that. Jack can do it, or actually Scott, or Ray, as well, from your own perspective.

MR. DAVIS: I'll take a first shot at it. Certainly, I think getting the Reevaluated Hazards into mitigation strategies is a challenge going forward. I don't think it's insurmountable, but I certainly think it will take some focused effort, as Tony had mentioned.

The other things that we have ongoing are all on schedule. But, certainly, as you go into implementation you sometimes run into situations you didn't anticipate, and that's why you saw some of the relaxation requests that were coming through later on as we were moving along. So, in those two areas, but we're well aware of those, and we're continuing to watch them, so I think that's probably what I would say. And I would welcome anyone else's comments.

MR. FLANDERS: Yes, I would second Jack's view in terms of the challenge associated with now considering the Reevaluated or mitigating strategies against the Reevaluated Hazards for both seismic and flooding. I mean, a lot of the attention has been focused on flooding in terms of the need to finish the completion of the hazard reviews which has its own set of challenges associated with

that, which we've discussed and can talk more about.

Also, on the seismic side in terms of demonstration that the licensees' mitigating strategies can actually cope with and address the Reevaluated Seismic Hazard; for certain plants, I think is going to be --- is going to require some level of effort to come up with that guidance in a timely way, and then to actually execute the guidance in terms of doing it on the part of the industry and in the Staff's review, as well, on the timeline that we're looking at.

CHAIRMAN BURNS: Okay. Ray, anything from the Regional perspective?

MR. LORSON: The only thing I would add is that it's important as we do these analyses and as we do these audits that we develop a well-founded licensing basis. You know, the field inspectors when they go out, it's important that we know what the criteria are, and we have clearly defined criteria. And I think we've been successful with that. I think the audits that Jack's group has been doing has been helping --- very helpful in that regard.

CHAIRMAN BURNS: All right, thanks.

One issue Dr. Lyman raised was this issue on the Westinghouse reactor coolant pump seal issue. Could you let me know what the Staff's thinking is on that issue?

MR. DAVIS: Yes. Certainly, he raises a legitimate point that it can impact upwards of 13 plants. Actually, it's somewhat less than that because some folks have taken action already to put in an

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additional seal package, like a shield seal, or something like that. But, certainly, the NSAL, the 14.1 and the 15.2 NSAL that was put out by Westinghouse certainly does, or could potentially impact the strategies, particularly the timelines in which they're doing something. And we're actively engaged with the Owners Group right now, we're actively engaged with Westinghouse to try to understand it better, and then understand what viable paths are forward other than just changing a mitigation strategy at this late stage.

Certainly, it would even impact some of the plants that are already in compliance, so it's a legitimate issue. We're working through it. We think that there's a resolution path for it. And, again, I can go into a lot more detail if you want on the specifics of what it involves with the over-pressurization and leak, but I think probably I've given you enough for right now.

CHAIRMAN BURNS: My time is up. Commissioner Svinicki.

COMMISSIONER SVINICKI: I want to thank all of you for your presentations and all the hard work that your presentations represent done by both you and others on Staff. So, again, we have done a lot, and I appreciate Chairman Burns' reflection on that, having stepped away from it and then coming back. I'm sure the magnitude of it is even more significant having had that perspective of stepping away for some period of time.

Mike, I appreciate --- I think we haven't really focused

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on you. You started with one of the most important things that was discussed today, which is the Guiding Principles that the Staff uses in focusing on this work. Since they weren't on the PowerPoint, I'll repeat them just really quickly; do not distract from safety, be disciplined in the screening of additional issues, do not displace work of greater safety-significance, do it right the first time, and establish a sound basis for a decision. So, it is really important, I think, to keep those principles in mind.

As an outgrowth of what I said to the first panel, I might actually say to you those principles are more important than ever now, this many years out from the event. I actually am developing that view, that it is important what you do initially, but it's very, very important that you keep that perspective all along the way. Otherwise, I think you can find yourself on a bit of a hamster wheel, so I think it's important that we focus on that.

Some specific topics, on the flood hazard reevaluation, the Commission Majority not having adopted --- as a matter of public record, I voted for the Staff's recommendation, but that was not the outcome. But in today's presentation, the statement was made, so for a new process for the integrated assessment going forward that Staff is developing as an outgrowth of the Commission's Staff Requirements Memorandum, the statement was made, "For the process to be effective, we will need industry to support technical meetings and audits. In order to expedite, we will need them to share timely

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information with the Staff, we will need industry to limit changes to current submittals to only correcting errors."

So, please assure me that the Commission having elected the more prolonged of the options in front of us, we do not now make it industry's problem to make up the time difference.

MR. FLANDERS: Yes, I think there's a couple of points. I'll start, Mike, and then you can certainly jump in.

Those statements were relative to completion of the Reevaluated Hazards. Completion of the Reevaluated Hazards is necessary regardless --- it would have been necessary regardless of the outcome of the Commission vote on the COMSECY. So, those statements go really to this desire to actually complete the evaluation of the mitigating strategies against the Reevaluated Hazards before 2016. That desire has now created a need for us really to try to get the hazards in the hands of the licensees, or agreed upon hazards in the hands of the licensees as soon as possible. That's a fair request on their part in terms of needing that in order to be evaluated.

So, in order for us to accelerate some of these activities, there are certain things that have been a constant challenge as part of completing the hazard review. And those statements go directly towards the things that have been a constant hazard ----a constant challenge in completing the hazard reviews.

For many plants, we've had situations where the licensee would come in and would have used one approach in their

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original submittal. Staff spends time reviewing it, sends a Request for Information, and then gets a new, entirely new analysis. That creates challenges. It pretty much puts you back to square one for reviewing certain pieces of information.

There have been times where, and recognizing if you think about it from the licensees' perspective, there's a number of things that they're working on, so when you send them a Request for Information, they may say I can't get around to answering this for three months, six months, whatever period of time. And, of course, that also creates a challenge in terms of when the Staff will get responses. So, those comments really go to the need for both of us --- both --- not only those are for industry, but also for ourselves, to really agree that we are going to make this a priority to complete these reviews as timely as possible. So, I don't think that's intended to put ---

COMMISSIONER SVINICKI: Okay, and I appreciate that assurance. As I said, contextually, it could sound different. So, as I said, please assure me ---

MR. FLANDERS: I appreciate the question.

COMMISSIONER SVINICKI: --- that that's not the purpose of those statements. So, I appreciate that.

MR. JOHNSON: Commissioner, can I also just add? If we've been successful, and I think Maria made this point, actually, in the first panel. If we've been successful at anything, I think, in terms of working with the industry on these items it's been to jointly put our

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heads down and do the work that it takes to move forward.

I think I heard in the first panel, what I've known about the industry, and that is they're committed to do that. We are also committed to working through these items. You didn't hear any difference on us with respect to milestones and desires to meet those milestones, so we will, in fact, move forward.

COMMISSIONER SVINICKI: Okay. Well, it is --- I mean, it's a significant body of work on both sides, so we do also need to be able to take the requisite care and attention, again, for both us and for the submittals to be of quality. So, I am a little worried always when I see well, we've got to limit changes, and we've got to do this, and we also have to do it right. That was one of your principles that I began with, so I appreciate keeping that front of mind.

In the Staff's six-month status, the fifth six-month status update on Response to Lessons Learned from Fukushima, that was a Notation Voting Paper for the Staff. This goes back to the middle of last year. In there, there was Combined Rulemaking that was proposed. It was approved by the Commission. It was described in Enclosure 6 to the SECY Paper, but in that enclosure about this consolidated rulemaking, the Staff made the following commitment. And, again, this was approved by the Commission. So, the Staff made the commitment that, "The Staff understands that different portions of the consolidated rulemaking will have different backfitting justifications under 10 CFR 50.109. And, accordingly, portions of the consolidated

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rulemaking may not be supportable in accordance with the provisions of 10 CFR 50.109."

"The Staff," again, this is the Staff's commitment. "The Staff will also need to determine whether the consolidated rulemaking will be inconsistent with any applicable issue finality provisions in 10 CFR Part 52. As such, the Staff intends to construct the consolidated rulemaking with this in mind, and enable any requirements that do not meet the backfitting or issue finality requirements to be bifurcated from the consolidated rulemaking at the final rule stage."

Can you assure me that in the development you have fulfilled that commitment in that when the Commission receives consolidated rulemaking language to vote on, it will be possible to excise, if the Commission should not join the Staff in some of its backfitting, or in terms of its look at the technical, or regulatory basis, or justification for requirements. Is it possible to have these bifurcated things excised out of the proposed language?

MR. JOHNSON: Yes, Commissioner. I can assure you that was our approach in developing the proposed rule. I think as we move through the proposed rulemaking stage and engage in public comments, for example, we will, and the Commission ultimately decides, will be able to either move forward with that entire package as it's proposed, or we'll be able to separate out pieces. The discussion --- harken to the discussion on SAMGs, for example. It's entirely possible that we can, because of their differences in terms of how they

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were --- the status, I guess I would say, they had, as we move forward into putting these together we'll be able to partition them out, if you will, as we go forward.

COMMISSIONER SVINICKI: And, again, it was the Staff's commitment, but I commented very favorably on it in my vote on that particular paper, because what it allows the Commission to do is not set back the entirety of an effort, which is a very significant undertaking. And I think where you can do that -- you know, Congressional staff often in proposed statute has what we call bracketed text, meaning it can be dropped out if there's not support for it. And it's a little more work, but to the extent you can structure for decision makers to say if you don't join me in this conclusion, then it's kind of modular. So, again, I was favorable on it. I think it's extremely helpful so that we can keep decision making going forward in a structured way.

So, we have --- I've just a minute left, and we have a meeting that I believe we'll be noticing specifically on the proposed rule, itself. I think we're doing that in July, so I don't want to --- I look forward to what will be delivered to me today. I don't know if I'll take it home over the weekend or not. I'm kind of behind on some other things. I hope it's that thick, because you've got your work ---

MR. JOHNSON: It's thick.

COMMISSIONER SVINICKI: --- cut out for you. But, you know, I think you have a sense, I've telegraphed a bit, that we need

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to look really closely at a justification, which if the descriptions are accurate, reads to me like well, Commission, take this thing that there was never a basis. It was a voluntary initiative because there was not --- we could not substantiate a basis to make it compulsory. Make it compulsory now, Commission, as part of regulations. I'm talking about the SAMGs; because you get more safety. I think enhanced defense-in-depth is at the highest level saying well, you'll enhance safety, and you'll add more measures of safety.

You know, Mike, your time here at NRC makes my eight years look like nothing. You know, that's a big, big ask, because that's your asking someone to take a real leap with you. I may not be able to take it, but it certainly, I'm sure, will engender a really, really significant debate back and forth.

And I take as a very sober thing the Commission's ability under law to have the authority to say I deem this a matter of adequate protection. It sounds almost regal, you know, like a royal proclamation of some kind. But with that kind of authority comes the need to be extremely prudent in using it. So, we have a lot of authority to compel, but the reason we're the gold standard is the quality of work that we have historically done. And I'm not sure if this is the kind of level of substantiating a basis for something that is the kind of work that earned us the gold standard label. I'm just being really, really candid with you, but I'll be taking a very close look at that. And I yield back. Thank you.

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CHAIRMAN BURNS: Thank you, Commissioner. Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thank you, Chairman. Thank you all for your presentations. I want to add my thanks to that of my colleagues to not just you at the table, but all the Staff behind you, and the Staff throughout the NRC in support of other offices, such as OGC, for your strong adherence to our principles of good regulation throughout this entire process. Has it been completely smooth? No, nothing hard like this will ever be completely smooth. There will be bumps and hurdles, but I think you've maintained a focus on principles, as Commissioner Svinicki has talked about, in Mike's opening statement. And as important as those individual principles are, but the broader principles of good regulation.

I'm particularly impressed with the extent and scope of continued and ongoing stakeholder engagement, public meetings, et cetera. I won't ask what the last count is on this, but I know it's been very significant.

I was thinking about Mike Johnson, to thank you for your continued leadership with this effort. I know that continuity is so important to have a strategic leader guidepost for the Staff, so thank you for what you've done in that area, Mike.

Bill, I want to talk to you real quick just to comment on a comment that you made that I thought was important. You mentioned the conundrum of direction four years ago, four and a half years ago to

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proceed for the External Hazard Assessments under Recommendation 2.1, in parallel with addressing what started out as Station Blackout, but then morphed into FLEX, and morphed into Mitigating Strategies, and the rulemaking we'll see, as Commissioner Svinicki discussed, later on today, I guess.

So, just to kind of keep the historical context in place, the Commission recognized that at the time, recognized there were perhaps going to be some challenges with this parallel effort, but similar to the comment in the first panel that I made to Dr. Lyman about Near Term Task Force Recommendation 1, if you wait to get all that done and then looked at individual plant safety enhancements, we'd be waiting a long time. The same thinking applies, I believe, to the conundrum you've raised, but thank you for bringing that point up. I think we recognized it at the time.

I told Mike Johnson this in more than one meeting. I think I've told Bill Dean and Glenn Tracy, I think I told Scott Flanders this, but will continue to highlight the importance of keeping the Commission informed as you go forward in the Flooding Hazard Reevaluations of challenges. I think we found a couple of times prior to last fall where there were perhaps challenges that the Staff was facing that were not fully communicated to the Commission. It's so important to keep us informed of those efforts, and I think you understand what I'm talking about. In that note, in the last week I've had periodics with Bill Dean and Glenn Tracy where I've communicated the value of getting

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out in the field and seeing the in situ application of various strategies. I talked about the Monticello visit. I think Bill is going out there soon. But I think that for Scott's group it's so important for people looking at especially the targeted strategies on a site-specific basis, it's so important for your team to have the ability to get out and see what it means on site. There's just no replacement for that, because we see significant variations from one location to the other.

Scott, on Slide 11, I do want to ask you one question. The last bullet, it says, "To support the mitigating strategies timelines, the Staff is identifying alternative approaches to provide earlier feedback on Reevaluated Hazards." Is there any comment you can make, or maybe an example or two that you can talk about in that context?

MR. FLANDERS: Sure. So, there are some --- in order to reach our closure on certain issues, for some reviews that have recently been submitted, as I mentioned, there are some Category 1 plants had resubmitted their hazard. In an effort to try to accelerate our completion of those reviews, we are engaging the licensee in a different way, where we have more interactive discussions, and we intend to implement additional audits which will allow us to get a better understanding of the models and the information to use right there with the expert who actually prepared the models in use. It allows us to answer questions in a much faster way, as opposed to getting a partial submittal, and then a lot of the detail that you really need to look at and

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putting on an electronic reading room, and then Staff has to sift through that and try to find the information. So, we're trying to get to access to the information in a much faster way.

For these closing reviews in many cases the fastest way really to see what's going on is really to get an opportunity to look at the model and the input and output files and the interface, and seeing that allows the experts really to dial in on the things that are most significant, and the things that may be in question the most. And I think by doing that in an audit fashion, it's even faster because you also have the licensee's experts there. They can explain what they were thinking, and what they were doing. So, to do that is going to be a little bit more resource-intensive, but we do think it's a way that will effectively allow us to get to the end point much faster. That's one example.

While I have just a second ---

COMMISSIONER OSTENDORFF: Sure.

MR. FLANDERS: --- in terms of getting out into the field, I couldn't agree more with you in terms of the comments. We have tried to do that on many occasions supporting the Regions on a lot of activities. For example, on the Monticello case where our Staff actually supported and participated in those inspection activities to get out in the field, so that is critical, also to provide context. We appreciate that comment.

COMMISSIONER OSTENDORFF: Thank you, appreciate that.

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Jack, I want to comment on two of your slides, on Slide 18. This is the second bullet, "Analysis indicates an installation of filters is not justified." I would just remark, since Commissioner Svinicki and I were here during the time period of that decision making, there will be folks that will accuse the --- and I know this Information Paper is going to come to us at some point in time.

MR. DAVIS: Right.

COMMISSIONER OSTENDORFF: Not for Commission decision, but for information. I would just comment, there'll will be folks who'll say well, you know, you said this two years ago. Why aren't you going forward with this? Well, we didn't say that two years ago. We said we were going to direct the Staff to proceed upon the rulemaking process, and that process involves development of regulatory analysis that looks at scientific engineering principles as to what's the right thing to do here. So, I think it's a real strength of our process that the Staff has fully investigated whatever, you know, the topic is, in this case the filtering strategies piece. And I'll look forward to seeing the paper, but I think that there will be folks that don't understand that external to the organization. But thank you for highlighting that.

MR. DAVIS: I appreciate it, Commissioner Ostendorff. In fact, that's also why you look at the name change from filtering strategies to containment protection and release reduction because it more accurately reflects what's actually --- what we're trying to achieve. So, thank you.

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MR. DEAN: And if you don't mind ---

COMMISSIONER OSTENDORFF: Please, Bill, yes.

MR. DEAN: Yes, I'm sorry. There's a couple of aspects, too, when you look at things in moments in time. Right? So, at the time that the Staff came forward to the Commission with its recommendation, we had not yet had Commission direction, for example, on economic consequences. That came out shortly thereafter, which perhaps if we had had that before we made the recommendation, it maybe could have affected some of --- at least some of the qualitative factors.

Clearly, you've indicated we've had the opportunity over the last several years to do a much more substantive quantitative analysis, which sort of reinforces what Jack said in terms of where our analysis is taking us. And then, also, just consideration of all the things that have been done relative to mitigating strategies, relative to severe accident capable hardened vents, and so. So, the landscape is different than it was several years ago, so hopefully our paper will be able to describe all of those things.

COMMISSIONER OSTENDORFF: Bill, thank you. That's a very helpful point to make.

Jack, I'll also tell you, your Slide 19, the progress made in Tiers 2 and 3, I found that to be a very helpful, informative slide to put it in perspective, so thank you for presenting that. Again, it goes to our responsibility as a regulator to communicate externally. I think that's

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very helpful, so thank you.

Ray, thanks for being here. I think the role of the Regions is so important in this. And also comment for all of the Regions, I've been extraordinarily impressed with the level of knowledge that the Residents, the Senior Residents have had in all things Fukushima, and the whole approach. Their grasp of the flood level, the strategy, the --- just the whole gamut of issues, I think is a real pride of the Agency. So, thank you for representing the Regions here today in that context.

MR. LORSON: Thank you for those comments, Commissioner.

COMMISSIONER OSTENDORFF: I also want to comment, just last Wednesday, Davis-Besse, very quickly, I was looking at their --- they have a construction site to build a new building basically to house a new emergency feedwater system that will be associated with mitigating strategies. And that building is right next to the plant, the existing plant. So going back to Commissioner Svinicki's comment about getting it right the first time, they're taking their time to make sure that they fully understand the impact on the operational unit of this construction project, because if you drill down or you excavate something you could have a miniature seismic event, for instance. So, I think that the level of focus to that by the licensee and by the NRC Resident and Region III personnel is impressive.

I'm out of time. Thank you all for your presentations.

CHAIRMAN BURNS: Thank you, Commissioner.

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Commissioner Baran.

COMMISSIONER BARAN: Thanks. Thank you to all of you for your presentations, and more importantly for all the work described in those presentations. I know it's been an enormous effort over a sustained period of time.

The April six-month status update to the Commission on the Lessons Learned from Fukushima provided the Staff review of the National Academy of Sciences Report on Improving Safety in the U.S. Post-Fukushima. And the Staff's conclusion was that ongoing or planned NRC and industry activities address all of the recommendations. And I wanted to ask Michael, really anyone on the panel, whether you thought there were any new insights that the NAS report provided?

MR. JOHNSON: I guess I'll start and, Jack, if you want to, or anyone else wants to weigh in.

I think we were thoughtful in terms of our review. Your conclusion that we repeated in the paper is accurate. We didn't find that there were recommendations that we hadn't already --- aren't captured in our current plans or activities that we were already taking, so we were comfortable with respect to that. We recognize that there are a few aspects of things that were provided by them that we'll continue to consider along with all the other insights from various assessments and work that we do in wrapping up the Tier 2 and Tier 3 items. So, I don't have --- nothing comes to mind in terms of a significant insight that we

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might have, but we certainly will continue to consider that body of work as we go forward.

MR. DAVIS: Yes, if I can just add, also. As you remember, the National Academy of Science wasn't critiquing, if you will, the NRC's program. Right? They were taking a fresh look at it, and then when we looked at our program it was fairly consistent with the comments that they're making.

I'd also add that we have ongoing work with the National Academy of Science right now on spent fuel pool, so we wait to hear more information from them, and there may be some insights that they give us from that.

COMMISSIONER BARAN: Are there any particular findings or recommendations that the NAS had that going forward, you know, Mike, you mentioned that there are areas where what they came up with should inform our decision making going forward. I mean, are there any particular examples of that where you think yes, that's a really good point we need to keep in mind as we go forward on this?

MR. JOHNSON: Again, I don't --- I wouldn't point to anything, necessarily, specifically. I know there was work, there was a recommendation related, for example, to emergency planning and EPZ, those kinds of things, would that work, or you've still that item out there related to that, so again that's one area we'll continue as we plow through all of the areas to just be mindful of what they said.

COMMISSIONER BARAN: The Commission recently

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received the ACRS letter on the proposed rule on mitigation of beyond-design-basis events, which I guess we'll be getting later today, looking forward to it. The ACRS suggested that the Severe Accident Management Guidelines, or SAMGs as we call them, be implemented through voluntary compliance. We talked a little bit about this earlier, rather than becoming mandatory through rulemaking.

Mike, what are you --- we're going to likely have a Commission hearing on this going forward. We're all going to delve into the proposed rule probably starting like 5 p.m. today. But what are you --- but I have you here now, so what are your thoughts on this recommendation? Walk us through your reasoning, the Staff's reasoning for including SAMGs in the proposed rule.

MR. JOHNSON: Thanks, Commissioner, and I'll start. I'll give you my perspectives, and then to the extent someone at the table wants to weigh in, we can go more. And we will, obviously, have an opportunity to talk more about this.

I think there's widespread agreement among all of us, the NRC, the ACRS, external stakeholders, the first panel, I think you heard widespread agreement regarding the importance of Severe Accident Management Guidelines, and what that can bring in terms of enhancement in defense-in-depth, for example, the benefit of SAMGs in terms of their being able --- providing an ability to preserve the containment, to minimize/reduce releases, for example, the sort of indirect benefit that has in terms of the emergency response. And

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really, again, bolstering that capability to provide --- to adequately protect people who live near the plant. So, there's widespread agreement about the benefit of SAMGs.

I think the only difference is whether or not to require them, or whether or not to continue to rely on them as a voluntary-type initiative. And I know Tony Pietrangelo's perspective is that the glass is half full, for example. My perspective was that the glass is half empty. Having said that, I think we do have to offer up a recommendation, an analysis that ACRS, for example, thought could be broader with respect to the quantitative analysis and the damage states that we considered, and the way in which we did our regulatory analysis, to the insights that we gleaned from that as it related to the quantitative benefit of SAMGs.

We --- certainly, they'll appreciate the fact, the importance of SAMGs from a defense-in-depth perspective, for their reasons that I talked about. So, we've offered all of that up in the proposed rule. Ultimately, it will be up to the Commission to decide whether or not it's voluntary, or what the regulatory footprint is, I guess I should say.

Again, finish where I started, we're all in agreement that SAMGs are important, an important part of the fix, if you will, the improvement, if you will, that we're making in terms of the Fukushima items.

MR. DEAN: And if I could weigh in, and Mike was quite on target with his comments here relative to the Staff's perspective on

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SAMGs.

I would just offer that when I think historically about some of the things said in the days after Fukushima that the NRC was kind of trumping, as well. We've got these SAMGs in place. Right? We've got these hardened vents at BWR Mark I and Mark IIs, and then when we dig into it a little bit further we find well, maybe not every plant followed that voluntary initiative for hardened vents, and not everybody was maintaining the SAMGs, you know, in an available or up to date manner. So that certainly points to, I think, weaknesses in the NRC regulatory approach towards dealing with voluntary initiatives.

And I know, Commissioner Svinicki, you talked about the paper relative to Recommendation 1, and the things that the Commission basically said disapproved. And there was a good dialogue, a good discussion in there about treatment of voluntary initiatives. And I think one of the things that if we had, perhaps, a more substantive approach towards the treatment of voluntary initiatives, you know, maybe a better regulatory hook, then maybe we wouldn't have to rely on rulemaking. So, I think that's part of it. I think in the proposed rulemaking we want to seek some feedback on that particular issue.

COMMISSIONER BARAN: And Commissioner Svinicki talked a little bit about what some of the findings were of the Staff when Post-Fukushima the Staff took a look at the SAMGs and assessed their status. Talk a little bit more about that. I mean, what did the Staff find there that led you to conclude that we need to require this?

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MR. JOHNSON: I was waiting for any minute Jack to jump up and say something.

(Simultaneous speech)

COMMISSIONER BARAN: Commission, can I as a part of our preparation for the next Commission meeting on this subject, can I offer to go back and do a more exhaustive look at the specific findings, and try to draw a connection as it relates. I think you'll find a robust discussion and regulatory analysis that undergirds the Staff's recommendation with respect to SAMGs. We don't talk a lot about what came out of that inspection except in the level of detail that we talked about today almost. Well, we can do that for you to supplement going forward so that we don't have to get all that today.

MR. DAVIS: Yes. The only thing I would add, too, is this notion about how you integrate your emergency response, if you will. Right? If you know how they're going to integrate FLEX into it, they have FLEX support guidelines, so they go down their emergency operating procedures and they find points where they --- they determine that they're in a beyond-design-basis thing, and then they go into FLEX. So, that sounds nice when you put it on paper, but let's all be honest, right? In a real accident that's very hard to determine. Well, it's the same notion when you carry that forward all the way to you're now into post-core damage. How does all that come together and integrate well? So, I think part of us saying that hey, maybe we should add a little bit more rigor to that adds to that, making sure that it works cohesively.

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COMMISSIONER BARAN: And, Jack, when I first arrived in October, there was a lot of discussion at that time about NRC oversight of the Regional Response Centers, which are now operational. What's the latest thinking on how we can ensure the availability and reliability of that equipment going forward?

MR. DAVIS: So, we're in the process of working with the Regions, and working with the Division of Inspection and Regional Support, also NRO on how best to oversight the Regional Response Centers. Latest thinking is that we would use the Vendor Inspection Program, and we're working through that, looking at what would the right frequency be, and so on, given, again, the redundant nature of the equipment and so on.

But what gives us confidence, if you will, today? We have participated in numerous amount of V&V activities, tabletops with them. We've reviewed their documentation, and specifically looking at maintenance and testing, and how they're going to maintain the equipment reliable and capable to respond.

We actually went out and watched as they took pieces of equipment from there and actually got them over to the airport, and got them on the aircraft to simulate you're going somewhere. And we followed that all the way through, and there were a number of observations that were made that made the program better. So, we feel fairly confident that given what we found, given what we looked at that we can take the time to put the right program in place going forward.

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COMMISSIONER BARAN: Okay, thank you.

CHAIRMAN BURNS: Commissioner Svinicki.

COMMISSIONER SVINICKI: There's been a number of references to some of my statements, so I'd just like to close with this comment; that the ACRS is very telling to me, what they said about SAMGs. It says, "We consider how the requirement is imposed to be as important as how the requirement is implemented."

And while it's interesting to me that the members of the ACRS find that important, let me tell you who else finds that important. I find it very important. The people sitting on this side of the table have to take that very, very seriously, because I talked about the powers and authorities granted to the public office I occupy. It's a hair's breath between exercising the impressive authorities I have under law to require things, and abusing my discretion by having reliance on something that states make this compulsory because it increases defense-in-depth.

With more, some could view that as not enough of a basis to compel action. So, you know, whether or not we looked at a voluntary industry initiative --- and I think many of you would accept the stipulation that the standards for inspection of voluntary industry initiatives are not the same as regulatory requirements, so post-Fukushima having gone and found issues, I don't think there's a single gentleman on the other side of the table that was surprised by that outcome, because it was voluntary industry initiative. But making

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things compulsory is a sober power to have, but there's obligations that come along with it. So, I look forward to looking at --- Mr. Dean's indicated the stack of reg analysis is this high, so I look forward to looking beyond the one sentence that says "this enhances defense-in-depth," which I hope all of you would also agree might be a basis to make a regulation of pretty much anything. And that was a question I got asked in my last Congressional hearing; is there a level where it's abusive? I was asked that question, and I said, "Yes, there is a level that is abusive, but you have to look at it case by case," which is what we'll do. Thank you.

CHAIRMAN BURNS: Thank you.

MR. JOHNSON: May I just add, one of the things that you'll find in that package is we go into a little bit of detail about what we would do --- how we would implement a requirement and it is scaled. So, I know you've got to look at the package and arrive ----the Commission needs to arrive at a decision. We did recognize that given the fact that it's --- we're talking about beyond-design-basis situations, we're talking about a situation where you have, for example, a core damage frequency event, extremely low-frequency event, situations where you would be needing these SAMGs. So, we tried to right-size the requirement, but all of that is in the package, and we look forward to the next opportunity to meet with you on this.

CHAIRMAN BURNS: I want to thank the Staff, as well as our first panel, again, for their presentations, for giving us a

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comprehensive view of where we stand with respect to the efforts that the Agency and industry have done since the Fukushima Daiichi accident.

We, obviously, had a foreshadowing of an important paper and an important meeting we will have later in early summer, in July, and we look forward, again, to the engagement of the Staff, the industry, and our stakeholders as we continue on. So, with that we are adjourned. Thank you very much.

(Whereupon, the above-entitled matter went off the record at 12:01 p.m.)

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