

UNITED STATES  
NUCLEAR REGULATORY COMMISSION

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

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THURSDAY,  
FEBRUARY 16, 2017

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ROCKVILLE, MARYLAND

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The Commission met in the Commissioners' Hearing Room at the Nuclear Regulatory Commission, One White Flint North, 11555 Rockville Pike, at 8:58 a.m., Kristine L. Svinicki, Chairman, presiding.

COMMISSION MEMBERS:

KRISTINE L. SVINICKI, Chairman

JEFF BARAN, Commissioner

STEPHEN G. BURNS, Commissioner

ALSO PRESENT:

ANNETTE VIETTI-COOK, Secretary of the Commission

MARGARET DOANE, General Counsel

**NRC STAFF:**

ERIC BOWMAN, Japan Lessons-Learned Division, Office  
of Nuclear Reactor Regulation

BILL DEAN, Director, Office of Nuclear Reactor  
Regulation

MICHAEL FRANOVICH, Acting Director, Japan Lessons-  
Learned Division, Office of Nuclear Reactor  
Regulation

STEPHEN LAVIE, Office of Nuclear Safety and Incident  
Response

TIMOTHY REED, Division of Policy and Rulemaking,  
Office of Nuclear Reactor Regulation

**INDUSTRY AND STAKEHOLDERS PRESENT:**

DAVID LOCHBAUM, Director, Nuclear Safety Project,  
Union of Concerned Scientists

PATRICK MULLIGAN, Chief, Bureau of Nuclear  
Engineering, Division of Energy Security and  
Sustainability, New Jersey Department of  
Environmental Protection

BILL PITESA, Senior Vice President and Chief Nuclear  
Officer, Duke Energy Corporation

JOSEPH E. POLLOCK, Vice President of Operations and  
Chief Nuclear Officer, Nuclear Energy  
Institute

## PROCEEDINGS

CHAIRMAN SVINICKI: Do either of my colleagues have any comments on the affirmation item? If not, we will close the affirmation session, and I invite the first panel's panelists to join us at the table.

Well again, good morning to everyone and welcome, and to those tuning in, we meet this morning to hear the status of actions taken by the NRC and industry in response to lessons learned from the Fukushima Daiichi accident. Our first panel, we will be joined by Joseph Pollock, Vice President of Operations and Chief Nuclear Office of the Nuclear Energy Institute; Bill Pitesa, Senior Vice President and Chief Nuclear Officer, Duke Energy Corporation; Patrick Mulligan, Chief, Bureau of Nuclear Engineering, Division of Energy Security and Sustainability of the New Jersey Department of Environmental Protection; and Mr. David Lochbaum, Director, Nuclear Safety Project, Union of Concerned Scientists.

Before we begin, I want to acknowledge the fact that this is the first NRC public Commission meeting that I am chairing. I am very grateful and humbled by President Trump's designation of me as Chairman of the Nuclear Regulatory Commission. Before we begin, I just wanted to address a comment first of all about how grateful I am for the service of former Chairman Burns.

Many of you know that he has a very long association with the Nuclear Regulatory Commission, and also after a brief period abroad returned as a Commissioner, then so ably stepped in in a somewhat unexpected request with the departure of Chairman MacFarlane.

1           You know, I want to say that personally I have a long career in public  
2 service and so does Commissioner Burns, and again to me he's an inspiration and a role  
3 model of what is a call to public service, what is it to demonstrate such commitment to an  
4 organization. And so please join me in acknowledging his service as Chairman.

5           (Applause.)

6           CHAIRMAN SVINICKI: And I wanted to share a reflection about  
7 Commissioner Baran as well, so he didn't feel left out. I just want to say that, you know,  
8 I knew Steve when he returned to the Commission and I did not know you. But it has  
9 been such a pleasure working as colleagues. I sit here, you know, really grateful. I  
10 don't think that I could work with two more gracious individuals than the gentlemen who  
11 sit on either side of me.

12           So thank you both so much. With that, we can turn to the subject matter  
13 of the day. It's interesting as I prepared for today's meeting to think about the long  
14 journey that the NRC as an agency and the industry as well have been on since the tragic  
15 tsunami and earthquake event in Japan.

16           It was interesting on Friday. I had an opportunity to be at a U.S. nuclear  
17 power plant. I had not visited the operating side there since before Fukushima, and as  
18 we took a tour of the site, the actions, the implementation of the post-Fukushima actions  
19 were so visible to me.

20           You don't even have to be particularly close to or knowledgeable about  
21 all the actions that have been taken and implemented at sites to have -- to be struck by  
22 the further enhancements that have been made to the preparedness of the sites, their  
23 resiliency to withstand extreme natural events and other hazards.

1           So I think it's interesting to prepare for this meeting. I've been here for  
2 the entirety of the NRC's journey as we've taken these actions. As a body of work  
3 between the regulator and the industry, the implementation, it's very impressive to me.  
4 So we will hear a status report today, but for those of us who have been here during the  
5 entirety of these events, there's a tremendous amount of effort.

6           I think for NRC's part it would have to be many hundreds of NRC staff  
7 that have participated in where we find ourselves today, and it is still evident that we have  
8 increased the resiliency and responsiveness of these facilities. So I look forward to  
9 hearing from our presenters today. Would either of my colleagues like to add any  
10 comments? Commissioner Baran.

11           COMMISSIONER BARAN: Well thank you for your kind opening  
12 remarks, and I had something I wanted to say to Steve and to you. To Steve, I just want  
13 to join Kristine in thanking you publicly for all of your hard work as chairman. I think you  
14 can tell everyone in the room appreciates everything you did as chairman and your efforts.

15           I want to officially congratulate Kristine on her designation as chairman,  
16 wish her all the best. We don't always agree on policy, but I respect you tremendously,  
17 and I look forward to working with you in your new role.

18           CHAIRMAN SVINICKI: Thank you very much.

19           COMMISSIONER BURNS: I have to do it all myself now.

20           (Laughter.)

21           COMMISSIONER BURNS: No. I want to thank my colleagues for your  
22 kind remarks and, you know, it's interesting. As they said, when I came back from and I  
23 think my wife will still kicks me once in a while from coming back from Paris, but I let her

1 go back when we go back a little bit and all.

2 But it has been an interesting journey, and I appreciate the support that  
3 my colleagues have. As Jeff said, we have I think good debates, don't always agree.  
4 But I think we try to do the best for the American public, and I do wish Chairman Svinicki  
5 all the best.

6 She and I were talking the other day, and there is something and  
7 something about this. You are still your own person, but a lot of people think they own  
8 a piece of you and all that.

9 CHAIRMAN SVINICKI: I'm finding that out.

10 COMMISSIONER BURNS: Yeah, and I won't go on actually. Most of  
11 you know, I was not a nuclear engineer but I was actually German major and there is an  
12 old German play by Friedrich Schiller about Don Carlos, which talks about Phillip II, the  
13 King of Spain. He's actually basically he says I can't get anything done because all you  
14 people are doing things.

15 Well, it's not quite that bad. It's not as bad as it was maybe for the King  
16 of Spain. But sometimes you have work those struggles through and I wish you all the  
17 success and all the support for that. Thanks.

18 CHAIRMAN SVINICKI: Thank you. Thank you both. Mr. Pollock, I  
19 believe we'll begin the presentations with you.

20 MR. POLLOCK: Thank you Chairman Svinicki, Commissioner Baran  
21 and Commissioner Burns. I don't know how to follow up this introduction you started,  
22 but I'll try. I'd like to talk about where we've come from, as you said, over this journey,  
23 coming up on your sixth anniversary actually of the events of Fukushima.

1           Go to the next slide, please. Significant safety enhancements across  
2 the industry have been accomplished as a result of the actions taken on Fukushima, the  
3 Tier 1 activities which were the priorities identified by the Commission to move forward  
4 on or substantially complete.

5           The NRC rulemaking aligns with the industry efforts that were taking  
6 place, and in this case many things were done in parallel. So we were working and  
7 installing as we were writing the requirements to work and to install, and I think that  
8 speaks to the open communications and dialogues that we had throughout this time  
9 period.

10           In fact, by our accounts there's somewhere over 300 public meetings that  
11 discussed these with thousands of participants, to make sure that we had clear  
12 communications as we continued forward. The focus now is going to be changing from  
13 installation to inspection.

14           While inspections took place throughout the time period of installing, the  
15 plants have substantially installed the modifications for mitigating strategies, and now  
16 we're going into the NRC's inspection of the final installations and going through. So it  
17 is a transition taking place.

18           Next slide. The spent fuel pool level instrumentations were completed.  
19 I already spoke to the FLEX implementation, and as we found out subsequently in  
20 information is that the fuel pools did survive the events in Fukushima with minimal  
21 damage, but the uncertainty surrounding the levels in the fuel pool distracted attention in  
22 the response.

23           So while information provided later on would identify that it was not a

1 requirement, it was something that was taken on and directed by the NRC and I think the  
2 operators find value in having that, to be able to focus your attention on much more  
3 important things.

4 The hardened vent implementation is on schedule. As you know, the  
5 NRC has required orders and modified those orders as a result of a lot of research  
6 activities going on concurrently to that development, and we expect those to be completed  
7 on time going through.

8 The seismic and flooding evaluations, which were substantial, was we  
9 went in to look at new information and could anything change to our position. More  
10 importantly, could it change the ability to implement the mitigating strategies with the new  
11 information that was developed.

12 And then we do support the status recommendations on the Tier 2 and  
13 Tier 3 actions, and in fact the majority of the Tier 2 was consumed in the actions that were  
14 taking place for Tier 1, and then the disposition of Tier 3 we concur with the decisions  
15 made by the Commission going forward.

16 Next slide. So the flooding hazard, reevaluation hazards as you walk  
17 through are about 85 percent complete. As you're aware, there's a couple of the sites  
18 that were extremely complex for the Army Corps of Engineers to do analysis on parts of  
19 the flooding plains and the dams that are upstream from that, in order for the sites to  
20 complete that analysis, but we have completed that analysis.

21 The focus evaluations and the integrated assessments were all  
22 scheduled through the 2017 and 2018 time period. The focus evaluations again were to  
23 evaluate whether you could handle the mitigating strategies, still implement those



1 mitigating strategies or alternate strategies as a result of these evaluations, and then the  
2 mitigating strategy assessments, as I said, will be completed this year going through.

3 In the area of seismic, the request for the information is about 90 percent  
4 complete by the end of this year. It's on schedule, as some of the plants requiring  
5 seismic probability risk assessments are scheduled to go out into the 2019 time frame.  
6 That was understood from the beginning, with resources both in the public domain for  
7 people capable of performing these assessments, as well as NRC staff to review the  
8 assessments.

9 And again, the mitigating strategies assessments will be about 80  
10 percent complete, in alignment with the seismic probability risk assessment being  
11 complete. What that means is the sites that went back and looked at their FLEX  
12 mitigating strategies with the new information they had as a result of these evaluations  
13 on seismic made determinations of would they be able to still implement those strategies  
14 or deploy an alternate strategy, and that has been completed in about 80 percent of the  
15 sites.

16 Next slide. The FLEX inspections. There's a current focus on  
17 inspections, and it's important to understand that focus. While inspections have taken  
18 place throughout this time period, from the initial inspections for the NRC, walkdowns of  
19 the current fleet status prior to modifications as well to inspections throughout the time  
20 period going through.

21 The industry through all this has routinely shared the lessons learned.  
22 We had held workshops which the NRC has participated to identify the findings they're  
23 seeing so that we could share with the rest of the industry and learn from those, so that

1 the subsequent inspections would not have the same items happen to be revisited. The  
2 industry would learn and move.

3 And in fact we're holding a workshop next month in Atlanta with regional  
4 and headquarters inspectors, as well as the industry, to talk about the going forward.  
5 There is a knowledge retention and transfer, and that's taking place both at the NRC and  
6 the industry. What I mean by that, as Chairman Svinicki said, she's been here through  
7 the whole time period.

8 In the industry that is the case in some, and in many cases people have  
9 started either to retire or to be reassigned to other projects. So new people are taking  
10 responsibility. So we're making sure that that knowledge that was captured during this  
11 time frame is being transferred to the industry.

12 And as well, the NRC's inspectors are participating to share that  
13 knowledge and learning, going through that. So it's important for us in the clear  
14 communications and the transparency, that this information be provided. We've held  
15 those throughout the implementation phases of the mitigating strategies.

16 And then the last points I wanted to, we do support the draft final rule as  
17 the regulatory centerpiece of post-Fukushima activities. It codifies the work that's been  
18 done in response to the NRC orders and combines the work and assures mitigating  
19 strategies remain feasible for the reevaluated hazards.

20 Again, the rule has been thoroughly vetted. Overall, we believe that our  
21 comments have been satisfactorily resolved, and that has a lot to do with the 300 plus  
22 public meetings I talked about, where we could be very clear on what our concerns were,  
23 and staff could voice our concerns and we could come to the understandings so we can

1 move forward. So that concludes my remarks.

2 CHAIRMAN SVINICKI: Thank you very much. Mr. Pitesa.

3 MR. PITESA: Bill Pitesa, Chief Nuclear Office, Duke Energy. I  
4 certainly appreciate the invitation also from the Commissioners and the Chairman. You  
5 know, it's -- I listened to your remarks Chairman on opening up and talking about  
6 Fukushima. All of the chief nuclear officers in the country had an opportunity to go there  
7 in 2013, and it is absolutely eye-opening the circumstances that presented themselves,  
8 and the response that the operators took at that time.

9 To me, the most valuable aspect of this horrific tragedy is the fact that  
10 we are going to get to learn from it and take advantage of things, so that they don't happen  
11 here. I commit to our operators in every visit to control rooms across our plants that we  
12 will make sure they have the equipment, the training and all the things they need, such  
13 that that event cannot happen at one of our plants.

14 I think that's such an important piece of the lessons learned. We can all  
15 talk about all the specifics, but that overarching message is so important because we are  
16 a better industry now than before this event happened.

17 And I'm going to talk through representing some of my peers. Quite  
18 frankly it's a little challenging because I think you guys have seen more FLEX equipment  
19 than I will ever have seen in my career, because you've been to many plants and seen  
20 many things.

21 It's incredibly important that we keep an eye on the tragedies that  
22 happened in Japan and also the application and the ultimate benefits, not just of U.S. but  
23 the entire industry. So if you look very specifically on my first slide, it really talks about

1 the chief nuclear officers got together about five years ago and started talking about the  
2 FLEX, and ultimately what can we do collectively to respond to an event, such that we  
3 can take advantage of equipment across sites and across locations.

4 It's really probably the first time we came together in a way that ultimately  
5 led to a common solution to an industry problem. Our history had always been each of  
6 us will do it differently, and in this case we did it in a very common manner.

7 I'm certainly very proud in fact that now all 11 reactors at Duke have  
8 completed FLEX, have completed the spent fuel level instrumentation, and ultimately  
9 we're very committed to completing the beyond design rule events.

10 Next slide, please. So if you look at the implementation of FLEX and  
11 spent fuel pool, I've got some pictures later on, but overarching it does -- has created a  
12 significant level of improvement in safety, and we've established maintenance activities  
13 with this equipment. We've given training to our operators. We've tested the  
14 equipment.

15 So I'm very confident that if that equipment is needed, it can be utilized  
16 by people who know how to use it, and that's very important. Certainly overall, as I said  
17 before, I think we are a much safer industry now with the implementation of this  
18 equipment.

19 Next slide. So we're still working on the hardened vents at our two units  
20 that are boiling water reactors, and we're on a very clear path to closure in the 2018-2019  
21 time frame, and feel very confident that we'll have that implemented exactly per the orders  
22 and rules.

23 Next slide. I always appreciate the pictures. You know, when a look at

1 the domes we built, we built these, the domes at four of our sites. At one of our sites we  
2 were able to use an existing facility, and at one of our sites we used the three buildings  
3 versus the domes. It was our first one, and we weren't sure exactly if the rules were  
4 going to change, so we decided it was safer to implement the three buildings.

5 But overall, I am very -- when I visit inside these domes, when I visit the  
6 response centers at Memphis and Phoenix, it really conveys that we've got good  
7 equipment, we're taking care of that equipment and if it's ever needed, it's going to be  
8 available to us.

9 Next slide. So I had to give you more pictures, and you can look at little  
10 bit more at that. But like I say, I know you guys have seen all of this equipment. But  
11 we're committed to taking very good care of it and making sure it will work when we need  
12 it.

13 Next slide. So beyond just what we've done with equipment, beyond  
14 just what we've done with all aspects of building these buildings and putting equipment  
15 inside of it, we have also done a significant amount of inspections and analysis. On this  
16 slide, really just trying to convey the level of effort we've done with seismic, with flooding  
17 walkdowns, with flooding reevaluations and seismic reevaluations.

18 We're very committed that these industries are not -- these occurrences  
19 are not hypothetical. They're ones that we're going to be able to respond to if they were  
20 to actually occur, and that requires inspections and then follow-up on those inspections  
21 with activities in the plant, to make sure that all aspects of the way that we will preserve  
22 our ability to safely shut down the reactors will be available, whether it's flood or seismic  
23 events.

1           Next slide. And then just the last is just thought I'd give a breakdown of,  
2 you know. This has been a large investment by our industry. But you know, it was  
3 intimidating on the front end, but I would say in retrospect it's absolutely been beneficial  
4 in every way.

5           When I look going forward, I think now that we've made these safety  
6 improvements to our plants. We'll look at crediting those safety improvements, how we  
7 can utilize them more. It can't just be we put this in place and just set it to the side and  
8 now it's a one and done. It needs to be really alive as part of our way of the way we work  
9 day-in/day out.

10           Now I'm looking at ways during outages that I can go ahead and pre-  
11 deploy FLEX equipment or other things and say, you know, if something were to go  
12 wrong, if equipment didn't work right, I've got available backup equipment that I can just  
13 readily hook up and use.

14           So I think, I think it still there is a wide opportunity now of taking  
15 advantage of all the improvements that we've made with this FLEX equipment, with the  
16 analysis we've done, with the inspections we've done. That's all I've got. Thank you.

17           CHAIRMAN SVINICKI: Thank you very much. Mr. Mulligan.

18           MR. MULLIGAN: Good morning Chairman Svinicki and Commissioner  
19 Baran and Commissioner Burns. I want to thank you for the opportunity and invitation to  
20 come down and present to you this morning. My topic, I'll be talking about real-time  
21 monitoring.

22           And so I'd like to start with an assessment of some of the points that were  
23 brought up in the document that was put out recently in December on real-time

1 monitoring. Now I think, I believe that the current regulations and the guidance that we  
2 have in place provides us with a mechanism where we can make protection action  
3 recommendations for public health and safety prior to the need for even gathering  
4 radiation data.

5 I think that the EAL schemes we have, the notification schemes we have  
6 and the processes we have in place for offsite response gives us that capability.  
7 However, I believe that the offsite monitoring capability is all robust. I mean we have  
8 mature offsite response programs that have those capabilities and have been developing  
9 them for a long time.

10 So I believe that to support those assessments and those decisions that  
11 we make, we have sufficient offsite monitoring capabilities. While I believe that public  
12 release of data won't necessary enhance our decision-making process, I do believe that  
13 making radiation data public can be beneficial, and I'll talk a little bit about that towards  
14 the end of my comments here.

15 Next slide, please. New Jersey was one of the first to install fixed  
16 monitoring stations, and we believe firmly that it is an excellent system for early warning  
17 and detection of any releases to nuclear power plants. We believe that there are still a  
18 couple of EALs in place that -- where you can actually classify an event based on offsite  
19 doses if nothing else is available.

20 So we believe that the fixed monitoring stations that we have in place can  
21 provide a good early warning system for us to detect offsite radiation doses, and I can  
22 talk a little bit more about that. You know, New Jersey has a fairly robust system around  
23 both of our nuclear power plant sites in New Jersey.

1           We've got all of the wind sectors covered at both sides, and that data is  
2 transmitted to the State of New Jersey real time, minute by minute, 24 hours a day, seven  
3 days a week. So we've got sentinels out there constantly.

4           WE do believe -- next slide please -- we do believe so much in this that  
5 after a couple of events, one of them was the incident at Fukushima and the other one  
6 was Superstorm Sandy in New Jersey where we were challenged. At that point in time  
7 during Superstorm Sandy, our fixed radiation monitoring sites were probably the only way  
8 we were going to get any radiation data should there have been an accident at one of  
9 those power plants.

10           As you know, Oyster Creek did go to an alert during that event, and that  
11 was really the only way we would have had to monitor offsite. Roads were impassable.  
12 It would have been impossible to get field teams out. So we believe that they provide a  
13 measure of redundancy to us for our real time field teams going out.

14           To support that, realizing how important it was, we try to make our  
15 network of fixed monitoring sites better, and we invested a lot of money in doing that.  
16 Redundant network systems, automatic failover on power failures within the state,  
17 accessibility through various means on the Internet and Intranet for the DEP, and we also  
18 have battery backups at each site. We're actually looking at making those battery  
19 backups a little bit more robust so that we can have extended power.

20           Next slide. Fuel data is important, and it's important for us to get data  
21 faster. So we recently invested quite a bit of funds into coming up with mobile radiation  
22 detection equipment. We have four vehicles now.

23           They can transmit data back to our assessment facility real time. Those



1 are capable of monitoring ambient gamma radiation, air iodine concentrations and air  
2 particulate concentrations. So we can get those in real time as well as our teams are out  
3 there gathering data in the field.

4 We also have plans and procedures that can dispatch additional field  
5 teams to supplement that if necessary to hand-held instruments. I'm going to spend a  
6 little bit of time talking about data-sharing, because that's really important to us. We've  
7 been involved with that for a while. We've been actively involved with CRCPD on their  
8 inter-agency environmental data-sharing and communication committee.

9 We were instrumental in helping draft the policy recommendations that  
10 were incorporated into the latest draft of the National Response Framework, the  
11 Nuclear/Radiological Incident Annex, and we're currently involved and the committee's  
12 working on trying to come up with a policy on how we can share data publicly. We've  
13 not reached any resolution on that. It's a tricky subject, but we're still working towards  
14 making that happen.

15 Next slide, please. Our real time data is shared within the state through  
16 a web application that we've developed through ESRI. So we share that with our partner  
17 agencies, the State Office of Emergency Management, the Department of Health and  
18 others. We're also working with the federal agencies. We actually were one of the first  
19 agencies to share live data with -- through the Rad Responder Network with our federal  
20 partners.

21 So we are sharing that minute by minute data in real time with the  
22 Department of Energy and the Department of -- the Environmental Protection Agency and  
23 others who have requested it. So we do make that data available, and like I said, that's

1 real time live data that's going through that network.

2 So we are very interested in sharing our data that we collect with other  
3 outside organizations, so that everybody has access to it.

4 Next slide, please. The commitment for New Jersey is to make all of our  
5 radiation data accessible within the state government to all agencies, and to also making  
6 the Rad Responder Network our primary way or means of sharing data with outside  
7 organizations, including neighboring states, local organizations, licensees and with the  
8 federal government.

9 We also are still evaluating the policy recommendations for making  
10 radiation data publicly available. I think a couple of the things, while it doesn't help us  
11 make decisions for the public making that public, I think you can go a long way sharing  
12 that data with the public to give them confidence, that the decisions that are being made  
13 for them are the proper decisions.

14 If I'm told a shelter, if I can go and I can look at radiation data that backs  
15 that up, it makes me feel more comfortable taking that action. Or if I'm told to evacuate,  
16 I can actually go look at data that says I need to be evacuating it, it makes me more  
17 comfortable with the decisions that are being made.

18 So I think that it can be helpful. However, there needs to be some  
19 guidelines on that. I mean you can't put radiation data out there publicly without context.  
20 So we need to come to a consensus about how we can put that out in good context, so  
21 that the public can understand and they can't interpret it in ways that it's not meant to be  
22 interpreted. So we need to have context.

23 We also have to have validation and verification before it's made public.

1 We can't just be putting data out there before it's vetted, by some people who know what  
2 the data means. Obviously, there are times that you're going to collect data and there's  
3 going to be mistakes, there's going to be errors.

4 So that we need to make sure that the data before it's made public is  
5 validated and verified. Finally, we need to come up with policy decisions. You can't go  
6 into an emergency and try to make policy on the fly. We have to have a mechanism set  
7 up in advance to have permissions to allow the data to be publicly available. It's not the  
8 time in the middle of an emergency for me to go try to find a chain of command that's  
9 going to help me get that done.

10 So I need to have that in advance, so that I am empowered, that I can  
11 make the decision, that it's my data that I can release it, and that everyone else is  
12 comfortable with that. So those are the three things that I think that are really the hurdles  
13 that we need to get over, to come up with a policy for making data public. That concludes  
14 my comments. Thank you.

15 CHAIRMAN SVINICKI: Thank you very much. Mr. Lochbaum.

16 MR. LOCHBAUM: Good morning. Thanks for this opportunity to share  
17 with you our perspectives on the progress made and the steps remaining for the lessons  
18 learned from Fukushima. I was little concerned about duplicating prior presentations, so  
19 I appreciate Joe and Bill holding back so I'd have some new ground to cover.

20 I will focus more on the steps remaining, but recognize and appreciate  
21 the many steps already taken by the Commission, NRC staff, and industry. We're clearly  
22 better off today than we were six years ago.

23 Next slide, please. Due to their complexity and breadth, the

1 implementation of the NRC's post-Fukushima lessons learned has been a marathon  
2 rather than a sprint. The passage of time reflects that reality, and not stonewalling or  
3 foot-dragging on the part of the NRC or the industry.

4 But it's a good time to ask if we're there yet, and if not, what additional  
5 steps should be taken. Given the time constraints on my presentation, I will focus on  
6 flood protection and to a lesser degree mitigating strategies. We believe these concerns  
7 we have about these lessons also apply to many of if not all of the other lessons too.

8 Next slide, please. After Fukushima, the NRC required walkdowns and  
9 reevaluations to reduce vulnerabilities due to flooding hazards. These requirements  
10 were a supplement to existing regulatory requirements that had been in place for  
11 decades. In other words, the NRC and the industry had more than a passing  
12 acquaintance with flood protection requirements.

13 Next slide, please. The NRC's familiarity with and enforcement of these  
14 long-standing requirements helped Fort Calhoun be ready when it became an island in  
15 the Missouri River in June of 2011. The NRC did a stellar job at Fort Calhoun, giving us  
16 confidence that flooding can be a manageable risk.

17 Next slide, please. But on the other side of the coin, Arkansas Nuclear  
18 One's March 2013 event cast doubt on whether that flood risk is being properly managed  
19 everywhere. This picture shows the 550-ton stator that dropped onto the turbine deck  
20 and crashed through an opening into the truck bay below. The center of the picture  
21 shows pipes and cables damaged by the falling stator.

22 After walkdowns concluded that the plant was adequately protected  
23 against flooding, this event clearly showed this conclusion to be wildly optimistic at best

1 or entirely bogus at worse. The walkdowns had not missed a pathway or two; it missed  
2 more than 100.

3 Next slide, please. And Arkansas Nuclear One was not unique. This  
4 is a picture showing some of the 50,000 gallons of rainwater that flooded the auxiliary  
5 building at St. Lucie in January of 2014, through pathways that the owner had told the  
6 NRC simply did not exist.

7 Next slide, please. After performing the flood protection walkdowns  
8 mandated by the NRC, the owner gave the NRC a thumbs up. The January 2014 event  
9 suggests that perhaps using a different finger may have been more appropriate.

10 Next slide, please. It's hard to suspect, yet alone believe that these are  
11 the only two reactors in the U.S. with defective flood protection measures. Maybe the  
12 rest of the reactors got it right, but maybe not seems an equally valid situation. Just two  
13 days ago, I read that ten nuclear plants in Japan were discovered to having missing flood  
14 protection features.

15 These discoveries were made during inspections mandated by the  
16 Japanese regulator after 6-1/2 tons of rainwater flooded the Unit 2 reactor building at the  
17 Shika plant in September of 2016.

18 Next slide, please. About 90 percent of the walkdowns conducted after  
19 Fukushima identified deficient flood protection measures against long-standing  
20 requirements that had been routinely inspected. Does this mean that only ten percent  
21 of the plants have properly implemented the post-Fukushima flood protection measures?  
22 Being adequately protected against a flood, unless a flood happens, is at least 100  
23 percent unacceptable.

1           Next slide, please. The mitigating strategies order expanded the post-  
2 9/11 upgrades that the NRC imposed by B.5.b and subsequent rulemaking. These  
3 measures have undergone less road testing to ensure they meet their good intentions.

4           Next slide, please. I apologize for sounding like a broken record, but  
5 nuclear safety is achieved by the NRC establishing and enforcing proper regulatory  
6 requirements. The NRC has established proper regulatory requirements for flood  
7 protection and mitigating strategies, but ample evidence strongly suggests that not all  
8 reactors meet these requirements.

9           Next slide, please. The NRC's baseline inspection effort and its post-  
10 Fukushima temporary inspection efforts have not provided reasonable assurance of  
11 adequate protection against flooding hazards and extended loss of power events. The  
12 St. Lucie event led to the discovery of defective flooding barriers that had been missed  
13 for 30 years, including missed by post-Fukushima focused inspections.

14           We recommend that the NRC conduct vertical slice inspections at eight  
15 plants for flooding protection and mitigating strategies compliance. The results from  
16 these inspections would either confirm that we are there, or reveal what additional steps  
17 are needed to get there. Thank you.

18           CHAIRMAN SVINICKI: Thank you very much. We rotate the order of  
19 recognition for questions, and it happens to fall to me to go first, so I will begin the Q & A  
20 period. Thematically in some of your presentations, I heard you touching on the topic of  
21 really what I call sustainment, meaning going forward, being that the NRC requested and  
22 demanded certain actions.

23           Those have been implemented to a very great or very extensive at this

1 point extent. But there is the sustainment question, and I take from Mr. Lochbaum's  
2 presentation, even if you look at the post-9/11 B.5.b measures, when we went out and  
3 looked at those you found variability in some of the sustainment measures there.

4 Mr. Pitesa, you talked about differentiating between a one and done, I  
5 think that was your term, versus keeping the FLEX program's mitigating strategies alive.  
6 I would note you showed pictures of equipment. It's not possible to show pictures of  
7 procedures or you could, but it wouldn't be very interesting.

8 But a key thing is that there is a lot that undergirds the existence of that  
9 equipment. There's training, there's procedures. Who's going to use it, when are they  
10 going to use it. For any of you that would like to talk about the challenges and concerns  
11 of this theme of sustainment going forward, maybe for Mr. Pollock and Mr. Pitesa, what  
12 are the measures that give you confidence in sustainment of this new resiliency that  
13 you've created at these plants.

14 Mr. Lochbaum, I'd offer to you an opportunity to address the same matter.  
15 Mr. Pollock.

16 MR. POLLOCK: Yeah. Thank you Chairman. I'll start and then Bill  
17 can add on there. The one thing we talked about is continued workshop and the  
18 formation. The industry actually requested that we continue with this going forward, even  
19 though we've been implemented, which is somewhat unusual for implementation of  
20 regulatory requirements.

21 The second thing is, and Bill can talk to it more, we're looking to use this  
22 equipment, the procedures that we've developed in other areas so that it stays fresh. So  
23 whether you use them for a refueling outage, as backup equipment or you're using it from

1 other risk advantages, it's not just a one and done.

2 It's expanded the use of this mitigating equipment so it doesn't just go sit  
3 in some warehouse or storage not to be used other than surveillances. I think that's what  
4 we're seeing. There's been utilities across the country that have utilized this equipment  
5 already and have seen the benefit of defense in-depth just from that application.

6 CHAIRMAN SVINICKI: Thank you. Mr. Pitesa.

7 MR. PITESA: I mean to echo on that message, it's very true. It's  
8 becoming part of our operation of the plant, and that to me is the differentiator that makes  
9 it sustainable. We'll be using this equipment routinely, whether it's through outages,  
10 whether it's through during an ERO drill, whether it's through activities that are going on.

11 Quite frankly, we have even used this equipment for other activities,  
12 things like bulldozers and things, to keep people fresh on being able to use them should  
13 there be debris that has to be removed, giving them practice on a more routine basis.  
14 So, and then on top of that, that's kind of the hands-on aspect of it.

15 But our processes, our procedures, our training just literally forces a level  
16 of refreshment that's going on almost continuously with this equipment, and I certainly  
17 anticipate that we'll be viewing this equipment as part of our infrastructure maybe more  
18 so than when it was first put into the dome or in the FLEX buildings, that ultimately many  
19 of my operators, many of my engineers, many of my PRA folks, the folks that are looking  
20 at designs and changes and everything else, will recognize this equipment as part of the  
21 infrastructure of our plant.

22 CHAIRMAN SVINICKI: Have you -- before I turn to Mr. Lochbaum  
23 though, you know, hearing that it sounds so logical. But we force ourselves to look at



1 every dimension of things and are there any potential challenges though when it becomes  
2 such an integrated part of the overall operation of the plant, or is used and invoked in  
3 other instances?

4 Because right now, as you walk about in the plants where there is the  
5 FLEX equipment, it has special painting on the floor. It's like so you know if someone  
6 absconded with it and took it and is using it for some other purpose. But has that  
7 dimension of sustainment been fulfilled, that it will indeed be there and it wasn't called  
8 into service in some other way that it never made its way back to where a responder is  
9 looking for it?

10 MR. PITESA: That's a great question, and we are very systematic in the  
11 way that we require that equipment get right back to where it belongs, and then ultimately  
12 doing a follow-up inspection to make sure it's back and it works okay. I won't deny we  
13 have had some challenges around early on implementation.

14 We had a situation where someone used something, put it back and  
15 didn't reconnect the battery charger. We found it the same day, but ultimately we have  
16 to make sure our processes and procedures are robust enough they give us confidence  
17 that that equipment will always be there if it's ever needed.

18 And then the -- but the aspect of the other uses, I do think is still an  
19 important piece of our path forward. I think we saw problems with B.5.b equipment  
20 because we weren't regularly putting our hands on that equipment, that led to some quite  
21 frankly embarrassing revelations when we went back and looked at it as an industry, and  
22 our goal collectively and all the CNOs are very committed to this, is we're going to make  
23 sure this equipment never reaches a dormant stage of inactivity, that we don't -- that we

1 have seen maybe in other things in the past.

2 CHAIRMAN SVINICKI: Thank you. Mr. Lochbaum, did you want to  
3 talk about the challenges?

4 MR. LOCHBAUM: Just briefly. I think to add to what Joe and Bill said  
5 is by integrating it into day-to-day or more day-to-day plant activities, I think the benefit  
6 from that is if there are some problems, because of the Fukushima lessons, the FLEX  
7 equipment is more universal, more standard across the industry.

8 The lessons learned from Plant A are more learnable or transferable to  
9 other plants. So not only do the lessons benefit that plant, how to do better, but also it  
10 benefits the industry. That's a little bit different than B.5.b in the post-9/11. They were  
11 both great intentions, but that operating experience value was less more diminished on  
12 9/11.

13 CHAIRMAN SVINICKI: Thank you for that. It's interesting. Yesterday  
14 at the NRC, the Office of Nuclear Security and Incident Response conducted one of our  
15 knowledge management seminars, and we were very honored to have Governor Tom  
16 Ridge, the first Secretary of Homeland Security and the first advisor to the President for  
17 Homeland Security after 9/11, addressed us about 9/11, Katrina and Rita and just he kept  
18 using this term of a culture of preparedness and, you know, how as a nation do we  
19 develop that.

20 He reflected a lot on his experiences in those events. But it was  
21 interesting to me that, you know, we talked about this notion of no event is actually  
22 responded to and addressed from Washington or from a corporate office. It is really the  
23 responders on the ground that are the ones that do that, and he spoke a lot about federal-

1 state partnership and also just the integrated law enforcement responders, federal, state,  
2 all of that coherency through planning and exercises that needs to come together.

3 So Mr. Mulligan, you did mention the CRCPD, the work, the input that  
4 that group, the recommendations and lessons they've done in terms of the federal-state  
5 coordination. In addition to the data-sharing issue and things that you've looked at, do  
6 you have any sense of in general do you think that the contributions and input through  
7 CRCPD have shown improvements and other actions in terms of just our preparedness  
8 overall to coordinate maybe a little bit better than we did on the radiation issues post-  
9 Fukushima?

10 MR. MULLIGAN: I believe they have, and there have been a number of  
11 other initiatives that have been cooperatively developed between state, locals and federal  
12 agencies that have improved response. There's a program out there now to develop a  
13 radiological operations support specialist, what's called a ROSS. So we're training state  
14 and local individuals to be experts in response, where we can share that resource with  
15 other states.

16 If there were an incident in California, we have people on the east coast  
17 that can go there and support them. Because we know that we're going to run out very  
18 quickly of radiation experts within the state, and we're going to run out of them on the  
19 federal level. They're all going to be busy maybe at FRMAC.

20 So that we need those experts in other areas to be at the local EOCs and  
21 the state EOCs to help explain radiation. So that's one of the initiatives that we've done.  
22 We've also worked on the Advisory team for Health and the Environment to come with  
23 some other initiatives, where the state-federal partners can work more cooperatively and

1 improve that response.

2 So the CRCPD has been involved with a number of initiatives, making  
3 public data, you know, FRMAC-backed products. You know, we've improved on all of  
4 those things. That is only, you know, made our response capabilities more enhanced.  
5 So I believe there's been a lot going on.

6 CHAIRMAN SVINICKI: Thank you. Well again, I thank each of you for  
7 your presentations and we make reference to this 300 public meetings. I know that each  
8 of you and the organizations you represent have been very involved over the last number  
9 of years in all of the activities we're talking about today. So I thank you for that effort and  
10 those contributions. Thank you very much. Commissioner Baran.

11 COMMISSIONER BARAN: Thanks. Well thank you all for being here.  
12 We appreciate it. Mr. Mulligan, the Commission is currently considering the NRC's staff  
13 proposed resolution of three post-Fukushima open items, and one of those is the  
14 recommendation to study the efficacy of real time radiation monitoring at nuclear power  
15 plants.

16 I want to get more of your thoughts on fixed monitoring stations, because  
17 as you explained during your presentation, New Jersey uses them at Salem, Hope Creek,  
18 and Oyster Creek. Can you talk a little more about the situations where you found the  
19 monitoring stations to be useful? You mentioned the example of Superstorm Sandy.  
20 Are there other examples? Do you see benefits during emergency preparedness  
21 exercises or other times?

22 MR. MULLIGAN: We actually we do see -- we use them at every one of  
23 our emergency preparedness exercises. We have a simulation program that runs. So

1 we're looking at them, as we would be looking at them during a real emergency. So  
2 we're in tune to those. We use them much like another field team. I mean if there's a -  
3 - one of our fixed radiation monitoring sites located somewhere, we don't need to send a  
4 field team there.

5 So we can actually save some radiation dose to some of our field team  
6 members by having those in place. On a day-to-day basis, you know, when there was a  
7 rain event post-Fukushima, we saw that on all of our monitors. There was a period of  
8 time, a four hour period where it was raining that we actually saw some of the fallout from  
9 that. That's how sensitive they are.

10 There have been -- I mean we see fuel shipments in and out and  
11 materials going by, and there was also one incident where there was an industrial  
12 radiographer doing some work and not using their shielding as they should. We caught  
13 that at one of our sites. So there are a number of opportunities and a number of ways  
14 we use that.

15 But first and foremost it's that early warning system that we can detect  
16 prior to anywhere else, because you know, in New Jersey we're kind of close. I mean  
17 we're an hour to an hour and a half away. Other states, where the response time from  
18 organizations might be longer, in a larger state they could be valuable while teams are in  
19 transit to get there. They can give you some real offsite data.

20 COMMISSIONER BARAN: Uh-huh. So it sounds like there are some  
21 cases where in a Superstorm Sandy situation, where you don't necessarily have the use  
22 of the monitoring vehicles and fixed monitoring stations are useful there. There may be  
23 some dose reduction benefits at other times.

1           Are there cases where you find it useful in terms of directing your mobile  
2 monitoring equipment? In other words, you get some readings off the fixed monitoring  
3 stations that allows you to zero in on where you're going to deploy the vehicles. Is that  
4 used or not really?

5           MR. MULLIGAN: Not really, but it can give us an idea. You know, a lot  
6 of the modeling that we do leads us down that road that, you know, a plume's going to  
7 look exactly like it does when we do our modeling. That's just not the case. I mean if  
8 you look at, you know, the modeling results and what really happened at Fukushima or  
9 at Chernobyl, it just goes everywhere.

10           So while it doesn't directly tell us where it's going to go, it can redirect.  
11 If we're picking up radiation in areas we didn't believe that it should be, based on the wind  
12 direction and the wind patterns, you know, the micrometeorology in areas can move it all  
13 around, especially in an area like Oyster Creek, where you have sea breeze effect, you  
14 know.

15           So they can help us redirect teams to areas where we didn't believe there  
16 should be radiation but there is.

17           COMMISSIONER BARAN: In its evaluation of this issue, the NRC staff  
18 focuses quite a bit on a 1982 study that concluded that a monitoring system consisting of  
19 16 or 32 stations couldn't provide reliable information about a potential radioactive plume  
20 because the plume could pass between the stations or could be underestimated if a less  
21 radioactive part of the plume was -- crossed over a station. What do you think about that  
22 conclusion?

23           MR. MULLIGAN: I'd have to say that I really -- I disagree strongly with

1 that. You know for me, I don't believe that you're going to sneak a plume between two  
2 of those. I mean the shine from a plume that's a significant plume is going to be picked  
3 up by one of these radiation monitors that we have. These picks are very sensitive.

4 The other thing is that any data that I get during a radiological incident is  
5 valuable data. Whether it's a centerline point or an off the centerline point, because I've  
6 got, you know, as a health physicist and knowing if I have an off centerline data, knowing  
7 how far that is away from the centerline, knowing where that is, I can back-calculate to  
8 what the centerline dose is.

9 So for you to -- for them to suggest that I can't tell what the peak is based  
10 on an off center value is just not true. I can do that, and so that I -- you know, I do believe  
11 that while you may not be able to get the most accurate data, I mean you can get data  
12 that you can really work with.

13 COMMISSIONER BARAN: Okay, and you mentioned that you either  
14 have or you've looked at upgrading the equipment over the years. Based on your  
15 experience in New Jersey, how have the costs and reliability of the fixed modernizations  
16 changed over the last, you know, 30-35 years?

17 MR. MULLIGAN: We are just in this process right now of upgrading our  
18 systems. The last time we upgraded was in 2000, so the units that have been on there  
19 have been operating without issues for probably close to 17 years, and the only reason  
20 why we're replacing them is because the manufacturer is no longer supporting that model.  
21 They're still working fine. We just didn't want to be caught without them, so we're  
22 replacing them now.

23 So you're looking probably at a 15 or 20 year life of these that we've only

1 replaced them two times in New Jersey. The original installation was in '88. We  
2 upgraded in 2000, now we're upgrading again. I believe if you're looking at a cost-benefit  
3 for the amount of time that they're in service and for the amount of protection and data  
4 that they give you 24 hours a day, you know, minute by minute, I believe that, I believe  
5 that they're a cost effective way to maintain surveillance around the site.

6 COMMISSIONER BARAN: And do you have a sense, if you're kind of  
7 heading into the third generation of these, how have -- have costs changed over time?  
8 Is it cheaper or more expensive to do it this time than in '88?

9 MR. MULLIGAN: Actually, I believe the costs have either stayed the  
10 same or they're a little bit less now.

11 COMMISSIONER BARAN: The Fukushima Near Term Task Force  
12 recommended considering whether radiation monitoring data should be available on the  
13 Internet, and it sounds like that's an issue you're grappling with in New Jersey. You  
14 talked about the importance of validating and vetting that data before it goes out there.

15 If you get to a point where you can validate and vet, what do you see as  
16 the pros and cons of releasing information publicly?

17 MR. MULLIGAN: I think one of the pros would be public confidence  
18 obviously. I mean, you know, if the public knows that you're getting data and gathering  
19 data and you're not sharing with them, they have the sense, at least from what some of  
20 the reports are, that you're withholding things, and when you're withholding information  
21 from somebody, there's a level of distrust.

22 So I believe that making that data publicly available will generate trust in  
23 the decision makers that are providing the protective actions that they're taking. Again,



1 some of the cons are that if people don't understand what the data means, it could cause  
2 a general panic too.

3 If you're looking at something that's twice background and they see that  
4 oh, you know, it's doubled, it's going high and they don't understand that that's not a big  
5 deal, you know, then that could create things that you don't want to happen, especially  
6 for incidents where there's actually no actions that need to be taken at all. So that's the  
7 downside of maybe sharing things publicly as well.

8 COMMISSIONER BARAN: Are you hearing interest from the public in  
9 getting access to the data? Is that --

10 MR. MULLIGAN: All the time.

11 COMMISSIONER BARAN: All the time.

12 MR. MULLIGAN: Yeah.

13 COMMISSIONER BARAN: Dave, do you have thoughts about a review  
14 on radiation monitoring stations generally or about this more specific question of public  
15 availability of the data?

16 MR. LOCHBAUM: Public availability is generally good, but there is  
17 strong caveats on this one, in the validating and vetting process. If the public perceives  
18 that as you're pulling out the bad data and only presenting the good data, even though  
19 there's valid reasons for perhaps doing it, that's a big confidence hit that's hard to recover  
20 from.

21 Patrick mentioned that the state is training people to help other states if  
22 they need because there's a shortage of people. There's even a shortage in the public.  
23 I'm a nuclear engineer. I wouldn't understand those numbers, whether to shelter to

1 evacuate if I saw it.

2 So I don't want data. That doesn't help me. I want to have trust in the  
3 people who are telling me that decision. I think there's other ways of gaining that trust  
4 than me looking at the data.

5 COMMISSIONER BARAN: During this presentation, Joe indicated that  
6 NEI supports the draft final rule for mitigating beyond design basis events. Does UCS  
7 have thoughts about the draft final rule?

8 MR. LOCHBAUM: To be honest with you, we haven't looked at the  
9 draft. Neither Ed nor I have got to it yet.

10 COMMISSIONER BARAN: Yeah, okay. Let me ask one more  
11 question, just to follow up on something you mentioned in your presentation. On the idea  
12 of the eight vertical slice inspections, can you just talk a little bit more about what you  
13 have in mind and how that compares to the inspection the agencies are already doing for  
14 mitigating strategies and the staff assessment the agency is doing on the flooding side?

15 MR. LOCHBAUM: Sure. The real model I had or the template I had in  
16 mind was the inspections that the NRC did after Millstone, the design basis events issue  
17 back in the mid-90's. The NRC sent out teams to I think it was 17 or 18 nuclear power  
18 plants to look at how design basis information was translated into operating procedures,  
19 training, maintenance procedures, etc.

20 They found some problems at certain plants that had to be fixed, certain,  
21 you know, a broken widget that had to be fixed. But they also drew some insights more  
22 broadly into a lot of the findings had to do with calculations and calculation control, that  
23 were then built in or factored into the inspection program, the routine inspection program.

1           So I think a similar effort here, a deeper dive on flooding protection and  
2 mitigating strategies could reveal individual problems. But the bigger value from that  
3 would be to gain confidence in what part of the baseline inspections are effective, and  
4 what tweaks may be necessary to sustain that effectiveness going forward, or improve or  
5 sustain that effectiveness going forward.

6           I think if we continue the status quo, the inspectors are looking at whether  
7 there's a flood protection barrier there or not. They're not then pulling the string to make  
8 sure that it's properly designed and maintained to be there. You know, they're basically  
9 like a checklist, is it there or not. The deeper dive will assure that that's the appropriate  
10 barrier for that penetration or that pathway.

11           And again, if those inspections show that that homework's there, then  
12 you just continue. If it shows that there's a recurring theme, then that leads to a different  
13 fix more broadly.

14           COMMISSIONER BARAN: Thank you. Thanks.

15           CHAIRMAN SVINICKI: Commissioner Burns.

16           COMMISSIONER BURNS: Thank you. Thanks all. Thanks for the  
17 presentations. It's a reflection on the response to Fukushima. I think one of the  
18 interesting things, and I think most of our industry representatives and Mr. Lochbaum for  
19 UCS touched on it is one of the benefits we see is sort of a standardization.

20           I think back to post-TMI. I mean one of the big arguments was greater  
21 standardization across it. But and this is an area perhaps where we've really achieved  
22 it, in a way or -- and I think need to sustain it, because I think Dave sort of touched on this  
23 and I think Joe and Bill as well, is that there is a way of learning from what we see in

1 terms of how the equipment is implemented and, you know.

2 I think one of you mentioned, I think we all have gone. I mean it's been  
3 one of those things on my list and going out to plants, that you know, go see what they've  
4 done and also have the opportunity to see sort of internationally. It's very, very common,  
5 but particularly for a large fleet like that in the United States, you know, nearly 100  
6 operating plants.

7 In addition, the National Response Centers in Phoenix and Memphis. I  
8 think that -- I think that's in terms of a lesson learned or what's impressive about that is  
9 that sort of focus on this greater or broader standardization across the response.

10 You know, granted each plant where things are is different, but the notion  
11 of, for example, the color coding on some of the cabling, the type of equipment you have  
12 there, I think, I appreciate the comments that have been given here this morning, because  
13 I think that really for me reinforced that aspect.

14 One of the things we spent a lot of time, and I want to ask a few questions  
15 on is more on the flooding and the other natural hazard evaluations. Joe, I just want --  
16 I'd like to ask a clarifying question on I think it's your Slide 4, and I may have missed the  
17 explanation. But in the beginning it talks about 85 percent completion of the responses  
18 to the 50.54(f) requests, and then 100 percent mitigation strategy assessment is  
19 complete.

20 I'm trying to understand the numbers. Are we talking about two different  
21 things there? If you can help me out. I just may have missed it in your talk but --

22 MR. POLLOCK: There's two aspects to it. There's the one where we  
23 actually did the evaluation of what the new flooding hazard would be. So in essence,

1 what would you have to protect against to be able to implement the mitigating strategies  
2 and what the consequences were to the plant.

3 In some cases, they're not totally complete because there's an aspect  
4 missing. The plants have made the evaluation on whether the aspect is still missing so  
5 I can't submit it to the NRC yet until I get the complete data. It would impact their ability  
6 to implement mitigating strategies.

7 If they've done that determination and went through that, they could still  
8 do the mitigating strategies for those. So that's what the mitigating strategies  
9 assessments and why that's 100 percent complete, although not everything's been turned  
10 in to the NRC for the 50.54(f) because in some cases there may be a data point that we  
11 don't have. But it doesn't appear that it will influence the outcome of the evaluation. It's  
12 just an incomplete data point for me to submit.

13 COMMISSIONER BURNS: Okay, okay, and in a seismic area, I know  
14 this -- I mean I remember early, you know, and one of the challenges I think the seismic  
15 areas is the number of experts you have to do the kind of work that needs to be done. Is  
16 that -- does that continue to be a challenge or does the industry see itself in a fairly good  
17 position --

18 MR. POLLOCK: Well we haven't, we haven't got any more experts  
19 where we might have got out of that. But we've been through most of the evaluations.  
20 So the plants that had either no change or minimal change, their evaluations are complete  
21 more. So now the focus is on the plants, on the seismic probability risk assessments,  
22 which is the more complicated part of the evaluation.

23 COMMISSIONER BURNS: Okay, and Bill you talked about the

1 importance of knowledge, of knowledge transfer in this area. So what are the types of  
2 things that you're doing you think that need to be done, to assure that, you know, because  
3 there are fewer people like me and particularly those who left and came back. So was it  
4 that you need to, you know, what is it you need to do.

5 I think Dave, you touched on this as well. What's the strategy? What's  
6 the success path?

7 MR. PITESA: One of the interesting things about particularly FLEX  
8 equipment, some of the things we've done is they are a very recent analysis and things.  
9 So we're not talking about somebody did this in the 70's and now we need to transfer that  
10 knowledge to another generation.

11 Quite frankly, I've got an individual behind me, Adam who's here. He  
12 leads it for Brunswick. If he'd raise his hand please, and he's not in the same generation  
13 I'm from. And so I think it does paint a picture that we across our organization have  
14 pulled these experts in and everything.

15 But now if we're able, and I believe we'll be able to keep this very real  
16 going forward. To me the best way to learn is always hands-on. You can take all the  
17 classrooms in the world, but until you touch it and what we're working very hard is to make  
18 sure that across all aspects of the operators or engineers or maintenance people who  
19 need to touch it, we're giving them that opportunity.

20 And so I don't envision that at least the lessons we've learned from  
21 Fukushima, the equipment that we've got in place is going to be a challenge from a  
22 knowledge transfer position, because literally they're the ones learning it almost from the  
23 beginning.

1 COMMISSIONER BURNS: Okay, yeah.

2 MR. POLLOCK: I do want to correct something. By 2017, all the  
3 mitigating strategies assessments will be completed.

4 COMMISSIONER BURNS: Okay, okay. Thanks. And Mr. Mulligan, I  
5 appreciate the dialogue on this question on public release or when, how do you  
6 communicate actual readings to the public. I'm wondering if in one of the considerations  
7 is in what kinds of units that it would be actually big, because I'll tell you my OECD/NEA  
8 buddies used to jab me all the time about we Americans in our milirem and rem, versus  
9 the Becquerels and millisievert and all that.

10 Is that one of the considerations, because that would be actually if we  
11 had an incident here, in translating it for I think some of the international community, that  
12 might be an issue. So I don't know if that's one of the considerations that goes through  
13 people's heads as they think about how and when and in what form to report this.

14 MR. MULLIGAN: Yeah. It took me about 24 hours to get on the Sievert  
15 scale looking at Fukushima. So yeah, that's one of the -- one of the things I mentioned  
16 was context.

17 COMMISSIONER BURNS: Yeah.

18 MR. MULLIGAN: So when you're putting out data publicly to put it in  
19 context, that would be units, what units actually mean, and then putting units even in  
20 simpler terms of what that means to the public. So putting data out in context and that  
21 includes units and what health effects and those kind of things. Those are the kind of  
22 issues we're struggling with, because it's not easy to put that in terms that almost anyone  
23 from the public can understand. So that's the struggle right now is doing that.

1                   COMMISSIONER BURNS: Okay, and I know some of the -- I think it  
2 was some of the, for example recently, with the tritium spill at the Indian Point site earlier  
3 this year, when you look at the, you know, the numbers, because you start to talk about  
4 tens of thousands of whatever the unit was. Yeah, picocurie. When you have tens of  
5 thousands, I mean most of us, you know, says that's a big number, you know, type of  
6 thing.

7                   So I mean I just sort of emphasize, it sort of underlines I think the  
8 challenge. But appreciate the, sort of the work on that, because I think a lot of just  
9 regurgitating information doesn't always help people. So being thoughtful about the  
10 context and trying, again with the objective transparency, but also assuring that really  
11 what the right thing that needs to be communicated about protective actions, whether it's  
12 sheltering, evacuation or the like. I think that's important. So I appreciate the work on  
13 that.

14                  I think my question was answered, Dave, on the vertical slice and I do  
15 remember I was actually cleaning out some old files and found my old copy of the  
16 Millstone report a couple of weeks ago. So I may go back and look at that. But I  
17 appreciate that, because that was one of my questions that you answered. Thanks,  
18 Madam Chairman.

19                  CHAIRMAN SVINICKI: That's okay. I've been yes sir'd at times too in  
20 my building in my time here, so that's all right. Did you have anything additional? Okay.  
21 Well once again thank you to each of the panelists, and we will take a brief break, perhaps  
22 about ten minutes. So five minutes, ten after we will reconvene. Thank you.

23                  (Whereupon, the above-entitled matter went off the record at 10:07 a.m.)



1 and resumed at 10:16 a.m.)

2 MR. FRANOVICH: Thank you. Good morning, Chairman and  
3 Commissioners.

4 We're pleased to be here today to talk about the status of the Fukushima  
5 Lessons Learned activities.

6 As has been noted several times today, we are very close to the six year  
7 anniversary of the accident at Fukushima Dai-ichi.

8 And, in the time that has passed, we've accomplished our goals set out  
9 by the Commission of having a majority of the safety enhancements in place at U.S.  
10 nuclear plants by the end of calendar year 2016.

11 I'm going to leave the details of the actions that we've taken and the  
12 results that we've achieved to the members of the panel that I'll introduce in a minute.

13 I want to focus, if I can for just a minute on the high level overall lessons  
14 learned activity.

15 First, it really was an enormous endeavor and a tremendous  
16 accomplishment. As the longest serving member of the Steering Committee, I can  
17 remember the early days after the accident and the early days after the Near-Term Task  
18 Force Report thinking about sort of projecting ahead on just the significant amount of work  
19 that we would have to take on.

20 We'd need to evaluate the Task Force recommendations, of course, and  
21 identify needed changes. We would need to address several policy issues and raise  
22 them up for consideration.

23 Of course, in some instances, and with stakeholder involvement, we

1 would need to identify potential new requirements and new guidance.

2 And, in addition to that, we would need to develop an approach and an  
3 overall schedule for the implementation of those requirements and guidance.

4 Licensees would need to develop plans and submit those plans to us.  
5 We would need to review each of those plans. And, ultimately, licensees would need to  
6 procure the equipment and make the modifications, change their procedures and train on  
7 them.

8 We would need to document our review of the acceptability of those plans  
9 and verify the implementation through inspection.

10 And, we needed to do all of that with a sense of urgency, but with  
11 sufficient technical rigor so that we could do it right the first time, while ensuring that we  
12 didn't distract from other priority activities that were ongoing.

13 Well, so, with the work of the staff and the industry and other  
14 stakeholders and the Advisory Committee on Reactor Safeguards in over 300 public  
15 meetings, this would describe -- or it was described in the previous panel, with more than  
16 20 public meetings between the NRC Steering Committee and the Industry Steering  
17 Committee, with over 30 meetings with the Advisory Committee on Reactor Safeguards,  
18 with close collaboration of our international partners, and, of course, with the direction  
19 and oversight of the Commission, we counted, I think, about 40 Commission papers and  
20 over 15 Commission meetings with all of that activity, we did it.

21 That's my first high level conclusion or statement I wanted to make.

22 Secondly, over the six years of folks who took part or were present at the  
23 early stages in the endeavor, many of those folks left to take on other assignments.

1                   And, so, we've continually had new folks join us. It was true for the  
2 Steering Committee, it was true for the Japan Lessons Learned Division, Directorate and  
3 then Division.

4                   It was certainly true on the part of the working groups, the external  
5 hazards folks, for example.

6                   And, it's true, I think as you heard in the earlier panel from Joe Pollock,  
7 true on the part of the industry.

8                   Despite the significant turnover of individuals, both on the NRC side and  
9 on the industry side, we maintain continuity of purpose and continuity of direction. We  
10 maintained focus and momentum throughout those changes. And, I think that is  
11 significant.

12                   Third, I think you're going to hear in the presentation today that the effort  
13 really demonstrated our ability to integrate a separate but related activities to seek and  
14 identify insights based on lessons as we were moving through implementation of the  
15 activity. And, then, to self-adjust towards a more effective outcome.

16                   So, I think that was a significant accomplishment throughout this lessons  
17 learned activity.

18                   And, then, lastly, the effort demonstrates our ability to innovate, for  
19 example, to make changes to processes and procedures and approaches to address  
20 challenges that we projected.

21                   And, so, you'll hear those examples. You'll hear how we were able to  
22 do that to, again, achieve the success that we have achieved.

23                   Slide two, please?

1           Immediately after the accident, we established the Near-Term Task  
2 Force in response to the Commission direction to review NRC processes and regulations  
3 to determine whether the Agency should make improvements to our regulatory system  
4 and to make recommendations to the Commission for its policy for policy direction.

5           The Task Force concluded at that time, that continued operation of the  
6 fleet and continued licensing activities did not pose an imminent risk to public health and  
7 safety.

8           But, they also presented a number of recommendations. And, this slide  
9 lists the categories of those recommendations and specific recommendations.

10          But, also, on the right of that slide, it emphasizes where we are on  
11 dispositioning each of those recommendations.

12          And, as you can see, we've dispositioned almost all of those  
13 recommendations and those few that remain are on a closure path.

14          And, so, as a result, I agree with some of the statements of the first panel,  
15 safety has been improved.

16          Next slide, please?

17          In our presentation, we are going to provide you additional detail of our  
18 progress, what implementation looks like today and what we've left to do.

19          First, Bill Dean, who is the Director of the Office of Nuclear Reactor  
20 Regulations is going to provide an overview of the Tier 1 status implementation.

21          Mike Franovich, who is the Acting Director of the Japan Lessons Learned  
22 Division will provide an update on the status of the remaining Tier 1 activities and an  
23 overview of our assessments regarding the Tier 2 and the Tier 3 activities.

1                   And, then, finally Tim Reed and Eric Bowman will walk us through the  
2 Mitigation of Beyond Design Basis External Events Rulemaking.

3                   And, so, now, I'll turn the presentation over to Bill.

4                   MR. DEAN: Thanks, Mike.

5                   Good morning, Chairman and Commissioners. It's a pleasure, as  
6 always, to be here this morning. And, in particular, Chairman Svinicki, for your first turn  
7 at the helm, even though it's probably like your 1000th Commission meeting.

8                   CHAIRMAN SVINICKI: Probably something like that, yes.

9                   MR. DEAN: And, I do apologize in advance if I stumble over titles as we  
10 go through Q&A, but, anyway --

11                  CHAIRMAN SVINICKI: I have to interrupt you now. I printed out  
12 something yesterday and I grabbed it off the printer and it said the Chairman approves  
13 whatever. And, I'm like, well, this is Burns'. Where's my email? And, I was just like,  
14 wait a second, that is mine.

15                  (LAUGHTER)

16                  MR. DEAN: So, anyway, so, the next slide, please?

17                  This slide should be fairly familiar to the Commission. We've been using  
18 it for, geez, almost since the beginning, I think.

19                  And, it's proved to be an effective slide to provide a snapshot of where  
20 we stand in terms of our efforts to complete the Tier 1 activities, which were the ones that  
21 were of most substance and safety enhancements.

22                  And, so, obviously, this demonstrates that we're well along, as Mike  
23 indicated in his opening remarks. So, let me talk about these in segments.

1                   So, with respect to the orders, 85 of the 99 operating plants are in  
2 compliance with the 12-049 order, our mitigating strategies.

3                   In essence, really, all of the plants have met the requirements except for  
4 the fact that the 14 BWRs Mark I and Mark II BWRs still have work to do in terms of  
5 coming into compliance with containment vent orders. And, for those sites, there is a  
6 close relationship or interrelationship between the vents and the mitigating strategies.

7                   So, while they have put in place all of the equipment and the strategies,  
8 to date, until they complete their vent orders which is still another year or two away, they  
9 can't claim victory relative to the mitigating strategies order. But, in essence, all of that  
10 work has been done at all the sites.

11                   With respect to the spent fuel pool instrumentation, all plants with the  
12 exception of FitzPatrick are in compliance with that. And, FitzPatrick is an outlier  
13 because of the fact that their path, until very recently, was to shut down. They had asked  
14 for an exemption from that. So, they have plans to get in compliance with that order later  
15 this year. So, by the summertime, we should have all plants in compliance with the spent  
16 fuel pool instrumentation orders.

17                   And, then, with respect to hardened vents, as you all know, there are two  
18 phases to that. There's the wet well phase, or Phase I, and the dry well phase, Phase  
19 II.

20                   At this point, about 20 percent of the plants are complete with their Phase  
21 I work and we expect by the end of this year, 70 percent of the plants to be complete with  
22 their Phase I wet well venting, hardened severe action and capable vents.

23                   And, then, we're well ahead in terms of the pace in terms of coming into

1 compliance with Phase II. I think you're aware that all the plants that have to come into  
2 compliance with that order plan on using water addition strategy and not to install a  
3 specific dry well vent.

4 And, so, we expect them to be well in advance of the 2019 backstop for  
5 those orders.

6 In the area of the 50.54(f) request, the reevaluations, with respect to  
7 seismic reevaluations, approximately 50 percent have completed this work. And, that  
8 will continue over the next several years.

9 In terms of flooding hazard reevaluations, we've received all of the  
10 flooding hazard -- reevaluated flooding hazards from all the licensees. We do have two  
11 sites remaining, Beaver Valley and Brunswick that have some complexity to them that we  
12 are specifically focused on in terms of completing our evaluation of their reevaluated  
13 flooding hazard.

14 Once we give that to those sites, then they can then begin developing  
15 their mitigating strategies assessment.

16 So, and, a matter of fact, Mike just a week or so ago was at Beaver Valley  
17 specifically to walk down the site with his counterparts from the Office of New Reactors  
18 and to work with the licensee to make sure we have alignment in terms of the forward  
19 going strategy at that site.

20 I will mention one thing in terms of flooding hazard that we're seeing is,  
21 a number of licensees are queuing up to provide us with a revised reevaluated flooding  
22 hazard.

23 So, that's something that we're going to have to deal with in terms of how

1 do we look at that information in an efficient and effective manner and not have it distract  
2 us from the primary mission that we have in terms of getting through the mitigating  
3 strategies assessment.

4 So, that's something that we're in conversation with the Office of New  
5 Reactors and the staff there in terms of how to do that efficiently and effectively.

6 Mike's going to talk in a little bit about where we are with Tier 2 and Tier  
7 3. And, then, Tim and Eric are going to touch on the mitigating Beyond Design Basis  
8 Event Rulemaking.

9 And, so, those, obviously, are centerpieces of our post-Fukushima  
10 response.

11 And, I will say the Commission obviously has -- knows that we have two  
12 papers in front of them and we certainly look forward to your feedback and your direction  
13 as a result of those two Commission papers.

14 And, hopefully, today's meeting will help clarify or answer perhaps some  
15 of the questions or issues or concerns that you might have. So, hopefully we can help  
16 in that regard.

17 Before I turn it over to Mike, I do want to provide a couple of comments  
18 or observations.

19 So, first of all, in a little bit, Eric and Tim are going to talk to you about the  
20 rulemaking. And, those two individuals, as well as Howard Benowitz from OGC I think  
21 have done a phenomenal job in terms of leading the staff effort.

22 A lot of people have contributed to that rulemaking. It's a substantial  
23 accomplishment and I just want to recognize their efforts collectively in leading that effort



1 and developing what I think is a very coherent rulemaking to the Commission.

2 Over the past several months, Mike Franovich and I have had the  
3 opportunity to actually participate and observe several of the TI-191 inspections. These  
4 are the inspections that the Regions are doing to evaluate and validate that the licensees  
5 have indeed implemented what they committed to in terms of the mitigating strategies  
6 order.

7 And, it has been very impressive, not only to see the quality of our  
8 inspectors and inspection teams and the way that they are inspecting the licensees  
9 implementation, but also the robustness and the capability that exists out there, not just  
10 for mitigating Beyond Design Basis Events, but how this equipment might be used in other  
11 ways. And, I'll talk to that later on in our presentation when we talk about FLEX.

12 And, then, the last thing I want to mention is just the recognition of the  
13 entire division over the years. It started off as a directorate and grew to a division.

14 And, now that a lot of the major work, and particularly much of the major  
15 policy issues have been brought forward to the Commission, particularly with rulemaking  
16 and the Tier 2 and Tier 3, while there still is remaining work to be done and substantial  
17 and important work that Mike's going to talk about, collectively, the JLD organization has  
18 done a phenomenal job, I think, in terms of managing and working through a very  
19 complex, involved and evolving environment. And, so, you know, my compliments to  
20 them.

21 You know, we're looking at, obviously, with the decline in some of the  
22 workload, reshaping JLD and then our plans are in beginning in fiscal year '18 to downsize  
23 the division to two branches. And, it's important to keep those two branches solid for

1 some period of time because of the knowledge management that they have and the  
2 knowledge transfer that needs to occur.

3 And, so, it's very important that we keep that collective group together  
4 because of that corporate knowledge that they have and I think Mike will talk later about  
5 some of the KM type work that we plan to do.

6 So, with that, let me turn it over to Mike to tell you about coming  
7 attractions.

8 MR. FRANOVICH: All right, thanks, Bill.

9 Good morning, Chairman and Commissioners.

10 Can we go to slide five, please?

11 Pleased to tell you that implementation of the mitigating strategies order  
12 is nearly complete, as you've heard from other panelists.

13 We have completed onsite audits at each of the U.S. plants. Nearly  
14 every plant has notified us that they comply with the order's requirements.

15 We have now issues about half of the site specific evaluations, safety  
16 evaluations documenting our assessment of the licensees' strategies.

17 And, the Regions continue with their inspections to confirm order  
18 compliance.

19 We have now completed about a quarter of these inspections and have  
20 identified no substantive findings to date. We credit this to the thoroughness of the audit  
21 process, including the week-long onsite audit that is done by a multidisciplinary team of  
22 experts and also to the dedication of the licensees to improve site safety.

23 Looking toward the future, we have developed and are implementing a

1 plan to transition the JLD activities to long-term oversight.

2 The plan outlines roles and responsibilities and provides for enhanced  
3 knowledge transfer opportunities. This plan assures consistent implementation through  
4 deliberate cross regional engagement.

5 To ensure the benefits of these safety enhancements endure, we are  
6 updating and developing inspection procedures to incorporate Beyond Design Basis  
7 features in the reactor oversight process.

8 The procedures will be informed by the lessons learned from the ongoing  
9 mitigating strategies inspections.

10 If I can go to the next slide?

11 Okay, regarding the BWR reliable hardened vent containment order, the  
12 order entails two phases and Bill described.

13 Phase I requires licensees to upgrade containment wet well venting  
14 capabilities. The upgrade ensures that the hardened vent can operate longer, have  
15 better hydrogen control and can function under severe accident conditions in order to  
16 remove heat and to better preserve the containment function.

17 For Phase II, it requires a similar dry well venting capability. Phase II  
18 entails either installation of a dry well vent they can operate under severe accident  
19 conditions or implementation of a containment venting strategy that makes it unlikely to  
20 need to vent from the containment during a severe accident.

21 No licensees to date have elected to install a dry well vent as an option.

22 We have reviewed licensees' plans for Phase I and Phase II and issued  
23 Interim Staff Evaluations well ahead of schedule.

1            Maybe I should pause here for a moment just to refresh memories about  
2 the ISEs themselves. We did develop the ISE concepts starting with the mitigating  
3 strategies order. The ISEs provide a licensee a degree of assurance regarding  
4 acceptability of their plans.

5            This approach enables licensees to move forward in a timely way with  
6 equipment procurement and installation in advance of issuing our safety evaluations.

7            We are now looking -- working with the industry to expedite closure of  
8 the remaining open items. As licensees complete their analyses and finalize their  
9 designs, they will provide appropriate information for staff review using the auto process  
10 and the electronic portals.

11           The staff will develop the safety evaluations as the open items are closed  
12 to expedite the completion of these documents.

13           In addition, industry and staff are developing templates and for submittals  
14 regarding the safety evaluations and are coordinating, when information becomes  
15 available, to more efficiently use resources.

16           We will inspect the sites after they are in compliance and have received  
17 the safety evaluation, similar to what we are doing under mitigating strategies order  
18 approach.

19           A draft inspection procedure is now under development and we expect  
20 the compliance inspections to begin in the mid to late 2018 time frame.

21           If we can go to the next slide, please? Slide seven.

22           We have continued to make steady progress in the area of seismic and  
23 flooding hazard reevaluations. All sites have submitted their analyses for NRC review.

1           For seismic, we issued the last of the staff assessments at the end of last  
2 year. We are now focusing on assessing the impact of any hazards that exceed a site's  
3 design basis.

4           The majority of sites with exceedances will perform limited scope  
5 evaluations such as assessing potential spent fuel pool impacts.

6           Fewer than one-third of the U.S. plants are preparing seismic  
7 probabilistic risk assessments. We expect to receive the first of these over the next -- in  
8 the next month. The remaining sites will make their submittals on a staggered schedule  
9 to allow us to be utilize and optimize our resources.

10           For flooding, we have sent nearly every site its hazard acceptability  
11 letters with the exception of Beaver Valley and Brunswick, as Bill noted, informing them  
12 that the flooding levels to use for the subsequent evaluations.

13           These letters are then followed up by full staff assessments documenting  
14 the technical basis for the conclusions in the letter.

15           We have now issued over half of the staff assessments.

16           Licensees that identify the exceedances in the flooding level will also  
17 perform additional analyses to inform -- they'll do either a focused evaluation or they'll do  
18 what's called the integrated assessment.

19           The results of these will also be put into what's called our Phase II  
20 decision making process to determine if backfits are appropriate.

21           In addition to Recommendation 2.1 process, the reevaluated hazard  
22 information will also be used to show compliance with the upcoming Mitigation Beyond  
23 Design Basis Rule as directed by Commission SRM-COMSECY-14-0037.

1           Most sites have evaluated their mitigating strategies against their  
2 reevaluated hazards. We have begun reviewing these assessment and will continue  
3 over the next 18 months.

4           Next slide, please?

5           So, regarding Tier 2 and 3 recommendations, we have completed our  
6 final assessments, so the remaining Tier 2 and 3 recommendations and submitted our  
7 assessment to you for your consideration for SECY Pager 16-0144.

8           Recall that the majority of the Tier 2 and 3 recommendations were  
9 previously closed in SECY Papers 15-0137 and 16-0041.

10          The remaining recommendations require additional assessment or  
11 development of a resolution approach, including stakeholder interaction before the staff  
12 can determine a firm disposition path.

13          Over the past several months, we have discussed these final  
14 recommendations with our stakeholders, including the public, industry, state and federal  
15 government agencies and the Advisory Committee on Reactor Safeguards.

16          For two of the three recommendations, natural hazards other than  
17 seismic and flooding and real time radiation monitoring, we have recommended no further  
18 regulatory action.

19          For ongoing confirmation of natural hazards, we concluded that the NRC  
20 can meet the intent of Near-Term Task Force Recommendation 2.2, which is related to  
21 periodic assessment of hazards using a more efficient approach than a proposed  
22 rulemaking.

23          We have recommended enhancing existing processes and developing

1 associated staff procedures. The propose framework will ensure that we proactively and  
2 routinely aggregate new external hazard information, assess new information in a  
3 systematic and predictable manner and inform appropriate regulatory programs promptly  
4 about new hazard information that likely affects safety.

5 The proposed framework has three components. The first being  
6 knowledge retention activities that preserves and leverages the hazard information  
7 gathered from various regulatory reviews.

8 Second, a continued collaboration and coordination with stakeholders  
9 including other federal agencies.

10 And, third, an assessment activity which includes aggregation evaluation  
11 of significant new information as well as referral of potential significant issues to  
12 appropriate regulatory programs like the generic issues program.

13 The full details of the framework are proposed and described in SECY-  
14 16-0144.

15 With that, I will now turn over the presentation to Tim Reed and Tim will  
16 cover the Mitigation of Beyond Design Basis Events Rulemaking.

17 Tim?

18 MR. REED: Thanks, Mike.

19 Good morning, Chairman, Commissioners.

20 As the slide states -- go to the next slide, please -- the draft final Mitigation  
21 of Beyond Design Basis Events Rule would integrate into final regulation.

22 The key requirements that stem from almost six years of our ongoing  
23 efforts to address the events in Japan, of course, in 2011.

1 I think it's very clear from the discussion today that the majority of the  
2 safety improvements have, in fact, either been complete or are about to be complete as  
3 a result of implementing the ongoing Fukushima orders and the associated license  
4 conditions for new reactors.

5 So, the question arises then, what's the rulemaking doing that's different?

6 Well, the rulemaking would make generically applicable these key  
7 requirements. And, by that, we would place into the regulations predictable stable  
8 requirements.

9 And, we have an advantage here because we can learn the lessons from  
10 the ongoing implementation, we folded that into the infrastructure of the rule and we also,  
11 of course, have benefitted from the external stakeholder feedback that's been provided  
12 as part of the rulemaking process.

13 So, once the regulation's in place, then we no longer have need to use  
14 orders or license conditions.

15 So, I think the graphic on the slide then depicts the approach we've taken.  
16 It's, as you know, and, in fact, directed, we have followed a performance-based approach  
17 to address these events for Beyond Design Basis External Events.

18 That has, in turn, enabled a flexible and adaptable mitigation capability  
19 put in place and that fits well with Beyond Design Basis External Events.

20 And, this approach is similar, of course, to what we did following the  
21 events of 9/11 for power reactors.

22 So, then, the objective then of this Mitigation of Beyond Design Basis  
23 Events Rule is to take this work and produce a coherent and integrated set of



1 requirements that reflect the lessons learned as well as its feedback.

2 And, I think what we provided you in draft final form has accomplished  
3 that task -- that objective, excuse me.

4 Since we issued the proposed rule in November of 2015 for 90-day  
5 comment period, I think it's been improved significantly. And, that's the benefit -- I credit  
6 to the folks who provided the feedback on our proposed rule.

7 We've simplified it. We've clarified it. We aligned it with its guidance.  
8 I think there's been a lot of improvements there.

9 So, as a brief overview then, I'll walk through the rule at a very high level  
10 here. That'll sort of set the table for the remainder of my discussion and Eric's discussion  
11 on the rule.

12 It's structured, first, as most rules are in Part 50, to contain applicability  
13 provisions in Paragraph A. It's followed by the integrated response capability  
14 requirements in Paragraph B. And, really, the rest of the rule is there to support that.

15 So, we have equipment requirements, we have training requirements, we  
16 have drill requirements.

17 We have the spent fuel pool monitoring requirement set in there really by  
18 themselves. Then, we have the configuration management provision and there's  
19 documentation of changes in there also.

20 As most rules do, we have a scheduler and compliance provision in there.  
21 And, then, finally, we have a paragraph that we rescind orders and facilitate the removal  
22 of the license conditions.

23 So, that's the structure of the rule. I'll talk about the applicability portion,

1 the scheduler and compliance portion, the last paragraph to rescind orders and remove  
2 license conditions. I'll finish with the integrated response capability requirements.  
3 Then, I'll hand it off to Eric and he'll finish that rule and also talk about the supporting  
4 guidance. So, that's the plan.

5 So, I want to go to the next slide, please.

6 So, I just mentioned, we followed a performance-based approach. And,  
7 I think it's better really understood, and I think Mike actually mentioned earlier, it's really  
8 enabled licensees to implement innovative approaches. And, I think most of you folks  
9 have been out there and seen this, it's pretty impressive.

10 And, it fits with our specific facility designs. They're in events, they're  
11 operational practices. They're external events. And, that's enabled the safety  
12 improvements to be put in place while minimizing what otherwise would be a larger  
13 amount of regulatory impact and cost had we been -- had we followed a more prescriptive  
14 regulatory approach. So, I think it's been very good.

15 This slide also talks about our broad view. What are we talking about  
16 there? Well, as you know, very well know, we looked at all of the ongoing regulatory  
17 actions internally. We tried to, in several different actions with the Commission,  
18 consolidate those down to what became the Mitigation Beyond Design Basis Events Rule.

19 I think that directly led to our development of the rule and proved to be a  
20 more effective, efficient rule. So, that's the inside look.

21 But, I think the more important look is how we viewed the rule itself. We  
22 were thinking the entirety of the reactor life cycle, not just the beginning, when you scope  
23 applicants and licensees in, but the end of the reactor life. So, we have built in

1 decommissioning provisions from the get go. So, that's some of our views there.

2 We also were very mindful of the fact, and this is always the case when  
3 you're making generically applicable orders, you know at the end state, you're going to  
4 be dealing with a rule at least and orders.

5 In this case, we have, unfortunately, have a very complex circumstance  
6 because we have orders and license conditions and a rule. So, we were mindful of need  
7 to address that end state also.

8 So, let's talk about the first paragraph, Paragraph A, that's applicability  
9 provisions.

10 The draft final rule applies to the same sets of licensees and applicants  
11 as the proposed rule. And, those are operating licensees under Part 50, combining  
12 license holders under Part 52 and applicants will do the same.

13 Applicants for operating licensees under Part 50 and applicants for a  
14 combined licenses under Part 52. No other licensees and no designs, for example, on  
15 power reactors.

16 Now, having said that, designers are certainly free to address our  
17 regulation as they -- if they chose to, in effect, as you're probably aware, we do have such  
18 an example in house right now.

19 And, moving on then to our decommissioning provisions, or what's  
20 referred to as phase out on this slide.

21 These decommissioning provisions reflect the recent decisions we've  
22 made on decommissioning, so there's no new regulatory territory carved out there.  
23 However, what is new is we built them into the regulation.

1           And so, what that means is, licensees no longer would have a need to  
2 request exemptions and staff would not have to review those. It would happen as part  
3 of the regulation.

4           So, this would, I think, would result in less resources spent. And, that's,  
5 by the way, another mind set we had throughout, just thinking about everybody's  
6 resources. So, that's a very good provision in the rule.

7           The approach in the final rule is the same as it was in the proposed rule.  
8 It's basically at a high level, it's a three-stage approach. Simply put, once you remove  
9 the reactor fuel from the vessel permanently through the spent fuel pool, clearly now,  
10 you're mitigation strategy has come down to your spent fuel pool. So, you can simplify  
11 it there.

12           Once you get to a low enough decay heat that you basically have a lot of  
13 boil off time, time to take ad hoc measures to sustain function, you can now move down  
14 to the extensive damage mitigation guidelines portion of our rule.

15           Now, that stays in place until the spent fuel pool is empty of all fuel. And,  
16 which typically, when you move to dry cask storage.

17           So, at that point, then, all requirements cease. So, it's the same  
18 approach as the proposed rule. But, I think you'll find, hopefully, throughout the  
19 regulation, that we've clarified and improved the language in Paragraph A.

20           So, moving on then to our scheduler and compliance provisions, that's  
21 Paragraph H. I think there's two things interesting about that versus the final rule that  
22 were not in the proposed rule.

23           First, the flexible scheduling provision. When we put the proposed rule

1 out, we were very well aware of the challenge the licensees would face in trying to address  
2 their reevaluated hazard information I think within the proposed two-year compliance  
3 period. So, we actually requested feedback on how to address that issue in the  
4 regulation -- in the proposed rule.

5 We got a suggestion to use a flexible scheduling provision. We liked  
6 that suggestion. We worked it into what you find in H-2. Okay? So, that -- what that  
7 means is that provision only applies to addressing the reevaluated hazard information.

8 In other respects, we think our -- I'll call it the full compliance period which  
9 is two or three years, I'll talk about in a moment, that should be sufficient for everything  
10 else in the rule.

11 In terms of licensees that want to voluntarily use that flexible scheduling  
12 provision, they would need to first show good cause they cannot comply with the nominal  
13 two or three year compliance provisions in the rule and then provide a proposed schedule  
14 and supporting basis for that schedule. Okay?

15 So, then, here's some more of that mind set again on resources. We  
16 structured this to be approved unless we notify to the licensee to the contrary within 120  
17 days of submittal of that. So, that's the same mindset that we've built through the  
18 regulation.

19 Another interesting feature of Paragraph H is, and I just mentioned, we  
20 have a two or three year compliance provision now in the regulation. This three year is  
21 new. This applies only to licensees having boiling water reactor GE designs with Mark I  
22 and Mark II containments.

23 This is feedback we received in our final rule CER meeting, Cumulative

1 Effects Regulation meeting, so this is, in fact, directly reflects the fact that these folks are  
2 implementing the CRX and Capable Venting Order, EA-13-109.

3 The venting system obviously is a very important part of their mitigation  
4 strategies. If they were to have to comply within two years, they would likely have to do  
5 procedures more than once, training more than once.

6 So, this is basically giving them that extra year. As you'll recall, that  
7 order was issued in June of 2013, more than a year later than the orders that we're making  
8 generically applicable to part of our rule.

9 So, this will avoid that unnecessary distraction, unnecessary resource  
10 expenditure. So, I think this is the CER process working very well for us.

11 Moving on then to Paragraph I, the last paragraph in the rule. This is  
12 our, as you'll look at, it's a set of requirements that would rescind the orders and support  
13 the removal of the license conditions.

14 I mentioned briefly, but, going back to that again, when we integrated  
15 everything into this rule, we not only had post-Fukushima strategies and guidelines, we  
16 have the post-9/11 strategies and guidelines that were implemented about ten years ago  
17 from 50.54(hh)(2). So, we're bringing those all in.

18 As a result, there are license conditions and orders associated with both.  
19 And, as license conditions and orders are completely redundant to the new rule we're  
20 going to be putting in place.

21 So, what we want to do and, by the way, we've got feedback on this issue  
22 as part of our CER questions. There was confusion as to what would apply when. And,  
23 so, this is our effort to address that feedback.

1           What we would do is try to transition from the effective date of the rule  
2 out to three years. And, at three years past the effective date of the rule, then our rule  
3 is established the only set of requirements for all the applicants and licensees to which  
4 this rule applies.

5           So, we're rescinding orders and removing license conditions in a  
6 disciplined process so there's no regulatory gap that occurs anywhere throughout that  
7 process.

8           We've built it into the regulation because that will -- we believe that will  
9 save resources. Obviously, the highest approval you can get is the Commission, the  
10 most information to support this is in that rulemaking package. So, we think this is the  
11 way to get it done and lessen resources on people's part.

12           So, that's the objective of Paragraph I.

13           Next slide, please?

14           So, I'll go on to now the Paragraph B, that's the integrated response  
15 capability. That is truly where Eric and I started when we started developing this  
16 regulation.

17           So, the regulation really is built around it and everything really is there to  
18 support that.

19           So, as you'll recall, these are the requirements to develop, implement  
20 and maintain an integrated response capability.

21           Now, the draft final rule has two or possibly three guideline sets  
22 associated with it. The proposed rule, only had two. And, so, I'll focus on that  
23 difference.

1           The first set of guidelines and strategies in the draft final rule are the  
2 FLEX strategies. And, these by volume are clearly a large majority of this regulation.  
3 And, these, of course, are to address or Mitigate Beyond Design Basis External Events  
4 and they're there to implement order EA-12-049, the Mitigation Strategies Order.

5           Those were in the proposed rule, they're in the final rule.

6           The second set is what appears to be new. These are seismic and  
7 flooding mitigation strategies in the guidelines and they can include events specific  
8 approaches.

9           Now, these, frankly, in most cases, will be FLEX. In other words, you  
10 can take your FLEX as is, address these scenarios without change or there'll be a  
11 modified version of FLEX, again, FLEX can do what it needs to do, it can also address  
12 these strategies, in which case, you're not going to have a different set of strategies,  
13 you're going to have FLEX or FLEX modified, if you will.

14           But, they can involve event specific approaches. That's allowed the  
15 flexibility in this regulation. And, if that involves strategies in the guidelines, then you  
16 could have another set of strategies and guidelines.

17           So, as you know, these only apply to the operating licensees and new  
18 reactors that are designed to these standards. So, this is not an issue for those folks.

19           And, it only applies when the calculated values using a new  
20 methodologies exceed their external design basis for flooding and seismic. So, that's  
21 the second set.

22           Then, the third set is the -- what was also in the proposed rule and that  
23 is the extent of mitigation guidelines or it's what's referred to as the post-9/11 strategies.



1           As you know, we are simply relocating those into this regulation,  
2 recognizing the overlap with the FLEX strategies and also recognizing the fact that any  
3 proper integration, you do need to consider those guidelines and strategies.

4           So, that's the final rule. So, what appears to be new, of course, is the  
5 reevaluated seismic and flooding strategies and guidelines. And, really, it's not new.  
6 The actual regulation had this flexibility built into it in the proposed rule, but it was built in  
7 to the guidance.

8           Now that guidance is still there in the final rule. What we've really done  
9 is aligned the regulation now with the guidance. So, the same flexibility that was there  
10 is now reflected in the regulation.

11           So, this is, I think, a good example of improving a final regulation such  
12 it's much more clear and understandable.

13           Moving on then to the rest of the Paragraph B, the next provision is the  
14 same provision basically that was in the proposed rule and that was the requirement that  
15 these strategies and guidelines need to be integrated with the symptom-based EOPs.

16           And, I said with, an emphasis on with, the symptom-based EOPs are  
17 step by step procedures. They were put following the events at TMI in the 1980s.

18           The strategies and guidelines have more flexibility as you need to  
19 address Beyond Design Basis conditions. So, they're fundamentally different, but  
20 nonetheless, we can integrate them, recognizing those differences.

21           The next provision was also in the proposed rule. You have to have  
22 obviously sufficient staffing to implement this integrated response capability. That's in  
23 the final rule, of course.

1           And, then, the last provision is really a command and control provision, if  
2 you will. You have to have the organization that directs the staffing to implement this  
3 integrated capability.

4           So, that's the structure of B, and that rounds out B. And, I'll hand it off  
5 to Eric and he'll talk about the rest of the rule and the supporting guidance.

6           MR. BOWMAN: Thank you, Tim.

7           Good morning, Chairman, Commissioners. I'll be discussing the  
8 portions of the rule that support the integrated response capability that Tim mentioned as  
9 well as the guidance supporting the rule.

10           The draft final rule contains requirements that support the integrated  
11 response capability. Some of the equipment requirements are directly linked only to the  
12 FLEX strategy and reevaluated mitigated -- the reevaluated hazards portions of the  
13 strategies as opposed to including the post-9/11 B.5.b strategies.

14           There are reasons that I'll go into why we're treating the two sets of  
15 strategies different as far as the supporting requirements are concerned.

16           As Tim mentioned, we're just moving the requirements from after 9/11  
17 from where they exist now in Part 50 to the new section 50.155. We are not changing  
18 anything with what the requirements are and we're sensitive to the need to meet the  
19 backfit rule if we move anything that's currently existing in guidance for those  
20 requirements from the guidance level to the requirement level.

21           The first of these supporting strategies have to do with the capacity and  
22 capability of the equipment. In Paragraph C, the equipment that supports the mitigating  
23 strategies, the FLEX strategies are required to have the capacity and capability to perform

1 the functions that they're designed to accomplish.

2 The post-9/11 strategies that capacity and capability is designated at the  
3 guidance level.

4 Similarly, the FLEX equipment has a requirement for a reasonable  
5 protection, it actually has two requirements for reasonable protection against natural  
6 phenomena.

7 One of the requirements for the equipment that supports the FLEX  
8 strategies that were originally developed under the mitigation strategies order is against  
9 the Design Basis natural phenomenon. And, there's a new one for the reevaluated  
10 hazards that came out from the seismic and flooding portions of the Request for  
11 Information, the 50.54(f) letter.

12 They're specific to the different things that the equipment will be used for  
13 because we have seen in the implementation process that licensees have developed  
14 some event-specific strategies for addressing the flooding hazard or the seismic hazard.

15 They can use the equipment for specific hazards, so we've laid it out so  
16 that they can have the reasonable protection for the phenomenon that the equipment  
17 would be used to mitigate.

18 In the post-9/11 strategies, that again is in the guidance level. It's a set  
19 in the guidance level by a selection of the storage locations as compared to what would  
20 be potential targets of a hostile action.

21 The other differences, communications capability is also required to  
22 support the FLEX strategies but not the post-9/11 strategies. Again, that is in the  
23 guidance level for the B.5.b post-9/11 strategies.

1 Next slide, please?

2 The second area, a couple of these areas Tim already mentioned  
3 because they were included in Paragraph B instead of Paragraph C.

4 There are other supporting requirements, the staffing to support the  
5 strategies. In this case, the staffing in the rule is designated to support both the FLEX  
6 strategies and the post-9/11 B.5.b strategies.

7 The reason we were able to cover both FLEX and B.5.b with the staffing  
8 requirement has to do with the 2011 Emergency Preparedness Enhancements  
9 Rulemaking where we had required a staffing analysis to show that the onsite on shift  
10 personnel were capable of performing the functions they were assigned including the  
11 B.5.b strategies as well as the emergency preparedness efforts.

12 So, we already had the requirement from that rulemaking.

13 And, similarly, we had in that rulemaking the imposition of a requirement  
14 for periodic, on an eight-year cycle, exercises for the B.5.b strategies.

15 As you'll see in the rulemaking, those requirements are being moved  
16 from what we had proposed in a new Section 7 of Appendix E to Part 50 into the new  
17 section 50.155.

18 Additionally, there is a training requirement to train the staff that will be  
19 performing the strategies using the systems approach to training in order to ensure that  
20 they're capable of performing the functions that they're assigned to perform for the  
21 strategies.

22 One part of the requirement for the training that we've included is we've  
23 allowed a cutout, if you will, for training that's already considered responsive to an existing

1 requirement.

2 For example, the FLEX strategies do, in general, for some of them,  
3 require the use of flexible hoses that the response personnel would have to roll out and  
4 connect that are essentially the same thing as a fire hose that would be used in a fire  
5 protection program.

6 We've got existing fire protection training that covers how a licensee  
7 needs to train their personnel on how to put out fire hoses, connect them and ensure that  
8 they will function.

9 We aren't asking licensees to go back and revisit whether or not that  
10 training is adequate because it's supported already by a regulatory program.

11 Any other similar types of things where there would be elements of the  
12 strategies that already exist in regulatory programs, they don't need to redo using the  
13 systems approach in training.

14 Next slide, please?

15 As Tim mentioned, we've included the need for a remote monitoring  
16 capability for the spent fuel pool level instrumentation. We had previously, in the  
17 proposed rule, had that as supporting to the mitigating strategies.

18 It's been moved to a separate section within the new Section 50.155 that  
19 is separate and distinct from the mitigating strategies. That's because of the genesis  
20 from the two separate orders.

21 The spent fuel pool instrumentation order was for the prioritization of  
22 actions between the spent fuel pool and the reactor elements of the casualty.

23 At the guidance level, the spent fuel pool instrumentation and the

1 mitigating strategies are fairly closely linked because the spent fuel pool level  
2 instrumentation, at the guidance level, was set to be able to function in the same context  
3 of the mitigating strategies would be used.

4           However, it wasn't required to be used for the mitigating strategies.

5           And, similarly, the guidance level for the mitigating strategies points to  
6 the spent fuel pool level instrumentation.

7           We're leaving that as it is where a licensee can continue to rely on using  
8 the spent fuel pool instrumentation that was initially installed under the order EA-12-051  
9 and will be required under the new portion of 50.155.

10           And, a licensee that does that would, therefore, have that equipment  
11 subject to the same requirements that are in the new Paragraph C, because then it would  
12 be equipment relied upon for the mitigating strategies.

13           However, it's not mandated that they interlock the two requirements, if  
14 you will.

15           Next slide, please?

16           There are three regulatory guides that are supporting the rule. These  
17 regulatory guides draw heavily on the interim staff guidance that was issued for the  
18 Request for Information that was sent out at the same time as the post-Fukushima orders.

19           And, also, the updates that we've had to make to the interim staff  
20 guidance is a result of the lessons that have been learned in the implementation of the  
21 mitigating strategies order.

22           The first of the regulatory guides is Regulatory Guide 1.226 which covers  
23 the FLEX strategies.

1 For the B.5.b strategies, we have not developed a new regulatory guide.  
2 In 2014, there was a section that was added to the Standard Review Plan Section 19.4  
3 that covers those strategies and it remains the same.

4 Regulatory Guide 1.227 covers the spent fuel pool instrumentation. It  
5 essentially carries forward the interim staff guidance from the spent fuel pool  
6 instrumentation order without any substantive changes.

7 And, finally, Regulatory Guide 1.228 which covers a lot of the remaining  
8 portions of the rule. It addresses the issues of integration of the sets of strategies with  
9 the EOPs, the command and control, training and drills.

10 It also provides guidelines for the performance of staffing and  
11 communications assessments that carry forward the assessments that were done for the  
12 Request for Information on that subject.

13 And, finally, in addition to providing regulatory guidance for how to  
14 comply with the draft final rule, these Regulatory Guides 1.226, 1.228 and the standard  
15 review plan, in particular, are responsive to the direction you provided us on the proposed  
16 rule to ensure that there's appropriate coordination in the guidance with the severe  
17 accident management guidelines.

18 With that, I'll turn the presentation back over to Bill.

19 Next slide, please?

20 MR. DEAN: Yes, thanks, Eric.

21 Next slide?

22 So, we're briefly, as I mentioned earlier, from the visits that Mike and I  
23 have recently made and to the sites and having a chance to see firsthand the FLEX

1 equipment, it also has allowed me to be able to visualize and evaluate or assess firsthand  
2 how this equipment could be utilized in other ways besides for a Beyond Design Basis  
3 External Event.

4 So, the staff has been hard at work in terms of developing, revising our  
5 guidance documents that will help incorporate FLEX in areas like how could you use  
6 FLEX for credit in significance determination process determinations?

7 How could you use FLEX, for example, in making a decision on a Notice  
8 of enforcement discretion? And, how can it be utilized in licensing applications?

9 And, then we've also begun work based on Commission direction in  
10 terms of how could FLEX be integrated into, for example, security related areas?

11 So, while this guidance is under development, we are making practical  
12 use of it now. We've leveraged our existing processes. For example, the recent  
13 emergency license amendment on Palo Verde where they had the failure of their  
14 emergency diesel generator.

15 We were able to leverage licensee's application of FLEX and incorporate  
16 that as both a defense-in-depth measure as well as how it could be accommodated in a  
17 risk assessment and basically support a decision where we allowed Palo Verde to extend  
18 their allowed outage time for the diesel to 62 days.

19 So, and then, also, licensees are incorporating FLEX under their PRA  
20 models. And, as they do that, that will provide us with a more consistent and reliable  
21 capability to basically leverage FLEX in some of our licensing decisions.

22 Before I turn it over to Mike for a last comment, I do want to recognize  
23 this individual on my right, Mike Franovich. Mike last summer actually had been selected



1 for an SES position in the Office of New Reactors. And, I implored Jennifer Uhle at the  
2 time that when Jack Davis departed, I really needed to sustain the corporate knowledge  
3 and leadership that Mike had been providing to this program.

4 And, I think that was one of the best decisions that Jennifer cooperatively  
5 made was to allow Mike to stay in position. Mike will be going over to his new job now  
6 in a couple of weeks.

7 But, helped shepherd us through these very import policy activities and  
8 to get these in front of the Commission. I just want to personally thank Mike for his  
9 leadership and his willingness to stay with us to see this through. So, thanks, Mike.

10 Mike?

11 MR. JOHNSON: Thanks, Bill.

12 So, as you've seen in the presentation today, the great majority of safety  
13 enhancements are now in place in the U.S. fleet and the U.S. fleet is better prepared to  
14 cope with extreme events.

15 What remains is on a sound path. We believe continued focus is  
16 warranted to make sure that we complete those activities that remain and we'll devote  
17 that focus.

18 As we discussed, the policy issues have been substantially resolved.  
19 The mitigating -- the draft final Mitigation Beyond Design Basis Rulemaking package and  
20 the final Tier 2 recommendations, closure plans are with the Commission.

21 Our next steps with respect to sun setting the Japan Lessons Learned  
22 Standing Committee and completing the transition to the line are imminent.

23 And, so, as we complete the transition, we're placing additional focus on

1 knowledge management and knowledge capture so that Tim and Eric and others can  
2 ultimately retire.

3 We want to make sure that we ultimately at some point, we want to make  
4 sure that we capture not just what we did, but the rationale behind we did it -- why we did  
5 it. And, so, that's what is involved in our knowledge capture of the activities.

6 I want to conclude this presentation with just a tremendous sense of pride  
7 that we feel, all of us I think, with respect to what we've been able to accomplish.

8 So, with that, we're ready to take the Commission's questions.

9 CHAIRMAN SVINICKI: Thank you all for the presentations. And, I'll  
10 pick up where you left off, Mike Johnson, to say, observing this as a member of the  
11 Commission throughout these events, I'm also very proud of the NRC staff.

12 At a speech at our Regulatory Information Conference a few years, I  
13 talked about how proud I was of our country for the fact that its reaction to what on TV,  
14 you know, is a very hard to thing to watch the events that happened Fukushima.

15 We were allowed, as a federal government Agency, the space, the  
16 breathing room that we needed to apply the technical rigor and the discipline to a set of  
17 actions that were going to have the kind of safety improvement effect that we analyzed.

18 And, we were allowed the space to set implementation schedules for  
19 those that were not so quick that they were a distraction from the day to day operations  
20 of those plants.

21 And, I'm proud of that as a very reasoned reaction to something, again,  
22 that was hard to watch was happening to our friends and colleagues in Japan. But, we  
23 were provided that space.

1 I think we made excellent use of that space and so, I also want to  
2 commend the staff.

3 And, I mentioned in the previous panel that is was by my estimation  
4 hundreds of NRC experts and staff with a direct involvement.

5 But, it was probably, you know, a thousand, 2,000, when we take in the  
6 indirect support that is needed in all the different functions that provide support so that  
7 the Tims and the Erics of the world, you know, can do the rulemaking activity that they  
8 do.

9 So, I think it will stand in the history of this Agency as a tremendous body  
10 of work to have done this.

11 And, by the way, there were lots of other things going on for us in that  
12 time period. So, let me begin with that.

13 And, it is important, and I think in this moment, it's good to recognize that.

14 That being said, I still have some questions that I'm going to direct to you.

15 One of the areas of concern going forward for us in sustainment is a little  
16 note I wrote to myself here when the previous panel was talking about knowledge transfer  
17 and the generational shift, the turnover to successors that come and take our jobs.

18 I wrote, our regulatory interpretation is well documented. And, I'm going  
19 to tell you what causes me to be focused on that in this moment.

20 In my first, I would say maybe couple of years of service on this  
21 Commission, I joined the Agency when it was deep, deep into codifying the post-  
22 September 11th security orders.

23 And, this is a term near and dear to many of us. Oh, we're just going to

1 codify some orders. So, some of the experience in that process was we codified the  
2 orders but with additional things.

3 Now, let me be clear from the start, you get into the implementation of  
4 something and you cannot proceed mindless of the lessons you learned, the moments  
5 of, gosh, if I knew then what I know now, I would have written this order slightly differently.

6 And, it's not all just originating from NRC. Many of it is, you know,  
7 people have implemented the things that we've directed them to do and we both learned  
8 lessons in that process.

9 But, as an Agency, it's important to bring discipline to that process of, I'm  
10 not picking on Tim, but I wrote some of his. He said improving the final rule and lessons  
11 learned in implementation because we could sit as the regulator and introduce a number  
12 of new measures.

13 I appreciated that both Tim and Eric were specific about being sensitive  
14 to backfit, about looking at the things that increased the efficiency and effectiveness in  
15 moving from the orders to the rule.

16 But, that being said, we will have people who will come along in the  
17 future, whether it's the actions taken post-9/11 or today. The other thing to navigate is  
18 this split between what do you bind us to in the rule language itself and what do we put in  
19 guidance?

20 And, Tim and Eric talked quite a bit about how they tried to navigate that,  
21 but that discussion also takes me back to that very first question. Our regulatory  
22 interpretation is well documented so that all of our successors don't get together and say  
23 between the Commission's vote, their staff requirements, memorandum, the direction to

1 the staff, where we ended up in rule space, I find myself now on issues, you know, I go  
2 back and try to take them mosaic of all of that.

3 It's like the equivalent of a legislative history in the Congress. You know,  
4 people gave floor speeches, people wrote committee reports. How do I stitch that  
5 together into saying the clear intent of the law is X. So, we have a version of that as  
6 regulators.

7 Would anyone speak overall to the approach to that, to making sure that  
8 an inspector in the field ten years from now knows the regulatory expectation for X or Y  
9 that arose out of the Fukushima response?

10 MR. DEAN: That's a great question. I'm going to hand it off to Mike in  
11 just a minute. But, it's something that we've been extremely conscious of.

12 And, you talk about the lessons learned from the 9/11 and the order of  
13 implementation. And, of course, Tim has some of the scars, I think, from that activity that  
14 I think he was very conscious of in terms of how this rule was developed.

15 But, in terms of knowledge management and knowledge transfer, we  
16 actually have a handful of specific actions that were taken to do exactly what you identified  
17 as that.

18 This ultimately is getting translated into the Regions and the inspectors  
19 are going to be the ones that are going to have basically approach the sustainability.

20 So, maybe I can let Mike talk a little bit about a couple of initiatives.

21 MR. FRANOVICH: And, Mike, before you do, let me just at a high level  
22 also to make the point.

23 So, we were mindful of both of the things that you raised. One about

1 what happens when you codify and things can grow.

2 In fact, I remember very vividly some of the early Steering Committee  
3 meetings with the industry Steering Committee where we talked about this plan to codify  
4 and how do we make sure that we exercise discipline in that process?

5 And, so, the emphasis that we placed throughout the process to make  
6 sure that we didn't grow, that we applied backfit along the way. We looked at what is  
7 necessary if we're going to make these improvements.

8 I think we did due diligence and we got great input from external  
9 stakeholders where they thought we got it wrong.

10 CHAIRMAN SVINICKI: And, let me be clear, the codification is  
11 absolutely necessary. I don't like us to be regulating for decades at a time in order space  
12 necessarily. I mean, there are instances where it's one off, but where it's generic, we  
13 need to move to codification.

14 I'm pleased that we did that and if you can move to codification with a lot  
15 of the same people, it's best.

16 MR. JOHNSON: Yes, the other thing I was going to make -- point I was  
17 going to make is, there came a time when we were thinking about, from an expediency  
18 standpoint, whether or not we could afford, for example, to do safety evaluations at the  
19 back end or whether we needed to get past those to get to inspections.

20 And, I remember very, very vividly, maybe Bill was engaged in that  
21 activity as member of the Standing Committee as well, where we said, you know what,  
22 ten years from now, some inspector in the field is going to be looking at what we did and  
23 they need some sort of a beacon, some sort of a stamp about what we thought about

1 what licensees were proposing to provide consistency and stability going forward.

2 And, so, I think, again, that's an example of where we were mindful of the  
3 challenge and took actions to address it.

4 Please, Mike.

5 MR. FRANOVICH: Thanks, Mike.

6 That's a great place for me to start off with. I've been in the field.  
7 Sometimes you get a vintage plan and you're trying to interpret the original licensing basis  
8 and sometimes it doesn't have that level of detail or documentation to go with.

9 And, then, you wind up in a protracted process, calling back  
10 Headquarters and writing agreements to try to make those interpretations.

11 So, the safety evaluations, essentially, one of those lessons learned, let's  
12 make sure we spend the time appropriately and be very clear and detailed as to what we  
13 looked at during the audits, what the position papers were that we supported, whether  
14 they were white papers presented by the industry or our own generated white papers and  
15 that we use those products to inform the TI-191 inspections so the inspectors actually  
16 take it in the field and we work with them on inspection plans.

17 So, go look in this one area that maybe we -- the audit teams didn't spend  
18 as much time, vice the areas that we've already documented in the SER.

19 I mean, there are other layers of KM/KT, knowledge management and  
20 knowledge transfer. For example, we are working on a NUREG to document a lot of the  
21 lessons learned from the JLD staff itself.

22 Fortunately, we have Eric Bowman with us who lived through the 9/11  
23 legacy of when the Commission directed we need to have more of a KM/KT effort in that

1 arena. So, we're able to leverage that experience as well.

2 The Reg Guides are another set of documents that, obviously, take  
3 clearer staff positions on interpretations of industry implementing guidance. So, it is a  
4 myriad of documents.

5 And, the last thing I'll note in the training arena, we are trying to leverage  
6 what industry has done and we actually have under our MOU with INPO where they have  
7 a set of online video -- training videos regarding the FLEX program.

8 So, we want to incorporate those features into our own qual program for  
9 inspectors and for staff.

10 So, those are few of the features that we're kind of working on right now.

11 CHAIRMAN SVINICKI: I appreciate that and that's helpful. You didn't  
12 mention, but I also would credit the reintegration organizationally and otherwise of a lot  
13 of this work into the standing line organizations I think is a sustainment measure.

14 Now, I know I've evidenced a certain amount of impatience about that  
15 over the years. But, it is happening now and I think if this is the time that the staff  
16 determined is comfortable and appropriate to take this, you know, the phasing in, I guess,  
17 Svinicki needs to be patient and say we're getting there eventually and we did get there.

18 The one other thing, and I only have a few seconds left, but we haven't  
19 talked about this, although Commissioner Burns did raise the issue of all of the  
20 international collaboration that's gone on since the accident in Japan and the fact that  
21 regulators have collaborated and cooperated.

22 We talk to each other. Some countries did stress tests. Some  
23 countries did -- there were changes in nomenclature. But, I think at bottom, we



1 discovered that the post-Fukushima set of areas of concern, we had good parallels  
2 around the globe.

3 But, we have had very special and intense integration of things with our  
4 Japanese counterpart as the Government of Japan looked after the accident, at  
5 restructuring of various organizational and process elements of their oversight of  
6 operating reactors.

7 So, I would ask Mike Johnson or Bill, at a high level, is there anything  
8 you'd want to say about how that's evolved to areas. I know that the area of resident  
9 inspection is something of interest to our colleagues in Japan and they're looking at our  
10 model a little more closely. So, just at a high level?

11 MR. DEAN: Sure, thanks for that, Commissioner.

12 We have had a lot of international collaboration and certainly in various  
13 international committees through NEA and IAEA and others as well as distinct  
14 interrelationships with our counterparts in Japan.

15 One of the things that we're currently doing right now is hosting five  
16 individuals from our counterpart, the NRA organization in Japan to basically firsthand  
17 evaluate the way we conduct our inspection program.

18 And, so, they've been out in Region III and Region III and Region IV have  
19 been sharing responsibility for hosting them at various sites and inspections.

20 Next month, they will come to Headquarters and be here for several  
21 months and get with the program office and understand sort of the program office focus.

22 And, then, we're having dialogue with them about a future cohort group  
23 coming over again to learn from us so that they can integrate that into their planning

1 efforts to refine their or revise their oversight process.

2 MR. JOHNSON: Thanks, Bill.

3 And, of course, on the other side of that, Japan and our regulatory  
4 counterpart in Japan has provided tremendous ability for us to look from afar to gain  
5 insights as they gain insights into what happened and how do we prepare to make sure  
6 that never happens again.

7 That's been a long -- sort of a longstanding close engagement that we've  
8 had with them and it's been very beneficial.

9 CHAIRMAN SVINICKI: Thank you both for that. Thank you.

10 Commissioner Baran?

11 COMMISSIONER BARAN: Well, thank you all for your presentations  
12 and, more importantly, for the years of work you all have been doing to implement post-  
13 Fukushima safety enhancements.

14 I want to -- there's really so much material here, so many ways to go, but  
15 I think I'll focus my questions on the staff's proposed resolution of the open Tier 2 and  
16 Tier 3 recommendations.

17 One open item is an evaluation of natural hazards other than seismic and  
18 flooding hazards. And, after applying a screening process, the staff focused its more  
19 detailed analysis in two areas, high winds and snow loads.

20 I thought the high wind analysis was pretty thorough, so I don't have  
21 questions about that.

22 I want to ask about the snow load evaluation, which isn't as lengthy. The  
23 staff identified five northern plants that could have issues with heavy snow loads on plant

1 structures like roofs and other things.

2 And, the staff concluded that no additional action was needed at these  
3 sites, in part, because they have procedures to take precautionary actions prior to winter  
4 events and to monitor potential adverse effects at the sites.

5 The staff's paper didn't really describe their procedures, though, in any  
6 level of detail. Do these five plants have detailed procedures for removing large amounts  
7 of snow from plant structures? Who does it? With what equipment? And, what time  
8 frames?

9 MR. FRANOVICH: I'll take that question. You're right, the actual  
10 SECY paper doesn't have a great amount of detail on the snow load aspect, especially  
11 about characterization of what we looked at in the procedures.

12 We did look at some of the procedures. We did not, as a staff, put a  
13 heavy reliance on them because we took more of a structural analysis type of approach  
14 in looking at margins available, in particular, looking at the ASCE Code and looking at  
15 how -- whether it's A BWR which may have more susceptibility to snow load on the roof  
16 versus a PWR.

17 So, we put more an emphasis on the structural analysis and capability.  
18 When it came to the procedures, all the five plants you've mentioned, they do have  
19 procedures for clearing roadways, ensuring that the operating crews can come on and  
20 handle the turnover in case they're snowed in, sufficient personnel, emergency response  
21 capability, et cetera.

22 Not all of them had detailed procedures regarding snow loads on roof,  
23 for example. So, I wouldn't -- that's why we didn't put a heavy reliance on that particular

1 element.

2 And, we went back to the structural analysis piece.

3 COMMISSIONER BARAN: So, you're -- the staff wasn't concerned  
4 about the lack of detailed procedures in that regard because of margin and the structural  
5 analysis you did?

6 MR. FRANOVICH: That's a fair characterization, yes.

7 COMMISSIONER BARAN: Okay.

8 Another open item I wanted to ask about is an evaluation of the efficacy  
9 of real time radiation monitoring at nuclear plants. And, we discussed this at length on  
10 the first panel.

11 And, I mentioned at that time that the staff's evaluations cites a 1982  
12 study that concluded that a monitoring system consisting of 16 or 32 stations couldn't  
13 provide reliable information about a potential radioactive plume.

14 And, from my point of view, there's nothing wrong with looking at the  
15 studies that are out there and have been done over the years, but my expectation is that  
16 the staff's going to take a fresh look at the effectiveness of these monitoring stations.

17 Did the staff take the next step and exam how many stations would be  
18 necessary for a radiation monitoring system to be effective?

19 MR. FRANOVICH: So, you correctly pointed out that it's pertinent to  
20 start with the history, what have we done as an Agency, in particular, post-Three Mile  
21 Island accident?

22 We did go back and look at that and that is documented in the SECY  
23 paper. And, we did point out some vulnerabilities about having a fixed station, fixed

1 monitoring capability.

2           While it may be of more utility to perhaps emergency officials who might  
3 be able to derive, you know, where the centerline of the plume may be following by sort  
4 of vectoring off of different detectors.

5           When it came to actual, you know, sharing of that information with the  
6 public, we had to be -- we were looking at it from a sensitive standpoint, well, what do you  
7 do if you have real time monitoring capability that's publically available where it might give  
8 false indication of true dose.

9           And, so, there were issues like that. We went back and looked at -- we  
10 sought stakeholder input. I think that's documented in the actual SECY paper itself to  
11 get the different perspectives.

12           Because there are advantages to such a system. So, we didn't go back  
13 and look at, you know, let's say you had the 32 detector system and we did any kind of  
14 sensitivity studies or anything like that to see if that would be a better system.

15           We were sensitive to the fact that there are, in the federal enterprise,  
16 other capabilities, for example with the Environmental Protection Agency and the RadNet  
17 System. As you're probably familiar with, there are a 130 -- more than 130 fixed stations  
18 across the country.

19           There is a portable deployment capability as well. And, actually, that  
20 has served, from a federal perspective, some useful information when we were looking  
21 at, for example, the Chernobyl event which was mentioned by the first panel regarding  
22 the plume and contour maps going across the United States at the time.

23           So, there is value in it and we are aware of what else is in the federal

1 enterprise, but we didn't go back and do any kind of updated analysis.

2 Because, ultimately, when we look at initial protective action  
3 recommendations are really primarily based on the plant conditions. We want an earlier  
4 warning type of approach rather than relying on deposition of radioactive material.

5 Although, there's value in having that information, we'd rather have  
6 operators declaring early from an emergency standpoint, if I see imminent core damage,  
7 I want to start making some recommendations to the local and state officials.

8 And, I don't know if maybe Steve Lavie was the principle author of the  
9 study, if you have any more to add to that.

10 COMMISSIONER BARAN: Okay, thanks.

11 MR. LAVIE: What Mike said was pretty -- is correct. One of the things  
12 I wanted to point out is, in this 1982 study, they did consider the difference between a 16  
13 station and 32 station.

14 And, as I recall, I'm standing here trying to remember what the number  
15 was, it was only about a five percent improvement in the reliability over the 16 station.

16 Recognizing, of course, you just doubled the cost of the system. And,  
17 making it even a higher resolution just keeps multiplying costs on the system which is  
18 probably not -- is not going to be resulting in a substantial increase in public health and  
19 safety.

20 COMMISSIONER BARAN: Well, I guess, I take your comment on the  
21 role that, you know, the monitors would play.

22 What I want to make sure, as an Agency, we're doing is, we're really  
23 grappling seriously with the recommendation that the Near-Term Task Force had which

1 is they had an explicit recommendation. We, as an Agency, should take a look at the  
2 efficacy of monitoring systems.

3 And, while there's value in going back and seeing what, you know, in  
4 1982 contractor study determined about that, I would expect that we'd go further than just  
5 that if we're going to take a fresh look at the effectiveness and value of these systems.

6 And, I can see various ways to do that. One way would be to look at it  
7 and say, okay, well, how many monitoring systems, you know, with today's technology  
8 would you need for an effective system and what do we think the cost of that would be?

9 You mentioned costs, so it sounds like we didn't really look at, well, if we  
10 have 16 or 32 isn't enough, how many would be?

11 On the cost side of things, you know, the staff briefly discussed that in  
12 the paper. It provides the 1982 costs for the system from this study and then it asserts  
13 and the quote, given inflation since 1982, the current costs would be significantly greater,  
14 end quote.

15 And, I don't know, I think that's a pretty odd statement to make. First of  
16 all, it's conclusory, there's no analysis behind it, but it just asserts that, well, the only factor  
17 is inflation.

18 But, I think we'd all agree that there have been some pretty significant  
19 technological advancements in the last 35 years in the area of sensors, data  
20 communications, battery power sources.

21 And, I would imagine that you could probably get a monitoring station  
22 today with more capabilities at lower cost than you would have in '82. And, that's -- we  
23 heard that from Mr. Mulligan on the first panel that he thinks the stations you get today

1 are more reliable, have more capabilities, probably cheaper than the ones you would have  
2 gotten in the '80s.

3 Did the staff look at the current costs of radiation monitors?

4 MR. LAVIE: No.

5 COMMISSIONER BARAN: Okay. And, so, to me, and you know, this  
6 is maybe kind of a blunt question, but if you didn't look at how many stations would be  
7 needed for an effective system, and you didn't look at the cost of the monitoring stations,  
8 how can you be sure that they wouldn't be a cost beneficial to substantial safety  
9 enhancement?

10 MR. DEAN: So, if I can take a shot at that, Commissioner, Steve, if you  
11 don't mind, from a high level.

12 And, I appreciate your comments and your remarks about, you know,  
13 how detailed an evaluation did we do on this.

14 But, I think that we looked at it from a much more higher level global  
15 perspective and that is, from a perspective of protecting public health and safety, the key  
16 is, what is the PAR decision or the PAR recommendation that a licensee is going to make  
17 and when does that occur?

18 That occurs well before there is any release or a need to have any offsite  
19 radiation monitoring. And, so, a decision to shelter in place, a decision to evacuate, the  
20 way the EAL schemes are developed is that those recommendations would be made well  
21 in advance because you want to evacuate people before there's a release and there's a  
22 plume. Right?

23 So, to then have to potentially require licensees to invest resources, no



1 matter, you know, whether it's a \$1,000 for a monitor or \$25,000 for a monitor, there was  
2 not going to be any substantial increase in protecting public health and safety.

3 There may be an increase in the potential for additional knowledge to be  
4 available, but there's other means that already exist for doing, you know, we have teams  
5 that go out and do plume surveys. We have the capacity for FRMAC to come in from  
6 FEMA to do whether it's flyovers or whatever to get information about where the plume is  
7 and so on and so forth.

8 So, it was, I think, viewed, and this would be my perspective, it would a  
9 nicety to do that, but that there was no way that we could make a justification, no matter  
10 what the cost was, that this was something that was needed for adequate protection for  
11 public health and safety or a cost beneficial substantive of increase in safety.

12 COMMISSIONER BARAN: Well, I want to push back on that a little bit  
13 because it, to me, what that sounds like is a disagreement with the underlying premise of  
14 the recommendation that this is really something that's important to look at.

15 And, then, kind of jumping to the conclusion that, well, it's not important  
16 to look at it and there's no way it could be a substantial safety enhancement.

17 I mean, is that -- I don't want to put words in your mouth, but that's kind  
18 of how I interpret what you just said. That's not grappling with the recommendation,  
19 that's saying it's not a good recommendation.

20 MR. DEAN: Right. So, Mike's going to interpret for me. Mike?

21 MR. JOHNSON: So, what I was going to say is that we did not -- we  
22 took every one of the recommendations that were made seriously.

23 And, I think the approach that Bill laid out is exactly the approach that we

1 had in mind. We started with such an approach, is something necessary for adequate  
2 protection based on the recommendation?

3 Is something -- would something represent a substantial increase? And,  
4 then, would it be cost justified?

5 So, implementing of the 51.109 as a way to look at this. And, so, we  
6 didn't -- that's why we didn't get the cost. We didn't get the costs for all of the other  
7 reasons that we've talked about, about what exists in the current framework and what  
8 would be needed beyond that to result in a substantial increase and we didn't see it.

9 MR. LAVIE: I'd like to address the Commissioner's comment about  
10 we're deprecating the recommendation.

11 In the recommendation language, the paragraph that proceeded the task  
12 force specified, as long as field teams are adequately staffed, equipped and capable of  
13 transit, given the nature of the natural disaster field monitoring remains an effective  
14 method to acquire radiation data.

15 COMMISSIONER BARAN: But, yet, they then went on to recommend  
16 that we take a fresh look at the efficacy of real time monitoring, right? I mean --

17 MR. LAVIE: Well, I want to separate real -- yes, no, I don't want to  
18 separate -- but we did look at the real time data and, based on the studies done in 1982  
19 and the recognition that the technical basis of that analysis was still valid, not the dollars  
20 and cents, but, you know, the plume dispersion is plume dispersion, it's science, it's  
21 physics, the location of the monitoring in relation to that plume.

22 An elevated plume at a boiling water reactor will pass maybe at least a  
23 thousand feet above the monitor.

1                   And, I agree with my colleague from New Jersey, there is plume shine,  
2 but not as much -- but they were referring to in the study was getting a reliable indication.  
3 And, they said, we can't get a reliable indication under all conditions.

4                   And, therefore, they believed it wasn't worth the effort. The staff,  
5 apparently, at that time agreed because they retracted the requirement from Reg Guide  
6 197.

7                   COMMISSIONER BARAN: But, I'm over my time but I just want to  
8 follow up and kind of close the loop on this.

9                   So, the 1982 studies there, is there new analysis, I mean, you basically  
10 said that the science hasn't changed, the staff believes those conclusions are still valid.

11                   Is there supporting analysis for the staff's new conclusion that the 1982  
12 findings are still true today?

13                   MR. LAVIE: Well, we've -- if the basis of the conclusions is valid, one  
14 would assume the conclusions are also valid.

15                   But, I want to point out and emphasize, and even in the paper, that  
16 conclusion was only one of the aspects we considered in making the recommendation.

17                   COMMISSIONER BARAN: Let me ask about, quickly, on one other  
18 aspect. I mean, one way to do this is how many monitors do you need and how much  
19 do they cost?

20                   Another way to do it would say, hey, if there are monitors operating right  
21 now in New Jersey and New York and Illinois, did the staff evaluate the effectiveness or  
22 capabilities of those systems that are active today?

23                   MR. LAVIE: Those systems, as Mr. Mulligan pointed out, do provide

1 data that could be useful. But, our question is, do they substantially increase the public  
2 health and safety?

3 Having confidence in response actions and having transparency are  
4 wonderful things. But what -- how do they help us with the criterion substantial increase  
5 in public health and safety? When everything we see already in the plants provides that  
6 assurance?

7 The NRC's protocol for relying on plant condition, the NRC's relied on  
8 plant conditions ever since TMI. They've always downplayed use of assessment.

9 Now, once the event is going full force and you start to get that data  
10 available, by all means, licensees are expected to use it. But, our initial protective  
11 actions, the most protective part of it are done on plant condition.

12 MR. FRANOVICH: So, if may add to that, just I mean, granted, we did  
13 leverage the '82 study. It is informed by the outreaches to the EP community and  
14 emergency preparedness specialists and experts through various forums to get their  
15 input.

16 I would also say we leverage the experience actually at Fukushima itself  
17 and how effective that system was at the time given shifts in wind.

18 But, the other thing we leverage may not may come out clearly in the  
19 paper, but in the backdrop, if you recall, we went through a very large EP rulemaking here  
20 I think it was about five years ago, six years ago.

21 And, then, part of that was looking at evacuation times and shadow  
22 evacuation effects, if you recall, which is a real known effect. Would such a system, if  
23 deployed in a real time basis to the public cause some unintended consequences there?

1           These are qualitative considerations, but something certainly in the back  
2 of your mind where it's, let's say, I had an indicator system out there and it was available  
3 on the Internet, and public officials are saying one thing but the indicator is saying  
4 something else, will people make their own decisions and perhaps self-evacuate to a  
5 region where perhaps the winds are shifting the plume is now moving in that particular  
6 sector?

7           Now, that's not a quantitative piece, it's a qualitative piece.

8           The other thing that's not in the paper I would say as a manager that I'd  
9 keenly think about when we look at kind of decisions that we're looking at here in terms  
10 of merit for public protection, and that we do have a state of art reactor consequence  
11 analysis. And, it does give us some pretty good insights about the accident progression,  
12 the effectiveness of emergency actions that are currently in place.

13           And, that they are effective and, the fact that they -- were orders of  
14 magnitude away from the Commission's safety goals in terms of safety. We're actually  
15 much, much better than what the safety goals have provided.

16           So, that is context, if we were to do a more rigorous analysis from a cost  
17 benefit standpoint, I think those would be factors that would have to be brought to bear.

18           But, we're trying to temper how much do you invest in looking at this  
19 particular issue vice doing a more detailed analysis?

20           So, I just wanted to provide that for some of the context. That may not  
21 be in the paper.

22           COMMISSIONER BARAN: And, I appreciate that and I am way over  
23 time, so let me just close and say thank you for mentioning the kind of public availability

1 aspect of this.

2 We talked about that a fair bit on the first panel. It strikes me as a  
3 complex kind of nuanced question.

4 My observation reading, you know, the staff's work here is, other than a  
5 statement that says, well, this could make shadow evacuations worse, we don't really  
6 grapple with that question or any of the complexities of it.

7 Maybe it's because, you know, you didn't see the merits of the monitoring  
8 stations in the first place even though that it was part of the recommendation on the public  
9 availability aspect of it.

10 I guess just to close on this, I would say, you know, there are three open  
11 items here. One of them was on how do we more proactively aggregate and review and  
12 assess new information on natural hazards? I thought you guys did a great job on that.

13 And, then, high winds was really thorough, snow loads a little briefer.

14 This, you know, piece doesn't have the rigor of like the high winds  
15 analysis and, you know, it's pretty obvious when you read it, it doesn't have that rigor.  
16 And, you know, I'm just not convinced we did enough there on this.

17 Well, thanks.

18 CHAIRMAN SVINICKI: Thank you, Commissioner Baran. And, that is  
19 a complex topic. I know we went a little over time, but I think it was important. It was  
20 important to explore that and Commissioner Burns, if you need a little extra time, please,  
21 I might have one follow up question myself at the end. Thank you.

22 COMMISSIONER BURNS: Oh, it just gave me more time to think about  
23 what my questions would be. So, that may be too bad for the staff.

1           Actually, I want to come back to -- I'm going to talk a little bit about some  
2 of the what I'll call administrative law or process issues with respect to implementation of  
3 this rule as a, and I use it guardedly, as a codification.

4           I actually worked on the, as well, on the post-9/11 orders as well as the  
5 development of some of the, well, of the rulemaking beyond.

6           And, one of the -- and I want to -- I may ask Tim and Eric a question along  
7 these lines. There was a significant difference in terms of the rulemaking that came  
8 about, probably about the time you got here, Chairman.

9           Which was that the initial orders in the security area were clear responses  
10 to the 9/11 context. But, the interesting thing, and I know my former boss and general  
11 counsel, Karen Cyr, would be here slapping everyone's hands for calling the security rule  
12 a codification of the orders. Ah, you all remember?

13           She was quite adamant about that, partly because one of the significant  
14 reasons we had to go forward with the security rulemaking was, is we had these supposed  
15 31 new applications for new reactors coming in the door that did not have -- which would  
16 have been entering with an application without, in effect, an updated security framework.

17           We had a security framework that went back probably to my youth in  
18 terms of late 1970s and early 1980s.

19           So, one of my questions for, I think, Tim or Eric or anyone is, I don't -- in  
20 terms of what we are -- and I will use the word codify, what we're codifying now with these  
21 orders, my sense is, what's the delta between what the orders did and what the  
22 rulemaking does here for the Fukushima or the MBDB rulemaking?

23           MR. REED; I'll take a cut and then I'm sure Eric will chime in as our usual

1 modus operandi.

2 But, the order, I view the difference as being the reevaluated hazard  
3 effort.

4 COMMISSIONER BURNS: Okay.

5 MR. REED: That's the really difference. Otherwise, I think of the rule  
6 as virtually the same as the order.

7 COMMISSIONER BURNS: Okay.

8 MR. REED: And, I like to use the word make generically applicable and  
9 I do that because we mentioned several times today, but I think we're going to be on  
10 about Rev 4 of NEI-12-06 by the time we're done.

11 That's become almost 250 pages of guidance that reflects all of that  
12 continual lessons learned. And, it's gotten bigger and better, right, as we've gone along.

13 And, so, and, of course, we have stakeholder feedback. In this case, it's  
14 really improved the rule and that's why I say generically applicable.

15 So, I see only the real difference being the reevaluated hazard  
16 information. In fact, that's why we have the flexible scheduling strategy there because  
17 that effort's extending out. So, that would be my answer to that.

18 MR. BOWMAN: I'd go along with what Tim had to say about that. But,  
19 looking at it holistically, we've gone through two revisions to the interim staff guidance  
20 that we initially issued with following the issuance of the order. And, that's feeding into  
21 the regulatory guides.

22 And, there were some clarifying language that's actually in the rule now.  
23 For example, the inclusion of staffing as a per se requirement, it was clearly intended in



1 the order where we had a specification requirement in the order for training of the staff.  
2 You can't have training of the staff without staffing.

3 But, it would be something that I would consider. Potentially, someone  
4 could view that as a backfit with it.

5 COMMISSIONER BURNS: So, one of the things I want to understand,  
6 too, is in terms of the scheduler and, you know, I will first confess, I have not started to  
7 dive into the rule yet, as I consider part of my weight training program, as I take it back  
8 and forth to the apartment -- my apartment.

9 But, in all kidding aside, you know, I'll be taking a close look at it.

10 But, what I want to make sure I understand up front, because this struck  
11 me, as you were all talking, you know, we talk about that the industry has implemented  
12 much of what's done.

13 We talk about some of the hazard issues. So, what -- maybe you can  
14 explain very succinctly what this difference in scheduling?

15 Because, like all rules, rules come into effect, you know, a certain time.  
16 So, tell me what really there is an extension of time for, if really anything, versus --

17 What I want to get is some confidence, we're not really undoing the  
18 compliance nature of what the industry has done or what our expectations are, it may be  
19 with respect to certain improvements that or whatever in the rule.

20 So, maybe Tim if you can try to --

21 MR. REED: Start and I'm sure Eric can do better.

22 But, basically, what you're doing there is you're looking at this  
23 reevaluated hazard information, the seismic and flooding scenarios. You're basically

1 looking at whether you can take that information --

2 And, in fact, it was mentioned in the first panel, you calculate a hazard.  
3 Then you take that hazard and you see what that means for your mitigation strategies.

4 You know, you're looking, for example, first, whether you can take FLEX  
5 as is. You know, FLEX has got its own purpose in B.1. Now, I'm going to take FLEX  
6 and see if I can do these different scenarios.

7 And, if I can do all these scenarios without change, you know, that's a  
8 great answer. Right?

9 If I can do that with modifications and still do both, then I'm back to a  
10 single set.

11 So, that's a lot of work, it's actually a lot of back and forth. It's ongoing  
12 right now. And, it's got some time to go.

13 As I think you heard in the first panel, there's some PRA work that's  
14 coming in. That's very important for one of the paths in the guidance, that's Path 5, if  
15 you will, on the seismic information.

16 And, so, that's really, I think, the main driver. The seismic, I think, is the  
17 one that's going to go on the furthest, and I think that's where folks will probably need that  
18 extra time to look at that information, see what it means as far as the mitigations strategies  
19 and comply with our rule.

20 And, I think giving them this two years fits very well with that.

21 MR. BOWMAN: The only thing I would add is that we've written about  
22 it in the Statement of Considerations as far as what good cause would be for using the  
23 flexible scheduling option.

1           Our intent is not to leave any regulatory gaps. We have the regulatory  
2 gaps covered to prevent them from existing with the two year and three years until we  
3 have included in the draft final rule the rescission of the requirements from the orders or  
4 the license conditions.

5           Good cause for going beyond the three years would include a licensee's  
6 including in their schedule for compliance, their continued compliance with the  
7 requirements of the order or with the requirements of those portions of the rule.

8           MR. REED: Yes, that's a great point. If you look at B.1 in our rule, it's  
9 really the order. And, so, if you were to extend the regulation, you want to have a  
10 schedule that goes out past when we rescind that order, I think the licensee has got say,  
11 I have to comply with B.1. In other words, the pulled requirements I'm in compliance  
12 with.

13           COMMISSIONER BURNS: Yes. Okay, good. That helps me.

14           One of the things, and I, again, I think I compliment the staff in terms of  
15 being as that tot the extent that we can remove administrative -- what would be  
16 administrative requirements or basically licensing actions for the sake of licensing actions,  
17 I think being creative and looking at that is a good thing.

18           One of the things, though, and this is all, you know, over the year, my  
19 experience and I think a lot of your experience, is you need to be on the same page.

20           So, when we say you can get rid of that license condition, yes, the order  
21 is kind of issue. The beauty of the order, and actually, I'm a bigger -- on the centerline,  
22 I'm probably a little bit different side of the centerline on orders than Chairman Svinicki is.

23           But, you know, I understand, this -- I think this is a good effort in terms of

1 bringing into the regulatory framework what was the intent behind these orders improving  
2 it all.

3 But, you've got to have, you know, we all have to see eye to eye. Do  
4 we know and how do we document what it -- what those license conditions or other license  
5 requirements, license terms are that we think are, you know, disappear because by force  
6 of the -- by the rule itself?

7 Because I think that's an important -- a mutual understanding has to  
8 eventually emerge there.

9 MR. REED: We took a very hard and strong look at the different license  
10 conditions that are out there. And, for the old B.5.b license conditions, it was fairly simple  
11 because of what the Commission found that the new regulation required the same thing  
12 that the license conditions did when we did the power reactor security requirements  
13 rulemaking.

14 For the new ones, the new reactor license conditions, for the ones that  
15 were -- they're combined licenses after the EA-12-049 mitigation strategies order, there  
16 are some pieces in some of them that require a little bit different things that would be a  
17 verification of as-built stuff like battery capacities and so forth.

18 As you look through Paragraph I in the draft final rule, you'll see that it's  
19 not a wholesale removal of the entire license conditions that require the mitigating  
20 strategies.

21 But, there are some exceptions that leave in place the stuff that is a delta  
22 between what's necessary for a verification of an as-built new reactor that wouldn't have  
23 been in the requirements that were issued in the order and wouldn't necessarily have

1 been in how we thought of putting in the requirement for the mitigating strategies in the  
2 rule.

3 MR. BOWMAN: So, the key is, they have to be truly redundant with the  
4 rule. I mean, that's what we're trying to make sure that that's the truth. And, so, then, if  
5 that's the case, then you can remove them.

6 COMMISSIONER BURNS: But there'll be some interaction with the  
7 licensee about what -- as I say, a meeting of the mind on that, I would expect. And, then,  
8 some sort of --

9 MR. REED: There's the administrative removal of the --

10 COMMISSIONER BURNS: Yes, okay.

11 If I can, two last questions.

12 First, Tim, you talked about in terms of the applicability of the rule and  
13 obviously with respect to operating fleet COLs that have been maybe issued, but you  
14 talked about an exception and I want to make sure, you said there's something in house  
15 that might not apply.

16 And, I kind of want to understand the other universe because I'm  
17 wondering if this other universe or what other set, you know, now that we've started  
18 getting the, you know, a lot of potential interest in advance reactor design.

19 So, how does that intersect here?

20 MR. REED: Okay, our rule doesn't have design requirements in them.

21 COMMISSIONER BURNS: Okay.

22 MR. REED: However, there's one application in house is design -- it  
23 looks very, very good. In fact, so good they may go address their entire regulation based

1 to really by their design, actually designed to address any heat up.

2 And, so, that now becomes a challenge because they can address what  
3 is really is an operational program in their design. So, that's our challenge to figure out  
4 how to do that.

5 But, that's that issue there. But, I was trying to say is, it's not a  
6 requirement for folks to do that. Certainly they can under their own free will, if they wish  
7 to.

8 And, certainly, as long as they're motivated to do that, you know, and  
9 we've seen the case already of a small reactor that does that, NuScale.

10 COMMISSIONER BURNS: NuScale?

11 MR. REED: Yes.

12 COMMISSIONER BURNS: Okay, okay, thanks.

13 And, my last question, if you will, is Dave Lochbaum suggested, I mean,  
14 one of the things he suggested is this approach of more of vertical slice.

15 And, I know, I mean, one of the challenges is, is that, and this isn't, you  
16 know attributing bad motives to staff or to industry or whatever, but sometimes, you don't  
17 always see things.

18 So, I don't know if you had any reaction about thinking to the suggestion  
19 that he made?

20 MR. FRANOVICH: Actually, Dave Lochbaum's suggestion is quite  
21 timely. We have had a continuous look at flood protection just as a matter of point.

22 In fact, since 2012, we've had more than ten greater than green findings  
23 in the reactor oversight process and we have made modifications to our procedures to

1 put more emphasis on, for example, on seals, seal integrity, service life, those kind of  
2 insights have been woven back into the program.

3 We've also looked at our operating experience program and use smart  
4 samples.

5 But, we are looking at the long-term transition to oversight and where do  
6 we take the insights from RTIs and put them into a long-term baseline inspection program.

7 And, so, we're trying to balance adding in the Beyond Design Basis  
8 capability attributes of what we're doing here with the current program so that we're not  
9 impacting some of the safety related type of focuses on the inspection program.

10 But, we're now looking at how to craft that procedure actually. So, we  
11 will take that suggestion under consideration.

12 I will note that we did do eight onsite audits that did a more probative look  
13 at how the walk downs licensees were following the guidance from industry.

14 And, on the two sites that were noted in his presentation were not in that  
15 set of eight. So, while it's not exactly a vertical slice in terms of looking at calculations  
16 necessarily, it was a little bit more probative look.

17 COMMISSIONER BURNS: Okay. Thanks very much.

18 Thank you, Madam Chairman.

19 CHAIRMAN SVINICKI: Well, I appreciate everyone's presentations.  
20 There's been such an interesting discussion that I wanted to offer just two quick  
21 observations, they're not really questions.

22 The first is that I want to maybe clarify, I didn't mean anything derogatory  
23 about the use of orders. It's just long been my temperament that the ability to compel

1 individuals or entities to take action is among the most powerful and sober authority that  
2 we can be given under law.

3           Therefore, I always approach it with a need for discipline and rigor. But,  
4 I in no way question the legitimacy of that authority under law because there is  
5 occasionally a necessity to operate outside of the transparency of the Administrative  
6 Procedure Act in the rulemaking process. And, that's just simply a reality.

7           So, I didn't mean to be anywhere on the continuum, I just acknowledge  
8 it, but I want us to always approach it in the way we do so that we wouldn't even venture  
9 near any abuse of the discretion of that massive power that we are entrusted with and to,  
10 you know, take very soberly.

11           The other thing that I thought might be helpful is to offer an observation,  
12 what's occurring to me about the Near-Term Task Force Report.

13           As a member of the Commission in receipt of that report, we gave a group  
14 a very capable NRC employees, albeit a small group, it might have been five people with  
15 one administrative support person.

16           They represented a lot of NRC knowledge, but I don't think a single one  
17 of them would indicate that they replicated the entirety of the NRC body of knowledge.

18           And, when we gave them 90 days, frankly, in a time period when facts  
19 on the ground from Fukushima were still emerging, and I'm talking, you know, weeks and  
20 months later, but it took a long time to have confidence that things there had stabilized.

21           We were receiving good information from our friends and colleagues in  
22 Japan and assessing that. These folks, though, were trying, while all of that information  
23 was still coming in, to do a quick assessment of a pretty board set of issues.



1           And, when we received their report, we, I think, struggled with being  
2 sensitive to what we had asked them to do. And, that, in essence, they had not been  
3 given the time to really push those ideas through the prism of the regulatory framework,  
4 through our processes.

5           And, as a Commission, how I would represent what we did, and we had  
6 lively deliberations about, you know, we've got this task force report we asked for this  
7 thing, but look at all of the constraints we put on these good folks trying to give us this  
8 work product.

9           And, they did a great job to a person. We were very complimentary of the  
10 work that they had done. But, we knew what was missing. And, what was missing was  
11 the ability for the entirety of NRC's experts to take that report from five very  
12 knowledgeable people and put it through that rock polisher of, you know, how does it  
13 meet these other constraints?

14           And, so, as a Commission, we struggled even with the language of that  
15 in terms of the SRM and the direction. We're like is it kind of without prejudice? We  
16 give you NRC staff, this report from other NRC staff.

17           But, in truth, you know, there was a thought of, we really want to hand it  
18 off in a neutral way and not say we don't disfavor any of these recommendations, but we  
19 were clear that we were not endorsing them, even in the form in which they existed. We  
20 want the body. So, the intervening years when I say I'm so proud of what we've done,  
21 because we did take that and put it through the rigor of what everybody else in the  
22 hundreds of other experts thought, and we arrived, you know, where we arrived.

23           So, I sit here as a person feeling very satisfied with the staff's

1 understanding of the direction and what they ultimately did.

2 So, I just want to share that the Commission did struggle with it. It was  
3 a complex question, but that was where the majority ended up.

4 And, so, I appreciate the work that you've done on that.

5 And, if my colleagues have anything?

6 COMMISSIONER BURNS: I might have one last one, I mean, Madam  
7 Chairman, you mentioned public service at the beginning of your remarks at the beginning  
8 of the meeting, and I just want to acknowledge a public servant who has served this  
9 Agency and the country well who passed away at the beginning of this week, Harold R.  
10 Denton, who was the Director of Nuclear Reactor Regulation at the time of the Three Mile  
11 Island accident.

12 And, I think Harold was a, you know, was an honest, plainspoken guy. I  
13 think we can all take lessons from him in terms of his communication and ability to  
14 basically transmit information of a highly technical nature. That was perhaps the  
15 hallmark of his leadership or taking as Governor Ridge said yesterday, sometimes you've  
16 got thrown into it and you have to do it.

17 And, that's what Harold did. He gained the confidence of the President,  
18 President Carter, in terms of being that communicator.

19 And, even after that, as we looked at and, you know, we were talking  
20 today about recommendations and improvements to safety in the wake of the Fukushima  
21 accident, but Harold took that on and continued to take that on as the Director of NRR.

22 I had the honor of working with him on a number of things including post-  
23 TMI orders and other implementation requirements, 2.206 Petitions.

1 In fact, I think I know there was at least one from UCS which Harold  
2 granted at least in part.

3 But, it was an honor to have worked with him, but, you know, particularly,  
4 that was one of those moments when someone's put in the spot where they have to stand  
5 up and lead and I think he did. And, I remember him well and I know a number of the  
6 staff who may be here knew him and remember him well as well.

7 Thank you.

8 CHAIRMAN SVINICKI: And, I really appreciate that, Steve. At the  
9 seminar, the knowledge management seminar that you just referenced that I talked about  
10 earlier, our Executive Director for Operations, Victor McCree, began with a moment of  
11 silence over Harold's passing.

12 It's awkward when you don't really know an individual. I know you have  
13 a richer set of personal experiences. I met Mr. Denton one time.

14 But, Victor and I were talking about it later and I said, you know, I didn't  
15 know him, but what of I know, it's like I look around and I see a lot of Harold Dentons here  
16 today, you know, the folks who are in our Ops Center activated 24 hours, you know, we  
17 cycle through people.

18 And, I feel like, in my one conversation with Harold, he was the kind of  
19 guy who was thrown into something, but his view would be, you know, any number of my  
20 colleagues could have been that guy. And, I see that proud tradition here today, I really  
21 do, through Fukushima and just, you know, how the commitment with which people come  
22 at things.

23 So, think Harold's legacy is absolutely alive and well and the people I see

1 in the lunchroom and the elevator here, I think that, you know, that I think is really his  
2 legacy.

3 So, thank you for mentioning that.

4 And, with that, we are adjourned, thank you.

5 (Whereupon, the above-entitled matter went off the record at 12:02 p.m.)

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