

UNITED STATES OF AMERICA  
U.S. NUCLEAR REGULATORY COMMISSION

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

APRIL 23, 2013

9:00 A.M.

TRANSCRIPT OF PROCEEDINGS

Public Meeting

Before the U.S. Nuclear Regulatory Commission:

Allison M. Macfarlane, Chairman

Kristine L. Svinicki, Commissioner

George Apostolakis, Commissioner

William D. Magwood, IV, Commissioner

William C. Ostendorff, Commissioner

## APPEARANCES

## External Panel:

James Scarola  
Executive Director, U.S. Industry Fukushima Response

David Heacock  
President and Chief Nuclear Officer, Dominion

David Lochbaum  
Director, Nuclear Safety Project, Union of Concerned  
Scientists

Paul Smith  
Nuclear Systems Analysis Section Chief, Illinois Emergency  
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## NRC Staff:

Bill Borchardt  
Executive Director for Operations

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Dave Skeen  
Director, Japan Lessons Learned Project Directorate

## 1 PROCEEDINGS

2 CHAIRMAN MACFARLANE: Okay, everybody ready? All right.

3 Good. Good morning.

4 MULTIPLE SPEAKERS: Good morning.

5 CHAIRMAN MACFARLANE: So today we're going to meet to  
6 discuss the status of actions taken in response to the lessons learned from the  
7 Fukushima Dai-ichi accident that happened in Japan March 11, 2011. It's been  
8 about eight months since our last update. We did that last summer. And so we'll  
9 hear the progress that the NRC has made and the industry has made in that  
10 intervening time.

11 In these past eight months, much has occurred, including  
12 completion of seismic and flooding walkdowns at each nuclear plant facility, a  
13 Commission decision on the issue of filtering strategies for boiling water reactors  
14 with Mark I and Mark II containment designs, and the receipt of integrated plans  
15 from each nuclear power plant licensee to implement the March 12, 2012, orders  
16 on mitigating strategies.

17 So today, we're going to hear from two separate panels: first, a  
18 panel of external folks, including representatives from the nuclear industry, the  
19 Union of Concerned Scientists, and the Illinois Emergency Management Agency.  
20 And following these presentations, we will have the NRC staff come up and brief  
21 us on the NRC's progress.

22 So just a few reminders before we begin. Please keep your  
23 remarks to 10 minutes so that we can get through everybody in time, and to the  
24 extent possible, all of you, including those of you that I see on a daily basis,  
25 remember to reduce your use of acronyms so that we are as transparent as

1 possible. Before we go on, let me ask my fellow Commissioners if they have any  
2 opening remarks. No? Okay. Okay, then to get started, I'm going to turn the  
3 floor over to James Scarola, who is the Executive Director of the U.S. Industry  
4 Fukushima Response.

5           JAMES SCAROLA: Thank you and good morning. I appreciate the  
6 opportunity to brief the Commission today on the progress that the industry has  
7 made. In doing so, I intend to go through the Way Forward document that the  
8 industry had initially started our actions and coordinated our actions through. We  
9 have a steering committee that continues to meet on a weekly basis by phone  
10 calls, and on a monthly basis in person, to guide the industry's actions in this  
11 regard. So my comments this morning will be in regard to the progress on that  
12 Way Forward.

13           As I start here on Slide 1, I want to go through just some insights  
14 and perspectives because I think it's important to, at this point and time, that we  
15 reflect a little bit on where we have come and the methods that we've been able  
16 to advance our interest in improving public safety.

17           So the first bullet that I have here is in regard to the early delivery of  
18 public safety improvements. And as we look through, while there is much  
19 analysis that still has to be done in various areas, like seismic and flooding, it  
20 does not mean that the delivery of improvements in public safety are waiting for  
21 the completion of that analysis. Through working with the industry as well as the  
22 interface here with the staff and the agency, we've been able to advance many of  
23 the improvements in public safety. At the time of initial walkdowns, so in the  
24 case of flooding, we were able to identify areas where the available physical  
25 margin was limited and compensatory actions were put in place at many of the

1 plants throughout the country. We've also done similar activities as we've begun  
2 to bring in additional equipment in the mitigating strategies. We've been able to  
3 advance the strategies, the awareness of our emergency response organizations  
4 to the availability of that equipment while we continue to develop the procedures.  
5 So, advancing public safety is not waiting. It is taking place, and much has been  
6 accomplished.

7           The other thing that I would talk to you here is the operational  
8 orientation of our actions. So one of the things that we set out early out was to  
9 recognize that there is a tremendous operational infrastructure here in the United  
10 States. And it's tied up in our university system and the strong research and  
11 development that gets done through the national labs. It's tied through  
12 organizations like EPRI, the suppliers, and the technical community of suppliers,  
13 as well as the Navy Nuclear Program and the operational standards that are in  
14 place as a result of that. So many of the actions that we took in the U.S. were  
15 operationally focused. We were very much interested in making sure that we  
16 preserve the operational focus that we have here in the United States, but also  
17 that we took advantage and recognized that operational orientation in our  
18 strategies as we made improvements.

19           The next bullet is in the area of technical rigor and analysis. And  
20 this is extremely important because as we have learned more about the events at  
21 Fukushima, there is much analysis that needs to take place, and while we set up  
22 some very aggressive schedules, we have been willing and, through interface,  
23 adjusted those schedules, as appropriate, to assure technical rigor is in place to  
24 avoid any unintended consequences. And I think that this is extremely important  
25 and continues to play very high on our priority list, as we consider things like

1 venting the containments, the strategies for isolation valves that might be in vent  
2 lines, whether they fail in a normally open or a normally closed position. We can  
3 make changes for severe accidents and extreme events that could, in fact, be  
4 contrary to what is necessary for design-basis events. So exercising the  
5 appropriate technical rigor, we find to be extremely important and a value that we  
6 must maintain as we continue to go forward.

7           Also, having a willingness to evolve as we learn more about the  
8 event. So, early out in the event, we set out a set of corrective actions that we  
9 thought were appropriate. We've also learned, as we continue to implement  
10 those actions, that those actions were not mutually exclusive; that many of the  
11 activities overlap in their benefits, and it is important and incumbent on us to  
12 continue to reevaluate based on what we have implemented or actions in place,  
13 those actions that are remaining. And we continue to do so as an industry  
14 steering committee.

15           And then, finally, and I think probably the most important, is that we  
16 recognize that much of our discussions have taken place around the hardware,  
17 and like our historical events in this industry, we've recognized that the biggest  
18 differentiator in avoiding events is leadership and safety culture, and that the  
19 leadership lessons out of this event, the safety culture lessons out of this event  
20 cannot be lost among the hardware discussions that we have. We've just issued  
21 through INPO leadership lessons. We plan this fall to take all the chief nuclear  
22 officers from the United States to Japan to tour the Fukushima site. That will be  
23 the first week in September. We will have counterparts meeting with our  
24 Japanese counterparts over in Tokyo and have site visits to both Dai-ichi and  
25 Daini while we're there. So we look forward to continuing to work through the

1 leadership lessons in the industry.

2           The next several pages I don't intend to go through in a lot of detail,  
3 but I'll hit the highlights. First, the color coding. When you see something in  
4 green, we are confident that we are on the right track. The track has been laid in  
5 the right direction, and we are moving rapidly in progress for that objective.  
6 Where there is something yellow, it requires additional guidance, as we continue  
7 to move forward. We're progressing, but these are the areas that the steering  
8 committees have the most focus on right now.

9           So in the first strategic goal area, maintaining operational focus --  
10 our area of concern here that could -- causes this to be yellow is strictly the  
11 cumulative impact. We've made many changes, and as we look at the  
12 significance of those changes, they are broad and many. As Mr. Heacock will  
13 discuss, you'll hear some of the detail of what implementation change looks like  
14 for a fleet.

15           The core cooling and containment integrity is very much on track.  
16 We are now moving into discussions on severe accident capable vents and  
17 progressing on those discussions for Mark I and Mark II containments. And,  
18 again, I think here is where we've got to make sure that technical rigor is put in  
19 play to make sure that we don't have unintended consequences here.

20           On the integration of emergency procedures, tremendous progress  
21 has been made there. One of the things that we still have outstanding, that we  
22 are working through, is international response capability. So we've established  
23 some very strong response capability here in the United States, but we recognize  
24 that that capability should also be made available in an interface on an  
25 international basis, and we still have further work to do in that area.

1 I'm going to move down here to the severe accident management  
2 guidelines. Under number 4, as we look at the guidelines, we're looking forward  
3 to the training impacts of those guidelines, and we've got to make sure that we  
4 continue to balance our focus in training on both design basis as well as extreme  
5 basis.

6 So, similar evaluations have been done, and in the interest of time,  
7 I won't go through it. But these outcomes -- these were the original stakeholder  
8 outcomes that we set. And I'll leave those and answer any questions that you  
9 may have in those areas. And then the last slide was on building blocks and  
10 ensuring that we had the right building blocks in place as we move forward. And  
11 several of those building blocks continue to have our attention. I would highlight  
12 the technical support in the R&D. And one of the things in the technical support  
13 in the R&D is really along the lines of modeling and what modeling capability we  
14 have on extreme events. And we're finding that as we go in and push for the  
15 technical rigor, that there is still a lot of work to do in the modeling area.

16 So, I want to take the last minute of my time here and just close  
17 with a concern and a caution as we go forward. And then I'll yield to questions  
18 here. But when we look at our history in the United States on preparation for  
19 extreme rare events, is that that preparation was done by good judgment in our  
20 development of our severe accident management guidelines. And there are a lot  
21 of smart people that developed those guidelines. Those guidelines have been  
22 used by the industry in our training programs, and our development programs,  
23 and our preparation for extreme events. But those guidelines differ significantly  
24 from our emergency operating procedures that are associated with design-basis  
25 events. And it isn't by accident. As we look at EOPs, our emergency operating



1 procedures, and the basis for those, there is very robust modeling associated  
2 with those, very robust analysis associated with those. And that is carried  
3 through all our programs. You can see it in our development of our simulator  
4 capabilities, the simulator modeling, the procedures that we use, and the drill  
5 scenarios that we go through. It's carried into our training programs for our  
6 operators. When we move into the severe accident, the extreme rare event, we  
7 are not at that same level of attention by the industry. That is not by accident.  
8 And we think it's important that we do not inadvertently tip the scale here. That  
9 as we continue our preparations for extreme event and do things that are prudent  
10 to do for that rare extreme occurrence, that we do not displace or inappropriately  
11 displace the focus of our engineering staffs, our technical resources, our training  
12 staffs, or our operator focus to where the scale is that every event that we run,  
13 every drill that we have, is associated with the rare extreme event, or that models  
14 are asked to be developed by the technical community, that are of the same level  
15 of validation and rigor as those that we use on design-basis scenarios. We think  
16 that that would be a misplace of the focus of our leadership teams, and have an  
17 inadvertent impact on our operation and, in fact, avoiding the design-basis events  
18 from occurring.

19           So I thank you for your time this morning, and I apologize for going  
20 a little bit over.

21           CHAIRMAN MACFARLANE: Okay. Next, we're going to hear from  
22 David Heacock, who is president and chief nuclear officer of Dominion.

23           DAVID HEACOCK: Thank you very much, and good morning. Jim  
24 kind of covered the broad bases and where the industry is. I'm going to drill  
25 down a bit and talk about what this looks like from a fleet perspective and from a

1 station perspective for Dominion.

2           Since the first two days after the event, we started having phone  
3 calls daily in the industry. And that evolved into the Fukushima steering  
4 committee, which I and Jim are members. And we've met over a hundred times  
5 since the Fukushima event, so very, very active. Been very busy making safety  
6 improvements that Jim talked about. We'll go to Slide 2, please. The mitigation  
7 strategies, pretty simple. If you lose cooling water here, you're going to have a  
8 problem with the core. And that's really what happened at Fukushima. So our  
9 focus here is to ensure the coolant water is never lost, either with installed FLEX  
10 equipment, portable FLEX equipment, or regionally supported FLEX equipment.  
11 So that's really a mechanism to provide some sort of power to allow water to be  
12 delivered to the core, however that happens to be.

13           I'll focus on pressurized water reactors, because that's all I have in  
14 my fleet. I'm not going to cover the BWR aspects here. Much analysis was done  
15 to figure out what equipment to buy and where to hook it up. And I'll talk more  
16 about that in just a couple of minutes here. But we've already purchased a  
17 second set. We have the B.5.b equipment on site. We purchased portable  
18 diesel generators; portable diesel-driven fire pumps, essentially, high-volume,  
19 low-pressure pumps; cables; hoses, et cetera; communications equipment;  
20 satellite radios and other radios supplied by power from the small, 5-kilowatt  
21 generators. That's all been done. Plant modifications are currently in process,  
22 and some have been complete. And I'll show you pictures of those in just a  
23 minute.

24           Slide 3 is water on a spent fuel pool. This is pretty straightforward.  
25 Dominion has four pools. We installed two level indicators in each pool. We

1 spent a lot of time figuring out what technology to use. We believe in our  
2 technology and our vendor. We're in the process of generating purchase orders  
3 to buy that equipment right now and design modifications to install that  
4 equipment. So that's ongoing.

5           Next slide, Slide 4. A lot of work on this work slide here. And I'll  
6 get to a slide in a minute that shows a cumulative or an integrated approach of all  
7 the work that's been done by the industry and by the NRC to date. The  
8 walkdown -- tremendous amount of energy went into these. We used 8,167  
9 person hours, for example, to do the seismic walkdowns at four sites. Over  
10 11,000 -- almost 12,000 -- person hours to do the flooding walkdown for each  
11 site. We have about 35 people we dedicated this process for over two years.  
12 That's kind of full-time equivalent because they'd come in and out. It does not  
13 include the design modifications. That's just the routine analysis.

14           When you think about it, in order to do the hazard reevaluations,  
15 you have to go back and look at your accident analysis again. In some cases,  
16 redo the accident analysis for a different type of accident. Extended of loss of  
17 AC power, for example. It's a different accident than was analyzed initially. So it  
18 takes quite a bit of analysis time to figure out what you're going to have to put  
19 your modifications on.

20           The hazard reanalysis -- we've done the flooding reanalysis and  
21 submitted it to the NRC for North Anna already. This was a localized, intense  
22 participation -- precipitation event. It's a high rain event. And we do see some  
23 ponding on site in new locations with the new technology we're using to do this  
24 analysis. So we'll have some mitigating efforts in place, like Jim talked about, so  
25 water doesn't get into the fuel pump house, for example, is one of our issues

1 there.

2           Seismic -- the guidance has been created. It's been endorsed by  
3 the NRC, and we're working down that process right now, doing the seismic  
4 analysis.

5           Next slide, Slide 5. This is lessons learned. What we found -- and  
6 Jim mentioned the time track to get all these modifications done in two cycles --  
7 we have pretty stringent milestones. You have to have the engineering done  
8 nine months ahead of time before an outage. And we're having to push back  
9 those timeframes, which requires additional management attention to do that. In  
10 other words, we're doing modifications this spring at the outages we have  
11 ongoing right now at North Anna and Millstone. In order to do that, the design  
12 change packages were late by our milestone. So we had to do additional efforts,  
13 put those into those outages right now.

14           You see expected cost per unit there. About 65 percent of the total  
15 cost is on FLEX. When you see the cost of the penetrations here in just a  
16 minute, you'll see why that is. Each connection, very, very expensive. All the  
17 connections, electrical, mechanical, about \$50 million for our fleet, to put it in  
18 perspective. And I'll talk about why that is in just a minute. And the rest is for the  
19 hazard reevaluations for flooding and for seismic.

20           We also found out we had limited fleet-wide solutions. You'd think  
21 you could do an auxiliary feed water modification, just repeat it six times. What  
22 you find is that cutting into a safety-related seismic Category 1 pipe, you have to  
23 reanalyze the entire system for which you're cutting into. So all the accident  
24 loads have to be reanalyzed, your seismic loads, your thermal loads, and every  
25 one of those configurations -- all six of them are unique. Even though the two

1 units are identical at North Anna, two units are identical at Surry, the  
2 configuration's unique for each unit. So each one has to be analyzed separately.

3 FLEX storage building is a big deal. We've looked at the ASCE 710  
4 approach. We've looked at seismic Category 1. Right now, we're leading for one  
5 building at each site -- seismic Category 1. The seismic reevaluation scopes are  
6 very difficult to get done in the schedule. We've talked about that in many public  
7 meetings.

8 And the last item on the flood issue, North Anna's been submitted.  
9 We have two years to submit the coastal plans for Surry and for Millstone. The  
10 screening analysis that was done -- very, very conservative. Shows high water  
11 levels -- we're going through a more detailed PRA-based approach on those right  
12 now. So those will take a little longer to do.

13 Next slide, Slide 6. It's Dominion's statistics. This shows you the  
14 numbers here: nine to 10 mechanical penetrations per unit. And simply in  
15 Virginia, those units, since they're identical, only require nine connections.  
16 Millstone, since it has two different technologies -- requires ten and two different  
17 spent fuel pools.

18 Simply speaking, each unit has emergency condensate storage  
19 tank to be able to replenish that water that supplies the auxiliary feed water -- has  
20 auxiliary feed water discharge. We have a quench spray connection to spray  
21 down the water inside containment and a reactor coolant connection on each  
22 unit. And the common one is the spent fuel pool. Electrical -- there's 220-volt  
23 and 240-volt connections on each unit. Tremendous amount of work has gone  
24 into that. We also have the B.5.b connections already installed at the plant. And  
25 those are available to be used. You can see the analysis and evaluation

1 numbers there.

2           The next slide's some photographs. Slide 7, upper left-hand corner  
3 is a diesel-driven, high-volume, low-pressure pump. These are very similar to  
4 what we use for B.5.b. We'll have N+1 of these pieces of equipment on site for  
5 each unit.

6           The right-hand side is an aux feed water connection. I'll show you  
7 a more detailed picture of that in just a minute. And down below is a temporary  
8 storage we have at Surry right now. We have essentially a Quonset hut. You  
9 can see the Caterpillar for clearing the area to get to the equipment in front there.  
10 And then we'll put a permanent storage building in later. We're working on that  
11 right now.

12           The next slide shows modifications in progress. The modifications  
13 at North Anna for quench spray, for aux feed water discharge and condensate  
14 storage are complete as of today. Millstone, the aux feed water connections are  
15 installed but not quite complete.

16           Upper left-hand corner, you can see drilling into the piping that  
17 feeds the emergency condensate storage tank. I was at the station on Friday  
18 and looked at this connection. The connection is all the way done. And the  
19 bottom picture is that actual connection. The orange bag is foreign material  
20 exclusion, or FME cover, and that's where the pump would be hooked up to  
21 either replenish emergency condensate storage tank or draw water out of it to  
22 supply it around the aux feed pumps. On the right-hand side, you'll see a brown  
23 pipe coming down. That's the new pipe I'm talking about. That's a \$900,000  
24 pipe. That brown pipe is a connection that provides auxiliary point of contact to  
25 the auxiliary feed water system. We also have two other connections for B.5.b

1 that are not within a seismic Class 1 type of structure, that's the additional  
2 change here.

3 Now, the next slide is a very confusing slide. And I apologize for  
4 how busy it is. If you wouldn't mind passing these around, I'd appreciate it. I  
5 have a bigger version of the same thing, in case you'd like to look at it. The  
6 reason this slide is so busy, is we've all been very busy over the last couple of  
7 years. Let me just kind of explain what this slide represents. If you go on the  
8 left-hand side there, is all the different items, either the orders or 50.54 fox trot  
9 requests for information -- mitigating strategies FLEX, for example, spent fuel  
10 pool levels, seismic walkdowns, et cetera. You can see the major categories that  
11 are color-coded down the left-hand side.

12 Let's start at the top there -- mitigating strategies -- and follow the  
13 brown lines to the right there. First thing you see is the analysis to support  
14 strategy development. You can't just go out and put connections in the plant.  
15 You have to figure out why you need to connect them, what the flow rate needs  
16 to be, what the accident analysis is that supports that. So we started way early  
17 with the accident analysis strategies. Then guidance, I say here -- that means  
18 we had to figure out how to put that in generic package. Many public meetings  
19 were had to talk about that. And ultimately, the NRC endorsed that guidance.

20 Develop the integrative plan, purchase the equipment. The dates,  
21 by the way, are wrong here. It says 6/14. It's really 10 of '14 on this graph. By  
22 October of '14, we'll have purchased all the equipment for all of our sites and all  
23 the connections will be done for FLEX. So about 18 months from now, we'll be  
24 done with all the FLEX modifications. That's the most important safety benefit,  
25 and we're moving very quickly along that line.

1           And then the lines below there are very, very similar. At the top is a  
2 plethora of flags. And the next four pages in the presentation describe all the  
3 nomenclature on these slides here. I know it's very complicated, but if I just  
4 explain a couple seconds here, I think it'll be apparent. Starting on the left-hand  
5 side, the NRC bulletin 2011-01 was issued. This is to verify the B.5.b equipment.  
6 You'll see a number of clear flags, or white flags, that are INPO-initiated items.  
7 And those are defined in your package as to what those are. The very first one is  
8 validate the B.5.b equipment. The NRC came in and did inspections as a result  
9 of this and published that data on their web page for all plants in the U.S.; very  
10 transparent process.

11           NEI flags at the top are for spent fuel pool generic guidance for  
12 communications and for FLEX equipment. And then you can see the NRC did  
13 endorse the guidance, did inspections along the way. So a tremendous amount  
14 of information on this slide. But it just shows you what's been going on for the  
15 last two years, both in the industry and the NRC.

16           So, bottom line is we're moving very quickly to try to get the safety  
17 benefits achieved as quickly as possible, and that's what we're focused on right  
18 now. Look forward to your questions at the end. Thank you.

19           CHAIRMAN MACFARLANE: Thank you very much. Now we have  
20 David Lochbaum, who is the director of the Nuclear Safety Project at the Union of  
21 Concerned Scientists.

22           DAVID LOCHBAUM: Well, thank you, and good morning. I  
23 appreciate this opportunity to share our perspectives on this topic. We have  
24 submitted comments in the past on lessons like potassium iodide, spent fuel  
25 storage, the station blackout rulemaking, and filtered containment vents. In



1 preparing for today's briefing, we reviewed those prior comments and found no  
2 need to revise or remove them. In other words, our comments today supplement  
3 rather than substitute for the prior comments.

4           Next slide, please. I could easily spend all my time today covering  
5 the many positive steps taken and planned by the NRC. To highlight a few, the  
6 numerous public meetings and webinars, coupled with volumes of accessible  
7 high-quality written material feed the large appetite for information about the  
8 accident and its lessons for our reactors. As with the creation of the Offices of  
9 Nuclear Security and Incident Response and New Reactors, the Japan Lessons  
10 Learned Project Directorate serves to keep focus there without distracting the  
11 focus from elsewhere. Meeting target dates is good, but providing clear  
12 justification for revising target dates is nearly as good.

13           Next slide, please. Labeling the other side of the coin as minuses  
14 seems too harsh. So we'll simply say that they're not pluses. Today, I want to  
15 narrow in on two programmatic issues and three specific concerns.

16           Next slide, please. In the past five months, the NRC has issued  
17 interim guidance on evaluating external hazards. We ask ourselves why this  
18 guidance is needed. After all, external hazards have been considered when  
19 reviewing license applications for decades. But those considerations for were  
20 design-basis floods and tsunamis. Because Recommendation 1 remains  
21 unresolved, the NRC staff must add more patches to the patchwork approach to  
22 beyond-design-basis events. While it's too late to resolve Recommendation 1  
23 first, it's not too late for the NRC staff to capture the points of discussion that  
24 arise during implementation or other recommendations and formally roll them into  
25 the Recommendation 1 action plan.

1           Next slide, please. The Japan Lessons Learned Project Directorate  
2 appears as both a plus and a non-plus. We did this not only to ensure that we'd  
3 get it at least partially right. But the fact that JLD's role is that it enables the NRC  
4 to focus on Fukushima Lessons Learned and to retain its focus on safety and  
5 security issues. The potential thorn is that this separation might create a silo or  
6 promote tunnel vision.

7           Next slide, please. For example, two of the sessions during the  
8 Regulatory Information Conference last month dealt with recent impending  
9 emergency planning rule changes. Recommendations 9.1, 9.2, 9.3, 10, and 11  
10 include emergency planning components. To promote fidelity between JLD's  
11 efforts and parallel efforts being conducted for other reasons, we recommend  
12 that the NRC formally integrate at least the major milestones for applicable  
13 parallel efforts into its timelines for pending Fukushima actions.

14           Next slide, please. Last December, we expressed concerns with  
15 flooding protection measures in a letter to the NRC. Our concern is that activities  
16 to verify that manual actions to protect against the external hazards can be  
17 completed in a timely manner are being performed during fair weather conditions,  
18 with no accounting for delays very likely imposed by those external hazards. For  
19 example, a plant in South Carolina has a flood wall at least -- has a flood wall  
20 that's at least five feet tall around an external building housing equipment needed  
21 to operate within minutes of a flood. Workers walk across dry ground to the  
22 facility, up and down stairs over the flood wall, to take actions within the building  
23 to verify the timelines. NRC must not allow fair-weather verifications of foul-  
24 weather protection schemes.

25           Next slide, please. Ensuring adequate makeup to a spent fuel pool

1 to compensate for water loss by evaporation, boil off, and drainage is a positive  
2 measure, but if, and only if, it doesn't introduce an internal flooding hazard. After  
3 all, it's a spent fuel pool and not a spent fuel pool -- not a spent fuel balloon. It  
4 doesn't get larger when more water is added to it. Water leaving the pool is  
5 overflow, evaporation, boil off, and drainage, finds its way into the basement,  
6 where all -- not some -- but all of the emergency core cooling pumps in boiling  
7 water reactors with Mark I and Mark II containments are housed. Saving the  
8 spent fuel pool by losing the reactor core must not be an acceptable option.

9           Next slide, please. I've reviewed several of the staffing evaluations  
10 performed to date. The radiation protection and chemistry technician staffing  
11 level seem very thin. I worked at plants that needed more of these workers for  
12 routine startups and controlled shut-downs than are specified for postulated  
13 accidents. Even with all these extra helpers, some startups and shut-downs  
14 were delayed by insufficient staffing. And that was with way more people than  
15 proposed for handling beyond design-basis accidents. Normally, I'd wait for the  
16 emergency exercises to be the final judge of whether staffing levels were  
17 adequate or not. But these exercises typically don't role play down to the extent  
18 needed to either confirm or refute the staffing studies. The consensus of the  
19 Three-Mile Island post-mortems was that too much emphasis had been placed  
20 on hardware and too little on human performance. We seem to be replicating  
21 that problem now in this regard. Thank you.

22           CHAIRMAN MACFARLANE: Thank you. Okay. Next, we're going  
23 to hear from Paul Smith, who is nuclear assistance analysis section chief at the  
24 Illinois Emergency Management Agency.

25           PAUL SMITH: Good morning, Madam Chair. Oh, here we go.

1 Good morning, Madam Chair and Commissioners.

2 Thank you for this opportunity to discuss my views representing the  
3 Illinois Emergency Management Agency. The NRC's progress and plans for  
4 addressing emergency preparedness related issues within the scope of Lessons  
5 Learned from the Fukushima Dai-ichi event.

6 I'd like to give you some -- the next few slides describe some of  
7 unique attributes of the state of Illinois Emergency Response capability. As you  
8 know, Illinois hosts the largest number of nuclear power plants in the United  
9 States. There are four Westinghouse pressurized water reactors -- four loops --  
10 and there's seven GE boiling water reactors with different Mark I, Mark II, and  
11 Mark III containments. Under a memorandum of understanding with NRC, Illinois  
12 has residence inspection program with resident inspector at each nuclear power  
13 plant. The reason I bring up this point of RI's program is the resident inspectors  
14 are important part of our emergency plan. When state activates the Illinois plan  
15 for radiological accidents, a resident inspector will be positioned in technical  
16 support center, the TSC, at the affected nuclear power plant, while another's  
17 assigned to the utility's emergency operation center. Both are bridged on a  
18 conference call with the reactor specialist, who is located in IEMA Radiological  
19 Emergency Assessment Center in Springfield, Illinois.

20 Illinois' mission is to minimize risks to the public due to radiological  
21 hazards posed by the Illinois facility -- nuclear facilities, radiological accidents,  
22 and acts of radiological terrorism. To support our mission, the state of Illinois  
23 participates in nine nuclear power exercises each year. There are three FEMA-  
24 graded exercises, three pre-drills prior to each graded exercise, and three utility  
25 off-year exercises.

1                   Some background on the Illinois Emergency Remote Monitoring  
2 System, or RMS. That system was designed, built, and installed by IEMA  
3 personnel, and continuously monitors select plant operational parameters at  
4 each facility. It's capable of identifying and measuring the presence of  
5 radioactive materials in the surrounding environment. The RMS consists of three  
6 separate subsystems. First is the reactor data link, or RDL. It receives over  
7 1,000 key parameters every minute from each operating reactor. The data is  
8 sent from the utilities to Springfield computers and includes reactor power levels,  
9 pressures, temperatures, breaker position, logistic states, meteorological data,  
10 radiation levels, and other vital station data.

11                   The next system or subsystem is the Gamma Detection Network, or  
12 GDN. It's a system of detectors placed radially around each of the nuclear plants  
13 to detect gamma radiation levels in the environment. Each of the 16 detectors  
14 for each site are spaced at 2.5 approximate degrees compass points and are  
15 located from two to five miles from the plant. This system is capable of  
16 detecting gamma radiation in the ranges of small background levels up to 10 r  
17 per hour.

18                   Third but not least is the Gaseous Effluent Monitoring system. This  
19 is a 24/7 continuous sampling of each nuclear power plant's ventilation effluent  
20 for radioactive particles, noble gases, and iodines. The GEM system can be  
21 remotely controlled by IEMA analysis, and IEMA also developed software to  
22 continually monitor and analyze the RMS data and provide information on  
23 unusual occurrences through the on-call IEMA personnel.

24                   Now to state of Illinois review. IEMA established a review team to  
25 assess the Nuclear Regulatory Commission near-term task force

1 recommendations from Fukushima Dai-ichi accident. In trying to organize our  
2 revision process -- our review process -- IEMA review team concluded the state  
3 does not design and operate or regulate nuclear power plants within the state.  
4 But the state develops plans, trains emergency personnel, analyzes data for  
5 recommendations, and responds to nuclear incidents utilizing the Illinois plan for  
6 radiological accidents. With the criteria for evaluation methods established, the  
7 majority of NRC recommendations that may impact the state and other off-site  
8 organizations were within the emergency preparedness related issue and were  
9 Tier 3 recommendations. The review team studied the Tier 1, 2, and 3  
10 recommendations based on the potential impact of state plans and procedures  
11 and it appeared that the recommendations with prolonged station blackouts have  
12 a cross cutting issue through all three tiers and the multi-unit have identified as  
13 Tier 2 and 3 identifiers.

14                   Next slide, it's going to be Slide 6, excuse me. In response to the  
15 NRC tier, Recommendation 9.3, regarding ERDS, or the Emergency Response  
16 Data System capability, IEMA has obtained 24/7, one-minute data updates from  
17 each nuclear station in Illinois for many years. We do see a benefit of updating  
18 NRC's ERDS system.

19                   Next slide. In response to Recommendation 10, additional  
20 emergency preparedness topics of prolonged station blackout in multiple events,  
21 and Recommendation 11, that regard an EP -- topics for decision making  
22 radiation monitoring and public education, Illinois would not only welcome the  
23 opportunity but would request to be involved in evaluation, development, and  
24 review of any changes to the emergency planning, as this would directly impact  
25 our programs and procedures, especially in the -- related to exercise and

1 training.

2           A prolonged station blackout or multi-unit event would require  
3 revisions to our unified reactor interface dose assessment model. Also need to  
4 provide adequate multi-unit simulator data, as most utilities have only modeled  
5 exercise data for a single unit.

6           Next slide. This would be Slide 8. Initial issue of the SECY  
7 Recommendation 3, based on emergency planning zone size. As you all know,  
8 the current EPZ 10 miles for the plume exposure pathway is based on NUREG  
9 0396, December '78. IEMA believes that our current strategies for emergency  
10 planning zones are sufficient and there is no technical basis for expanding EPZ  
11 beyond 10 miles. Details, planning of a 10-mile EPZ does not preclude nor  
12 prohibit ad hoc preventative actions taken beyond 10 miles using the same  
13 consideration as the planning within the 10 mile. If a radiological incident at our  
14 agency dose assessment model indicated that the EPA protective action  
15 guideline, or PAGs, were exceeded at the 10-mile EPZ boundary during the  
16 plume-phase accident -- or incident, then the Radiological Emergency Center  
17 would strongly recommend to our state incident response center to increase the  
18 evacuation or shelter requirements beyond the 10-mile EPZ.

19           Slide 9. Another issue, Recommendation 4, prestaging a potassium  
20 iodine beyond 10 miles. Recently -- IEMA recently established a KI redistribution  
21 plan and allows persons within the 10-mile EPZ to obtain a free supply of KI,  
22 compliments of the NRC, along with the usage instructions, at any Walgreens or  
23 participating drugstores within the 10-mile EPZ. And to be utilize as directed by  
24 local radio and/or television stations based on advisories from emergency  
25 response and health organizations.

1           Also, review of the White House Office for Science and Technology  
2 Policy invoking a waiver in January of 2008 to not extend the range of 10 to 20  
3 miles to provide KI. IEMA concurs with this waiver that evacuation and sheltering  
4 are the most effective protective measures in significantly reducing the total  
5 public exposure.

6           In conclusion, IEMA's review of the Tier 3 EP recommendations  
7 concluded that a decision to change either the two program plans listed below  
8 could diminish our limited resources, thereby possibly endangering the public  
9 health and safety of those citizens most at risk within existing 10-mile EPZ.  
10 Major one would be a decision to increase the emergency planning zone outside  
11 the 10-mile EPZ, and another would be decision to pre-stage potassium iodine  
12 beyond 10 miles. And that concludes my slide presentation.

13           CHAIRMAN MACFARLANE: Okay. Thank you. Thank you all  
14 very much. We will now have questions from the Commissioners, and we will  
15 start off with Commissioner Apostolakis.

16           COMMISSIONER APOSTOLAKIS: Thank you, Madam Chairman.  
17 Thank you all for your presentations. David --

18           DAVID LOCHBAUM: Which one?

19           [laughter]

20           COMMISSIONER APOSTOLAKIS: I was looking at you.

21           DAVID LOCHBAUM: Thought it was a trick.

22           [laughter]

23           COMMISSIONER APOSTOLAKIS: You say that NRC staff must  
24 deal with Recommendation 1 issues for every other recommendation. So am I to  
25 understand that you would like us to -- you would like to see us taking care of



1 Recommendation 1 before we deal with other things?

2 DAVID LOCHBAUM: From the get-go, yes. That would have been  
3 a preferred order. At this stage of the game, it's a little bit late to go back and  
4 undo that.

5 COMMISSIONER APOSTOLAKIS: We thought about it. And I  
6 think in some of our votes, we say things like that. But don't you agree though  
7 that Recommendation 1 would have taken a long time to resolve, and then all the  
8 other things would have to wait, like the walkdowns and so on? I mean, didn't we  
9 get any benefit from those things without Recommendation 1?

10 DAVID LOCHBAUM: It would have taken longer to resolve  
11 Recommendation 1. It was not a two-week task. But I think that would have  
12 provided a sounder foundation for the walkdowns and other issues that you're  
13 now working through, because all those delays are built into each one of those  
14 steps. So we think it would have led -- it perhaps would have taken longer in the  
15 long run, but I think it would have led to a higher quality product at the end, so  
16 that delay would have been worth the wait, in our view.

17 COMMISSIONER APOSTOLAKIS: Well, it was a judgment call, I  
18 would say. But -- because some of the things we did immediately, I think, are  
19 independent of Recommendation 1. But others, I agree. They do depend on --  
20 by the way, what do you think of this design extension category?

21 DAVID LOCHBAUM: Design extension --

22 COMMISSIONER APOSTOLAKIS: It's part of the  
23 Recommendation 1.

24 DAVID LOCHBAUM: I haven't looked at Recommendation 1 so far.  
25 I haven't been following that, so I --

1 COMMISSIONER APOSTOLAKIS: So you take your sweet time,  
2 too.

3 [laughter]

4 DAVID LOCHBAUM: Yes, I do.

5 COMMISSIONER APOSTOLAKIS: Well, that brings me to Mr.  
6 Scarola. You became a bit philosophical at the end, and you know my  
7 background. That excites me.

8 [laughter]

9 You said that we should keep placing emphasis on the design basis  
10 accidents and we should not let -- beyond-design-basis accidents distract us  
11 from taking care of DBAs. It seems to me -- and of course, Recommendation 1  
12 recommends that we establish -- I mean the design extension category, as you  
13 know. Is it a matter of balance here? I mean, we have to worry about those  
14 extreme events, even though they are rare, as you pointed out. But DBA is -- I  
15 think we are in good shape there.

16 JAMES SCAROLA: So, I will tell you from a DBA standpoint, that  
17 while we are in good shape and robust, maintenance of that, at that same level  
18 that we have it today, the concern is that we distract from that maintenance level.  
19 So when we think about what does it take to maintain it at that level today, every  
20 modification that we make, like David had talked about -- putting a valve in has  
21 the potential to impact design basis, all of our training programs with our new  
22 operators that come in on a daily basis, our new engineers. So I don't want to  
23 give the perception that design basis is on autopilot. It is far from it. It requires  
24 continued management attention. So, I think it is, you're correct, it is a balance,  
25 but the concern is that we could tip the scale, and as we get further out on the

1 rare extreme event, I believe that there is an inverse relationship in delivery of  
2 public safety benefit with the burden that is required to push the extreme events  
3 to the same robustness that we have in design basis.

4 COMMISSIONER APOSTOLAKIS: Which is -- do you want to go?

5 DAVID LOCHBAUM: I've got to agree with Jim's comment  
6 because it reminded me of the focused part of Three Mile on large break  
7 accidents at the sacrifice of not focusing enough resources on smaller accidents  
8 -- the more likely smaller -- small break LOCAs. So that when Jim presented his  
9 views, I thought he would speak to that point and I fully agree with that notion,  
10 and we can't be so focused on beyond-design-basis events that we let -- it  
11 comes at the expense of design basis.

12 COMMISSIONER APOSTOLAKIS: And I think we all agree with  
13 that. I mean, again, it's an issue of balance; although in my view, the DBAs  
14 should be revisited based on the operating experience we have accumulated and  
15 the technical knowledge we've accumulated. But I think your point touches on  
16 the issue of cumulative effects of regulation, which is a broader issue, it seems to  
17 me. And, as you probably know, the Commission is concerned about it and the  
18 staff is doing something about it.

19 JAMES SCAROLA: Yeah, and I'm cautious not to put this as  
20 strictly cumulative effect of regulation, because I think it is cumulative effect of  
21 the industry. We as an industry have learned very well how to add robustness in  
22 our foundation of any activity that we do. Right now, if I asked my engineers to  
23 design, it will be a class one system by the time I'm done. So, as we move into  
24 beyond-design-basis where we're asking to apply judgment and reasonableness  
25 that may not have the same foundation in robust models, there is a new learning

1 that needs to take place in order to prevent the scale from tipping inappropriately.

2 COMMISSIONER APOSTOLAKIS: And that's why I think it will be  
3 important when we consider Recommendation 1, to make sure that if there is a  
4 design extension category, it's structured appropriately so that it would not  
5 detract from what you're -- but you also mentioned something else: technical  
6 rigor.

7 JAMES SCAROLA: Yes, sir.

8 COMMISSIONER APOSTOLAKIS: And that brings me back to a  
9 point I raised some time when we met again: FLEX.

10 JAMES SCAROLA: Yes.

11 COMMISSIONER APOSTOLAKIS: I don't see any technical rigor  
12 in analyzing what can go wrong, how likely is it, and what would the  
13 consequences be; the three questions that are cast in stone up in the mountain.  
14 So, and you told me once that you thought the question, "What could go wrong?"  
15 was a good one. So, is that part of the technical rigor that the industry's  
16 applying?

17 JAMES SCAROLA: I believe it is and it comes as we phase  
18 through this. So, many of the "what can go wrong" questions, if you look at how  
19 we have vetted those out in the past, it has been through our practical exercises,  
20 to where we start to bring in the human elements and start to review what are  
21 those obstacles that could prevent success and how do we build robustness  
22 around the human element. I think where we are today, we are just transitioning  
23 now from the design specifications, from the engineering and technical work, and  
24 there will be feedback from those exercises that may, in fact, affect the design;  
25 may, in fact, affect the human factors that we have thought through in advance to

1 prevent what could go wrong. But I believe that we will learn, as we have in  
2 other areas of the operation, through exercises, how to further strengthen our  
3 human element and human factors in executing effect.

4 COMMISSIONER APOSTOLAKIS: I agree with what you say  
5 about the exercises, but I would like to see some study, some analysis by your  
6 experienced people that will look at what the operations are supposed to be or  
7 expected to be and then ask themselves, you know, how can this fail and what  
8 can we do to prevent failure?

9 DAVID HEACOCK: So, one element we've addressed as part of  
10 the design process is that we looked at multiple connection points, for example.  
11 One of the failures we looked at was what if you can't get to the connection point,  
12 and what if the event occurred, explosion, crash, whatever --

13 COMMISSIONER APOSTOLAKIS: Right. Right.

14 DAVID HEACOCK: -- so, for example, aux feed water, there's four  
15 different connection points in diverse locations around the station; we'll have  
16 three different sets of equipment to do that. So, some of those elements are --

17 COMMISSIONER APOSTOLAKIS: That's fine, but an integrated  
18 approach at least needs to be -- but you mentioned in that context in your second  
19 slide, initial portable equipment available on site. There are four bullets. The last  
20 one says interim storage established. Where do you plan to store this  
21 equipment? What kinds of structures are these going to be?

22 DAVID HEACOCK: Right now, we have temporary storage in  
23 either warehouses or temporary buildings. But what we intend to do, it's on a  
24 long-term schedule there for equipment storage is a seismic category one  
25 building.

1 COMMISSIONER APOSTOLAKIS: They will be seismic category  
2 one?

3 DAVID HEACOCK: We're still debating that internally. There's  
4 some views across the industry. It can be the requirements allow either that or a  
5 lower design structure in diverse locations.

6 COMMISSIONER APOSTOLAKIS: I see.

7 DAVID HEACOCK: So, that's the two options available, so you can  
8 spread it out so if one event were to affect one building, so have your N+1  
9 equipment available in the other building.

10 COMMISSIONER APOSTOLAKIS: No, that's good. I like that.  
11 I've run out of questions.

12 CHAIRMAN MACFARLANE: And you've run out of time. On to  
13 Commissioner Magwood.

14 COMMISSIONER MAGWOOD: Thank you Chairman. Good  
15 morning. Thank you for your presentations this morning. Let me first pick up on  
16 some of Commissioner Apostolakis' questions, and first let me also thank him for  
17 reminding us of the three questions carved in the mountain and I appreciate --

18 [laughter]

19 -- that you translate those from the original Greek.

20 [laughter]

21 COMMISSIONER MAGWOOD: The -- I think this issue of the --  
22 that you just talked about at the end about the storage building, can you talk to us  
23 a little bit about the kind of decision process that the utilities are going through to  
24 decide between the large, heavily protected seismic category one building and  
25 the disperse buildings? Is it just a question of the orientation of the site, is it just

1 that kind of a practical choice?

2           DAVID HEACOCK: Yes, a number of factors go into that and we  
3 discovered talking among all the utilities that each site has different design  
4 characteristics. For example, ones that are inland further, have lower high winds,  
5 so they might be able to withstand those winds with a lower strength structure  
6 that does not meet seismic category one. For the coastal sites and for all our  
7 sites in Virginia like North Anna, are close enough to the coast that we  
8 experience very high wind loads. We have to design for a 300 mile per hour  
9 tornado wind that picks up telephone poles and hurls them at the most sensitive  
10 points along the way. So, the missile strikes are a big problem, the wind-  
11 generated missile strikes are a big problem. So, you have a choice of either  
12 separating the buildings by a distance that a single missile can't take out multiple  
13 buildings, or building more robust buildings and make it a single building. So,  
14 we've looked at those options.

15           The cost of a series of smaller buildings to a lower designs are  
16 actually more expensive than a seismic class one building. This building's about  
17 10,000 square feet. It's about \$10 million per site, to put it in perspective. It's a  
18 big building and it has -- we're going to put a lot of stuff in it. So, right now we're  
19 leaning towards a single building on each site, that's seismic category one. But  
20 we've looked at all of the different options. Diversity of location is an important  
21 feature. If you put all your eggs in one basket, the basket better be very strong.  
22 So, that's the seismic class one basket.

23           COMMISSIONER MAGWOOD: When you said, "we," Dominion --

24           DAVID HEACOCK: Dominion, correct. The industry's doing the  
25 exact same thing.

1           JAMES SCAROLA: Yeah, from the industry standpoint, we allowed  
2 the diversity in the guidelines that we put out in terms of the options that a utility  
3 could pursue, but it's largely driven by every utility maybe having a unique aspect  
4 of what the external event probabilities are for that station; what's the dominant  
5 factors that I'm trying to protect. So, that's why we left that latitude in the  
6 guidelines and people are exercising that latitude as we would expect them.

7           COMMISSIONER MAGWOOD: Okay, so it's a very site-specific  
8 exercise that -- good, I appreciate that.

9           You know, Jim, since you were talking, you bounced back on this  
10 issue about the focus and ask David to comment on this, as well -- this balance --  
11 in fact, I think one the very first Commission meetings on this subject, we talked  
12 about, you know, achieving that balance between beyond-design-basis events  
13 and design basis. And I think that, you know, one likes to think that we have  
14 found the balance, but I think it's worth reminding ourselves that everything we're  
15 talking about in this post-Fukushima space is all beyond-design basis, the entire -  
16 - the whole kit and caboodle, it's all beyond-design basis, and there's really a lot  
17 of activity that we have very little regulatory footprint on before Fukushima. And  
18 that's not to say it was the right thing then and that they were restrained from  
19 that, but it is a change. So, I think it's fair to say that we, you know, we say we  
20 don't want to distract from the more frequent design-basis events, I mean, to  
21 some degree, haven't we done that? Isn't that a natural consequence of the fact  
22 that the operators have to now spend more time dealing with these, not just B.5.b  
23 now, but the FLEX and how to integrate FLEX with the EOPs, and we have given  
24 the operators more to do. And I just sort of ask both of you, do you think we  
25 have, and not to say it's inappropriate, but we have taken attention away from



1 design-basis events?

2 JAMES SCAROLA: Absolutely, when I look at the leadership focus  
3 over the last two years for all our fleets in the United States, this has consumed  
4 quite a bit of the leadership focus in the industry, and where the leadership  
5 focuses, naturally, the resources below that also will shift in that direction. So, I  
6 think that, appropriately, this was an unprecedented event that has happened to  
7 our industry, and we looked at it and didn't separate ourselves out and say, well  
8 this was in Japan, this was a tsunami; we didn't look for the reasons why it didn't  
9 apply to us. We deliberately brought those reasons, eliminated them, and made  
10 sure that the lessons would apply to us.

11 But now we think that we're at the point where it's time to move  
12 back into some normal operation where the next improvement opportunity is, in  
13 fact, competing against the many other design-basis improvement opportunities  
14 that we have. So, we as an industry, are looking forward and saying, "Okay,  
15 what is the point in time that we move into the new normal, and what does that  
16 new normal look like?" because it shouldn't be a standalone steering committee  
17 that guides this as a priority for all of the chief nuclear officers of every fleet. So,  
18 we believe that that -- we are moving into that transition phase. By the end of the  
19 year, I would expect us to be there, and I think it's important that we move there.  
20 Otherwise, we would tip the scale inappropriately.

21 COMMISSIONER MAGWOOD: I think, David Heacock, you want  
22 to make a comment in here with --

23 DAVID HEACOCK: Yeah, brief comment here. And Jim was  
24 absolutely right. There has been some distraction. We attempted at Dominion to  
25 try to put a firewall up. We used about 35 people in the corporate office run by

1 Gene Grecheck to kind of separate off that activity from other normal activities.  
2 They weren't responsible for anything else except for beyond-design-basis  
3 activities. And we tried to keep the stations out of it for the most part initially.  
4 Now that pendulum is swinging, like Jim talked about; we're getting into the  
5 implementation at the stations, we're integrating them with outages, the  
6 walkdowns had to be coordinated with other work activities. Work activities had  
7 to be stopped to allow the walkdowns to occur, seismic and flooding at the  
8 stations. So, definitely an impact on day-to-day maintenance operations  
9 activities.

10 We also attempted to put additional capital money in place to cover  
11 the beyond-the-design-basis activities, so it didn't draw away from our capital  
12 resources required for normal maintenance and margin improvement activities.  
13 But some of those activities, their resources were drawn away because the  
14 humans weren't available. You can't have one person doing accident analysis  
15 for beyond-design basis and also determining what the best use of your low  
16 leakage reactor pump seals are. You can't do both at the same time.

17 COMMISSIONER MAGWOOD: David Lochbaum?

18 DAVID LOCHBAUM: I guess the one thing we keep looking for,  
19 there is a distraction. I agree with everybody who said that. But, I think we look  
20 at the reactor oversight process and the data there to see if any events are  
21 occurring -- any declines are occurring that might be attributed to that distraction.  
22 We're seeing some events, but they seem like similar to events we saw prior to  
23 Fukushima. So, we have seen it -- we're looking for that to see if there's those  
24 signs. We haven't seen any yet.

25 COMMISSIONER MAGWOOD: Okay, now I appreciate that

1 observation. I think that obviously the danger is this -- I think what I heard from  
2 this side of the table is you're trying to get back to some sort of normal. But I  
3 guess the real concern is over time will this lead to distractions? Over time will  
4 this divert attention from operators and maintenance people away from things  
5 that have higher frequency probability. So, I guess we'll have to just keep  
6 watching to see how this develops. And just a couple minutes left.

7           David Lochbaum, you -- I appreciate your comment about the fair-  
8 weather scenario. I think this is something we've talked about in one degree or  
9 another in the past. It's important to have realistic assessment, but also realistic  
10 training. And this is something I sort of, you know, asked -- I've asked industry in  
11 the past and I think Jim and I have talked about this, and when you think about  
12 these scenarios, it sounds sort of like the opposite side of the coin from what I  
13 was just saying, but you think about these scenarios and you look at what  
14 happened at the Fukushima Dai-ichi site, operators were being asked to do the  
15 impossible under impossible situations. And it seems to me that training people  
16 to be able to respond to these usual events and extreme circumstances, even if  
17 you only do it once, I think is something it's worth doing. So, it's just something  
18 to put out there.

19           Just one last thing with you, Jim, and I appreciate your comment  
20 about the CNO visit. I was in Japan a couple weeks ago, and this is being talked  
21 about quite a bit. I met with the JNSC people and they are very excited by this  
22 visit and so we're looking forward to that. And I also appreciate your comment  
23 about the need to develop an international response capability. Can you give us  
24 a little bit more? Is this something the industry's really thinking about?

25           JAMES SCAROLA: It -- it certainly is. One of the goals that we

1 established in the path forward was to have the capability to respond better to an  
2 international event. So, while our initial focus here has been developing a  
3 response center at INPO, having the regional response centers with equipment,  
4 we've recognized that that same capability should allow us to focus our support  
5 on an international basis if needed. So, we are working now with WANO to  
6 develop, okay, what is the protocol that we would strengthen on an international  
7 basis? How could we better provide assistance and information flow real time  
8 during an event? So, I highlighted that because we think we've got further  
9 working guidance to provide to the industry there. We don't have that one where  
10 the track is well laid and we're just traveling down an approved path.

11 COMMISSIONER MAGWOOD: You know, obviously during the  
12 Fukushima crisis, as we were responding to events at the site, there was a very  
13 well integrated government industry effort. Do you feel -- for your activities that  
14 you're pursuing in this regard, do you feel there's a need for our side, for the  
15 government side, to be doing something similar or is this something industry can  
16 do on its own without a government infrastructure?

17 JAMES SCAROLA: I think that it's going to have to be an  
18 integrated response. I don't think that we can approach this strictly as industry  
19 absent government agencies, because I think both will respond, and coordinating  
20 that response I think is going to be important, just as we are coordinating on a  
21 national basis. I think we've got the protocol well laid out on a domestic event. I  
22 think we can take those same applications and say, how do we now expand that  
23 same coordinated activity on the international?

24 COMMISSIONER MAGWOOD: Appreciate that. Thank you.  
25 Thank all of you. Thank you, Chairman.

1 CHAIRMAN MACFARLANE: Okay. Commissioner Ostendorff.

2 COMMISSIONER OSTENDORFF: Thank you, Chairman. Thank  
3 you all for your presentations this morning. Jim, I'm going to start out with you on  
4 your insights in respect to slide -- your last bullet on Slide 2, hardware changes  
5 should not overshadow the leadership and human behavioral lessons. I  
6 completely agree with that point, and I think Dave Lochbaum does as well, from  
7 the comment I think you made in your presentation. I want to talk on this in two  
8 respects, one, and I'm not trying to criticize, but I don't know, sometime last year  
9 we had the PROS group in here and I just -- you know, it's not a question, it's just  
10 a comment -- I think one needs to be very careful about saying, "Well, we're  
11 concerned about training on our regular stuff because there's extra stuff added in  
12 there." We expect industry to lead and manage, to be able to do all this. We  
13 don't think these additional requirements were levied by the NRC without a lot of  
14 thought and foresight, and we're not saying it's easy, but we're expecting you to  
15 do it and to develop the balance yourselves. And so, I'm just going to tell you  
16 when PRA issues come up, I defer to my good colleague here, George  
17 Apostolakis, and I've had a lot of experience in training operators over decades  
18 of submarine operations. And I should tell you that I don't think you want the  
19 NRC to tell you how to allocate your training time. And I expect you guys to do it.  
20 So, I'm being a little bit critical, but feel free to push back on that if you have a -- if  
21 you disagree. But I don't think you want the NRC telling you how to allocate your  
22 time between design basis and beyond design basis training.

23 JAMES SCAROLA: I fully concur that we are best solving this as  
24 an industry.

25 COMMISSIONER OSTENDORFF: Sure.

1 JAMES SCAROLA: I think that certainly there can be some  
2 regulatory influence that could tip the scale inappropriately.

3 COMMISSIONER OSTENDORFF: You think that's occurred?

4 JAMES SCAROLA: At this point in time, I will tell you I think that  
5 we are now at the point on the discussions of extreme events where we are out  
6 at the tip of the tail in discussing the extreme events. And I think we've got to be  
7 careful here that every question is a good question, but whether that question  
8 needs to be answered with the same precision that we apply in design-basis  
9 events, I think that's where we can get off balance in our focus on design basis in  
10 balancing appropriate knowledge and training on the beyond-design basis.

11 So, I think we've got to be careful here as we ask the questions. A  
12 question could be as simple as to, "Hey, how high will the water level go during  
13 this flood?" "What temperature will you get to?" Very good questions. We might  
14 need to accept reasonable judgment.

15 COMMISSIONER OSTENDORFF: Okay. That's a fair point. And I  
16 encourage you to continue the discussions with our staff because I know that  
17 Mike Johnson's steering committee and JLD with Dave Skeen and others, are  
18 having frequent meetings with industry, but I will just tell you my own personal  
19 views are that I don't think the NRC has, from a regulatory standpoint, driven or  
20 required there to be any unrealistic or any inappropriate training requirements.  
21 I'll just tell you that.

22 JAMES SCAROLA: I would say that the NRC is no more guilty of  
23 this than the industry. But we both share in having this same propensity and  
24 interest in knowledge, that that knowledge be based in actual modeling and  
25 calculations and when we ask that and apply that, we have the ability here to

1 push something that, was reasonable judgment applied and tilt the scale  
2 inappropriately.

3 COMMISSIONER OSTENDORFF: Okay. Fair point. Dave -- and  
4 Commissioner Magwood already stepped into the severity -- I think appropriate  
5 topic on training, realistic training, I appreciate -- I thank my colleague for raising  
6 that because I wanted to also maybe piggyback on his question. I think your  
7 point about fair weather and foul weather situations is a point well taken. I know  
8 that before I had to actually fight a real fire in a submarine I fought fires in training  
9 scenarios where I got my hair, eyebrows singed, hands burned, and lungs full of  
10 smoke, and it was a really -- that one-time event that Commissioner Magwood  
11 was alluding to paid huge dividends. So I want to take Dave Lochbaum's  
12 concern and ask David Heacock a question. In the context of training the  
13 Dominion operators on FLEX equipment operation under challenging scenarios,  
14 can you share with us your philosophy and approach to ensure that training is  
15 realistic and challenging?

16 DAVID HEACOCK: Yes. We haven't actually gotten there yet.  
17 We've done with B.5.b training, but I think I need to point out that this is nothing  
18 new to us, the severe accident management guidelines, the SAMGs training, as  
19 you point out, we've done already. That's well beyond-the-design-basis training.  
20 And we've integrated that into our operator training, into our engineering training,  
21 for emergency preparedness training, and we've done all that already. Now,  
22 we're going back and looking at that again. We're going to revise SAMGs as a  
23 result of this and incorporate this training into the SAMGs and other guidelines as  
24 well. But we're developing those guidelines in training efforts right now. We're  
25 hoping to integrate them into our normal training drills that we do. You might

1 have to layer on hostile action on top of this, depending on the source of the  
2 event. So, that hasn't been done yet, but we're looking at all those elements,  
3 integrate them all together into one training exercise.

4 Now, Dave had some great comments there that it needs to be  
5 snowing, raining, and sleeting at the same time that you're doing that, to  
6 assimilate all the other events that might be occurring at the same time. But you  
7 can simulate those things. We do that with hostile action drills quite often, so we  
8 have experience in that area using models, equipment, and other simulation  
9 equipment that's available, and I'm certain we'll develop simulation equipment for  
10 this, as well, to make it as realistic as possible.

11 COMMISSIONER OSTENDORFF: Okay. Thank you. I'm going to  
12 stay, Dave Heacock, with you on your Dominion timeline -- I think you it's your  
13 Slide 9 that shows the portrayal of the different actions. I want to make a  
14 comment and then ask the entire panel a question. I've been very pleased with  
15 the NRC staff steering committee JLD efforts to look at all these different issues  
16 in a thoughtful, prioritized approach, and though the Near Term Task Force from  
17 July of '11 had a finite amount of hours on it, the amount of time that Mike  
18 Johnson, before him Marty Virgilio, with Eric Leeds, Jim Wiggins and others have  
19 spent since that Near Term Task Force came out is orders of magnitude more  
20 than initial efforts. So, a lot of things have been learned and there's been a lot of  
21 expansion of different efforts and evolution of approaches. And certainly, in the  
22 FLEX area, we've seen where that's encompassing station blackout issues in a  
23 very positive, upfront way. And I know that Jim Wiggins and company have  
24 looked at how to look at thoughtfully moving forward in some of the EP-related  
25 areas to tag team in a thoughtful, efficient manner with other recommendations.



1 So, this question will go to everybody here to provide a chance to respond. Are  
2 there any outstanding Tier 1, Tier 2, or Tier 3 actions from our steering  
3 committee's efforts that you think need to be rethought or consolidated,  
4 eliminated, or added to based on what we know today, two plus years after the  
5 event? And I'll let whoever wants to start first respond to that if you care to.

6 JAMES SCAROLA: I'll start out here is that first I want to comment  
7 on the effort by the agency here in staying practical, reasonable, and I think  
8 there's been unprecedented input opportunities for stakeholders in this process.  
9 And I think it has helped ensure that we had sound guidance put out to the  
10 industry, sound regulation, and I will tell you that I think that we continue to have  
11 very good dialogue there that is serving the public well. In terms of combining  
12 things that the near-term task force had laid out, we have had those discussions  
13 and we've seen those opportunities with many of the Tier 2 items and Tier 3  
14 items. The benefit that was intended by that item as a standalone has already  
15 been provided by actions that were taken in Tier 1. Very good receptivity to that  
16 dialogue, and I think that there has been some combining and some  
17 recommendations that are very specific on combining actions from the near-term  
18 task force.

19 COMMISSIONER OSTENDORFF: I want to make sure I provide a  
20 chance for others' response. I'll ask you to quickly wrap up.

21 JAMES SCAROLA: Okay. So, and then in terms of things that are  
22 outstanding, I think the area that we still have outstanding is we're working  
23 through still on what it means to severe hardened vents. Now, the hardened vent  
24 was clear. I think we are going through a lot of dialogue here on vents still in  
25 terms of making them severe accident capable now, and what that means to both

1 dry well and wet well. But the dialogue is, again, healthy and on track as it has  
2 been in the other areas that I think it will come to the right solution.

3 COMMISSIONER OSTENDORFF: I recognize my time's running  
4 out. Let me shift to Dave Lochbaum, then to Paul Smith for any comments you  
5 may have.

6 DAVID LOCHBAUM: One aspect we see missing from the process  
7 is there's been some findings from the walkdowns done of flooding, and in light of  
8 operating experience from Fort Calhoun in 2010 and Fukushima 2011, there  
9 were findings against the current licensing basis that were found during the  
10 walkdowns. We think that should have been complemented by an effort. Why  
11 didn't the existing testing and inspection regimes find that over many decades  
12 prior to this point? They were looked at several times in the past. Why were  
13 they missed? They might -- make some adjustments to what the licensees do  
14 and what the NRC inspectors do that need to be made going forward. That  
15 seems to be missing from the process so far.

16 COMMISSIONER OSTENDORFF: Okay. Thank you. Paul, do  
17 you have anything?

18 PAUL SMITH: Sure. As far as the IEMA's review of the Tier 3 EP  
19 recommendations, the one, like I said earlier was the most -- and I understand  
20 it's still a long-term evaluation, but if we get into the decision to increase the  
21 emergency planning zone outside of 10-mile EPZ, that would cost us the rewrite  
22 of our whole plan as far as only planning for a radiological assessment. We also  
23 have to take a look at reexamining all the location areas we got out in the -- past  
24 the 10 miles EPZ. We've got reception centers just within 10 to 20 miles of an  
25 EPZ. And also we've got radiological assessment field teams where they report

1 just outside the 10 mile EPZ. If you take a look at the state of Illinois, you've got  
2 three nuclear plants just barely outside each one's 10-mile EPZ, so even if you  
3 were to just extend five miles, you would bring in three plants, would have them  
4 be overlapping EPZs, and I could just see the public trying to go, "Okay now,  
5 which station am I responding to? Where is my reception center? How do I get  
6 there?" And I see that as very confusing. However, if the recommendation is  
7 made to extend it, we'll supply all our energy to get it done. But, like I said, I  
8 know it's a long-term evaluation, but that would impact us severely.

9 COMMISSIONER OSTENDORFF: Thank you. That's very helpful  
10 to have that specific example. Thank you, Chairman.

11 CHAIRMAN MACFARLANE: I want to go back to this discussion of  
12 design-basis events and beyond-design-basis events. And I want to help  
13 everyone to try to think outside the box for a moment so you can get the  
14 perspective of an earth scientist on this. There's a lot of discussion about  
15 extreme events. Let me help you here. These are not extreme events. These  
16 are normal events. The failure is us and our lack of understanding our inability to  
17 properly characterize the potential suite of events that will occur. Okay? That's  
18 because in part the science hasn't gotten there yet. All right? Now, we've  
19 moved the science along a little bit and now we understand what the suite of  
20 possible normal events are. So, this tells me that this requires everyone to revisit  
21 what the design basis event is and what it includes. So, I would argue that we  
22 don't need to be looking beyond design basis. We need to readjust our  
23 definition, which brings us back to Recommendation 1, in part. And so, I want to  
24 ask Dave Lochbaum if you have specific suggestions for us on Recommendation  
25 1.

1                   DAVID LOCHBAUM: Well, our recommendation all along has been  
2 to do that first. But that's -- we can't turn back the clock and do that.

3                   CHAIRMAN MACFARLANE: Right.

4                   DAVID LOCHBAUM: So, I think some of the issues that  
5 Recommendation 1 being unresolved raises are quality assurance requirements  
6 for equipment that you use in beyond-design-basis space, training, all the  
7 associated collateral things you do to ensure that the reliability of what you're  
8 relying on. For design-basis space, those are well-defined, that's the robust  
9 measures that Jim spoke to. For beyond design basis, it's not so clear and has  
10 to basically be worked out on each individual case. Our recommendation now for  
11 where we are is to -- some of the questions keep -- the same questions keep  
12 getting asked for each recommendation, is to basically come up with some -- find  
13 the common thread amongst those various discussions and capture that into the  
14 resolution of Recommendation 1. So, going forward, I don't think -- I'm not naïve  
15 enough to say we'd eliminate the debates or discussions, but hopefully narrow  
16 them down so there's better understanding of what the licensees and the NRC of  
17 what a beyond-design-basis space means in regard to quality assurance and all  
18 those attendant details.

19                  CHAIRMAN MACFARLANE: I think it would be helpful for you to,  
20 you know, have a look at what those questions are that keep coming up and put  
21 them down --

22                  DAVID LOCHBAUM: Okay.

23                  CHAIRMAN MACFARLANE: -- and help us think through that.  
24 That would be very helpful.

25                  So let me turn to Jim, and I liked your message about the

1 importance of leadership. It's certainly been my observation that a well-run, well-  
2 managed nuclear power plant is -- really the thing that shines is the  
3 management. And there are ones that are well-managed and there are ones that  
4 are badly managed, and that's often the root of the problem if there's a problem  
5 at a particular facility. Now let me ask you about the status of the industry efforts  
6 to establish the regional response centers and where you are with that, what your  
7 capabilities are or plan to be in regards to transportation of equipment to  
8 facilities, that kind of thing.

9           JAMES SCAROLA: So, we are on our schedule that we have laid  
10 out in terms of purchasing the equipment, establishing the storage requirements  
11 for the equipment, establishing maintenance programs for the equipment,  
12 establishing the transportation contracts for the equipment that will enable us to  
13 be able to deliver the equipment to facilities within 48 hours of the event. We  
14 have the ability to do that sooner, but with all areas, we anticipate that for design  
15 purposes, we have the FLEX equipment for the first 48 hours, is what we  
16 established, and then be able to deliver the equipment from the regional centers  
17 following that. And we're on track to do that on schedule. So, the equipment is  
18 arriving and those programs are being established for it.

19           CHAIRMAN MACFARLANE: And the equipment will be delivered  
20 via...

21           JAMES SCAROLA: It will be delivered via trucks in most cases. If  
22 need -- air transportation, we'll have air transportation contracts to be able to do  
23 that.

24           CHAIRMAN MACFARLANE: Okay. Let me -- you brought this up  
25 in the answer to Commissioner Ostendorff's question, but you talked about one

1 of the issues that hasn't been resolved yet is this issue of making the hardened  
2 vents accident capable, and the dry well versus wet well issues. So, I know  
3 we're going to be talking with the staff momentarily. I'm going to ask them about  
4 that, but I'd like to get your views --

5 JAMES SCAROLA: Sure.

6 CHAIRMAN MACFARLANE: -- on what the problem is, or if there  
7 is a problem.

8 JAMES SCAROLA: So, the challenge before us on the wet well  
9 and dry well vents as we begin to make the modifications, there's a point from  
10 the practical standpoint, that understanding the design requirements for both the  
11 dry well and the wet well is advantageous from an implementation standpoint of  
12 what mods you make.

13 When we move over into the dry well, the dry well conditions that  
14 the containment would be subject to, and the dry well valve operability  
15 requirements is where we don't have the analysis done to tell us what would that  
16 condition need to be. What's the temperature condition of the containment at  
17 that point in time? So, there can be some reasonable judgments applied there,  
18 but I think this is where we start to push the capabilities of the current models.  
19 The current models will not give us precision in what those requirements may be.  
20 So, when you start looking at that, you're now dealing with not just an extreme  
21 event and a tail-end event, but now you're dealing with the tip of the extreme  
22 event. And we're saying, okay --

23 CHAIRMAN MACFARLANE: The normal events.

24 JAMES SCAROLA: -- at some point -- I will comment on that, too --  
25 but at some point we're going to have to apply reasonable judgment. I think

1 we're in the discussions. The discussions are going well. I'm not critical of it.

2 CHAIRMAN MACFARLANE: We're sort of not in the forefront of  
3 these vents, right? Other countries have these vents. They exist. This is mature  
4 technology? There's a resource base to draw on here?

5 JAMES SCAROLA: We all have vents, but in terms of what they  
6 are hardened to, there is not a standard out there to apply. So, you cannot look  
7 at, you know, is the whole industry -- international community is also learning  
8 from Fukushima and the original design vents that were installed were not for the  
9 extreme event conditions that we see at Fukushima.

10 CHAIRMAN MACFARLANE: Right, but we're not the only country  
11 thinking about this --

12 JAMES SCAROLA: That is correct because we're not the only  
13 country that's thinking about this.

14 CHAIRMAN MACFARLANE: There's a -- there is a resource base  
15 to draw from and interact with.

16 JAMES SCAROLA: Absolutely.

17 CHAIRMAN MACFARLANE: Let me ask Paul Smith a question. I  
18 am curious about your remote monitoring system, especially the gamma  
19 detection network and the gaseous effluent monitoring system. And I'd like to  
20 know who pays for this system and whether you make the information that you  
21 gather available to the public real time. I've gotten questions from other --

22 PAUL SMITH: Okay.

23 CHAIRMAN MACFARLANE: -- folks in different states who are  
24 interested in this kind of situation.

25 PAUL SMITH: Well, I can answer it. As far as the gaseous effluent

1 monitoring system. That was designed by us. The only thing we got from utility  
2 was a building that we rent for a dollar a year. So, it's our equipment that's in  
3 there. And we also have a backup diesel generator to support it.

4 CHAIRMAN MACFARLANE: And you guys maintain it and pay for  
5 it?

6 PAUL SMITH: That's correct.

7 CHAIRMAN MACFARLANE: The state of Illinois?

8 PAUL SMITH: We bring in oil -- the fuel oil and maintain it. As far  
9 as the gamma detection network, we installed all that, the 16 per plant out from  
10 two to five miles, and we currently have as far as the -- it's just distribution power  
11 comes in from the non-regulated utility, which would be Commonwealth Edison.  
12 But if we lose that, we have a EPS backup and that's good for three to four days,  
13 and then we have solar power that would be good for seven days backup. And  
14 just recently in the -- unfortunately the LaSalle station had a dual unit loss of off-  
15 site power, we were able to get 24 hour, seven day from our RDLs -- from our  
16 GEM systems and also the gamma detection.

17 CHAIRMAN MACFARLANE: So, and the gamma detection  
18 network, is that something that the state of Illinois pays for and maintains?

19 PAUL SMITH: Yes, we built the cabinets, we maintain them, we --  
20 right now we're going through an upgrade, too, so we've upgraded about half of  
21 them so far.

22 CHAIRMAN MACFARLANE: Interesting. And is this -- is the data  
23 that you've gathered from this available to the public real time? Is it available on  
24 a website, or...

25 PAUL SMITH: Well, what we do do, is we give it to the utility so in



1 their emergency operation facility, they could bring up the CR gamma detection  
2 networks. They did their own software, but we're giving them the data through a  
3 link. Now, as far as sharing it with the public, we haven't made that leap yet, but  
4 we do share it with the liaison in the county emergency operation facility. We  
5 have an IEMA liaison in the counties. And he could ask us questions and we  
6 could give him the info. We could send the maps and we could give him  
7 snapshots of the screens, too.

8 CHAIRMAN MACFARLANE: There's no interest -- you guys  
9 haven't gotten interest from the public in having access to this?

10 PAUL SMITH: Well, we talked about it but we've never  
11 implemented it.

12 CHAIRMAN MACFARLANE: Okay. Interesting. Okay. Are you  
13 aware of other states that have this system?

14 PAUL SMITH: Like I said, and during the slides we've got -- Illinois  
15 is kind of unique, and I believe they wouldn't have it, but -- because -- it's when  
16 you get like a good practice when all the buses show up in a parking lot to take a  
17 look at what you've got, and then it means you're doing well. So, we do see a lot  
18 of people coming in --

19 CHAIRMAN MACFARLANE: To see it, yeah.

20 PAUL SMITH: -- trying to see what we've got. And what we do is  
21 we send them to the IEMA webpage, and all our codes are in there and all our  
22 admin codes to support this from the utility because the utility has to give us  
23 information based on post-TMI legislation the state of Illinois came up with. So  
24 we normally just send them to the website and then we've got another website;  
25 it's ready.illinois.gov, and it shows quite a bit more of the information that's

1 available.

2 CHAIRMAN MACFARLANE: Okay. Thank you. And  
3 congratulations on your system. I'm going to turn it over to Commissioner  
4 Svinicki.

5 COMMISSIONER SVINICKI: I'll add my thanks to everyone for the  
6 presentations, and I think it's the Bible that teaches us that the last shall be first,  
7 but the way our questioning works is that once you've been first, recognize then  
8 you're last, so I'm last today because I was first in questions at yesterday's  
9 meeting.

10 So, we've covered a lot of ground and I want to say that I  
11 appreciate the presentations, but also your responses to the questions. I think  
12 some -- through the observations and insights that you're sharing, I think that  
13 we're hearing some good commonality, and I think that there are some themes  
14 that are emerging here in these insights and observations about striking the right  
15 balance in how we move forward, about the importance in -- I think as Mr.  
16 Lochbaum observed, the post-Three Mile Island conclusion, that you can't just  
17 have an emphasis on hardware and not focus on human performance. I think  
18 that's an important theme. I was hearing some commonality from all of you on  
19 that. I think also, I appreciate the status update that is a reminder, at least to me,  
20 from Mr. Scarola and Mr. Heacock, that some of the response to Fukushima to  
21 date, at least on the industry side, has had -- been focused in some corporate or  
22 fleet-wide responses and that the individual stations have been somewhat  
23 buffered from activities to date.

24 So, I guess I take away from this what's new right now, is that the  
25 impact and implications of the response to Fukushima are really just beginning to

1 have their biggest impact station-by-station as we look, and that to date some of  
2 this has been more in the planning phases. But as we move forward over the  
3 next maybe two or three years, that at individual stations this is going to have a  
4 much greater impact than it's had for the past two years. And I think that that  
5 does bring this human performance element so much more to the forefront. So, I  
6 appreciate that a number of you have shared observations on that. Really  
7 appreciate that Mr. Smith is here today, and I would say to you that, you know, it  
8 is the individual Commissioners who sit on this side of the table that decide and  
9 offer the invitations to appear here. So, your perspectives representing a state  
10 that is such a significant partner to us, of course, in the area of emergency  
11 planning and emergency response, as are all of the states that host nuclear  
12 reactors, but, you know, as we reflect on the very tragic events in West, Texas  
13 and are reminded that it is the work with states, the work that the states do as  
14 first responders, the tragic loss of life there was, as I understand it, predominantly  
15 firefighters and first responders who were in there to fight the fire prior to the  
16 subsequent explosion. So, we need to remember that NRC's actions in  
17 emergency preparedness and emergency management are part of a mosaic of  
18 your work with FEMA, your work -- your direct work with first responders, and we  
19 need to remember that what we do will have an implication on that. Appreciated  
20 also your discussion about the number of drills and things that go on, that it is  
21 part of an overall national program of preparedness for all types of events and we  
22 need to think about what we do in this area in the context of everything else, that  
23 states and responders have to think about on a day-to-day basis. So, I think that  
24 your observations here today, although maybe we didn't have a lot of questions,  
25 is a very valuable part of the dialogue that we're having on these things.

1           So, you know, as I said, a lot of ground's been covered. I  
2 appreciate, I think, that either explicitly or implicitly you've all talked about how  
3 our approaches to the various issues raised by Fukushima are evolving and need  
4 to be continued. We need to continue to have a feedback loop where we're  
5 taking the actions and analysis that we've done to date and further integrating  
6 that back in to the issues both as we develop greater detail for implementation of  
7 the high Tier items and for the subsequent tiers that we're going to be evaluating  
8 or are evaluating now and will continue to do in the future.

9           We're going to hear from the NRC staff very shortly, and one of  
10 their early PowerPoint slides is about the principles that are guiding the NRC's  
11 response to Fukushima. So, since one of the key elements of why we have  
12 external stakeholders here is to have some feedback on how you think NRC is  
13 doing in this regard, one of the principles that the staff, the NRC staff, will present  
14 is, the guiding principle for our activity should be do it right the first time, which I  
15 think is another way of saying, do it once and do it right. We've talked a little bit  
16 about how -- and Mr. Lochbaum talked about how maybe if we had had a  
17 different sequence for issue resolution, we would be doing things a little bit  
18 differently. We've talked about the need to consider the implementation of early  
19 actions and how that affects the remaining things that we're going to look at.  
20 How do you think -- any of you who want to respond -- how do you think we're  
21 doing on the do it once and do it right?

22           JAMES SCAROLA: I'll jump in on that, is that I think we're doing  
23 very well on that. And I say that because I have seen a willingness to look for  
24 early actions in delivery of public safety while we take the appropriate time to go  
25 through the analysis that will eventually end up with some shift in design

1 requirements. And that discussion has been very good and the early actions I  
2 think have been well thought out. We did it in the flooding area with  
3 compensatory actions. We have it on track now with the seismic area, with an  
4 augmented approach, or an advanced approach in seismic. Those things I think  
5 are important for us to be able to deliver early benefit, yet keep to the philosophy  
6 of technical robust in our application of design principles. I think it's been on  
7 track and doing well.

8 COMMISSIONER SVINICKI: Okay, thank you. Dave Heacock,  
9 would you like add anything?

10 DAVID HEACOCK: Yeah, I agree. I think it's been a great  
11 opportunity here to have public forums and discuss many of these topics in great  
12 detail, multiple public forums and get all the inputs in. And I think we're doing just  
13 that. We're -- I'll just mention one thing. This Near Term Task Force report  
14 came out July 12th. I got it that evening when it became public. And I read the  
15 report that night. And the next day, the 13th, I chaired the Fukushima Regulatory  
16 Response Working Group. We went through that entire document the next day  
17 and we picked out the top six safety issues from that document, which ultimately  
18 is the same list NRC picked, and that was the Tier 1 focus. So, it's clear to me  
19 that we picked very early on the most significant items out of that task force  
20 independently and we worked -- and that hasn't changed in two years. So, that  
21 tells me were working on the right things and we've got them in the right order,  
22 and we're doing it correctly.

23 COMMISSIONER SVINICKI: Thank you. Dave, I didn't mean to  
24 speak for you, but I did feed in. I think you've already kind of addressed this, if  
25 you want to add anything.

1           DAVID LOCHBAUM: Well, a couple things in addition to the  
2 Recommendation 1 issues. The walkdown and flooding orders went out but the  
3 guidance came out later. I always -- if I was in the shoes of the person doing the  
4 walkdowns, I always want to know what the criteria I'm walking down against are.  
5 And that seemed to come out cart after the horse or whatever, and it -- I think it  
6 would have been better if you had the guidance with the answer key was first  
7 before you did the walkdowns. In looking at the results, I'm not sure that it was a  
8 distinction without a difference. I think the industry got there anyway. But I think  
9 it would have been cleaner to have the guidance out in front.

10           COMMISSIONER SVINICKI: And I share your observation on that  
11 almost as a -- and maybe just as a general philosophy. If I were in receipt of the  
12 orders we issue, that's always my first question, is I'd like to have some sense of  
13 what are the specific implementation steps.

14           DAVID LOCHBAUM: I don't think the industry is clueless, but --  
15 and I think they got that result anyway, but it just would have been cleaner had it  
16 been the other way around. But it didn't seem to make a huge bump in the road.

17           COMMISSIONER SVINICKI: Okay. Thank you. I appreciate that.  
18 And I didn't know, Mr. Smith, if you wanted to add anything and that I think some  
19 of the EP recommendations are -- and I know are longer term actions and you've  
20 already given some feedback on your preliminary thoughts on that.

21           PAUL SMITH: Yeah, that's correct. The only Tier 1 that may  
22 impact the state in resources is, after we get the design of the hardened vent  
23 system, if you can put a filter in there, then we would want to make sure that we'd  
24 be able to monitor that filter if it doesn't go up through the standby gas, or the  
25 plant ventilation. So, that could be -- that could impact us, too, but we haven't

1 seen a design yet on it, so we'll just hold off and see what happens.

2 COMMISSIONER SVINICKI: Okay, thank you for that. And I think  
3 I'll just close with one observation. My votes on the Fukushima matters are all  
4 publicly available, so to the extent anyone has needed some late night reading to  
5 fall asleep and has read those, you would observe that I've been pretty persistent  
6 at least in that -- maybe not initial votes, but subsequent votes, about  
7 reintegrating Fukushima activities back into the line organizations, we're a  
8 nuclear safety and security regulator; so nuclear safety issues -- and again, I've  
9 acknowledged that maybe in early days it was important to have some dedicated  
10 focus and buffer those activities off to the side. As Mr. Heacock indicated, a lot  
11 of operators did that, as well, not to distract station staff. But I think that there is  
12 a point in time, and I don't know when that magic moment is, that you need in  
13 order not to have the maybe tunnel vision or siloed thinking that Mr. Lochbaum  
14 talked about, you need to reintegrate those activities. It sounds like the industry  
15 is thinking that way. I know the NRC staff will present that they are already  
16 thinking that way as well. So, I appreciate that acknowledgment. And since Dr.  
17 Apostolakis has sighed heavily on our side of the table, I think my time is up.  
18 Thank you.

19 CHAIRMAN MACFARLANE: I think the sigh meant he has an  
20 additional question. Let me see if anybody else has additional questions. Go  
21 ahead, George.

22 COMMISSIONER APOSTOLAKIS: I get the impression, not only  
23 today, but in other occasions, too, that somehow the design-basis accidents are  
24 sacred.

25 CHAIRMAN MACFARLANE: It's set in stone.

1 COMMISSIONER APOSTOLAKIS: And we're talking about  
2 extreme events and so on. First of all, Fukushima was not an extreme event. It  
3 was an extreme event in terms of what happened, but in terms of probabilities, in  
4 the nuclear safety arena, it's about one in a thousand, which is pretty high for us.  
5 For the average guy on the street, that's a rare event. But for nuclear safety, one  
6 in a thousand roughly is not rare.

7 Then design-basis events; let's not forget that most, if not all of  
8 them, were developed 40 years ago. The state of knowledge was different. For  
9 example, they didn't pay much attention to human error, and now we know this is  
10 a major contributor to risk. The single failure criterion dealt only with hardware  
11 single failures. So, let's not be in awe of the design-basis envelope. We have to  
12 bring it up to date. And I agree with the Chairman that science in terms of -- for  
13 external events is progressing and we are doing things for earthquakes right now  
14 in the Central and Eastern United States and the West. So, a little less respect  
15 for the DBAs, I think, and a more questioning attitude would be a good idea.  
16 That's one person talking. Thank you very much.

17 JAMES SCAROLA: Can I --

18 COMMISSIONER APOSTOLAKIS: Jim, I think, wants to say  
19 something.

20 JAMES SCAROLA: I appreciate the counsel, as usual, professor.

21 [laughter]

22 However, I think it's also important to recognize that the design  
23 basis has not been static for 40 years. Our engineering staffs would tell you  
24 otherwise, is that even under the current regulatory process, as we have  
25 exhibited in the last two years, our ability to discuss concerns and changes



1 where data leads us to those concerns and changes, allows us to change the  
2 plant design and, in fact, we have done that over the last 40 years in this  
3 business. So, it would be, I don't think appropriate to characterize that we have  
4 been frozen in our design basis. Our activities over the years, and if we look at  
5 the regulatory changes that have occurred in this business since initial license,  
6 would tell us that we have a living design basis. And I think while we are dealing  
7 with external events today, they are just one more example of the willingness that  
8 we have to -- when new information becomes available, to appropriately analyze  
9 it and disposition it even under the current regulatory framework.

10 CHAIRMAN MACFARLANE: Any other additional questions? No?

11 Okay. So, now what we're going to do -- first of all, let me thank you all very  
12 much for your presentations. We're going to take a five-minute break while the  
13 next panel comes up.

14 [break]

15 CHAIRMAN MACFARLANE: Okay. I think we are ready to begin  
16 again. Now we have a presentation from the NRC staff and I will turn it over to  
17 William Borchardt, the Executive Director for Operations.

18 BILL BORCHARDT: Good morning. Thank you. Before Mike and  
19 the team begin the real presentation, I'd just like to make a few points. First, I'd  
20 like to acknowledge and thank all of the stakeholders for their valuable  
21 contribution throughout this entire process. It's been a very intense, sometimes  
22 difficult two years, and without their contribution, it would've been impossible for  
23 us to get to where we are. I'd also like to acknowledge the efforts of the Steering  
24 Committee and the Japan Lessons Learned Directorate because they've been at  
25 the forefront of all the progress that the NRC staff has made.

1           Having said that, I think we're at a unique position in time now. We  
2 are transitioning, in my view, from a period of policy decisions to one of  
3 implementation. And that's afforded us the opportunity to take a serious look at  
4 how we address the issue that David Lochbaum mentioned this morning, and  
5 one that we agree with, that we want to try to get our process back into the  
6 normal line function responsibilities at the right time. We think that right time is  
7 coming up, probably toward the end of this year, in my view, but that could  
8 change. But the makeup of the Steering Committee made sure that we didn't get  
9 disconnected. It's largely made up of representatives from the major program  
10 offices, and just by that fact alone, we made sure that the operating reactor fleet  
11 and our regulatory oversight of that on the day-to-day mission type activities  
12 didn't become disconnected from the work of the Fukushima lessons learned.  
13 However, returning these activities more to the line function I think will have  
14 additional benefits. So Mike, if we have time will mention that later on in the  
15 presentation this morning.

16           I'd also like to mention how valuable the international interactions  
17 have been throughout this process. We learned lessons from the international  
18 community very early on in the process. The near-term task force did a  
19 tremendous job given the time constraints we put them under; but having said  
20 that, there were some items that weren't included that we learned from our  
21 interactions with the international community. That interaction continues to this  
22 day in a very robust way, both through bilateral interactions, but also through the  
23 work of the International Atomic Agency and the Nuclear Energy Agency. And  
24 the next Convention on Nuclear Safety review meeting, which is about a year  
25 from now, will again have a very strong focus on Fukushima lessons learned.

1 And it's through that every regulatory agency in the world is bringing to the table  
2 what they're doing, what their industry is doing in their response to Fukushima so  
3 that we can cross-calibrate. I think that we're in very good position today based  
4 on our understanding of what's being done around the rest of the world. But it  
5 has been a very valuable source of information. I'll turn over to Mike.

6 MIKE JOHNSON: Good morning, Chairman and Commissioners.  
7 We're happy to be here today to discuss the status of the Fukushima lessons  
8 learned activities from the staff's perspective today. Dave Skeen, who is the  
9 director of the Japan Lessons Learned Project Directorate, will walk through the  
10 three orders that were issued on March 12th. Scott Flanders then, who is the  
11 director of the Division of Site Safety and Environmental Analysis in the Office of  
12 New Reactors, will give you an update on status of seismic and flooding. And  
13 then Eric Leeds, who is the director of the Office of Nuclear Reactor Regulation,  
14 will discuss the rulemakings in and Tier 2 and Tier 3 activities. Slide 3, please.

15 Before we begin, I'd like to make a few points. The first is that in its  
16 report in July of 2011, the near-term task force noted that the current regulatory  
17 approach and the result in planning capabilities, allowed the task force to  
18 conclude that a sequence of events like the Fukushima accident is unlikely to  
19 occur in the U.S. Some measures have been implemented, reducing the  
20 likelihood of core damage and radiological releases and therefore, continued  
21 operation and continued licensing activities do not pose an imminent risk to  
22 public health and safety. We supported those conclusions at that time; we  
23 continue to support those conclusions today. Notwithstanding that, we do  
24 believe that enhancements are appropriate; enhancements focused on assuring  
25 protection and thus the actions with respect to re-evaluating and upgrading the

1 seismic and flooding design basis -- flooding protection.

2           With respect to enhancing mitigation, strengthening station blackout  
3 mitigation for beyond-design-basis external events. I know I've used the word  
4 that I've tried to avoid in this presentation, based on the discussion of the last  
5 panel, but certainly, that really was focused on strengthening our protection, if  
6 you will, to enhance our mitigation with respect to those types of accidents.

7           And then finally strengthening emergency procedures for station  
8 blackout in multi-unit events. And on Slide 3 -- so on Slide 3, I do want to make  
9 the point that -- and Commissioner Svinicki touched on this a little bit -- we were  
10 driven by principles. And those principles had us, in fact, make sure that we  
11 were focused on -- did not distract from our focus on operational safety and  
12 security; that we didn't displace other high priority activities. And last but not  
13 least, we did want to make sure -- we do want to make sure -- that we take action  
14 promptly. But we want to do things right the first time, that was certainly a  
15 guiding principle. Now Slide 4, please.

16           As we -- as was discussed in the previous panel, and is highlighted  
17 on this slide -- and certainly you'll hear more discussion later -- we do believe  
18 that considerable progress has been made and, in fact, substantial safety  
19 enhancements will be made -- will be in place by 2016. Of course, some of those  
20 enhancements to safety will extend beyond the 2016 timeframe and some of  
21 those we'll discuss also, as we go.

22           We were well served by the activities of the near-term task force. But  
23 reflecting on a point that Commissioner Ostendorff made with the previous panel,  
24 we certainly have, through the work of the Steering Committee, through the work  
25 of the staff, with engagement of the industry and other external stakeholders,

1 we've continued to learn and we've continued to apply those learnings in the way  
2 in which we approached the lessons learned activities. In some instances, that  
3 provided for more integrated actions, in some instances broader actions, and  
4 then in a number of instances earlier actions being taken. And so we think this  
5 process, again, built on and continues to get better, based on the work of the  
6 NRC with all of the stakeholders in addressing these issues. And you'll hear that  
7 discussed. Eric and Dave will give examples that sort of illustrate those  
8 particular points.

9           Also, as addressed -- as we addressed the lessons learned, we  
10 look for opportunities to take earlier action on activities that gave us the best, if  
11 you will, the greatest safety benefit so that we could take additional time to do the  
12 detailed work that it takes to resolve some of these longer standing issues. So,  
13 again, I think that was discussed at the previous panel. Scott's discussion on  
14 seismic will illustrate at least one case of where we found that to be the case.  
15 Slide 5, please.

16           This slide touches briefly on some of the related efforts to the near-  
17 term task force. Eric will spend a few minutes talking about Recommendation 1,  
18 so I'm not going to talk further about that now. With respect to the risk  
19 management regulatory framework, of course that activity focuses on a strategic  
20 vision and options for the framework. We got direction from the Commission.  
21 We've informed the Recommendation 1 work based on that particular product,  
22 and we'll come back to the Commission, of course, with plans following the  
23 Commission's SRM on Recommendation 1.

24           We are implementing the Commission's actions on economic  
25 consequences, namely to update the regulatory analysis procedures. We have

1 prioritized actions to ensure timely implementation of the most risk-informed  
2 improvements. And then finally, with respect to application of lessons learned to  
3 other regulated facilities, we have -- the staff has developed a plan, we've been  
4 briefed, the Steering Committee's has been briefed on that plan. We look to  
5 engage -- begin implementing that plan later this year.

6 So that concludes my overview. And now let me turn to Dave.

7 DAVE SKEEN: Well thanks, Mike, and good morning Chairman  
8 MacFarlane and Commissioners. It is certainly a pleasure to be here today to  
9 discuss the staff's progress in implementing lessons learned from the accident at  
10 Fukushima Dai-ichi.

11 The staff has been working diligently over the last two years to  
12 enhance the safety at U.S. nuclear power plants. We have focused on taking  
13 regulatory actions to ensure that the plants can cope with external events that  
14 could lead to a prolonged loss of electrical power and loss of cooling water at  
15 power reactor sites. This slide provides a summary of regulatory actions that are  
16 currently underway.

17 As you are well aware, we issued three orders and requests for  
18 information just over a year ago, in March of 2012. We also initiated two  
19 rulemakings at that time. One is to address the station blackout and mitigating  
20 strategies that will build on the actions that are being taken by the order, and  
21 also, another rulemaking that will integrate the licensee emergency response  
22 procedures to deal with severe accidents at nuclear power plants. In the next  
23 couple of slides I'll focus on the progress we've been making on the orders. Next  
24 slide, please.

25 So the Tier 1 order status -- after the implementation guidance was

1 issued in August of 2012, the licensees developed their integrated plans to  
2 provide details on how the orders would be implemented at each plant. And they  
3 submitted those plans to us in February of this year. Since then, the NRC staff  
4 has been reviewing the integrative plans for two of the orders that address the  
5 mitigating strategies for the beyond-design-basis events, and also the enhanced  
6 spent fuel pool implementation, so that we can ensure the plants meet the intent  
7 of the orders. In our reviews, we've taken into account the refueling outage  
8 schedule for each plant and prioritized our review of the plans so that all  
9 licensees will have sufficient time to design and install the plant modifications in  
10 accordance with the schedules that we laid out in the orders, once we approve  
11 their plans.

12 We intend to issue the safety evaluations on each plan with the first  
13 safety evaluations to be issued by the end of May and following through the  
14 summer, and into the fall, and all will be done by the end of November of this  
15 year. All licensees will implement plan modifications within two refueling  
16 outages. Many of the plants will be in full compliance after the outages in 2014.  
17 Some more will be finished in 2015, and all plants will be in full compliance with  
18 the orders by the end of 2016. Next slide, please.

19 The third order that was originally issued to require reliable  
20 hardened containment vent system at all boiling water reactors with the Mark I  
21 and Mark II containments was also issued at the same time as the other two  
22 orders. However, the Commission recently directed the staff to revise this order.  
23 In response to a November 2012 notation vote paper that was developed by the  
24 staff, and made recommendations for additional requirements for the Mark I and  
25 Mark II containment venting systems, the Commission directed the staff to follow

1 a two-step process. The first step was to revise the order that we had issued last  
2 year to require that the containment vent also remain functional during severe  
3 accident conditions, after the reactor core has been damaged. We are currently  
4 working to issue this revised order by the end of May. And the implementation  
5 guides for this order will be complete by September.

6           The second step of the process is to develop a rulemaking that will  
7 consider filtration strategies to decontaminate and confine the potential release of  
8 radioactive material during a severe accident. And this includes the option of  
9 installing engineer containment filtering systems. The regulatory basis for the  
10 order -- for the rule is to be done within one year and the final rule will be issued  
11 within four years. So with that, I'll turn it over to Scott, to talk about the seismic  
12 and flooding issues.

13           SCOTT FLANDERS: Thanks, Dave. Good morning Chairman,  
14 Commissioners. Since the -- as Dave mentioned, the requests for information  
15 were issued in March of 2012, and since that time significant progress has been  
16 made about the seismic and flooding walkdown reevaluations. Today I'm going  
17 to discuss the status of the walkdowns and the reevaluations and discuss key  
18 observations for activities that have been completed. The progress that has  
19 been made on the walkdowns and reevaluations is based in large part on the  
20 interactions between staff and various stakeholders, including more than 60  
21 public meetings.

22           I'll first start with the walkdowns. Consistent with the request for  
23 information, the staff worked with the stakeholders to develop walkdown  
24 guidance and the NRC endorsed that guidance in May of 2012. Following the  
25 issuance of the guidance, the walkdowns were performed over the summer and -



1 - over the spring and summer of 2012, and in November of 2012 licensees  
2 submitted their flooding and seismic walkdown reports. Again, the purpose of the  
3 walkdowns was to identify degraded, non-conforming, and unanalyzed  
4 conditions, assess the adequacy of licensees' maintenance and monitoring  
5 programs, and identify areas where straight-forward safety enhancements could  
6 be made. In addition to the licensee walkdowns, NRC carried out special  
7 activities to assess whether the licensees followed the endorsed guidance. As a  
8 result of the walkdowns and inspections, nearly every plant found some non-  
9 conforming or degraded condition. These were entered into the licensees'  
10 corrective actions program and are being followed-up by the licensees and the  
11 NRC through the Reactor Oversight Program.

12           Let me share just a few general observations I think can give you  
13 some sense of the types of issues identified. For flooding, some plants identified  
14 procedures that could not be implemented or completed as written, or could not  
15 be completed in the time credited. Part of this was borne out through the  
16 reasonable simulation which was a unique piece that was added into the  
17 walkdown guidance. Additionally, temporary and permanent barriers were  
18 identified that may not perform as intended, and several plants identified  
19 degraded or missing seals.

20           For seismic, many of the issues that were identified were  
21 associated with anchorage, such as loose or missing bolts, and in some cases  
22 there were some seismic interaction issues that were identified. Those have  
23 been noted and addressed.

24           Licensees did propose some flood protection enhancements for  
25 some plants, which typically involve modifying or clarifying procedures, or in

1 some cases upgrading certain temporary equipment. Staff does intend to  
2 perform audits for some sites this summer to gather additional information  
3 necessary to complete its assessment and walkdown reports. Can I have the  
4 next slide, please?

5           As you may recall, the flooding reevaluations were split into -- the  
6 plants were split into three categories based on a prioritization process that  
7 considered a number of factors. The Category 1 plants were required to submit  
8 their reevaluated hazard this past March. And 16 of 22 plants submitted their  
9 reevaluated hazard, and six requested an extension. The extensions ranged  
10 anywhere from two months to over two years. While the staff is actively  
11 reviewing the submittals, there are some initial observations that I think are  
12 important to share. Based on our initial review, 10 of the 16 plants indicated they  
13 would need to perform an integrated assessment – meaning that their  
14 reevaluated hazard exceeds, at least in some aspects, their current design basis  
15 flood level. Eight plants proposed interim actions, and three plants indicated that  
16 while their reevaluated hazard exceeded their design basis flood elevation, it  
17 does not exceed the plant's flood protection, or in the case of one plant, that still  
18 doesn't reach plant grade. Staff has reviewed and approved the extension  
19 requests for four of the six plants, and meetings are scheduled next week with  
20 the licensee for the remaining two plants to gather additional information  
21 regarding the basis for their extension. Staff is actively reviewing the interim  
22 actions and intends to use the NRR office instruction to help establish what the  
23 appropriate regulatory footprint should be.

24           The instruction -- if we have Slide 10, please -- there you can see  
25 the name of the instruction. And this is an instruction -- that while it was originally

1 written for the purpose of using a risk informed decision-making process, it points  
2 to the use of this particular office instruction in situations where management  
3 believes that consistent decision-making and formal documentation process is  
4 important. And that's why we're using it here in this case for the interim actions,  
5 because we believe that's important to have formal documentation and a  
6 consistent approach to evaluate them.

7           Lastly, I want to mention the staff is actively working with several  
8 stakeholders to develop an interim staff guidance document for dam failure. We  
9 met two weeks ago with other federal agencies that own, operate, and regulate  
10 dams, and separately we held public meetings with the industry as well. The  
11 dam failures are complex for a number of reasons, and it's important that in our  
12 interactions with the other federal agencies, that we understand that well-  
13 established federal framework for dam safety that's already in place and how our  
14 work fits within or does not fit within that federal framework. Can I have the next  
15 slide, please?

16           Now turning to the seismic reevaluations, a significant milestone  
17 was reached in February when the NRC staff endorsed the EPRI screening  
18 prioritization, an implementation document which provides guidance on how the  
19 reevaluated hazards should be calculated and how the risk evaluation should be  
20 performed. This document is often referred to as the SPID. In addition to  
21 endorsing the SPID, the staff has been actively meeting publicly with industry on  
22 two other issues; specifically updating the EPRI ground motion model and an  
23 expedited approach. And I'll discuss both of these in a little more detail later.  
24 After several meetings with the staff -- and between staff and industry, on April  
25 9th, industry formally proposed a path forward that would incorporate both of

1 these issues, updating the EPRI guidance document and use of the expedited  
2 approach.

3           The industry's proposed path forward would change the schedule,  
4 including the 50,54(f) letters. Specifically the proposal will result in delaying the  
5 submittal of the completed hazard reevaluations for the Central and Eastern  
6 United States plants by about six months and will result in pushing back the  
7 submittal of the risk evaluations for the Central and Eastern United States plants  
8 anywhere from 10 months to a year, depending upon whether they're considered  
9 higher priority plants or lower priority plants. Additionally, it should be noted that  
10 it could extend an additional year in situations where the risk evaluation -- where  
11 there's a large number of plants that will need actual risk evaluation.

12           The industry's proposed path forward will result in all plants that are  
13 screened in, completing the expedited evaluation, and that would be completed  
14 for all plants in the Central and Eastern United States and Western plants by  
15 2016. And in the case of plants in the Central and Eastern United States, that  
16 evaluation would be completed by December of 2014, with the potential for plant  
17 modifications by 2016. Could I have the next slide, please?

18           First I want to spend a little bit of time talking about the updated  
19 ground motion model that industry proposed. And I thought it would be useful to  
20 include a simple picture on the slide to help describe the three components in  
21 evaluating a seismic hazard. In order to assess a seismic hazard, one needs to  
22 understand the seismic sources that could affect the site. You need to  
23 understand the geometry of the sources, possible earthquake magnitudes, how  
24 far they are away from the site, and how often you might expect to have an  
25 earthquake of a particular magnitude. Once you understand the sources, you

1 need to determine how seismic waves attenuate from the source to the site. And  
2 lastly, you need to understand local site conditions to determine how it affects the  
3 ground motion at the site. In the 50.54(f), the staff specified the source model  
4 and ground motion attenuation model that the licensee should use in the  
5 reevaluation. Specifically, the staff stated that the licensee should use the EPRI  
6 2004-2006 ground motion model. The EPRI 2004-2006 ground motion model is  
7 the last ground motion model endorsed by the NRC and is currently being used  
8 in new reactor reviews. And in 2009, the staff, along with EPRI, and Department  
9 of Energy, embarked upon an effort to develop a new ground motion model for  
10 the Central and Eastern United States called NGA-East. And this was because  
11 staff recognized that there was a significant amount of data that had been  
12 collected since the 2004-2006 model was developed, as well as some increased  
13 understanding of scientific knowledge. At the time we prepared the 50.54(f)  
14 letters, it was clear that we couldn't wait for that model to be completed. It was  
15 not scheduled to be completed until 2015. So the staff proposed the current --  
16 the use of the 2004-2006 model, which is currently being used for new reactor  
17 reviews. Subsequent to issuing the 50.54(f) letter, industry proposed an update  
18 to the EPRI 2004-2006 model. And in proposing this new model, industry  
19 pointed to the same information relative to the significant amount of data that's  
20 been collected, as well as advances in scientific knowledge associated with the  
21 attenuation of large magnitude earthquakes.

22           Industry presented the updated model for endorsement to the staff  
23 in January 2013. At that time the staff concluded that we could not endorse that  
24 model due to concerns associated with how the model addressed epistemic  
25 uncertainty -- or really it's the uncertainty in our knowledge about how ground

1 motion attenuation effects our ability to model it precisely. And then we also had  
2 concerns about the documentation. We felt the documentation to support the  
3 endorsement was insufficient. Similar concerns were raised by the project's own  
4 internal peer review panel.

5           Subsequent to that in March of -- March 26th of this year staff held  
6 a publicly noticed meeting with industry where the industry proposed a revised,  
7 updated model that appears to address the staff's concerns regarding the  
8 epistemic uncertainty. And the industry has acknowledged the inadequate level  
9 of documentation for the previous proposal, and are actively working on the  
10 documentation with the intent of submitting a model and associated  
11 documentation to the staff by June 2013, looking for staff's endorsement by the  
12 end of August. Can I have the next slide, please?

13           The purpose of this slide is to give you a general sense of the  
14 expedited approach being proposed by industry. The expedited approach is an  
15 interim evaluation that would be performed by plants with a reevaluated hazard  
16 that is higher than their design basis safe shutdown earthquake. And the  
17 reevaluated hazard -- is represented by the solid blue line in the upper right hand  
18 corner of that graph, and the safe shut down design-basis earthquake is  
19 represented by the red curve.

20           The evaluation would assess a subset of plant equipment's  
21 capability to withstand the higher ground motion that's conservatively  
22 representative of the reevaluated hazard. Now the subset of equipment that  
23 would be considered is installed equipment necessary for phase one of the  
24 mitigating strategies order, and phase two and three equipment connections  
25 only. This equipment is needed for core cooling in the event of station blackout

1 and a loss of ultimate heat sink. So, for BWRs, it's principally the reactor core  
2 isolation cooling system, and for PWRs auxiliary feed water system.

3           And to facilitate a timely review while maintaining conservatism, a  
4 review level ground motion spectra is determined, which is represented by the  
5 dashed blue line. The review level ground motion spectra is determined by  
6 scaling the safe shutdown earthquake spectra, by the largest ratio between the  
7 ground motion response spectra and -- which is a re-evaluated hazard -- and the  
8 safe shutdown earthquake design basis, in the 1 to 10 hertz range only. And the  
9 reason why it's focused on the 1 to 10 hertz range is that this is the frequency  
10 range of concern for the plant equipment of interest in the reevaluation. For the -  
11 - or excuse me -- in the expedited approach evaluation.

12           For pieces of equipment, it's possible to determine its likelihood of  
13 failure when subjected to a particular ground motion. This can be represented by  
14 the fragility curves, which you see in the lower left hand corner. A set of fragility  
15 curves can be developed for a piece of equipment, which you see there, and  
16 usually it can be across the spectrum; that ranges from between the mean, the  
17 median, 95th percentile, et cetera. The actuated approach uses the ground  
18 motion for which there is 95 percent confidence that the high probability of a  
19 component failing is less than 5 percent. This is the so-called high confidence of  
20 low probability of failure, or HCLPF. This is used to compare to the ground  
21 motion review level -- excuse me -- the review level ground motion. So, in this  
22 case, in this example here, the safety relief valve accumulators have a HCLPF  
23 value of about 0.32g and -- which is less than the review level ground motion. So  
24 in this case, there would be some need to make modifications to the  
25 accumulators. That's just a quick overview; a very simplified discussion on the

1 expedited approach, just to give you a general sense.

2           If I could have the next slide. Based on meetings with the industry  
3 and review of the draft guidance documents on the expedited approach, staff  
4 believes industry's proposed approach is reasonable. The staff arrived at this  
5 position based on balancing the incremental schedule changes against the  
6 opportunity to use an updated ground motion model that accounts for more  
7 recent data, and an expedited approach that evaluates certain key systems and  
8 could possibly result in plant modifications sooner. Additionally, the evaluations  
9 and potential plant modifications stemming from the expedited approach provides  
10 the added assurance and confidence that additional time can be taken to  
11 complete the risk evaluation. It's critical that the updated ground motion model  
12 and documentation are completed in a timely manner and are of a high quality  
13 and that the expedited evaluation guidance is completed and endorsed. Both of  
14 these are expected to be completed this summer. That concludes my remarks. I  
15 look forward to your questions.

16           ERIC LEEDS: All right, thank you, Scott. All right, if we could go to  
17 the next slide, please, on Recommendation 1? Thank you. All right, on the  
18 Recommendation 1 effort to improve the NRC's regulatory framework we've  
19 extended the completion schedule to allow the staff to incorporate additional  
20 stakeholder input. We plan to hold two additional public meetings; three more  
21 meetings with the ACRS subcommittee and an ACRS full committee meeting,  
22 Advisory Committee for Reactor Safety -- excuse me, using acronyms -- during  
23 this extended timeframe. Thank you, Commissioner.

24           We are expecting to receive the nuclear industry's input on  
25 potential regulatory framework improvements by the end of this month. Under



1 the new schedule, the staff will provide its recommendations to the Commission  
2 by early December of this year, with regard to Recommendation 1. If we could  
3 go to the next slide, please.

4           We'll talk a little bit about rule-making activities that David  
5 mentioned earlier. There are two. The first: the station blackout mitigation  
6 strategies rule order. This rule will incorporate insights from implementation of  
7 the mitigating strategies order. It will also address the spent fuel pool makeup  
8 capability, which is actually a Tier 2 item. It was Recommendation 7 from the  
9 new term task force, so we've actually been able to move that up. We have a  
10 revised integrated rulemaking schedule that the Commission approved, and that  
11 schedule is to have the draft regulatory basis, which was just published in the  
12 Federal Register this past April 10th. That's out for a 45-day comment period  
13 and that expires May 28th. We should have the final regulatory basis done this  
14 July. The proposed rule should be done middle of next year -- June of next year,  
15 and then the final rule by the end of 2016.

16           The other rulemaking activity ongoing is the on-site emergency  
17 response capabilities rulemaking. That's Recommendation 8 from the Near  
18 Term Task Force. This new rule will require integration of emergency  
19 procedures: the emergency operating procedures, the severe accident mitigation  
20 guidelines, as well as the extensive damage mitigation guidelines. The schedule  
21 for that rulemaking will be that the final regulatory basis should be issued this  
22 May. The proposed rule should be issued by the fourth quarter of 2014, and the  
23 final rule by the third quarter of 2016. Next slide, please.

24           If we can talk a little bit about the Tier 2 items. We've only been  
25 talking about Tier 1 thus far, but this slide gives us a brief overview of the status

1 of our Tier 2 activities. Tier 2 activities fall into three main areas: the spent fuel  
2 pool makeup capabilities, emergency preparedness issues, and reevaluation of  
3 other external hazards besides seismic and flooding that you heard Scott already  
4 speak to. For the first two areas, the spent fuel pool make up and emergency  
5 preparedness, the staff has found that the intent of these recommendations can  
6 be addressed under the implementation of the mitigating strategies order. An  
7 action is being taken to do just that. Therefore, these items are actually being  
8 addressed with Tier 1 items, with the Tier 1 priority; they will be completed faster  
9 than if they were kept separate. As a specific note for emergency preparedness,  
10 the item related to multi-unit dose assessment is expected to be in place by the  
11 end of calendar year 2014.

12           The final Tier 2 item related to reevaluation of other external  
13 hazards is dependent on insights we gain from implementation of the seismic  
14 and flooding reevaluation efforts that you heard is underway. And further, there  
15 is some staff resource limitations for addressing this item at the current time, but  
16 we're closely looking at when those limitations will subside so that we can begin  
17 this activity. You can go to the next slide.

18           Tier 3 activities, to summarize, are activities with regard to the  
19 items in Tier 3. I'd like to focus on two primary dependencies for completing  
20 most of them. First, many of the items require additional information or  
21 evaluation to support a regulatory decision. As an example, the Tier 3 item on  
22 reactor and containment instrumentation that can withstand severe accident  
23 conditions requires a thorough understanding of what instrumentation is needed,  
24 what it should be capable of doing, you know, what its functions are -- it's going  
25 to need to perform, and what are the conditions it would need to withstand based

1 on where it would be located. The staff is currently engaging experts from the  
2 standards development organizations and other stakeholders to try to develop  
3 consensus on how this issue should best be addressed.

4           Second, many of the Tier 3 items are dependent on insights gained  
5 from the implementation of Tier 1 items. A good example of a Tier 3 item that's  
6 dependent on other items would be the hydrogen control and mitigation. We  
7 expect that we are going to garner significant insight and possibly resolution of  
8 this issue from implementation of efforts on containment vending systems under  
9 Tier 1. That completes my remarks, and with that, I will turn it back to Mike.

10           MIKE JOHNSON: Thanks, Eric. Slide 19, please. This slide  
11 touches on a discussion point from the previous panel -- Commissioner Svinicki,  
12 a point that you made, and certainly a point that Bill made in his opening  
13 comments -- and it relates to how we oversee lessons learned going forward.  
14 And the point that Bill made is that as we have increasingly moved from a  
15 decision making and policy stage to an implementation stage, it makes sense for  
16 us to transition the oversight of the lesson learned activities from steering  
17 committee oversight phase, if you will, to a phase where that oversight is being  
18 provided by line management. And so, we are, in fact, working on a plan to  
19 enable us to make that transition. We think really the fact that we're there is a  
20 testament to the progress that we've made in terms of moving these activities  
21 through the process. We'll, of course -- if we impact the role of the Steering  
22 Committee, we'll come back to the Commission with a revised charter that talks  
23 very specifically about the role of the Steering Committee for example, on  
24 oversight so that the Commission has an opportunity to weigh in.

25           And I want to just make sure that we make the point that this

1 transition of oversight doesn't, in any way, communicate a lack of focus on the  
2 staff's intent to drive to resolution the actions that have been approved by the  
3 Commission as a result of the Fukushima lessons learned. Next slide, please.

4           And so, in summary, this is -- as we've just past the two year  
5 anniversary of the accident at Fukushima, if we look back on the near-term task  
6 force report that I started with, where we had a great effort and recommendations  
7 but largely just that -- recommendations -- to the point where we are today, in  
8 fact, implementing lessons learned, as you heard in the previous panel, changes  
9 are being made in plants. We conducted regulatory activities. We are turning  
10 regulatory actions into licensing implementation. And in fact, those actions --  
11 those activities have already resulted in safety improvements in power plants.

12           The implementation schedules that we're on are reasonable, we  
13 believe. They are very much in line with or ahead of the activities, in fact, taken  
14 by a number of our international counterparts, and we will certainly continue to  
15 share information with our international counterparts to ensure collaboration and  
16 continued learning as we move forward. So with that, that concludes the staff's  
17 presentation.

18           CHAIRMAN MACFARLANE: Okay. Thank you very much. And let  
19 me compliment all of you. I know you've been doing a lot of hard, focused work  
20 on this, and I think you've been doing an excellent job, so I do appreciate and  
21 value all the work that you guys do. Okay, let's start with questions, and I will  
22 turn it over to Commissioner Apostolakis.

23           COMMISSIONER APOSTOLAKIS: Thank you. Somehow my  
24 questions are all for you, Scott.

25           SCOTT FLANDERS: I thought they might be.

1 [laughter]

2 COMMISSIONER APOSTOLAKIS: You used some key words  
3 here. On Slide 9, you have several findings from the flooding evaluations --  
4 walkdowns -- and only one minor for seismic; that doesn't surprise me. But this  
5 brings up a bigger issue here, and I think it's related to what Mr. Lochbaum said  
6 earlier. Why have we neglected floods and we have paid all this attention to  
7 earthquakes -- deservedly so -- but why have we not done the same with floods  
8 or possibly other external events?

9 SCOTT FLANDERS: Well, first let me start by -- and I heard the  
10 question earlier from Mr. Lochbaum regarding why so many observations we  
11 have for flooding versus -- even though there's routine inspection activities that  
12 continue to go on. First, there are a number of activities that have been identified  
13 in the flooding area prior to these walkdowns. There were issues identified at  
14 various plants related to their flooding -- compliance with their current licensing  
15 basis. That was identified. And the walkdowns also, I think, identified other  
16 issues, in the sense that it was really a first time in which there was a  
17 comprehensive look at all aspects of the flood protection for a particular site.  
18 Usually when we do inspections we focus in on particular systems structure  
19 component modules, and we cycle around, but we don't look at everything at one  
20 time. And that was also -- which was the unique part of these walkdowns. As  
21 well as the -- there were some unique pieces added in. I mentioned briefly in my  
22 presentation the issue of using reasonable simulation, where you would actually  
23 attempt to implement the procedure. And I think in many cases it would identify  
24 where shortcomings in the procedure, the clarity of it in various aspects; so I  
25 think that resulted in identifying more issues.

1 I would also add that if you look at our history, we've had a number  
2 of activities and follow on activities on seismic -- 846, the IPEEE, a lot of these  
3 focus on seismic, and some of the other external hazards, with the exception of  
4 maybe going back a long time in the early '80s, where we had the systematic  
5 evaluation plans, SEP plans. The focus on the unique comprehensive look at  
6 flooding -- and some of the other external hazards -- hasn't necessarily been  
7 done.

8 COMMISSIONER APOSTOLAKIS: Woah, woah, woah, woah. I  
9 only have 10 minutes, guys.

10 [laughter]

11 MIKE JOHNSON: I was just -- I would -- we would be remiss if we  
12 didn't point out that at the end of this, one of the actions that we have is to go  
13 back and look at our procedures, for example, our walkdown procedures, and  
14 ask ourselves the very questions that we're asking -- you know -- why -- to what  
15 extent were we finding those things outside of this effort and to what extent does  
16 that mean we need to adjust the reactor oversight process. So, that will certainly  
17 help.

18 I will also point out that we were able to -- in terms of these  
19 walkdown activities -- focus with a team, with guidance in a concerted way, in the  
20 bright light of Fukushima. And to be quite honest, that helped us find things, and  
21 we benefitted from that. So, I don't want to at all diminish -- we got value as a  
22 result of these walkdown activities, and we'll look to see if there are other things  
23 that we can plow back into the ROP going forward.

24 SCOTT FLANDERS: I should mention that we're generating three  
25 reports as the result of the walkdowns. One is internal -- an early insights report.

1 We're also developing a site-specific report for each of the walkdowns, and then  
2 at the end we are going to develop -- towards this fall -- a comprehensive look at  
3 the results of the walkdowns and the insights that were gained that we would  
4 share and feedback into the ROP process.

5 COMMISSIONER APOSTOLAKIS: Yes, sir.

6 ERIC LEEDS: Thank you, Commissioner. I am going to echo a  
7 little bit about what Mike and Scott said. You know, there were some activities  
8 going on in flooding. You, yourself, I know you visited one of the plants. The  
9 staff had a very significant issue on flooding that we'd started working on before  
10 Fukushima, you know. In our office of Research, Brian Sheron's folks were  
11 working on a generic issue 204, we were looking at dam -- the possibility for  
12 upstream dam failures long before Fukushima. That doesn't absolve us for what  
13 we have, you know, what's gone on in the past. Hindsight is always 20-20.  
14 Could we have done better? Yeah, probably. But I'll go back to Mike's point; we  
15 are forward focused. We are looking at flooding very hard right now, you know,  
16 we're going to -- stress to the staff we can fix it going forward. I can't change  
17 what happened in the past, but we can fix it going forward, and that's where our  
18 emphasis is and that's where our resources are.

19 COMMISSIONER APOSTOLAKIS: On Slide 10, Scott, you say for  
20 flood reevaluations that you are using an integrated risk-informed decision  
21 making process for emergent issues. My understanding is there's no risk  
22 analysis for floods.

23 SCOTT FLANDERS: Yeah, and --

24 COMMISSIONER APOSTOLAKIS: How do you risk inform it?

25 SCOTT FLANDERS: We're not. In my comments maybe I wasn't

1 as clear as I could've been. We're using this particular office procedure as a tool  
2 to help us establish a regulatory footprint for the interim actions. Not so much  
3 that we're using that quantitative risk-informed aspects of it or --

4 COMMISSIONER APOSTOLAKIS: Qualitative risk assessment;  
5 please don't say that.

6 SCOTT FLANDERS: No, we're not using qualitative either. But the  
7 actual office instructions -- the office instruction has a very structured procedure  
8 by which -- how do you go through and walk through decision-making processes,  
9 and also how you would inform and document your decision. And that's the  
10 piece --

11 COMMISSIONER APOSTOLAKIS: And what's the regulatory  
12 footprint?

13 SCOTT FLANDERS: In terms of, for example, interim actions are  
14 put in place. They have some kind of regulatory footprint to assure that they stay  
15 in place while the integrated assessment is completed and finally ultimately once  
16 the NRC makes a decision on whether or not we need to make any changes to  
17 the design --

18 COMMISSIONER APOSTOLAKIS: Does this include your review  
19 of the proposed interim measures?

20 SCOTT FLANDERS: Yes. Yes. That's what this is focused on is  
21 the review of the interim actions.

22 COMMISSIONER APOSTOLAKIS: On Slide 12, you said that the  
23 ground motion model that EPRI is developing, of has developed, has been  
24 approved by the NRC for use. Is that correct?

25 SCOTT FLANDERS: The ground motion model -- the EPRI 2004-



1 2006 model.

2 COMMISSIONER APOSTOLAKIS: Right, that needed some  
3 improvements. But they're doing that now.

4 SCOTT FLANDERS: The other model, we haven't received it yet.  
5 They briefed us on March 26th with a revised model that we believe better  
6 addresses the epistemic uncertainty, and we still have -- they intend to submit  
7 that to us.

8 COMMISSIONER APOSTOLAKIS: The biggest problem, as I  
9 recall, with ground motion was model uncertainty, and you mention epistemic  
10 uncertainty and so on. Do you -- I realize you have not reviewed the latest  
11 version, but do you think that issue can be settled, when it comes to ground  
12 motion?

13 SCOTT FLANDERS: Well, I would say -- I would answer the  
14 question like this: Based on our current knowledge of ground motion and the  
15 various studies, what you want to do is to ensure that your model at least  
16 represents this body and range of the technical defensible interpretations on  
17 ground motion, and in doing so, you want to make sure that you account for that  
18 breadth. And so with the model that they proposed, we believe, appropriately  
19 accounts for the various interpretations and the various different perspectives in  
20 an appropriate way, to actually help us manage our understanding of the  
21 epistemic uncertainty.

22 COMMISSIONER APOSTOLAKIS: So there is no proposed model  
23 that is an outlier or anything like in the old days?

24 SCOTT FLANDERS: Well there are some models that are outliers,  
25 and I think in the course of this process they try to determine how best to account

1 for those models. This is principally an update, and so they use a lot of the new  
2 models that they currently --

3 COMMISSIONER APOSTOLAKIS: I see Mr. Chokshi getting  
4 anxious --

5 NILESH CHOKSHI: I think that, as you mention there, that outlier  
6 like what we had in the past -- we don't see things like that --

7 COMMISSIONER APOSTOLAKIS: Good, good. Now, on Slide 13,  
8 what is the blue line again?

9 SCOTT FLANDERS: Which -- the solid blue line? It represents  
10 new ground motion response spectra.

11 COMMISSIONER APOSTOLAKIS: So, this blue line shows that  
12 there is no problem with a design basis for below 10 hertz?

13 SCOTT FLANDERS: Well if you look at the tail of that blue line --  
14 this picture's awfully small -- but you'll see that the blue line, once you get up  
15 around between 8 to 10 hertz roughly, you start to exceed the safe shut -- the  
16 design basis safe shutdown earthquake. And so the ratio between how much it  
17 exceeds at that point -- at that 8 to 10 point -- is what they use to, the ratio --

18 COMMISSIONER APOSTOLAKIS: They're going to do all this with  
19 the seismic margin analysis just because for this little -- it exceeds the design  
20 basis --

21 SCOTT FLANDERS: And so --

22 COMMISSIONER APOSTOLAKIS: -- around 8 or 9 hertz?

23 SCOTT FLANDERS: So in this case you --

24 COMMISSIONER APOSTOLAKIS: That's a lot.

25 SCOTT FLANDERS: In this case you would do that for two

1 reasons. One, in an expedited approach this allows you to simplify. You  
2 wouldn't have to understand and figure out the in structure response spectra, and  
3 so this would allow you just to use the same in structure response spectra that  
4 you used when you established your original design basis.

5 COMMISSIONER APOSTOLAKIS: How would you do for the  
6 components that are susceptible to failure at higher frequencies? You didn't say  
7 anything about that.

8 SCOTT FLANDERS: Well so for the expedited approach, you  
9 focus on components that are needed for your station blackout, your phase one  
10 of your mitigating strategies. So you're not relying on those higher frequency  
11 components such as relays, et cetera so --

12 COMMISSIONER APOSTOLAKIS: So we do nothing about those?

13 SCOTT FLANDERS: This is for this expedited approach, so you're  
14 assuming you have station blackout conditions. Now, for the actual reevaluated  
15 hazard, there's a whole separate activity and focus on the high frequency. This  
16 is just -- this is an approach and a process that's used strictly for this -- looking at  
17 this expedited approach and looking at this subset of --

18 COMMISSIONER APOSTOLAKIS: I realize it was used. I'm  
19 asking why is it used, but I have --

20 SCOTT FLANDERS: Because the key aspect is that there's  
21 assumption that you're focused on equipment that you're going to need in  
22 situations you have a station blackout and a loss of all ultimate heat sink.

23 COMMISSIONER APOSTOLAKIS: If I look at the --

24 [talking simultaneously]

25 COMMISSIONER APOSTOLAKIS: -- I will say, "I really don't have

1 a problem with my structures, but I do have a problem with the relays and so on.”

2 There’s Nilesh again.

3 [laughter]

4 NILESH CHOKSI: There are two aspects. First of all this should  
5 not be taken as a typical, you know, that this is the case. This is just the one, a  
6 cartoon, because for a softer side in things you will also see accidents is in the  
7 lower frequencies. It just happens to be, you know, one --

8 COMMISSIONER APOSTOLAKIS: It’s an unfortunate example.

9 NILESH CHOKSI: It’s just a -- yeah -- this is not the situation  
10 everywhere.

11 COMMISSIONER APOSTOLAKIS: Thank you, thank you, thank  
12 you.

13 NILESH CHOKSI: Okay.

14 COMMISSIONER APOSTOLAKIS: Back to you.

15 [laughter]

16 CHAIRMAN MACFARLANE: Okay. Over to Commissioner  
17 Magwood

18 COMMISSIONER MAGWOOD: Thank you, Chairman. Just to sort  
19 of -- I appreciate that discussion because I think it didn’t answer the question; so  
20 let me just make sure I have this straight. So because in this particular -- in this  
21 one example, there’s an exceedence of the ground motion response spectra over  
22 between 8 and 10 hertz and the maximum of that exceedence is used -- the ratio  
23 is used to create the dotted line.

24 SCOTT FLANDERS: That’s correct.

25 COMMISSIONER MAGWOOD: And that’s what would be used by

1 this particular plant as a basis for --

2 SCOTT FLANDERS: Evaluating --

3 COMMISSIONER MAGWOOD: Evaluation.

4 SCOTT FLANDERS: Yes.

5 COMMISSIONER MAGWOOD: Interesting. Okay, I hadn't heard  
6 that before.

7 Well, first let me thank Bill for recognizing the contributions of the,  
8 you know, the many participants in this conversation over the last two years.  
9 We've -- there's been a pretty broad discussion within the country, within the  
10 large community, and then also internationally, and I think that's been a very,  
11 very important conversation so I appreciate that Bill mentioned that. Let me also,  
12 you know, thank the staff. Most of the people at this table have been in my office  
13 as we've agonized over these issues over the last two years and had long  
14 conversations and somewhat philosophical conversations, I see Mike sitting  
15 there laughing because we've had long, long conversations on some of these  
16 issues. And I appreciate that because I think it's been -- it's been -- while this  
17 has been very serious business it's been a very rewarding exercise. Because I  
18 think it's demonstrated that the depth of knowledge that's on the staff. I think this  
19 work has really put the staff through its paces and shown what it's capable of, so  
20 I want to recognize that and appreciate that.

21 And I do think that, you know, the JLD has been a very important  
22 mechanism. I think it was very early in the life of the JLD when we recognized it  
23 was being -- it was going to be an effective approach. And it's one that I think  
24 we've encouraged, or at least I've encouraged, that the staff considered use in  
25 other events where there's a need for an immediate focus on very specific

1 issues. And I think it's proven to be a very good mechanism. One I will not use  
2 all the time, but one that you should keep in your back pocket for the future. I  
3 think it's been a very effective approach.

4           Actually I think that you've managed to answer my questions as  
5 you were going through the presentation, so I don't have a lot to add. And I think  
6 Commissioner Apostolakis knocked off one that I did have.

7           One thing I do want to follow up on is dam failure. I did have the  
8 opportunity, as you know, I think, to visit one of the dams that we've spent a lot of  
9 time talking about. And for those who have not visited dams, it's worth walking  
10 along one of them to see exactly how massive these structures are so that -- put  
11 some physical context to the conversation. But as I went through the exercise of  
12 talking to the staff and talking to others about these dam failure issues, I became  
13 more familiar with how much of this does involve other agencies. And it's  
14 apparently a pretty complex dance that we have to go through to arrive at these -  
15 - the staff guidance on dam failures. Can you -- you want to talk a bit more about  
16 that? What -- because -- and whether the staff is satisfied with the direction this  
17 is taking right now, or do you feel that you're being constrained in any way in  
18 these conversations? Just whatever thoughts you have about this.

19           SCOTT FLANDERS: No I think we've had healthy conversations  
20 with the other agencies, principally the Corp of Engineers, Bill Reck, and FERC,  
21 regarding this topic of dam failure; recognizing that their responsibility for dam  
22 safety and the federal guidance that's already been established in that  
23 framework. And so in the context of those discussions, what we're looking at is a  
24 situation where we're trying to analyze pretty unlikely events in terms of dam  
25 failure. And how do you reconcile the assumptions that we want to use in terms

1 of what we expect a nuclear facility to protect against, which would be -- could be  
2 very different than what other facilities would use from the standpoint of  
3 regulating dam safety. And how do you match that? And then the easiest part is  
4 the technical of how you actually do the dam failure analysis. But it's more how  
5 does this fit within the framework, and how can it be communicated to the public  
6 as well, so that they understand how this fits as opposed to the dam safety?

7           MIKE JOHNSON: Thanks, Scott, and Commissioner. And I want  
8 you to know that Bill and I have been engaged with our counterparts in the  
9 federal government at our level actually in terms of making sure that our partners  
10 understand the task that we're up to with respect to the Fukushima lessons  
11 learned; that we recognize our -- the interactions between us and our federal  
12 partners around these issues. In fact, in the session that Bill and I had, one of  
13 the topics that we talked about was information sharing -- and between the  
14 federal partners, but also information sharing with the public, for example,  
15 external stake holders. And so we're working through those issues Scott and  
16 Ken Karwoski, who's a dam safety officer, has been closely engaged. We've  
17 been alert to issues and resolution of those kind of issues that could impede our  
18 progress in moving forward with a constant offer to Scott that we would get  
19 engaged if we need to, but also we would look to engage the Commission should  
20 we need to to make progress.

21           COMMISSIONER MAGWOOD: Just sort of picking at this scab a  
22 little bit further because -- you know, I think Scott said something very important.  
23 And that is that in a lot of these conversations we're dancing around in sort of 10  
24 to the minus 5 space. And I don't think a lot of agencies think about those  
25 issues. So how does that interface work? Would you go to them and say, "Well,

1 you know, once in every 50 thousand years the following thing could happen.”  
2 I’m sure they stare at you across the table wondering what you’re talking about.  
3 So how do you have that conversation?

4 SCOTT FLANDERS: And that’s been the focus of most of our  
5 discussions. I can recall when myself and Dr. Cook went down and met with  
6 what’s called the Interagency Committee on Dam Safety, which is where we get  
7 all the dam regulators together. We went down and met with them and it --

8 [laughter]

9 -- when --

10 COMMISSIONER MAGWOOD: Those dam regulators.

11 SCOTT FLANDERS: I lost my train of thought.

12 [laughter]

13 So when we were interacting that has been the focus. When we  
14 first went down and briefed them and we talked about what we expect nuclear  
15 power plants to protect against; the type of external hazards we expect them to  
16 protect against. And in the cases where we can -- I mean for much of particularly  
17 in the -- area, most of it is deterministic, right? It’s difficult and we’re still trying to  
18 work and we have workshops and try to establish probabilistic approach, but  
19 much of it’s deterministic. But in those cases where we can establish a  
20 probabilistic approach, the values that we use even in seismic in terms of looking  
21 at the seismic hazards are far different than what other agencies have used. And  
22 our use of risk -- I think we’re maybe using it in a regulation in a little more risk  
23 informing than the other agencies. And so that’s been a challenge in terms of the  
24 unlikely events that we would expect a plant to design to versus what other  
25 agencies would believe is an appropriate level to protect against. And that’s



1 been the one issue that we're continually having discussions on. We have a  
2 meeting coming up on May 9th with the other agencies -- where we're getting  
3 together with the other agencies to continue to dialogue on these issues as we  
4 work through the interim guidance. We actually issued that out for public  
5 comment and we're continuing to work with those agencies on this topic.

6           COMMISSIONER MAGWOOD: Thank you. Sounds like fun. Just  
7 one last question for you, Eric. You know, you mentioned I think you or someone  
8 around the table mentioned that the other external hazards are basically being  
9 held in abeyance, as we get through flooding and seismic, and we use lessons  
10 learned from flooding and seismic to evaluate these other things. It seems to me  
11 that there may be some plants where those other external hazards actually  
12 present more of a threat than flooding and seismic. Is that something the staff's  
13 thought about? I mean, for example, you know, obviously, you know, extreme  
14 storms come to mind for some plants. Is this -- how does the staff evaluate this?  
15 Are we just going to wait or are there some other effort to look at these?

16           ERIC LEEDS: Thank you for the question, Commissioner. I've  
17 thought a lot about it because it's certainly one of the major concerns to me as  
18 the director of the Office of Nuclear Reactor Regulation. You know, you think  
19 about Fukushima and the three major learnings -- lot of learnings. But if you take  
20 a look at the three major learnings: power, station black out, external events,  
21 multi-unit events that affect multiple units; three major learnings, external events.  
22 So I've thought a lot about it from the stand point of -- you know, we've been  
23 focused on seismic and flooding because that's what we saw at Fukushima; and  
24 with good reason. And obviously we heard about the walkdowns and that we are  
25 already making safety improvements because we're focusing on those areas. So

1 as a director of the office, makes me think about, "Okay what other hazards are  
2 out there?" You know, what's keeping me up at night, and the two that I'm very,  
3 very concerned about, and I'll throw out at you: tornadoes, hurricanes. You  
4 know, very specific concerns. Is it okay to take our time -- you know, we're  
5 working very hard. We're resource-challenged, you know -- why are we focused  
6 on these two? Why aren't we focused on tornadoes and hurricanes? And I think  
7 back to the operational history that we've seen, and that are -- the plants out  
8 there have been challenged by these external events. In fact hurricanes happen  
9 every year, and I think back to the hurricane Andrew in 1994 which devastated  
10 South Florida, caused billions and billions of dollars' worth of damage. That  
11 passed right over Turkey Point Nuclear Power Plant. The plant was fine. Design  
12 basis, all that. Hurricane Katrina impacted three nuclear power plants. The  
13 public didn't hear about it in the newspapers, you know, they didn't see it on TV  
14 because those plants were fine. We took our actions, those plants took the  
15 actions. In 2011, tornados hit three nuclear power plants. Those plants all came  
16 through those. So that gives me comfort to breathe, and say, "Okay we know  
17 that these things happen, we know that our plants have withstood them in the  
18 past." That doesn't mean that we don't go back and look at it real hard to see  
19 what other learnings there are, and if we need to make any improvements. But I  
20 feel as though I have time to get to those and look at them hard, where flooding  
21 and seismic are certainly areas where -- I think those are the priority. I think they  
22 have been justly prioritized as the first things to focus on. I hope that answered  
23 your question.

24 COMMISSIONER MAGWOOD: No, that's a good answer. I  
25 appreciate that, makes a lot of sense. Just to -- Chairman, before I pass this

1 back to you -- I just wanted to -- I don't know if Mr. Smith is still here from IEMA.  
2 Oh, still back there -- but we were chatting after the last panel, and he reminded  
3 us that Illinois is going through some pretty severe flooding right now. A lot of  
4 people are being affected by that. So I just wanted to, you know, particularly  
5 thank him for taking the time to come out here and talk to us. It's very important  
6 to share your views and particularly given that I'm sure it's a very busy time back  
7 in your shop, and you know, best wishes to your folks and all the people working  
8 to deal with the situation in Illinois. Thank you. Thank you, chairman.

9 CHAIRMAN MACFARLANE: Thank you. Commissioner  
10 Ostendorff.

11 COMMISSIONER OSTENDORFF: Thank you, Chairman. I want  
12 to add my thanks to those of my colleagues, to the group here before us, and the  
13 team members that are around this building and that are not here, for all your  
14 work on the Steering Committee and the JLD. I think it's been very significant,  
15 and I completely agree with the accolades provided by my colleagues to my right.

16 I want to focus, Mike on -- make a couple of comments to you  
17 specifically on the Steering Committee, then ask you a question. But first I want  
18 to just tell you how much I've appreciated your work. I know that when the  
19 Steering Committee started under Marty's leadership, he had a lot of issues to  
20 work with. But I say that I think you've been here about a year now in this  
21 responsibility, and I think even though there's a lot of new things that Marty  
22 started out with, the degree of difficulty has increased since you've taken over,  
23 just because of the natural phase of these kinds of things. So I've appreciated  
24 what you've done. I want to -- as a Commissioner, I've appreciated your efforts  
25 to keep us informed. I think the periodic reports and briefings provided to the

1 Commissioners and our staffs have been very, very helpful. And so as a  
2 consequence to that, I have not been surprised really by anything. And I just  
3 want to tell you that the communication has been significant.

4 I also want to comment on the number of public meetings. I was  
5 looking at the slide -- and I believe, Scott, this is your slide -- where you talked  
6 about, if I understood it correctly, 60 public meetings on flooding and seismic  
7 walkdown and reevaluation. It's just on that one subset of issues. And you know  
8 looking at living our principles of openness, that Bill you've often done very  
9 effectively, I think there's no better manifestation of that than the actual fact of the  
10 number of meetings we've had. You know, I look at my experience in other  
11 agencies and the executive branch, I just want to commend you all for having  
12 lived up to those principles, to engage the public and industry, and people that  
13 may disagree with a lot of the nature of our activities. And I think it's been very  
14 constructive and a very positive example.

15 I also want to comment that Commissioner Svinicki had very  
16 appropriately raised in the first panel, and she has been very consistently doing  
17 this about importance of doing it right the first time and taking the time to get it  
18 right. And I've appreciated her focus in that area, but also the explanations you  
19 have given us as a group on, why are some things taking longer. It is far easier  
20 as we all know to find problems than it is to fix them. And for those that have  
21 operational or running facilities experiences or operation type backgrounds, you  
22 can empathize with that comment, where it's far easier to cast a stone than it is  
23 to actually get there and let's go fix the problem. So I applaud this group in that  
24 and, Eric, you particularly -- your comment made in response to Commissioner  
25 Apostolakis' question on flooding where you acknowledged that, "Hey we're

1 trying to fix problems going forward,” and not trying to apologize for or defend  
2 where the gaps we may have had in certain flooding issues, for instance. But the  
3 constructive approach you’ve taken going forward, I think, is a very key marker  
4 for all of us. So thank you for making that point.

5           So with that precursor, let me ask Mike a question. I asked the first  
6 panel a question about, you know, Tier 1, Tier 2, and Tier 3, kind of where we  
7 are, you and your teammates have taken efforts to look at kind of repackaging  
8 certain things based on new knowledge and the evolutionary process on station  
9 blackout rulemaking as it compares to where mitigation strategies order was, and  
10 industry efforts on FLEX, and Jim Wiggins’ efforts on emergency planning  
11 preparedness area. And so you’ve come back to the Commission to ask us a  
12 couple of times on “Here’s what we think you ought to do” and I think the  
13 Commission’s been very supportive. It may be that those kinds of issues are --  
14 have been dealt with, but do you foresee others areas for looking at either  
15 combining, adding to, or eliminating existing Tier 1, Tier 2, Tier 3 type actions?

16           MIKE JOHNSON: I would say today, I don’t -- I’m not aware of any  
17 additional areas. But our entire focus going forward has been, for example, as  
18 we look to do the Tier 3 items that we’ve laid out in a plan, we’ll first start with  
19 now where are we based on the implementation of the Tier 1 items or the items  
20 that preceded it and to what extent does that obviate the need, for example, for  
21 us to do additional things on Tier 3? So, I mean, I think it’s that focus and  
22 approach of the Steering Committee and the staff as we take on additional items  
23 that enables us to find linkages, to find integration, to avoid if, you will, doing  
24 things twice or duplicating or looking in a siloed way as opposed to looking at  
25 actions in an integrated way as we go forward.

1           COMMISSIONER OSTENDORFF: Okay. Bill, do you want to add  
2 anything to that? Okay. Bill, let me turn to you for a question. I think Mike had  
3 alluded to -- very briefly to international partners and collaboration. You have  
4 done that as well, and you've been representing the agency in a number of  
5 international conferences and discussions in these areas. And so I'll ask you as  
6 a senior leader for the NRC staff, if I look at just the Tier 1 Fukushima action  
7 items, do you see any significant deltas between how we're approaching  
8 corrective actions to address Tier 1, and how other countries are addressing  
9 similar type of actions?

10           BILL BORCHARDT: I don't believe there's any Tier 1 schedule  
11 type activities that any other countries are implementing that we're not. The one  
12 -- the biggest delta that strikes me through all the conversations is we imposed a  
13 lot of requirements as a result of 9/11. That wasn't done around the rest of the  
14 world. So if you look very superficially at what many other countries are doing,  
15 what you find when you analyze it is they're doing some catch-up work. They're  
16 doing some things that we did as a result of 9/11 under the umbrella now of  
17 Fukushima lessons learned that we had already done. So some countries it  
18 looks like they're doing more, but part of that is just catch-up. So if you then look  
19 at what we're doing as a result of Fukushima and what they're doing it matches  
20 up very well I think.

21           COMMISSIONER OSTENDORFF: Any other comments from other  
22 panel members on that, because I know that there's always -- you know, taking  
23 the pulse of what other people are doing as either a peer review or benchmark  
24 type data point is helpful.

25           ERIC LEEDS: We had a bilateral with the DASN specifically just on

1 Fukushima; we spent a day on all the activities that we're doing and did it with  
2 members with the JLD --

3 CHAIRMAN MACFARLANE: DASN is --

4 ERIC LEEDS: Oh, I'm sorry thank you for the -- the French  
5 regulator. Excuse me. Thank you, Chairman. With the French regulator, and it  
6 was very interesting. I think it was very worthwhile. And we talked about where  
7 we -- where each country was, what we're implementing, what the timeframes  
8 are that we're implementing on, and it struck -- a number of items struck me, and  
9 at the end of the day I felt very good about it because some of the items we were  
10 coming at it from a different way, but we were getting to the same technical  
11 standpoint. I'll give you one example. What's so important, having water cool  
12 the core and electricity? The French were coming at it a little differently than we  
13 were, but when it came down to the bottom line, we were both going after the  
14 same issue. So talking it out and hearing about it and spending the time; it made  
15 me feel better about where we are.

16 COMMISSIONER OSTENDORFF: Okay. Any other comments on  
17 that? All right, again, thank you all for your work and service on these areas and  
18 I have no other questions. Thank you, Chairman.

19 CHAIRMAN MACFARLANE: Okay, great. Okay, so I appreciate,  
20 Eric, your discussion on these additional external events, shall we call them;  
21 tornado and hurricanes in particular. I think we have to be mindful that with a  
22 changing climate, I think we need to really reevaluate the frequency and the  
23 strength or energy associated with these events. And just as a reminder, you  
24 know, plants came through earthquakes before Fukushima just fine, right? Or  
25 with some damage in the case Kashiwazaki-Kariwa. But then we had

1 Fukushima, and, you know, you're going to say, "Well there was a tsunami and  
2 that caused the problem," but the tsunami was the direct result of the earthquake.  
3 So have we thought through other external hazards in terms of additional pieces  
4 that may be a problem? So I'm not ready to dismiss -- to feel comfortable that  
5 we haven't dealt with hurricanes and tornadoes yet. I'd like to see us move on  
6 that, but of course I have a bias being an earth scientist.

7           MIKE JOHNSON: Chairman, can I -- one of the points I wanted to  
8 make is as we continue, for example, the new reactor reviews, that's giving us an  
9 opportunity to look at these other external hazards. Again, focused on new  
10 reactors, not yet focused as part of this effort going forward, as Eric explained.  
11 But, for example we, in terms of looking at new reactors, have learned that there  
12 are hurricanes, for example -- for plants that were subject to those hurricanes,  
13 you can get missile generated, wind generated missiles that exceed what you  
14 would get for that plant for example from a tornado. And so we factor that  
15 information and through the work of Research and to guidance that we are  
16 looking at for new reactors. And so we are continuing -- I don't want you to have  
17 the impression that we're not --

18           CHAIRMAN MACFARLANE: [affirmative]

19           MIKE JOHNSON: -- sort of mindless or not being mindful of, if you  
20 will, those other hazards. It's just that with respect to this activity, as Eric  
21 explained, we wanted to start with seismic and flooding.

22           CHAIRMAN MACFARLANE: [affirmative]

23           SCOTT FLANDERS: Just to add to Mike's comments, when we  
24 were looking at the issue of hurricane-generated missiles and the idea that given  
25 the wind profiles from a hurricane you could actually have missiles with higher



1 energy from lower wind speeds than you could from a tornado. We also looked  
2 at tornadoes, and in the sense of what plants were designed to in the past versus  
3 what they're required to be designed to now. And one of the things that's  
4 changed has been the Fujita scale, and now moved to an enhanced Fujita scale,  
5 and the new Fujita scale actually has lowered some of the wind speeds for the  
6 various categories of tornadoes and a lot of the plants were designed to much  
7 higher wind speeds in the past. So for plants who are dominated by tornado we  
8 do have some sense of --

9 CHAIRMAN MACFARLANE: Okay, that's good.

10 SCOTT FLANDERS: -- confidence in that area.

11 CHAIRMAN MACFARLANE: Good.

12 SCOTT FLANDERS: But certainly for hurricane generated  
13 missiles, as Mike said, that's something that we certainly need to look at, and  
14 that we should also look at the tornadoes as well. But that gives us some  
15 confidence along the lines that Eric had mentioned.

16 CHAIRMAN MACFARLANE: Okay. Great. That's helpful. So,  
17 Scott, I'm going to stay with you for just a second. You talked about the staff  
18 allowing extension requests for flood reevaluations. Did the staff deny any  
19 extension request for flood evaluations?

20 SCOTT FLANDERS: So far we have not. We have approved four  
21 of the six plants. Each of the four plants we felt the justification was adequate.  
22 Three of those plants were -- I should say two of the four plants actually included  
23 additional interim actions while they did their evaluation. And one plant's  
24 evaluation is actually due in a few weeks, May 10th. That was very short, but  
25 they also did include interim actions as well. And then for the other two plants --

1 are co-located. The other two plants, the justification for the additional time we  
2 thought was warranted to ensure they have a more robust analysis, and that they  
3 had demonstrated in the past their readiness to deal with their most principal  
4 issue which, would likely be a storm surge, and their ability to prepare for that.  
5 So we felt that there was adequate justification to take the additional time which,  
6 would essentially -- the risk would be highest in the hurricane season for that  
7 plant.

8 CHAIRMAN MACFARLANE: Okay. So another question for you.  
9 So in the seismic hazard development. So what's happening is an update of the  
10 EPRI 2004/2006 model that's being used for these current hazard reevaluations.  
11 But as you mentioned today, there's a more robust complete analysis in progress  
12 called the NGA East Model.

13 SCOTT FLANDERS: Yes.

14 CHAIRMAN MACFARLANE: Right? And that's not expected to be  
15 done until 2015.

16 SCOTT FLANDERS: Yes. That's correct.

17 CHAIRMAN MACFARLANE: Do we have adequate resources to  
18 make sure that that is complete?

19 SCOTT FLANDERS: So that is a project that's being funded by  
20 three organizations; we're working jointly with EPRI and the Department of  
21 Energy. And I could turn to our colleagues from Research, our lead in that, but  
22 based on our discussions with our colleagues in Research, for projects like that  
23 there always tends to be challenges around funding. I don't know the current  
24 situation as a result of the most recent budget processes, but we can see if  
25 there's any. I looked at Dr. Ake; he's actually leading that project for the NRC.

1 JON AKE: Jon Ake from the Office of Research. Yeah, we are  
2 experiencing some challenges with funding for that project as we move forward.  
3 The --

4 CHAIRMAN MACFARLANE: It seems to me it's pretty important to  
5 complete.

6 JON AKE: Yeah, the scope --

7 CHAIRMAN MACFARLANE: We update our information and we  
8 don't continue to operate on more than 10-year old data, right?

9 JON AKE: Right. The scope of the -- for the Eastern U.S. plants  
10 much of the data, if you will, will actually be provided by simulations --

11 CHAIRMAN MACFARLANE: Yeah.

12 JON AKE: -- and development of the simulation platform is more  
13 complex than we perhaps thought initially, but the other thing that -- we think we  
14 have funding in place for that level of effort at this point in time. The part of the  
15 project we foresee a potential funding shortfall, based on prior experience and  
16 multiple projects like this, is the documentation phase.

17 CHAIRMAN MACFARLANE: Okay.

18 JON AKE: As scientists we like to do the calculations. We aren't  
19 so good at sitting down and writing things up at the end and --

20 CHAIRMAN MACFARLANE: But we have to get better at that, but  
21 I'd like to see this well supported and moving forward.

22 JON AKE: That's the part of this project -- of all these projects  
23 that's run over is documentation.

24 CHAIRMAN MACFARLANE: Okay. Thanks, Jon.

25 MIKE JOHNSON: Thanks, Chairman. And can I add also we're --

1 make note of your concern and we agree certainly. There is also a Tier 3 item  
2 that looks at the periodic reevaluation

3 CHAIRMAN MACFARLANE: Yes I know. It's very important.

4 MIKE JOHNSON: And so -- it's very important and we'll focus on  
5 that also, because we know that there will be continual evolution and models, we  
6 want to have a process to look at what we learned about the hazard, and to what  
7 extent we need to make changes in the plants with respect for that.

8 CHAIRMAN MACFARLANE: Okay, let's move to a totally different  
9 topic in the small time remaining, and talk about this wet well versus dry well, the  
10 implementation, and can you explain the problem here?

11 ERIC LEEDS: If you don't mind, I'd like to ask Dr. Jennifer Uhle to  
12 come to the podium there; she's the manager that's leading our effort on this,  
13 please. Thank you, Jennifer.

14 JENNIFER UHLE: Hi. Good morning. Yeah, there's really -- we're  
15 in the process of getting information from the industry. They have - we've had  
16 several public meeting where we've narrowed down the -- I would say the areas  
17 where there is not agreement, and primarily just to simplify things, it really boils  
18 down to whether or not the wet well vent, under all -- or under the severe  
19 accident conditions including the addition of water into the containment, whether  
20 or not the wet well vent can continue to depressurize the containment system.

21 CHAIRMAN MACFARLANE: And if it can't, then we need a dry  
22 well then.

23 JENNIFER UHLE: That's right, that is our position.

24 CHAIRMAN MACFARLANE: That can operate under accident  
25 conditions.

1 JENNIFER UHLE: So at this stage, the industry has calculations  
2 as well as analyses, and the industry claim is that they would demonstrate that  
3 the wet well vent would be operable under all conditions. Yes, under these  
4 conditions, and the staff needs to look at that. I think the staff view is that there's  
5 uncertainty associated with these analyses, and that it boils down --

6 CHAIRMAN MACFARLANE: Significant uncertainty?

7 JENNIFER UHLE: I believe the staff feels like there's adequate  
8 uncertainty that would require a dry well vent. The industry believes this  
9 uncertainty is not to the level which would require a dry well vent, so we have  
10 information coming in, and I'm trying to look at some of the industry leaders here  
11 and say you really need to provide that information, so --

12 CHAIRMAN MACFARLANE: As quickly as possible.

13 JENNIFER UHLE: -- we have a deadline with regard to the order,  
14 and that information would then be analyzed and we'd make a recommendation  
15 to the Steering Committee.

16 CHAIRMAN MACFARLANE: Thanks for that encouragement,  
17 Jennifer.

18 DAVE SKEEN: If I could just add, Chairman, we have been  
19 working with the industry on this and we recognize the deadlines out there on the  
20 order. Certainly they're going to provide some information, we plan on having a  
21 public meeting Thursday afternoon to talk more about where the differences are  
22 in the staff and the industry, but we still plan on getting the order out in the 60-  
23 day timeframe.

24 CHAIRMAN MACFARLANE: Okay, and in the 12 seconds  
25 remaining to me, we haven't had an opportunity to go into detail about this, but I

1 think it's important to make it clear to the public exactly what we're going to be  
2 doing going forward with the filtering strategies.

3 MIKE JOHNSON: Going forward with the filtering strategies, the  
4 Commission's given us direction to undertake a rulemaking to develop those  
5 either filtering strategies or an engineering filtered vent, so we'll enter that  
6 process. We'll lay out the specific plans to accomplish that, in accordance with  
7 the Commission's directions.

8 CHAIRMAN MACFARLANE: So when will we get specific plans?

9 MIKE JOHNSON: I don't have -- Dave, do you have the details?

10 DAVE SKEEN: The way the paper that the SRM -- the staff  
11 requirements memorandum came back from the Commission, was to give us a  
12 year to do the regulatory basis for a rulemaking, and so we'll be having those  
13 public meetings as we're developing that; so again, we'll engage the  
14 stakeholders on that. A slight problem right now is we're trying to get this order  
15 out in the 60-day time frame, that's a lot of the same folks who'll be working on  
16 the regulatory basis piece too; so, as soon as we get the order out, we'll start  
17 working on that, and we'll be setting up the public meetings to work through that.

18 CHAIRMAN MACFARLANE: Okay, thanks. Commissioner  
19 Svinicki.

20 COMMISSIONER SVINICKI: Well, I just will join in thanking all of  
21 you for your presentations, and certainly the hard work of all the staff that you  
22 represent here today; I know that as impressive as the five of you are, you didn't  
23 do this all by yourselves, so I want to recognize. And what's interesting about -- I  
24 was trying to think about the principal offices to be acknowledged, and I really  
25 realized that it was really every office, it's even, it's Office of General Counsel,

1 Commission Appellate Adjudication, and all of our corporate and administrative  
2 functions that make possible webcasting all these public meetings and things like  
3 that; so it's been a whole of the agency, I think, a call to really support these  
4 activities. So I realize that I couldn't even single out a few; that wouldn't be  
5 appropriate. So I want to thank everyone for their hard work, and again, just  
6 rising to the occasion on that.

7           But again, the other thing I appreciate that Commissioner  
8 Ostendorff mentioned, we hear from the staff panel and it might look like we don't  
9 have as many specific questions as we did for the external parties. That's  
10 because there isn't a day that goes by that something related to Fukushima  
11 doesn't -- either isn't published by the agency, or crosses my desk somehow, and  
12 there isn't a week that goes by that I don't meet with you and your staffs on the  
13 various activities that you've provided an update on today. Nevertheless, these  
14 public sessions, as the Chairman mentioned, we had one maybe eight months  
15 ago, these are important because we have constant dialogue about it, but that  
16 doesn't mean that the broader audience and the public gets this kind of concise  
17 overview of where we stand today, so I think that it's important for us to convene  
18 and hold these Commission or public -- the Commission needs to convene  
19 publicly on these topics as well.

20           I did just have a couple of questions on -- I know it was either Mike  
21 or Eric, you discussed how the -- how we are -- as we address additional issues  
22 we are incorporating in considering the actions that were already taken. A  
23 specific example that was given is the Tier 3 item on hydrogen control and  
24 mitigation may, you know, possibly be resolved by containment venting, and our  
25 action there. My question wasn't about how those things are connected, which I

1 understand it was. How would we enshrine that evaluation then if we have Tier 3  
2 item, and it turns out that at the end of the day, we've assessed it, and it doesn't  
3 in and of itself generate a regulatory response, but the response was in other  
4 actions that we took? But how would we, for purposes of posterity, collect that in  
5 some sort of package, so that in the future, people would know how we  
6 dispositioned every item?

7           MIKE JOHNSON: I haven't, Commissioner, talked about those --  
8 that specific process in detail with the Steering committee; although it occurred to  
9 us that one of the things we want to do is have that answer before we talk about,  
10 if you will, sunseting the Steering Committee. But my vision would be that we  
11 would disposition each one of the Tier 3 items. There would be some document  
12 written that captures the staff's consideration moving forward so that would be  
13 clear years from now how that item was dealt with by the agency in terms of its  
14 consideration.

15           COMMISSIONER SVINICKI: Okay. I think -- I think, again, it's  
16 helpful I think that's obvious from my asking the question about it, but even if it's  
17 pointers to where further analysis was done in other issues, I think that having  
18 that kind of a -- something that substantiates. It's just as important, I think, for us  
19 to substantiate why we didn't act on something as why we are acting on  
20 something -- so think for completeness. And again, so it sounds like the staff will  
21 have further discussion on how it is that you're going to do that. But the notion of  
22 doing it, it sounds -- getting a lot of head nods here. It's obviously part of your  
23 dialogue.

24           And then the other question that I had was, may seem a little bit  
25 unrelated to this topic, but under the rubric of the International Atomic Energy



1 Agency, regulators such as in the United States have undergone an integrated  
2 regulatory review system, review the U.S. -- the United States, but really, the  
3 USNRC, we had a team in to review our regulatory framework pre-Fukushima.  
4 But I know that many of our senior experts participate in teams that are reviewing  
5 other countries; we also have senior leaders at USNRC who have led the review  
6 teams for other countries' regulatory agencies. How is that -- well, and the other  
7 thing is that most countries, and I think the U.S. will have, although I'm unsure of  
8 the year, we will have a follow-up review, which is when the team comes in to  
9 see what you've done after the review. How is Fukushima being handled, either  
10 for initial reviews or follow-up reviews?

11 BILL BORCHARDT: It's every mission that the International Atomic  
12 Energy Agency does under the integrated regulatory review service -- has now a  
13 Fukushima module, as they call it, so there is a section of the report that focuses  
14 on Fukushima lessons learned. In addition, the IAEA has initiated an action plan  
15 that reports to the Director General Amano, and that will document internationally  
16 all the actions that are being taken by the regulatory bodies and the industries  
17 across I think it's a dozen or so specific kind of themes or topic areas.

18 COMMISSIONER SVINICKI: So how specifically, again, for a  
19 country like ours where, the Fukushima had not occurred at the time of the initial  
20 review, a follow-up is supposed to be just that, a follow-up, will we have this new  
21 module on Fukushima done at the time of the United States follow-up, or is that  
22 undetermined at this time?

23 BILL BORCHARDT: Well, the way the process works is the host  
24 nation, the United States, in the case when they come here, defines what they  
25 want to have reviewed. That's how we focused the review we had a few years

1 ago on the reactor program. A full scope mission by the IAEA, looks at materials,  
2 reactors, all different things. But, I cannot anticipate that we wouldn't have  
3 Fukushima follow-up included in our follow-up mission. Even though it would be  
4 a new area, just because that is what's being done in every other country that's  
5 having a mission.

6 COMMISSIONER SVINICKI: Okay, and I believe that you're  
7 leading a mission this fall --

8 BILL BORCHARDT: To the U.K.

9 COMMISSIONER SVINICKI: They set up, is that a follow-up?

10 BILL BORCHARDT: It is. But it'll also have Fukushima.

11 COMMISSIONER SVINICKI: Okay. All right. Thank you, thank  
12 you Chairman.

13 CHAIRMAN MACFARLANE: Any follow-up questions? No? All  
14 right, well, I thank you all very much. I thank the previous panel as well. I think  
15 this was a very interesting and rewarding morning, and I wish you well. Thank  
16 you. Adjourned.

17 [Whereupon, the proceedings were concluded]