

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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

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TUESDAY,

NOVEMBER 17, 2015

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ROCKVILLE, MARYLAND

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The Commission convened in the Commissioners Hearing Room at the Nuclear Regulatory Commission, One White Flint North, 11555 Rockville Pike, at 9:00 a.m., Stephen G. Burns, Chairman, presiding.

COMMISSION MEMBERS:

STEPHEN G. BURNS, Chairman

KRISTINE L. SVINICKI

WILLIAM C. OSTENDORFF

JEFF BARAN

ALSO PRESENT:

ANNETTE L. VIETTI-COOK, Secretary of the
Commission

MARGARET M. DOANE, General Counsel

EXTERNAL PANEL:

RANDALL K. EDINGTON, Executive Vice President

Nuclear and Chief Nuclear Officer, Arizona
Public Service Company, Palo Verde Nuclear
Generating Station

ANTHONY PIETRANGELO, Chief Nuclear Officer, Nuclear
Energy Institute

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

NRC STAFF:

VICTOR McCREE, Executive Director for Operations

MIKE JOHNSON, Deputy Executive Director for Reactor
and Preparedness Programs and Fukushima
Steering Committee Chairman

BILL DEAN, Office of Nuclear Reactor Regulation

JACK DAVIS, Director, Japan Lessons Learned Division

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

9:03 a.m.

CHAIRMAN BURNS: Good morning everyone.

Before we begin, I'd like to take a brief moment to acknowledge our solidarity with the French people.

In the face of the attacks in Paris last week, we have strong historic ties in this country to France and, indeed, I think our emergence as a nation owes no small debt to the support of France during our revolution.

And, I want to extend our support and our thoughts and to our friends and colleagues both at the EOCED Nuclear Energy Agency where I was employed for about three years, but also our colleagues at the French regulator, the Autorité de Sûreté Nucléaire, the ASN, with whom we mutually explore ways to achieve effective regulation to ensure public health and safety.

Nous sommes avec vous, nous sommes unis. We are with you, we are united.

With that, I'd like to welcome our panelists today to today's meeting to discuss the actions taken in response to lessons learned from the Fukushima Dai-ichi accident and plans for resolving open Tier 2 and 3 recommendations.

As you know, the Commission has these proposed plans before it. It is a voting matter and today's discussion will aid in our deliberations, particularly on SECY-15-0137 which is publically available and on our website.

And, we'll have presentations from an external panel,

1 first with Randall Edington, Executive Vice President and Chief Nuclear
2 Officer from the Arizona Public Service Company, Palo Verde Nuclear
3 Generating Station.

4 Tony Pietrangelo, the Chief Nuclear Officer of Nuclear
5 Energy Institute.

6 Then, David Lochbaum, the Director of the Nuclear
7 Safety Project, Union of Concerned Scientists. And, following that
8 panel, we'll have a brief break and then hear from the staff.

9 And, before we begin, would any of my fellow
10 Commissioners like to say anything?

11 COMMISSIONER SVINICKI: Thank you, Mr.
12 Chairman.

13 And, certainly, I associate myself fully with your
14 message to the country and the people of France, a deep, deep ally of
15 ours going back throughout the history of both of our Republics.

16 On the topic of today's meeting, I think it is appropriate
17 and valuable that we continue to shine a light on the work that has been
18 done, both at NRC and among the industry.

19 Having visited two plants late last week, it is very
20 visible and apparent to see the FLEX equipment and other changes
21 that are a result of the regulatory action that we've taken as an agency.

22 So, I think it is good that we intermittently have this
23 opportunity to engage our own staff and to hear from external
24 stakeholders in the industry.

25 Thank you.

26 CHAIRMAN BURNS: Thank you.

1 Okay, I think Mr. Edington, you're up first.

2 MR. EDINGTON: Well, thank you. I appreciate the
3 opportunity to speak on behalf of the industry.

4 I will talk some about some of the deltas or differences
5 that we have learned through the research as we've looked. And,
6 that's not for talking about one way or it's better, but to ensure that we
7 focus on the appropriate learnings, that we use our strengths
8 appropriately where possible.

9 Let's see where we got on slides. I'm blind, I don't
10 know where the slides are. There they go. All right, next slide,
11 please? And one more?

12 Just a quick reminder, on March 11, 2011 at 14:46 in
13 the afternoon, a 9.0 earthquake that was east of Japan and these three
14 nuclear stations were affected, Dai-ichi, Daini and Onagawa.

15 The earthquake was 9.0 which was the largest in
16 Japan and, I believe, reported the fifth largest in the world on the record.
17 And, it emphasized the robust designs of our plants. Those plants did
18 automatically trip as per design and there were some transmission and
19 switch yard problems and loss of offsite power.

20 Next slide, please?

21 More importantly is the -- one more, yes -- the east --
22 the subduction zone faults on east side of Japan generated a large
23 tsunami, multiple tsunamis actually, and the tsunami warning was as
24 much as three minutes after the earthquake, so the site, you could
25 imagine, the sites already has a tsunami warning.

26 Forty-one minutes after that, the first tsunami wave hit

1 which was at design basis. Over the next 14 or 15 minutes, another
2 five or six, one we know somewhere in the 46 to 49 feet which did do
3 the damage at the plant.

4 Next? Next slide, please?

5 This just represents the tsunami. If you look at the
6 black, that's the largest and then you work on -- there's a scale at the
7 top, you move into the red and the purple and you see the size of the
8 tsunamis that affected the entire coast and certainly did damage up and
9 down the coast of Japan.

10 Next slide, please?

11 This represents the site and these are, going from right
12 to left, you know, one, two, three and four, Unit 5 and 6 is off the picture
13 to the right. They were at a slightly higher level and they were also in
14 refueling. Unit 4 was also in refueling and Unit 1, 2 and 3 were
15 operating at the time of the tsunami and the earthquake.

16 Something that, again, a point that I'd like to make is
17 first the robust designs of our plants for seismic. Yes, there were some
18 switch yard damage and all that, but even though we've seen lots of
19 design or earthquake, we've never seen something that challenges the
20 actual safety of the plant. So, there can be impact but we're aware of
21 the robust designs of our plants, well above design basis.

22 Another key area is operational focus. So, when this
23 happened, Unit 1 which had an isolation condenser immediately had
24 lost its isolation condenser and did not have the ultimate cooling.

25 That's one of the things I'm going to point out is
26 operational focus in our industry in the U.S. is extreme due to our

1 training and our nature and the areas we did.

2 And then, almost 24 hours later, was the hydrogen
3 explosion on Unit 1 which complicated everything. And, in fact, a lot of
4 people don't realize that there were portable generators just got hooked
5 up, were ready to -- and power when that explosion happened and this
6 completely changed the situation.

7 Next slide, please?

8 Of course, the tsunami hitting the site -- next slide,
9 please -- and then this is the damage and this is Unit 4 and 3. Unit 4,
10 again, this damage was from a common power or common line coming
11 out of Unit 3, not from Unit 4 itself that created the hydrogen explosion.

12 Next slide, please?

13 So, one of the other areas that I would emphasize is
14 our industry unity in the U.S. is unbelievable. It has been built for
15 many, many years. This, we always knew it and this brought it even
16 more into play.

17 And, if you look at our common training and our
18 licensing, the areas we've done within INPO, our industry is so united,
19 although we are competing companies, we are very united in safety and
20 all our training, sharing of resources, et cetera.

21 When we first got together, we were first working on
22 what was happening, trying to understand the events so we can react to
23 it appropriately. We were on phone calls immediately. We met very
24 soon with a group of CNOs and established the way forward and
25 started the Fukushima Steering Committee.

26 And, of course, the NRC shortly thereafter also

1 established a Fukushima Steering Committee for all of us to make sure
2 that we were learning and moving forward.

3 There were some initial discussions on -- and I'll just
4 use my site -- tsunamis aren't going to happen in Arizona. You know,
5 we have a low seismic area. But, we immediately said that's not where
6 we want to go. We want to go as an industry together and we want to
7 give our operators, our field people tools to operate no matter what
8 happens.

9 So, we made an assumption that there was damage to
10 our plant. We don't care what initiated it because we couldn't spend a
11 lot of time arguing that this would not happen at my site. We have only
12 about 18 plants that are on the coast out of the 100 plants. So, you
13 know, if you wanted to, you could have said tsunami doesn't apply.

14 But, what we said is this happened. We don't care
15 how it happened. You're going to develop the tools as an industry and
16 move forward. And, we worked, of course, in conjunction with the
17 NRC to do that.

18 That was our biggest focus. We established that
19 steering committee. That steering committee is still active today. I
20 am a member of that steering committee and we would -- we do have a
21 sunset clause.

22 And, when I talk about the industry, I'm talking about
23 the utilities, INPO, NEI, EPRI and the Owners Group. We're all united
24 together and moving together under this group.

25 Next slide, please?

26 Significant lessons learned, natural vents, and again,

1 I'll go back to tsunami first and foremost and then fast flooding. After
2 that, we move to I'll call it slow flooding that inundates the sites for a
3 long period of time and then pretty much everything else.

4 And, there's big gaps between those. So, the tsunami
5 and the fast flooding is the biggest lessons learned from an extreme
6 natural event.

7 Technical differences, whether it's a BWR or PWR, it
8 could be the geographical location, it could be age. And, as we've
9 continued to learn, it's sometimes the upgrades that you put in the plant
10 and we were surprised sometimes when we got into Japan and saw
11 some of the upgrades that we had done at our sites that did not get
12 done worldwide. And, of course, we worked with WANO to try to
13 strengthen that area.

14 And then, finally, organizational and cultural aspect.
15 But, again, this is not saying anyone's right or wrong, this is saying
16 these are what we have. I'll, again, emphasize, the U.S. industry and
17 it's huge operational focus and actual training, the way we train together
18 is a key part of that.

19 We have this industry unity that is unbelievable strong
20 and that, again, we take for granted because we think that's the way it
21 is. But the more we get out in other industries, if you look at the
22 Deepwater Horizon oil well explosion in the Gulf, you would think there
23 was only one oil company in the world at the time. When we work, we
24 work together and we work constantly together.

25 And, the common ground from our training, our
26 regulatory backgrounds, it's very common throughout the U.S. and very

1 strong.

2 Next slide, please? One more time, please? And
3 once more?

4 So, basically, we set out to establish FLEX. So, that
5 was something that early on when we quit worrying about what
6 happened and said let's start putting our fixes in, then we came up to
7 this FLEX concept. And, at the time, we were talking a regional
8 SAFER center which changed to a national center later.

9 And, we set out after this concept of FLEX, a few years
10 later when we were touring Japan as Chief Nuclear Officers and we
11 went to Daini, not Dai-ichi but Daini, this really came to play and
12 strengthened our belief in this area that this is absolutely the right thing
13 to do.

14 So, at Daini, with a little bit of an operational focus and
15 some tools, they were able to protect that site, even though there was
16 extensive damage there, too.

17 So, the FLEX, if you see our emphasis, though it
18 prevention of fuel damage. So, all our efforts was put in FLEX, give
19 our operators more tools, strengthen our area to prevent fuel damage.

20 Next, please? Again? And, go ahead and circle the
21 four.

22 All right, so, just to emphasize, we have not ignored
23 design basis or black out, emergency plans, they've done upgrades in
24 all of those areas. And, SAMGs, of course, was an immediate
25 upgrades and a lot more working on now.

26 And SAMGs, of Severe Accident Management

1 Guidelines, is based on after fuel damage.

2 Now, the SAFER center, I have put in there and it's
3 kind of interesting that we use the SAFER center before and we know
4 we can use a lot of this equipment and FLEX equipment after and we're
5 focusing on SAMGs at this time now that we have the FLEX essentially.
6 It'll take another year to finish completely.

7 So, that's the concept that we had. That's what we've
8 implemented or in the middle of finishing implementing as we go
9 forward.

10 Next, please?

11 Our onsite FLEX equipment, beyond design basis, and
12 the emphasis there is this is beyond design basis and we need to keep
13 it functionally capable, not hold it to the same standard we did before,
14 but this extra equipment on top.

15 Next, please?

16 You see our common equipment. A couple of
17 messages there is common connections. So the connections of data
18 equipment, whether it's FLEX at the site or at the SAFER center can be
19 connected at any plant in the U.S.

20 What you may not know is all that equipment has
21 common placards. We have hard cards, operating, same font, same
22 type. So, if you go from one piece of equipment to another at any
23 plant, you might not have been trained on that specific piece of
24 equipment but you were trained functionally and you have the same
25 procedures. We even have a writer's guide for all of this. So, all of
26 the industry has moved together to do that.

1 Next slide, please?

2 This is very important in that we already had our
3 emergency planning. Of course, the NRC has upgraded theirs. The
4 sites upgraded theirs. But, one key area is we added the Industry
5 Response Center at INPO. We always had this agreement, but now
6 we have more capability and basically, that's to coordinate the 60 sites
7 to provide support to each other. It's all preplanned. We've already
8 signed contracts. We agree to resources people, et cetera, to help
9 each other in any event.

10 Next slide, please?

11 The national SAFER centers, we work on them
12 regional. But, we realized basically from a coping viewpoint, very little
13 equipment is needed. It's basically redundancy and recovery now and
14 it's capable of providing across the industry and, again, common
15 electrical, technical connections and training and placards.

16 Next slide, please?

17 It's very important to international lessons learned, we
18 have spent quite a bit of time working and a lot of people don't realize, I
19 went over in 2012 on the Pressurized Reactor Owners Group. All of
20 the chief nuclear officers in the U.S. went over in September of 2013.
21 All the Japanese chief nuclear officers came to Arizona in an industry
22 meeting in October 2014 and, just last September, just a few months
23 ago, all new chief nuclear officers have gone over. I was on that trip
24 also.

25 Every chief nuclear officer in the United States but two
26 has been there and many of them that are up and coming have been

1 there. And, that's part of our orientation process and we will continue it
2 at least a few more years to ensure that, as part of a CNO, that you're
3 looking at the industry as a whole.

4 So, last slide, please?

5 So, Fukushima, well, Fukushima is still a continuing
6 area. They are still generating brown water and building tanks and
7 we've got to get to the point where we're processing the water and
8 releasing it.

9 In some areas, it's the knowledge and training when
10 we get into things like flooding and seismic, one of the things is we had
11 a lot of deep, narrow knowledge on flooding and seismic. We have a
12 lot of industry turnover. So, this knowledge and training transfer
13 happened.

14 But, we also integrated that knowledge. We have a
15 much broader knowledge. It's in our e-plans. So, we have a lot of
16 people now that understand the importance of flooding and seismic
17 where before, we had a very localized deep knowledge based and I
18 think that leaves us in a much better condition.

19 We set out as an industry to provide tools for our
20 operators in our industry and I think we've done that with FLEX. We
21 want to remind everybody beyond design basis and functional
22 capabilities.

23 And, finally, with the emphasis of putting FLEX in which
24 most plants are in now by the end of this year, we'll have almost
25 everybody will be a few minor exceptions, they'll be 98 percent done, if
26 you would.

1 We feel like we've taken an already safe industry and
2 made it safer and I'm quite proud of the efforts that we've done as an
3 industry to improve the safety of these plants.

4 That's all I have, thank you.

5 CHAIRMAN BURNS: Okay, thank you.

6 Mr. Pietrangelo?

7 MR. PIETRANGELO: Mr. Chairman, Commissioners,
8 good morning.

9 I just want to commend the Commission for its continue
10 interest and oversight in the Fukushima response.

11 We spent a lot of time on it. The Agency spent a lot of
12 time on it. One of my main messages today is that we're not done yet.
13 There's an awful lot of work that continues to be done in the field and at
14 the Agency here. And, we're kind of at a point where I think it's nature
15 to exhale on the work that's been accomplished thus far.

16 But, I'll give you some examples later about things that
17 we exhaled before and then ran into trouble in the implementation
18 space. So, we've got to continue the vigor of oversight and
19 implementation on this issue.

20 Next slide, please?

21 There has been a lot of progress and I don't want to
22 understate that. As Randy said, FLEX implementation continues
23 across the industry. We've got about two-thirds of the plant through
24 FLEX by the end of this year and the remaining third next year.

25 We're on schedule on the guidance development for
26 the mitigating strategies assessments that will be conducted in 2016.

1 About half the plant have gotten their good enough letter on the flood
2 levels to use with these mitigating strategies assessments.

3 We've got the guidance out now for comment on how
4 to do that MSA and for the seismic issue, I think we're targeting the end
5 of March to have that guidance approved by the NRC.

6 So, we're on schedule for the mitigating strategies
7 assessments.

8 I also want to compliment the extensive work and a
9 major part of this briefing today on the remaining Tier 2 and Tier 3
10 recommendations. Most of the focus has been on Tier 1 thus far, but
11 there have been a lot of people behind the scenes. I think working
12 these Tier 2 and Tier 3 issues and I think you'll hear today the amount of
13 progress that's been accomplished there.

14 Next slide?

15 So, on the Tier 2 and 3 recommendation plans, I could
16 just think it's an excellent example of how the staff has worked in an
17 integrated manner to use work in one area to help disposition issues
18 and determine what needs to be done in other areas.

19 Several of the activities that were in Tiers 2 and 3 at the
20 outset were actually brought forward and moved into Tier 1. For
21 example, the spent fuel pool and emergency planning
22 sub-recommendations were moved into Tier 1 and those have basically
23 been completed or will be completed by the end of 2016.

24 As I said, technical work on related activities like the
25 CPRR, Containment Protection and Release Reduction rulemaking,
26 that basis was used to disposition some of the proposed

1 recommendations you'll get today as well as some of the technical work
2 done on the mitigating beyond design basis events rules.

3 So, that's I think a good example of taking work in one
4 area, using it in another and not having to redo things that have already
5 been addressed in other areas.

6 There's been a high degree of technical rigor in these
7 activities and a number of public meetings, both technical as well as
8 oversight, through the different steering committees. So, I have
9 nothing but respect for what's been thus far and the progress that's
10 been made on the Tier 2 and 3 plans.

11 Next slide?

12 However, considerable work remains. So, we've got
13 to get through FLEX implementation. And, as I said, we're about
14 two-thirds of the way done.

15 We just got the proposed rule out on the mitigating
16 beyond design basis events rulemaking. We'll be getting our
17 comments in by the February date. And then, there's work that the
18 staff's going to have to do to address those comments and get the final
19 rule of the commission by the end of next year.

20 As I mentioned, we're finalizing the guidance on the
21 flooding and seismic mitigating strategies assessment. We have to
22 have to that guidance approved by the staff so that we can go forward in
23 2016 and conduct those.

24 So, we'll be using the balance of 2016 to do those
25 MSAs and there's a handoff back to the NRC staff on reviewing the
26 results of those MSAs. We can't lose sight of that.

1 So, a lot of work on the table as we go forward.

2 Next slide?

3 Challenges, I think as we said at previous Commission
4 briefings, the mitigating strategies beyond -- mitigating beyond design
5 basis event rulemaking is really a new piece of the regulatory
6 framework that addresses beyond design basis events.

7 Hundreds, literally almost thousands of new people,
8 new sets of eyes will be in this area for the first time. And, it reminded
9 me of an experience from about 20, 25 years ago with Maintenance
10 Rule implementation, Chairman Burns, you're the only one at the table
11 who was in the Agency at the time.

12 But my recollection is we got five years to implement
13 the Maintenance Rule. It was promulgated in 1991 and the effective
14 date was 1996. So, we had multiple industry task forces much like
15 we've had on Fukushima, lots of interaction with the staff, pilot
16 programs, audits. It was the first risk-informed performance-based
17 rule.

18 This is the first beyond design basis rule. So, you
19 would have thought with five years of implementation experience and a
20 lot of interaction with the staff, we'd be on the same page when we went
21 to the field and did the inspection, the baseline inspections as part of
22 the Maintenance Rule.

23 On average, each site got about four Level IV
24 violations at the time. A lot of scope questions, interpretation issues,
25 continued meetings going forward. I think we eventually formed a
26 panel to field frequently asked questions from the field.

1 But, even with that much implementation time, we still
2 had differences in implementation. So, I'm not -- I really don't want to
3 repeat that experience as an industry. We've put a lot of work into the
4 implementation of FLEX as well as all the other things we've been
5 required to do by the Agency.

6 So, my message is, we need to maintain that tech
7 oversight. I would highly recommend a panel that maintains the
8 expertise that's been developed over the last several years in putting
9 together this plan such that there will be questions that come out of the
10 field to get these dispositioned quickly so that we can get them any
11 changes required out to the field and the implementation will go
12 smoothly.

13 Final slide?

14 So again, there's a lot to be proud of in terms of the
15 work both at the Agency and Randy detailed all of the work that the
16 industry's done. But, this is not the time to exhale. Okay? We're not
17 going to sunset our steering committee this year, maybe at the end of
18 next year when we get through implementation of the FLEX at every
19 site.

20 As I said, there's a lot of work that remain on the table,
21 both for the Agency and the industry and we've got to continue this
22 oversight to ensure the successful implementation of all the things
23 we've put in place.

24 Thank you.

25 CHAIRMAN BURNS: Thanks.

26 Mr. Lochbaum?

1 MR. LOCHBAUM: Thank you and good morning.

2 Thank you for this opportunity to share our views on
3 this important topic.

4 Slide 2, please?

5 My comments today will focus on these portions of the
6 NRC's overall slate of Fukushima lessons learned.

7 Slide 3, please?

8 I want to start with the walkdowns. Following the
9 walkdowns mandated by the NRC, Arkansas Nuclear One informed the
10 Agency that there were no flood protection deficiencies.

11 Slide 4, please?

12 That was in November of 2012. Four months later,
13 the plant experienced an accident that revealed flooding protection
14 deficiencies.

15 Slide 5, please?

16 The NRC issued a yellow finding due to the number
17 and severity of flooding protection problems, all of which had apparently
18 been invisible during the mandated walkdowns.

19 Slide 6, please?

20 Following the walkdowns mandated by the NRC, St.
21 Lucie informed the Agency that there was only one flooding protection
22 deficiency.

23 Slide 7, please?

24 And this was under oath or affirmation that both these
25 assurances came in. Once again, that assurance was received by the
26 NRC in November of 2012, less than two months later, real rain

1 revealed real holes, literally, in this licensee's unreal assurances.

2 Slide 8, please?

3 Not only did rainwater find its way into the plant, but
4 workers were later able to find additional pathways that had apparently
5 also been invisible during the walkdowns mandated by the NRC.

6 Slide 9, please?

7 Despite its assurances provided to the NRC, St. Lucie
8 was not protected against even design basis floods, let alone beyond
9 design basis floods.

10 Slide 10, please?

11 We can sit here and pretend that Arkansas Nuclear
12 One and St. Lucie are the only two plants to have done a pitiful job on
13 the walkdowns or we can realistically assume other nuclear plants are
14 out there with existing flooding and seismic protection deficiencies that
15 have not been rendered visible by actual events.

16 Earlier this year, the NRC moved Pilgrim into Column 4
17 largely because the company did not conduct an adequate extent of
18 condition assessment following an equipment problem in a January
19 2013 event that allowed a similar component to experience a
20 malfunction during the January 2015 event.

21 Likewise, the NRC has not properly assessed the
22 extent of condition of the bogus flood walkdowns received from the
23 industry.

24 Slide 11, please?

25 The flooding walkdowns were supposed to provide the
26 foundation needed to fully and properly inform the flooding

1 reevaluations. Because the flooding walkdowns were woefully
2 inadequate, the reevaluations are fundamentally flawed.

3 Slide 12, please?

4 The walkdowns were also hampered when the wrong
5 answer keys were used. The NRC via Information Notice 2012-01 and
6 its Resident Inspectors identified this seismic protection problem at
7 Three Mile Island, not the nearly useless walkdown performed by the
8 plant's owner.

9 Slide 13, please?

10 Turning briefly to hardened vents with my most
11 complicated slide, the staff's draft regulatory analysis showed that
12 external filters are not cost justified at two boiling water reactor plants in
13 the United States but may be cost justified at the majority of those
14 plants.

15 Plant specific analyses are needed to ensure that all
16 the plants, not just some, are in the green band.

17 Slide 14, please?

18 Turning to mitigation strategies, design basis hazards
19 are mitigated by automatic initiation of permanently installed and
20 frequently tested equipment supplemented by manual actions guided
21 by updated procedures and rigorous training.

22 Beyond design basis hazards are to be mitigated by
23 manual deployment of scant tested portable equipment guided by
24 outdated procedures and little to no training. Will it be successful?
25 We hope so, but doubt it.

26 Slide 15, please?

1 The success of the manual mitigating action seems to
2 be in the eye of the beholder. This table shows that comparisons of
3 risks of largely manual actions calculated by the industry and the NRC.

4 The core damage risk calculated by the NRC and the
5 industry for these events, and these are events where the NRC issued
6 a white a greater finding in the history of the ROP, the color codes mesh
7 up with the finding level are vastly different due largely to the amount of
8 credit given for manual actions by workers when installed systems have
9 failed.

10 Slide 16, please?

11 I cannot tell you whether the NRC or the industry's
12 calculations are right. But, I can tell you it's very wrong to have such
13 wide spread perspectives on the value of measures intended to protect
14 workers and the public.

15 Perhaps the NRC and the industry will never be on the
16 same page, but it is imperative that they at least get in the same book.

17 It is impossible to gauge the effectiveness of safety
18 measures using such desperate yardsticks.

19 Slide 17, please?

20 Turning to the regulatory framework, a dozen years
21 ago, the Mothers for Peace and UCS petitioned the NRC about a safety
22 security gap. The NRC agreed and closed this gap by revising 10 CFR
23 73.58.

24 Apparently, when one gap closed, another opens.
25 There's now a gap between design basis and beyond design basis
26 measures.

1 Slide 18, please?

2 As shown by these examples, the gap could
3 unintentionally allow a change made in design basis space to
4 undermine measures relied upon in beyond design basis space.

5 For example, earlier this year, Pilgrim submitted its
6 flood hazard reevaluation. They claim the design basis flood is caused
7 by storm surge that still leaves nearly ten feet of margin to safety
8 components needed to deal with that situation.

9 But heavy rainfall events which are beyond design
10 basis have negative margin. The company claims that they're
11 protected against anyway through three interior doors inside the
12 containment building, reactor building. But these interior non-safety
13 related doors can be legally removed tomorrow because they are not
14 needed against design basis hazards. So, there's a disconnect that
15 needs to be rectified.

16 Slide 19, please?

17 Similarly, the gap could unintentionally allow a change
18 made in beyond design basis space undermine measures relied upon
19 in design basis space. This is less likely, but still possible.

20 This is like the two over one measures and efforts that
21 were undertaken by the NRC and the industry in the 1980s to guard
22 against non-safety related equipment failing and compromising safety
23 related equipment during an event.

24 Slide 20, please?

25 We can recycle our old petition, change the date and
26 once again seek to close this new gap or the NRC can save us the

1 postage and close it itself.

2 Slide 21, please?

3 In theory, once the safety net protecting against design
4 basis hazards has been established, it cannot be altered without prior
5 NRC review and approval. In practice, plant owners often illegally
6 change the safety nets protecting plant workers and the public without
7 the NRC's permission.

8 Slide 22, please?

9 In theory, once the safety net protecting against
10 beyond design basis hazards has been established, it can be modified
11 or removed without NRC review and approval. In practice, it would be
12 naive to suspect, let alone believe the safety nets won't degrade over
13 time.

14 Slide 23, please?

15 The litmus test that we apply to the Fukushima lessons
16 learned is whether they would have averted or mitigated disaster had
17 Fukushima been equipped with them on March 10, 2011?

18 The industry is confident of success. The NRC is less
19 optimistic. Even if adequate today, what ensures the adequacy can be
20 maintained. Americans deserve better from this Agency and the
21 industry.

22 Thank you.

23 CHAIRMAN BURNS: Okay, thanks for the
24 presentations. We'll begin with Commissioner Svinicki.

25 COMMISSIONER SVINICKI: Well, my thanks again
26 to each of you for agreeing to participate in our meeting today and for all

1 the input and involvement you've had in participating in the
2 development of the regulatory measures that have been taken.

3 I wanted to begin with a reaction, Mr. Pietrangelo to a
4 point you had made because it is something that I am quite focused on
5 right now. I mentioned visiting sites over the last 12 months or so,
6 nuclear power plant sites, and see that there are -- there's a lot of visible
7 evidence of the actions being taken to respond to the Commission
8 orders that were issued after Fukushima.

9 But, as we move into a phase where elements of Tier 1
10 are either implemented or becoming very fully implemented at nuclear
11 power plant sites, NRC will need to begin to take a lot of care and
12 attention in terms of the training of our own inspection core.

13 Of course, when I visit nuclear power plant sites, I
14 always spend time with our senior and Senior Resident Inspector and
15 Resident Inspector. Often there are other regional inspectors from our
16 regional offices there on site.

17 And, a lot of the evolution of our regulatory response
18 has been for NRC very Headquarters focused. And so, we need to
19 bring these experts in our field elements, we need to make sure that we
20 will have consistency and coherency of approach as we get more and
21 more deeply into inspection and other enforcement parts of our
22 programs.

23 So, I just wanted to speak from my side of the table
24 about the fact that that will require a lot of management care and
25 attention to make sure that that's done right.

26 And, of course, we don't want to repeat painful

1 experiences of the past, Tony, as you mentioned, but I do think there
2 will be a bit of a learning curve for the inspectors out there. And so, I
3 don't start with an expectation of perfection, but certainly, we should
4 incorporate lessons learned from previous experiences.

5 And I think whatever up front time we spend in training
6 and making sure that we've got a coherent approach to the regulatory
7 process across the country, that will be time well spent because going
8 through a series of inspections and then finding out we don't have that
9 consistency that will require a lot of rehabilitation of that.

10 And so, I appreciate your point. It is interesting in
11 March, we'll be five years out from the accident in Japan and I feel like
12 we have the same need for attention and focus and work. It's just the
13 topics that we're focused on are changing over the course of the years.
14 But, that is something that NRC needs to be fully turning its attention to.

15 MR. PIETRANGELO: Commissioner, can I offer one
16 comment?

17 We just conducted a workshop in Baltimore two weeks
18 ago on FLEX implementation as well as the Appendix G for the flooding
19 mitigating strategies assessments. And, there were 25 people from
20 NRC in attendance at that, and a lot of them inspectors in the field.

21 So, we're trying to incorporate or offer the same
22 insights into the guidance that we provide to our folks in the field to the
23 NRC.

24 And, I want to compliment the Japan lessons learned
25 directorate for the audits. I think they are looking forward to try to get
26 their people out in the field to see what's being implemented in advance

1 of the rulemaking so that everyone is on the same page when that -- the
2 real inspections start.

3 So, I think we're mindful of the past and I drew the
4 analogy of the maintenance, well, simply because it was the first
5 risk-informed performance-based rule. This is the first beyond design
6 basis rule. So, they're different, it's new territory and we've got to draw
7 a bright line, I think between the design basis and the beyond design
8 basis.

9 And, I think we're doing stuff now to address that but
10 it's going to require continued oversight on the part of the Commission
11 as well as our folks in the field.

12 COMMISSIONER SVINICKI: Based on that
13 elaboration, I will react to a second point you made about we need to
14 continue to have coordinating bodies that will be able to take what
15 appear to be or become evident that our generic issues, not generic
16 technical issues, but generic procedural and implementation issues and
17 bring those to resolution.

18 I have been a rather consistent voice that NRC have
19 some sort of structured plan to return our Fukushima related activities,
20 particularly when they get to a stage of long term sustainability. We
21 need to be incorporating that back into our line organization.

22 I just want to mention that I do take your point that, as
23 we move through new phases of getting to that sustainability on these
24 measures, there will probably be the need for our managers to be able
25 to come together quickly, look across activities and resolve issues.

26 I'm not sure we need that -- that means we need to

1 keep these activities outside the line organization. NRC management
2 has been consistently, at least migrating towards moving this back into
3 line management, but I will just also share that point that I think there's
4 some balance between those two.

5 I don't want to keep Fukushima-related measures
6 entirely outside the line chain, but also I think we will have a need to
7 take rapid resolution on some generic issues that arise. And I'm
8 counting on our expert senior leadership here to propose the sweet
9 spot for the Commission as far as the timing of that.

10 I do want to commend Commissioner Ostendorff. I
11 will say that our Commission has been very unified in directing the NRC
12 staff to come up with a set of recommendations and plans for resolution
13 of Tier 2 and Tier 3 items.

14 I do feel that Commissioner Ostendorff, by my
15 observation, began 12 to 18 months ago to consistently mention the
16 need to get that in front of the Commission at the appropriate time so
17 that we could have a sense of what is at least the proposed path to
18 resolution of some of the remainder of the issues.

19 One of those items, and I know that this paper isn't
20 squarely the topic of this meeting, but the SECY paper regarding the
21 closure of the Tier 2 and Tier 3 items, or the path to resolution for those,
22 is in front of the Commission. One of the Tier 2 items is evaluation of
23 other external natural hazards.

24 And, as I work on evaluating this SECY paper, I'm
25 thinking to myself, to what extent is the extreme focus we've had on
26 seismic and flooding, does any of that envelop or bound the other

1 natural hazards work? And so, I'm trying to get almost a gut sense of
2 how much of looking at other hazards is, at the end of the day, going to
3 be encompassed by the mitigation that you take?

4 Because again, the facility is mitigating and that's what
5 the measures address. So, in some instances, the hazards cause a
6 similar type of effect on the facility.

7 So, I would ask each of you, any of you want to offer an
8 opinion. Do you think that when we move forward and evaluate a bit
9 more fully the evaluation of other external natural hazards and
10 approaches to that, do you think, in general, those hazards are going to
11 be encompassed by the mitigation measures and the approaches
12 we've taken on seismic and flooding? Because damage is damage I
13 guess what I'm saying, it very simply put.

14 MR. PIETRANGELO: I think Randy noted it in his
15 presentation, but when we set out with the concept of FLEX, it wasn't
16 based on any particular external hazard. We just assumed
17 consequences of loss of all power, loss of ultimate heat sink. How are
18 you going to cool the core, cool the spent fuel and maintain containment
19 integrity?

20 So, that was -- it was external hazard independent, it
21 was agnostic on what caused the event. So, in that respect, I think we
22 are prepared for the what if scenarios in any of the external hazards
23 because we started with a consequence and assume that, you know,
24 we didn't care what got us there, if you will.

25 I think when it comes to other external hazards, you will
26 have to look at, you know, I think it has to be screened for how it affects

1 the design basis and, if your design basis doesn't handle it, how does
2 the beyond basis equipment you have in place would handle that.

3 So, I think we're set up well to disposition those other
4 external hazards whether it's wind or --

5 COMMISSIONER SVINICKI: Has anything emerged
6 so far that would be a damage or a hazard that would just fall squarely
7 outside of the work we've been doing for the last four and a half years?

8 I mean like a, you know, tornadic winds? Hurricanes
9 have winds. I just, again, and I'm not trying to downplay the issue and
10 the staff's going to do a careful look at this, but it's just hard for me, I
11 don't know, maybe pandemic. I just, I'm trying to think what's the
12 nature. And, of course, that's not really, well, is that a natural hazard?
13 I guess it's a biologic factor, but I don't know.

14 Randy, go ahead.

15 MR. EDINGTON: Well, again, when we started, we
16 said we're going to move ahead and put in FLEX and Tony made the
17 point that we have that we did not assume what caused it.

18 We did ask that each plant look at the conditions of
19 their site and they take that in account when they're putting in,
20 recognizing that, as we go through later and study, we may have to
21 move a piece of equipment or a connection or something.

22 The flooding -- so a tsunami and the fast flooding is
23 what's become the biggest issues. And then it's a huge job when we
24 move down to other external events. So, tornados, is your equipment
25 separate? Do you still have -- you're still protected in your design
26 basis equipment.

1 So, it's that multiple levels of defense, the
2 conservativisms and we just added more levels. So, we will have --
3 whereas, we continue to look, we may find a condition or a FLEX
4 connection may need to be moved.

5 We had a couple in some of the flooding scenarios
6 where we had to come up with a different way to solve something and
7 that your site had so much flooding over a long period that you have put
8 your diesel on the roof in some cases or we put, you know, made sure
9 we had capabilities of boats and everything else to move it around on
10 some FLEX.

11 So, we took a lot of that into account. And, as we go
12 forward, we need to ask that question on each time and say. But I
13 think most of it is fairly broadly taken.

14 COMMISSIONER SVINICKI: So, it sounds like you're
15 saying it may, if something like that fell outside what we've looked at, it
16 may be related either to progression of the event or damage or duration
17 and those are the types of things we'll look at.

18 And, David, wanted to offer you an opportunity with this
19 --

20 MR. LOCHBAUM: There's a couple potentials, I'm
21 not -- can't say that they're definite issues, but the two potentials that
22 come to mind are frazzle ice that could block the ultimate heat sink for
23 design basis equipment and the FLEX equipment.

24 And a related but a different context would be
25 downstream dam failure which could turn the ultimate heat sink into a
26 mud flat which would challenge all of the makeup systems.

1 But, I think the work that's been done might be
2 incremental, a few additions to adjust to those if they turn out to be an
3 issue. I don't think there's anything we have to start from a clean slate
4 and fix that some problem.

5 COMMISSIONER SVINICKI: Okay, thank you.

6 MR. PIETRANGELO: Commissioner, can I --

7 COMMISSIONER SVINICKI: Oh, wait.

8 MR. PIETRANGELO: Just to broaden your question,
9 when we thought about FLEX --

10 COMMISSIONER SVINICKI: You're fixing my
11 questions now?

12 MR. PIETRANGELO: No, but just a consideration --

13 COMMISSIONER SVINICKI: Even Mr. Lochbaum
14 would not do that to me. He's a very very nice gentleman.

15 (Laughter.)

16 MR. PIETRANGELO: -- whether it's an external
17 hazard, unsealed conduit, manufacturing defect, operator error,
18 maintenance issue, it doesn't matter at the end of the day. You've got
19 to do those three safety functions under conditions you probably didn't
20 imaging. All right?

21 FLEX give you another set of options for that. We saw
22 it work at Daini very, very well when it was not even planned and it was
23 in one guy's head where all this stuff was and they shutdown safely for a
24 plant.

25 So, we've got a lot of training. We've got a lot of
26 equipment. We've got a lot of drills and exercises and maintaining to

1 do but I think we're much in a much better position than we were four
2 years ago to deal with whatever it is, be it a new external hazard or
3 some other combination of things we would have never thought of.

4 COMMISSIONER SVINICKI: Thank you. Thank
5 you, Mr. Chairman.

6 CHAIRMAN BURNS: Thank you.

7 Commissioner Ostendorff?

8 COMMISSIONER OSTENDORFF: Thank you,
9 Chairman.

10 Thank you all for being here this morning. As others
11 have noted, this is an important topic and an important meeting.

12 I'm going to start off with Mr. Edington here. You
13 made a couple of comments and maybe I'll ask you a question.

14 But, I appreciated the discussion of industry
15 engagement and I know that Commissioner Svinicki will remember, we
16 were in this room maybe in July of 2011 once the Near Term Task
17 Force Report came out and Bill Borchardt was sitting where Mr.
18 Pietrangelo is and we had a discussion on where we're headed with the
19 Near Term Task Force and post-Fukushima actions and so forth.

20 And, this is not a question, but a comment. I know
21 that Bill Borchardt, when asked the question what was the biggest
22 lesson learned that the Agency had from the Three Mile Island
23 experience, it was that there was all kinds of stuff done, much of which
24 added to the safety but much of which did not.

25 And, just kind of throwing the kitchen sink at the entire
26 nuclear enterprise whether it be the regulator side or the industry side.

1 And, I'm going back to that comment from over four
2 years ago, because some of you were at that meeting and recall this,
3 that I think the engagement by the NRC, this is just my personal
4 opinion, the engagement by the NRC with industry, with NGOs, even
5 when there's been differences of opinion, that engagement has helped
6 ensure that we were not just throwing the kitchen sink at the issue, but
7 rather having a thoughtful, strategic approach to dealing with
8 post-Fukushima action items.

9 So, I think that continues to be the case. Sometimes
10 it's taken maybe a little bit long than we would have liked, but it is
11 important to get it right -- done right the first time, not just to have a knee
12 jerk reaction and then, well, let's go back and do, you know, we'll
13 change our opinion or decision on this.

14 So, I think when, in future years, I'm hoping that it's the
15 case, but I think it's the case if I were asking this question today,
16 somebody says, hey, Ostendorff, what'd you learn from the Fukushima
17 actions by the Agency? It was the importance of engagement with
18 industry and NGOs and others in an open fashion in public to kind of
19 hash these things out in a thoughtful way.

20 So, I appreciated, Randy, your bringing that topic up.
21 I know that there's times when David, perhaps, there's a different
22 viewpoint on some of this and we respect that. That's why we come to
23 the table in public and have a chance to share different viewpoints.

24 I know that the first briefing I ever had on FLEX was
25 one of your team members out there in Palo Verde almost three years
26 ago. I mean because it was in the wintertime of 2013 when Palo Verde

1 folks briefed me Phoenix on your strategies and so forth.

2 And so, I appreciate your leadership in this area and I
3 think, as Mr. Pietrangelo's mentioned, it's a much more complicated set
4 of issues than first meets the eye.

5 I know that from my experience operating submarines
6 and the Navel reactors program, anytime you have a plant modification,
7 just the modification of submarines to allow hydraulics -- 700 pound
8 hydraulics, excuse me, hydraulics with 700 pounds of air to close the
9 maneuvering room doors and pressurized maneuvering to protect the
10 operators in the event of a steam line rupture, that took close to ten
11 years to finish for all the 688 class submarines.

12 And, it required a lot of training by operators. So, just
13 that one small piece, which is not nearly as complicated as the scope of
14 issues industry has dealt with, it takes a while.

15 So, I think those of us that have had some experience
16 in operating and maintaining and training people in these things
17 appreciate the level of difficulty involved in making these things happen.

18 So, thank you, Randy.

19 Tony, on your comment about not done yet and not
20 time to exhale, I appreciate that you mentioned that twice because I
21 think you're exactly right. This is -- it is far from a done deal and much
22 work to be done.

23 I know that when I had a chance to visit nuclear
24 facilities, I think last week's my 61st commercial nuclear plant site visit.
25 The last four weeks I've been to Watts Bar, Vogtle, Byron and LaSalle
26 and I've spent, in particular, the last two visits to Byron and LaSalle, a

1 lot of time looking at FLEX.

2 And so, it's the devil's in the details and the operating
3 procedures and the color coded connections for power supplies, the
4 different sizes of hoses, six-inch or eight-inch, to provide emergency
5 cooling water for the core, for the spent fuel pool, et cetera, there's a lot
6 of details there.

7 So, I guess my high level question that, having seen a
8 lot of this but I'm not an expert on it, but I've seen a lot of sites, are there
9 any big picture concerns that any of the three of you have on FLEX as
10 far as the ability to implement?

11 I know that David, may have a different viewpoint, but
12 I'm going to give him a chance to --

13 MR. LOCHBAUM: Well, I think the concern we have
14 is there's an awful lot of similarity in design basis space. Control
15 rooms are largely similar, training is much more rigorous, the
16 procedures are much more developed and used.

17 On the FLEX side, there is training, there is some
18 commonality. But, there's almost no practice, no use, no learning
19 curve to find out what works, what doesn't work.

20 So, we're going to break off the shrink wrap in case of
21 some severe accident and hope that it works. I hope also, but I don't
22 have that assurance.

23 COMMISSIONER OSTENDORFF: Well, I'll just tell
24 you, you know, I appreciate your comment there. I can tell you I have
25 a different view. When I visit the sites, I, you know, I've seen a lot of
26 FLEX strategies being discussed by operators at various levels in the

1 power station operation.

2 I think a lot of time has been spent on training and
3 walkthroughs and a lot of attention has been paid to detail. I saw just
4 last week with Exelon, they had several ramps that have been
5 constructed specifically to allow for vehicles to go over hoses to make
6 sure that those hoses that are providing makeup water from the pond or
7 the lake for cooling aren't, you know, compressed when a vehicle goes
8 over those hoses. Just one example.

9 So, I guess I've had a lot of chance to see this.
10 Perhaps you've not had the opportunities to visit that I have. I see it
11 differently, David.

12 Do you have any particular examples that cause you
13 concern? I guess --

14 MR. LOCHBAUM: Well, I think the example that
15 comes to mind is Pilgrim which has their FLEX equipment stored in two
16 buildings that looks like they were bought at Sears, sheds, and they're
17 like 2,300 feet apart with the hope that whatever bad disaster that
18 causes you to use it doesn't wipe out both those buildings and scatter
19 all that equipment in the ocean and elsewhere.

20 If I look at the -- I've been inside the FLEX building in
21 Watts Bar which, if there's a problem in Tennessee, that's where I'm
22 going because that's very robust. The door weighs 9,200 pounds.

23 COMMISSIONER OSTENDORFF: I know, I was
24 there three weeks ago.

25 MR. LOCHBAUM: So, Pilgrim looks good on paper
26 but I hope that paper doesn't get blow away by a storm that's going to

1 take those two sheds away.

2 COMMISSIONER OSTENDORFF: All right.

3 I'm much more optimistic I think than you are, but I
4 appreciate your viewpoint there.

5 David, while I'm on you, just let me ask you this
6 question. You know, you've seen the staff paper, the SECY paper on
7 the resolution of outstanding Tier 2 and Tier 3 items, do you have any
8 particular disagreements with the staff recommendation as to where it
9 stands today?

10 MR. LOCHBAUM: Well, given our track record, every
11 time we endorse something, it gets killed. I think enhancing the ROP
12 is the most important thing. We need to save that because that will be
13 killed. That's a waste of time.

14 There's a lot of things we feel are being dismissed
15 cavalierly or, that's the wrong word, improperly, or without full
16 consideration of the factors.

17 Again, it goes back to my concluding slide. I think the
18 changes we've made have been better, improved things, but I don't
19 think if Fukushima had had them the outcome would have been -- the
20 time line might have been a little bit different, but the disaster would
21 have been just the same.

22 So, given that condition, we're disappointed in the
23 efforts that have been undertaken and I don't feel that the American
24 public's adequately protected. And, I don't think any of the Tier 2
25 things would fundamentally change that. We've not done a good
26 enough job in the Tier 1 ones to hope for the Tier 2 and Tier 3 ones to fix

1 it.

2 COMMISSIONER OSTENDORFF: Okay. Again, I
3 respectfully appreciate your voicing your perspective. Mine's very
4 different. I think the Tier 1 has added a lot of safety value to the
5 existing nuclear power plants and I have a high level of confidence that
6 the Tier 1 actions will be effective.

7 So, if you had a -- in the very unlikely event if we had a
8 beyond design basis event. So, we just may agree to disagree on that.
9 But, I appreciate your being here at the table.

10 Tony, let me just close out by saying, I appreciate the
11 leadership that has been exhibited by NEI on initiating steps on the
12 severe accident management guidelines to -- given the Commission's
13 decision here a few months ago and I just want to acknowledge that
14 step.

15 Thank you all for being here.

16 Thank you, Chairman.

17 CHAIRMAN BURNS: Thank you, Commissioner.

18 Commissioner Baran?

19 COMMISSIONER BARAN: Thanks.

20 David, let me follow up on Commissioner Ostendorff's
21 last question for you about the staff's proposed resolution of the
22 remaining Tier 2 and Tier 3 items.

23 Fukushima lessons learned activities replaced in Tier 2
24 or Tier 3 based on skill set availability, the need for more analysis, not
25 because they weren't important safety issues, the staff's proposing to
26 close out some of these items now, some in the near future after some

1 additional stakeholder interaction and the rest by the end of next year,
2 by the end of 2016.

3 At a high level, which remaining Tier 2 and Tier 3 items
4 do you see as the most significant?

5 MR. LOCHBAUM: I think it would be the hydrogen
6 control mitigation aspect. But only -- not just to evaluate, actually fix
7 the problem.

8 The orders issued to date address the problems on the
9 BWR side, but we've had longstanding concerns with the ice condenser
10 designs which is equivalent in terms of size and vulnerability.

11 And, while steps have been taken to address that
12 through GI-206 or something like that, we don't think that that problem's
13 been out there.

14 The severe accidents we've had to date, Three Mile
15 Island had a hydrogen detonation, Fukushima had several, it doesn't
16 suggest that we've got our arms around that problem. So, I think
17 there's more work -- implementation to do, not more evaluations. The
18 library's filled with NUREGs so we don't need more of those, but we
19 need real fixes for hydrogen control and mitigation.

20 COMMISSIONER BARAN: Let me ask you about a
21 few of the other items. The Near Term Task Force recommended that
22 NRC evaluate potential enhancements, the capability to prevent or
23 mitigate seismically induced fires and floods.

24 Under NRC regulations, nuclear plant fire protection
25 systems are not required to be designed to withstand a seismic event.
26 That's also true of some piping and tanks that could release water after

1 an earthquake.

2 From your perspective, how significant is this issue of
3 seismically induced fires and floods?

4 MR. LOCHBAUM: I agree with the staff position in the
5 paper. But, the one thing we would suggest adding to that is there was
6 a lot of good work done for two over one in the early '80s that I
7 mentioned in my presentation and that addressed some of these
8 issues.

9 There's been a history in the -- to fixes that were
10 implemented that have eroded over time. So, going back and maybe
11 selectively doing a sample audit of those two over one fixes to make
12 sure we're still where we thought we are might verify the assumptions
13 made in the staff paper.

14 Otherwise, I think I would agree with the staff on that
15 one.

16 COMMISSIONER BARAN: Okay. Let me ask you
17 about the recommendation to require licensees to reevaluate their
18 seismic and flooding hazards every ten years to address new and
19 significant information.

20 The staff agrees here that we need a more proactive
21 and systematic approach to consider new hazard information going
22 forward. What do you think about the staff's approach, if we develop
23 something that's more proactive, do you think we still need to require a
24 reevaluation every five years or ten years or 20 years?

25 And, with respect to flooding hazards, how does
26 climate change play into this?

1 MR. LOCHBAUM: Well, when I saw the Near Term
2 Task Force came out, I thought that recommendation was great. The
3 more reflection on it, I'm not sure that the ten year or periodic revisit is
4 the right way to solve it. I think the staff may be on to something that's
5 still more proactively.

6 But, I think whatever path is taken there, we need to
7 complement it with a quicker resolution of issues, whatever the -- what
8 was it, October 28, 2015 the NRC approve a license amendment
9 change for fire protection at Browns Ferry? Only 40 years after the fire
10 and 11 years and after the rule came out? We need to do a little bit
11 faster job than decades. I think we can do better.

12 COMMISSIONER BARAN: And, on the flooding
13 hazard side, how do you think climate change plays into this or how
14 should we be as an Agency accounting for that?

15 MR. LOCHBAUM: I think the challenge there is for
16 the Agency and its licensees to know what is the number that on
17 design, you know, three foot rise in climate.

18 So, it's difficult to project that. I think my bowling ball
19 -- my crystal ball's more like a bowling ball when trying to project what
20 that will be.

21 So, it's difficult and if the Agency were to come up with
22 something post cost, it'd be hard to justify.

23 So, I think that if that proactive measure comes out,
24 how to deal with changes in a timely manner, it would address that
25 issue as well.

26 COMMISSIONER BARAN: So that's -- just to make

1 sure I understand your point there, your point is basically, today, we're
2 not going to be able to predict with precision what the flooding hazard
3 might look like at a given plant 20 to 30 years, but if we had a process to
4 proactively incorporate new information that would account for changes
5 in climate and the effect that would have on potential flood hazards, that
6 would be the right direction to head on that?

7 MR. LOCHBAUM: I agree. And, I think the backstop
8 for that is that it's pretty slow happening. So, as Turkey Point and
9 some of these other - as temperatures went up or levels went up, there
10 was time to see that, whoops, we have a problem at this plant or that
11 plant and make the appropriate adjustment.

12 So, I think that's the right answer and I think the
13 backstop is the fact that it's fairly slow moving.

14 COMMISSIONER BARAN: Let me ask about one
15 more Tier 3 item, this one relating to requiring reactor and containment
16 instrumentation to be enhanced to withstand beyond design basis
17 accident conditions.

18 The mitigating beyond design basis event proposed
19 rule did not include a requirement along these lines. And, the staff
20 concluded that additional instrumentation isn't needed for licensees to
21 effectively implement severe accident management guidelines.

22 What do you think about that?

23 MR. LOCHBAUM: At the earlier Commission briefing,
24 I commented my recommendation was that the Office of Research of
25 the Agency more broadly look at information needs for design basis and
26 beyond design basis applications and verify that the existing

1 implementation is adequate or identified any gaps and allow those to be
2 fixed.

3 But, I don't think -- every severe accident we've had,
4 we've come up with some new instrumentation shortfall and, again,
5 we're relying on -- we're reacting to reality rather than proactively trying
6 to address it and prevent problems in the future. So, I don't think we're
7 there yet.

8 COMMISSIONER BARAN: In the Tier 3 paper that's
9 before the Commission, the staff says that the quantified benefits of
10 enhanced instrumentation aren't likely to justify requiring it.

11 Licensees have committed to developing, updating
12 and training on SAMGs, but unlike SAMGs, licensees may choose not
13 to enhance instrumentation.

14 Because an instrumentation requirement would result
15 in licensees doing more than what they're doing now, the increase in
16 safety from such a requirement may well be greater than for requiring
17 SAMGs.

18 What do you think about that? Should NRC look
19 harder at potential requirements for reactor and containment
20 instrumentation that would survive a severe accident?

21 MR. LOCHBAUM: Well, I understand that the
22 situation the staff's in when things like that come up, how do you justify
23 the cost of implementing them?

24 I talked at the earlier Commission briefing about having
25 some way that when a safety upgrade is made, that everybody agrees
26 and improved safety that there ought to be some payback that the

1 industry gets for that.

2 You know, I mentioned when I bought my fire
3 extinguisher and lock the doors, my insurance premium dropped more
4 than those costs. But, if there were to cost \$10.00 and we say it all
5 improves safety, it doesn't reduce liability insurance or there's no --

6 So, I think we need to come up with a framework that
7 allows safety upgrades to have some cost benefit because they benefit
8 the public, they need to benefit the industry as well. And, that might
9 lessen that hurdle towards implementing those upgrades and the costs
10 that come with them.

11 COMMISSIONER BARAN: Okay, thanks for your
12 thoughts on those.

13 Thank you, Mr. Chairman.

14 CHAIRMAN BURNS: Okay. Thank you all for your
15 presentations. I appreciate the reference Tony made to the
16 Maintenance Rule which was the -- one of the priorities of my former
17 boss, Admiral Carr, when he became a Commissioner in 1986. And,
18 he got it through in '91.

19 And, I think actually, David, in commenting on a note, I
20 think a NUREG or a synopsis of sort of the history of regulation, I think
21 there was a favorable comment you made in terms of the impact --
22 overall impact of the rule.

23 MR. LOCHBAUM: One of the three best things the
24 NRC has ever done.

25 CHAIRMAN BURNS: And I'll make sure I pass that
26 on to him next time I talk to him.

1 But, I think in that context, and I appreciate what
2 Commissioner Svinicki said, one of the things that's always in these
3 situations where we focus on sort of, I'll call it dramatic events or very
4 important regulatory issues is assuring we sort of -- we have that thing
5 that we need to act on.

6 And then, ultimately, we need to integrate it into the
7 norm. And, I think that will be a thing, as she said, we're looking for
8 that sweet spot. It is something to look for.

9 But, at the same token, this sort of vigilance which I
10 think both Tony and David sort of noted in their comments is that,
11 particularly the idea of we haven't sort of let it drift aside and that both,
12 from a regulatory standpoint, from the regulator standpoint, but also the
13 operator industry standpoint need to continue vigilance on that.

14 I have a couple of questions I want to ask. David, I
15 want to make sure I understood what you see as this gap between
16 design basis and beyond design basis. I want to make sure I
17 appreciate that to understand where, if you will, having talked this
18 morning about connections, where the connections need to be made?

19 MR. LOCHBAUM: Well, I think the Pilgrim example
20 illustrates that gap pretty well in our mind. There are some -- when
21 they did the flood hazard reevaluation, they identified some beyond
22 design basis events that could cause flooding of the internal buildings.

23 That flooding left unmitigated, could submerge
24 equipment needed to deal with that issue. But, they said that was okay
25 Because there's three interior doors that would prevent that flood water
26 from reaching that equipment.

1 But, that's not mentioned in the FSAR. That's not
2 controlled under the regulatory footprint. So, workers could go out, if
3 the door gets damaged, knocked off its hinges due to equipment
4 passing through it, whatever, there's no obligation to restore that
5 condition. Or they could replace it with louvered doors because all
6 they're doing is access control, not flood protection.

7 So, because it's not in a document other than this
8 flooding hazard evaluation where workers five years from now aren't
9 going to check that when they're processing work orders or design
10 changes, those measures that may protect against those events may
11 not be there tomorrow. There's no requirement that they remain there.

12 So, there needs to be some mechanism that ensures
13 that things that we're relying on to mitigate beyond design basis events
14 stay there. If that's the protection that's needed, the measures need to
15 stay. And right now, there's nothing that assures that that stays there.

16 Tony was nodding and he was talking to me earlier and
17 he raised a good point that the mitigating the beyond design basis
18 rulemaking that's pending could provide that connection or close that
19 gap.

20 CHAIRMAN BURNS: Okay. Yes, either of you --

21 MR. PIETRANGELO: If those doors are design basis,
22 right, they need to work and they need to be controlled as such.
23 Okay? So, I don't know if the Pilgrim doors are design basis or they
24 figured out whether they need them or not for beyond design basis, but
25 they needed to be treated accordingly.

26 And, the only thing with response to David's

1 admonition about, you know, this is a promise on the industry's part, it's
2 not a promise. That rulemaking that just got proposed is going to put it
3 in the regulation as an obligation by each licensee. All right?

4 So, we're going to train on it. We're going to drill on it.
5 They're going to be inspected on it. There's a lot of checks in place to
6 make sure that this doesn't drift away, so that that's what's different.

7 MR. EDINGTON: Yes, I think we're in a pretty key
8 area in that, if I could, there's -- our design basis which we know we
9 constantly inspect and we will find problems every once in a while, we
10 have beyond design basis which I want to continue to emphasize that it
11 has to be functional capable. It's actual many, many levels more.

12 We have worked very hard on common training,
13 common procedures, common connections and we tried to make
14 where, if there's something we have to take into account is our people,
15 no matter what site, are trained on very similar materials. Your RO
16 and SRO license that's overseen.

17 I can take an operator from one plant, put them in
18 another plant, they may not know that plant, but they know the
19 equipment and the fundamentals, same with maintenance. We've
20 made those type of things. So that's there.

21 And, I think the area that we didn't have to work with is
22 what is the right regulatory footprint for the transition piece without
23 letting it go too far? Because I can train extensively on beyond design
24 basis equipment, but I really needed to train extensively on the more
25 likely design and the higher probability areas, what we do now.

26 All of that is transferrable over here. This is extra

1 levels of conservatisms and we just need to work very careful on what is
2 the right regulatory footprint without being overpowering with these
3 beyond design basis areas.

4 And, it's appropriate that we have some type of
5 footprint that's visible to everybody and we're not against that at all.
6 But, we are interested -- we only know how to inspect at a certain level
7 and that's not just the NRC, that's ourselves. Our own people are
8 driving this many times to do this very detail.

9 That wasn't the intent of FLEX. FLEX is extra
10 equipment that's above and beyond what we need and it's been
11 simplified and it's basically to give tools to my people in the event
12 something unusual happens that I can't anticipate.

13 CHAIRMAN BURNS: Okay. And, you know, and
14 one of the -- this is not only, I think, one of the concerns it's also in terms
15 of -- and I think you're speaking to that a bit, is the -- one of the concerns
16 being sort of the maintaining the equipment.

17 We had the requirements, for example, in B.5.B and
18 what we were finding is some of the, I think, the walkdowns after
19 Fukushima event, but not at everywhere, but some of it could have
20 been better done than others.

21 I mean, what, in terms of, let's say, as an industry
22 guidance or through INPO or whatever, I think we have, obviously, we
23 have a role as a regulator looking at that, but sort of -- the sort of the
24 self-improvement and self-critical approach also has merits as well.

25 So, what as an industry, are you doing in that area with
26 respect to assuring that the continued viability and maintenance of the

1 --

2 MR. EDINGTON: Well, as you know, again, there are
3 many NEI documents that we agree to. There's INPO documents that
4 we all agree to and we inspect to. And then, what is that right interface
5 for the NRC?

6 In the SAFER centers, we worked hard on the audit
7 type function. You know, we do it under the QA process. And then
8 you inspect that audit. And, I think that's a good balance for that.

9 We'll just have to steadily work on what is that right
10 footprint that's visible without overpowering, if you would. And we
11 already have many documents that we live to today that is much better
12 than what we were doing ten years ago when we first developed
13 SAMGs and all. And, we've created more of, through IRs, with INPO
14 and other where they're auditing certain pieces, if you would.

15 But with that, I still understand the need for the right
16 amount of regulatory footprint awareness, if you would, in some cases.
17 And, in some cases, higher inspection type requirements. And, we're
18 working on those balances as we go forward.

19 CHAIRMAN BURNS: Yes.

20 MR. EDINGTON: I think that's a lot of the work we've
21 got to do from here is to get -- and we need to get that right and we need
22 to be careful not to overpower this functional equipment with too much
23 inspection, training and testing. But, it still needs a certain amount of
24 that.

25 MR. PIETRANGELO: Actually, EPRI was responsible
26 for developing the preventative maintenance program for the FLEX

1 equipment.

2 MR. EDINGTON: Yes, right.

3 MR. PIETRANGELO: That was captured in an NEI
4 document that was endorsed by the staff that'll be used as an
5 implementation guidance for the rulemaking. So, that's kind of the
6 regulatory footprint for that one.

7 But, I think we've got to make sure that we get the --
8 just because it was established at the front end doesn't make it
9 necessarily right. We need some operating experience on the
10 equipment and such.

11 MR. EDINGTON: Yes, and I think, again, what we're
12 worrying about sometimes is we may be trying to test too frequent and,
13 over time, we're going to have to shift some of those.

14 MR. PIETRANGELO: Right.

15 MR. EDINGTON: Or, we may have a testing too far
16 apart and when we run a few surveillances, we're going to have to move
17 them back just like you would adjust any PM program.

18 CHAIRMAN BURNS: Okay. Just a closing
19 comment, I was visiting the Darlington plant up in Canada which we
20 don't regulate, but the -- obviously.

21 The interesting thing on this question, David, you're
22 comment with respect to the FLEX buildings, they've taken a different
23 approach from the standpoint of they have what I would call a softer,
24 you know, over building for the equipment and they've taken the
25 philosophy that that's better than the hardened bunker.

26 And, I'm not going to weigh in on it but it's interesting

1 just sort of the different approaches. And, again, the objective is to try
2 to -- is protect the equipment and you have the equipment available.

3 But, it's interesting because, again, with the -- I think
4 the hazard is in the nature of high winds, you look in a lot of the
5 Midwest, we have, for example, the bunker, you know, more the bunker
6 like you and I have seen it at Watts Bar.

7 But, it's just -- it's an interesting sort of approach.

8 MR. LOCHBAUM: But, that speaks to my point about
9 inconsistency.

10 CHAIRMAN BURNS: Yes.

11 MR. LOCHBAUM: Inconsistency improves the
12 chance of being right even if you don't know when that is.

13 MR. PIETRANGELO: Chairman, in the early days --
14 go ahead.

15 CHAIRMAN BURNS: No, Commissioner?

16 COMMISSIONER SVINICKI: I just wanted to offer
17 one observation, what did you want, Mr. Pietrangelo, to respond to?

18 MR. PIETRANGELO: No, we used to joke in the early
19 days of our steering committee on, you know, the best place to put the
20 FLEX equipment was on a raft with a tent over it. Right? That would
21 make it available under certain conditions. So, to your point.

22 COMMISSIONER SVINICKI: I would just say there's
23 been an evolution in the thinking on FLEX. There was the terminology
24 I use is in the early days after observing what happened in Japan, the
25 thought was if I'm going to enhance my resilience and ability to respond,
26 should I go to Walmart and buy 20 of them or should I go to Neiman

1 Marcus and buy two and put them in a really hardened building?
2 Because, if I just bought 20 of them and they were commercial grade,
3 but I had one at the gas station down the road and one at Joe's house
4 and, you know there's different ways to be resilient.

5 So, I think we have, in some instances, evolved to this
6 notion of these hardened structures. But, that wasn't the point I was
7 going to make.

8 I think Mr. Lochbaum has raised a really good point
9 that I agree with so strongly about at the moment where you need to
10 respond is not the time to, I think you said, break the wrapping on the
11 thing.

12 I worry about that, frankly, at home with my fire
13 extinguisher. You mentioned having one, I'm thinking, you know,
14 when this pan of grease ignites is not the time for me to look at that in
15 the corner and go, let me read this tag and see how to operate this
16 thing.

17 But, I just wanted to share an observation similar to
18 Commissioner Ostendorff which maybe will give assurance to
19 somebody listening that, at Millstone last week, I noticed that some of
20 the FLEX equipment looked like it had been, you know, had some mud
21 and things on it.

22 And I was informed that responders had had an
23 opportunity to be working around, you know, moving some mock debris
24 with claw arms and things like that. So, I have observed that that is
25 going on at sites Because I agree fully that you don't break the shrink
26 wrap in the moment when those responders need to use that

1 equipment, but I guess I'd just say that that's not what I'm observing at
2 power plant sites.

3 MR. EDINGTON: If I could comment, and that was a
4 great point, that now we have this equipment and, from a period of risk,
5 so in outages and others, we are looking for that right balance.

6 And, every time I roll a piece of equipment out to
7 reduce risk at the outage, I test it, I practice it, people are used to setting
8 it up and we still don't have the ground rules set up on that.

9 But this was real equipment that can be used to reduce
10 risk every day at our operation and improve our capabilities with it so we
11 actually move it around and use it.

12 But, yes, we have to figure out what that right balance
13 and what are the right rules. We just need to be careful that those
14 rules don't prevent us from doing the commonsense thing which is
15 reduce risk today also.

16 CHAIRMAN BURNS: Well, I want to thank all the
17 panelists for an interesting discussion. This is obviously part one of
18 our meeting and we're going to take about a five or six minute break and
19 we'll resume around 10:25.

20 So, thanks again.

21 (Whereupon, the above-entitled matter went off the
22 record at 10:17 a.m.)

23 CHAIRMAN BURNS: Welcome back to part 2 of our
24 meeting. In this part of the session, we'll hear a presentation from the
25 Staff who will present their assessment status on Fukushima-related
26 actions, as well as speak to the IAEA's report on the Fukushima Dai-ichi

1 accident, progress on implementing Tier 1 recommendations, and a
2 high-level discussion of the Tier 2 and Tier 3 recommendations Closure
3 Plan which came to the Commission in the SECY that I referenced at
4 the beginning of the meeting.

5 And with that I'll have our EDO, Vic McCree, start off
6 the session with the staff.

7 MR. McCREE: Good morning, Mr. Chairman,
8 Commissioners. It's been over four and a half years since the accident
9 at Fukushima Dai-ichi, and we're pleased to report that we're on or
10 ahead of schedule in implementing Lessons Learned and that
11 significant safety improvements are being realized.

12 The scores of NRC Staff engaged in these initiatives,
13 some of whom are here today, have demonstrated tremendous
14 dedication, determination, and technical competence, and have
15 significantly advanced the initial recommendations provided by the
16 NRC's Near-Term Task Force. Of course, the Staff's work has been
17 augmented by our very valuable interactions with stakeholders,
18 including representatives from the nuclear industry, members of the
19 public, and the Advisory Committee on Reactor Safeguards.

20 We've also benefitted greatly from the collaboration
21 with our international partners, and we'll spend some time this morning
22 discussing work in that area.

23 With me today are Mike Johnson, the Deputy
24 Executive Director for Operations for Reactor and Preparedness
25 Programs; Bill Dean, the Director, Office of Nuclear Reactor
26 Regulation; and Jack Davis, the Director of the Japanese Lessons

1 Learned Directorate. I'll now turn it over to Mike.

2 MR. JOHNSON: Thanks, Vic. Good morning,
3 Chairman and Commissioners.

4 It is our pleasure to be here to talk about the progress
5 that we've made on Fukushima Tier 1, and also to talk about our
6 proposed plans for Tier 2 and Tier 3. We start off, and we'll spend most
7 of the -- actually spend most of the presentation focused on our
8 proposed Tier 2 and Tier 3 Resolution Plans, including providing an
9 overview of how we approached it, we'll talk about the criteria, and then
10 we'll spend some time on each of the individual plans.

11 Before that, Bill Dean will provide I think a more
12 detailed discussion of the various steps that we've taken as they relate
13 to Tier 1. We think it's important that we spend time on that because as
14 was discussed on the previous panel, it does set the stage, if you will,
15 for the plans that we are proposing. It provides, for example, an
16 opportunity for us to leverage things that have been done, leverage
17 increased learnings as we go forward, and so that's the order of our
18 presentation. And then as indicated by Vic, I'll be back at the end to talk
19 about international, including the work that we do with our international
20 counterparts, and a specific product that's been produced recently. So
21 with that, I'll turn it over to Bill Dean.

22 MR. DEAN: Thanks, Michael. Good morning,
23 Chairman and Commissioners. It's a pleasure to be here with you this
24 morning to talk about our status of Tier 1 activities, and then our
25 recommendations on Tier 2 and Tier 3. Next slide, please.

26 So, we've used this slide quite often over the past

1 several years in terms of providing a pictorial and a way to discuss our
2 progress on Tier 1. The key message here on this slide is that we are on
3 or ahead of schedule for all the Tier 1 activities. I'm going to talk about
4 each of them in turn.

5 With respect to the mitigating strategies, and some of
6 this will be repetitious to some of the input you got from Tony
7 Pietrangelo this morning. But as of the end of the fall outages which will
8 be wrapping up later this fall, there'll be 50 sites that will be in
9 compliance with the mitigating strategy orders, and over 80 that will be
10 compliance with the spent fuel pool instrumentation orders. That's
11 substantial safety improvements and safety enhancements that are
12 actually taking place, physical changes out there in the field.

13 With respect to the hardened vent orders, earlier this
14 year we completed our reviews and issued interim staff evaluations on
15 the Phase 1 of the wetwell venting submittals provided by licensees,
16 and we expect by the end of this calendar year to receive the Phase 2 of
17 the drywell venting plans from licensees, so we'll be well on our way in
18 terms of looking at the integrated picture of both the wetwell and the
19 drywell venting activities on the hardened vents.

20 I wasn't going to talk about walkdowns because they
21 have been completed but since Mr. Lochbaum talked about some of the
22 concerns he had with walkdowns this morning in the first panel, I do
23 want to indicate that I would say that the walkdown process was
24 successful. Some of the examples that Dave pointed out were certainly
25 areas where the licensees could have done better and should have
26 done better in terms of the implementation of the guidance that existed,

1 but we appropriately dealt with those issues within the Reactor
2 Oversight Process.

3 You may recall that as a result of our inspections of
4 licensees through our walkdowns, we identified a number of issues, at
5 least nine issues that were elevated to Findings of Significance in the
6 Reactor Oversight Process. So, I would consider the walkdowns, which
7 was intended to be an interim step before we pursued the reevaluated
8 flood hazard activities, to at least provide some confidence and level of
9 information to us in terms of what existed out there. And a number of
10 issues were identified and put in licensees corrective action programs
11 and addressed through the walkdowns.

12 Our inspection program is a sampling process, as you
13 all know. We don't look at every single thing that a licensee does, and
14 so we do have to have that trust factor, but I think that the system
15 worked in terms of what we did with inspections. And we shared the
16 information that emanated out of the ANO and the St. Lucie events so
17 that industry could learn from the failures of some of their peers. So, we
18 have more, obviously, work to do that will come out of the flooding
19 hazard evaluations, but I think that the walkdowns were a successful
20 implementation given what their intent was.

21 The seismic reevaluations and flooding reevaluations,
22 I'll talk about those in a minute on the next two slides. The staffing and
23 communication, we're well on our way there. Over 50 of the staffing
24 assessments have been provided to us by industry. We expect to
25 receive the remainder of those staffing assessments by the end of this
26 year, and it's taking us on average about four months or so to be able to

1 process those, do our reviews, and so we expect that those will be
2 completed in 2016.

3 The mitigation of beyond-design-basis event
4 rulemaking was put out for public comment last Friday, 90-day
5 comment period, so we're on schedule for that. And then the
6 containment protection and release reduction, as the Commission is
7 well aware, in August we were provided direction by the Commission to
8 cease activities on that, that we would rely on the existing Order 13-109
9 for the Mark I and Mark II containments, and so that activity has ceased.
10 The only thing that remains on that is to publish the regulatory guidance
11 that had been developed. Next slide, please.

12 In terms of flooding hazard reevaluation and closure
13 plan, about a year or so ago I think we were probably not in as good a
14 shape as we would like to have been in terms of our flooding hazard
15 reevaluations, and we were involved in a conundrum where on one
16 hand we had the activities associated with looking at the information
17 being provided through the 50.54(f) letters, and then we also had the
18 activities that were going on in terms of the mitigating strategy orders,
19 and we needed to be able to synchronize those. So, we came to the
20 Commission with what we saw as some of the challenges there. The
21 Commission gave us very strong and positive direction in terms of its
22 expectations for how the Staff should work in terms of flooding hazard
23 space, and we developed a flooding hazard plan that was provided to
24 the Commission in June of this year, and which you responded in July
25 with an SRM that basically provided us with a path forward. So, I'm very
26 pleased to say that through the collaborative efforts of the Office of New

1 Reactors and NRR, that we've been able to develop a very good
2 closure plan that is showing good progress.

3 At this point in terms of the hazard acceptance review
4 activities, we're nearing completion. We expect by the end of 2015 that
5 we'll have almost all of the letters to licensees associated with their
6 reevaluated flood hazards in their hands so they can begin to do their
7 planning for the mitigating strategy assessments that Mr. Pietrangelo
8 talked about this morning.

9 In terms of our own safety assessments, we're
10 continuing to make progress on those, as well. We have about 13 or 14
11 that are done now, and those will be continued to be making progress
12 on through the course of next year.

13 The key activities that will be in play in 2017 and 2018
14 are the remaining parts of our closure plan, which is what do we do with
15 those licensees that have flooding hazards that are above their design
16 basis? And what we've tailored our plan to do is, basically, two
17 activities. One is what are called focused evaluations, and for those
18 plants we'll be looking at if they're susceptible to a local intense
19 precipitation event, there's a certain focused evaluation they have to do,
20 or if they have exceedances because of other flooding hazards, there's
21 other aspects of a focused evaluation they'll have to do. But, basically,
22 the focus is going to be on do they have available physical margin, and
23 if they do, then that will allow us to be able to disposition those plants in
24 a reasonable assessment manner.

25 For the handful of plants, and we're anticipating maybe
26 on the order of a half a dozen or so plants, will have to move into the

1 integrated assessment where it's a much more comprehensive look at
2 the plant's resilience capabilities for the suite of flood hazards that exist
3 out there. We anticipate that we'll have the guidance in place for that
4 sometime next year, and look at being able to complete those
5 integrated assessments in 2018. And then that will help dictate in terms
6 of whether there's more regulatory action that will need to be taking
7 place utilizing our backfit rule in terms of imposing any sort of additional
8 requirements on licensees. So, that's where we are with the flooding
9 evaluation closure plan. Next slide, please.

10 In seismic space, you know, we've been able to sustain
11 the progress and the schedule that we identified, and so things are
12 moving along I think quite well on the seismic hazard area. Of course,
13 there was a differentiation between the plants in central, and eastern
14 United States, and the western plants, so the western plants are about
15 a year behind, and so that's part of what this slide indicates, is that we
16 expect to complete our acceptance reviews of the western plants by the
17 end of this calendar year.

18 I think the big message relative to this slide is that
19 when we did our initial screening back in 2014, we identified about 33
20 plants that would be required potentially to do a seismic PRA, but that
21 was an initial screening, and we had always indicated that we would
22 continue to refine that screening. So, we've done that over the last year
23 and a half, and what that has resulted in is identification of 13 of those
24 initial 33 that we believe because of the small gap that exists between
25 their existing design basis and what was revealed in the re-analysis in
26 terms of their ground motion response spectra, only having slight

1 exceedances, or maybe exceedances in just certain frequency bands
2 that they no longer will need to do a seismic PRA. There'll be more
3 focused evaluations that could be high-frequency or maybe the spent
4 fuel pool analysis, but that there's 20 plants that still remain that will
5 have to go through the seismic PRA analysis.

6 The benefit of that is, first of all, as you all know, we
7 have limited resources nationally in terms of seismic expertise, so this
8 will allow us to -- and industry to better apportion those resources to be
9 able to do these seismic PRAs. And we're identifying a staggered
10 approach, as we've done previously, to make sure that the plants get
11 the right focus at the right time. So, that will take place over the next
12 several years in terms of the seismic PRA assessment. But that will
13 also allow us to complete based on our original schedule approximately
14 one year ahead of what we had originally anticipated, so I think that's a
15 real positive thing, and that means that we'll be making safety
16 enhancements as a result of these assessments sooner than later. So,
17 I think that's a real good story.

18 So, the bottom line in terms of where we are with Tier
19 1, we're on or ahead of schedule in all the Tier 1 activities. We're
20 actually seeing significant safety enhancements being performed out
21 there in the field at the sites, and the MBDBE Rule is out there now for
22 comment, the proposed rule, and so I feel really proud of my team and
23 the organization in terms of what we've been able to accomplish in Tier
24 1. And with that, turn it over to Jack Davis to talk about Tier 2 and 3.

25 MR. DAVIS: Thanks, Bill, appreciate it. Normally, when
26 I'm before the Commission, I just talk from the top of my head, but

1 there's so much information, I'm actually going to rely on my iPad today,
2 so I hope you'll indulge me.

3 I did want to comment before I get to my part of the
4 presentation on what Bill said about the walkdowns. I do also believe
5 that the walkdowns were -- that we did an adequate job there. After the
6 ANO and the St. Lucie events, we took another relook at the walkdowns
7 to make sure that the integrity of that walkdown was adequate. I
8 personally participated in three of the walkdowns, and one of those
9 sites was back to St. Lucie. And the other thing I would remind the
10 Commission of is that at that time when we were doing the walkdowns,
11 we did allow some deferral of certain inspections because of operation
12 or safety issues, if it was in a high-radiation or something like that we
13 allowed them to wait until that time when they were in outage. So, some
14 of that contributed to some of the issues that you heard Dave talk about.

15 Anyway, turning to the next slide, in similar fashion to
16 seismic and flooding, earlier this year we took the initiative to reevaluate
17 the Tier 2 and Tier 3 Resolution Plans that we originally provided to the
18 Commission back in 2012 time frame underneath SECY-12-0095. We
19 felt that the good progress that we made on the Tier 1 implementation,
20 combined with several key Commission decisions that we made
21 allowed us sufficient and informed thought process that we thought we
22 could actually advance the schedule a little bit on the Tier 2 and Tier 3
23 stuff.

24 We worked collegially with our interested stakeholders
25 in evaluating how best to do this. And some of that's not totally
26 completed yet, but we've done a lot of that. And we believe that we're

1 maintaining the appropriate technical rigor while we're capitalizing on
2 what we've learned from the Tier 1 activities.

3 The proposal that we gave to you, we plan all Tier 2
4 and Tier 3 Recommendations could be resolved by the end of 2016,
5 which is somewhat ahead of the schedules that we provided to you
6 originally in the 12-0095. So, next slide, please.

7 They were broken down into basically three primary
8 categories. Group 1, again, was the ones that we believe we have
9 sufficient information right now that we can close that recommendation.
10 Group 2's we also believe we have sufficient information, but we
11 haven't done all of the interactions, if you will, with the ACRS and other
12 parties, and we believe we could benefit from their input, so we're
13 proposing to the Commission that those could be closed sometime
14 early in 2016 based upon feedback from those groups. And then
15 Group 3 recommendations are those that we haven't done a lot of
16 progress on. We believe that more work would need to be done. Still we
17 think we can get it completed by 2016, but we do believe we need more
18 work before we come back to the Commission with a recommendation.

19 A lot of the things that went into how we came up with
20 the recommendations and where we grouped them was related to
21 already our strong regulatory framework that already exists, the
22 substantial safety enhancements that we've gained from
23 implementation of mitigation strategies so far, the fact that we are
24 incorporating the reevaluated hazards of seismic and flooding into the
25 mitigation strategies, the detailed analyses that were done to support
26 the containment protection and release reduction rulemaking, the

1 mitigation strategies rulemaking, and so on, that showed a lot of these
2 things that it would be a hard bar to get over for making them a
3 cost-beneficial substantial safety improvement. And also the fact that
4 the Agency has many mature processes that work very well that can
5 handle the remaining items. If we can go to the next slide.

6 So, I'll start with Group 1, and I'll just remind folks. All of
7 these slides are going to follow the same format. The top block there
8 will show you what the recommendation is, the next block says why it
9 was put into Tier 1, excuse me, Tier 2 or Tier 3. The left block gives you
10 the high-level evaluation, and then the right block depicts what we are
11 proposing to the Commission.

12 So, if we start with protections or mitigations against
13 seismically induced fires and floods, we are recommending closure
14 now. As part of the Tier 1 activities, the Commission directed the Staff
15 to look at the feasibility of a PRA methodology that could support this.
16 We could develop a tool, and then use that tool to gain insights into if we
17 need to take any regulatory action in this area. That feasibility study has
18 been prepared by the Office of Research. It's currently under review. I
19 can tell you that what the draft results say so far is that significant
20 challenges still exist to actually not only developing the data that that
21 tool will use, but also the tool itself, and that to do that would take an
22 extensive amount of time, extensive amount of resources, and we're
23 not sure that the safety benefit that you would gain from that would
24 actually be commensurate with the level of effort we'd have to put into
25 that.

26 We think also, moreover, that there are deterministic

1 methods that exist right now that we can evaluate this particular
2 recommendation and make a recommendation. Our SECY paper that
3 you have before you listed the deterministic assessment. It considered
4 a number of things, the robust nature of the flooding protection
5 programs that we currently have, the initiatives that are taking place
6 underneath NFPA-805, the seismic walkdowns that were done
7 immediately after the accident looks specifically in these areas,
8 mitigation strategies I've already mentioned which provides yet another
9 additional layer of protection against such accidents. And, finally, we've
10 looked at a lot of the operating experience from both domestically and
11 internationally, and we really don't see a vulnerability here based upon
12 the evidence that exists out there today. Next slide.

13 So, these two recommendations were Staff-generated.
14 They weren't part of the original NTTF report. We still thought they were
15 appropriate to look at. The initial plans that we provided to the
16 Commission in 12-0095 was that basically wait longer term completion
17 of health effects before we've resolved this recommendation.

18 Our current policies and practices in this area,
19 including the rationale for those practices were described recently. I
20 think it was a 2014 denial of rulemaking petition that went into why the
21 current program that we have is adequate, and the Commission agreed
22 with us on that particular position. We recognize that long-term health
23 effects, they're going to be going on for quite a while related to the
24 Fukushima accident.

25 We have some additional reports since the accident,
26 both from the UN, also from the World Health Organization. These

1 reports continue to show that the Agency's processes in this area are
2 adequate for what we're doing. Of course, we always are going to
3 maintain our involvement like we do in the past, we will in the future.
4 And any of these reports that come out of anything were to challenge
5 that, certainly we would get back to the Commission to suggest that
6 perhaps it's no longer protective. But as of right now, we believe that it
7 is, and we have existing processes to continue to monitor that. Next
8 slide, please.

9 So, this slide provides a list of four EP
10 recommendations that we are proposing should be closed now. The
11 first two deal with the capabilities in the Emergency Response Data
12 System or ERDS, which as you know provides information to the
13 Agency during an accident. And then the second two deal with
14 emergency preparedness enhancements that are being led primarily by
15 FEMA, but also with support from the NRC.

16 So, if I start with the ERDS enhancement closure
17 recommendation, we offer to the Commission that the Commission is in
18 an advisory role, and any time there's an accident going on, we don't
19 have operation responsibility, so just by that fact alone it lowers the
20 impetus, if you will, for making enhancements to ERDS. In addition,
21 the Agency has alternative means to get data absent ERDS. We've
22 actually practiced this in certain exercises where we've simulated a
23 certain situation, and then simulated that ERDS wasn't available, and
24 we've shown that we can adequately get information that we need to
25 make informed decisions.

26 We also, when you look at what would be proposed to

1 update ERDS, it's fairly challenging, and in some cases perhaps maybe
2 not even technically feasible given the current technology. So, there
3 would be a lot of effort to go into that to look to see if we could actually
4 do it, and then to get over the cost beneficial hurdle might be pretty
5 difficult to do, so we don't think that it would be cost-justified to make
6 further improvements to ERDS at this time.

7 With respect to the second two recommendations,
8 FEMA is actively working this. We've been in coordination with them.
9 Training enhancements have been made. FEMA is nearly complete
10 with the update to the Nuclear Radiological Incident Annex to the
11 National Response Framework where they're going to incorporate
12 Lessons Learned on reentry and recovery. And we anticipate that this
13 will be done by the end of the year. Given the good progress that's
14 being made, we think that these two recommendations could also be
15 closed now. Next slide.

16 So, on to ROP modifications. This recommendation
17 would be for the NRC to adjust the ROP self-assessment by a
18 realignment to include defense-in-depth considerations. It was
19 dependent on the Commission direction for Recommendation 1 which,
20 as you know, has been closed to the Risk Management and Regulatory
21 Framework RMRF initiative. That initiative at Commission's direction
22 was treated outside the scope of the Fukushima Lessons Learned. I
23 know that there's a paper coming before you by the end of the year on
24 that. Certainly, if there was additional insights the Commission wanted
25 to provide us related to defense-in-depth, that would be obviously
26 acceptable to us. However, we believe that outside of the scope of

1 Fukushima, the Staff has already been working to enhance ROP
2 attributes. We'd like to note that there's been a couple that have already
3 been taking place ancillary, again, to the recommendation, as I said, but
4 such as improvements to the flood protection inspection procedures.
5 We have the TI-2515/191 that's -- we did the pilot at Watts Bar. We're
6 going to start in earnest next year working that issue; that we're going to
7 have lessons learned, if you will, from that, and we can incorporate any
8 improvements to the program based upon that.

9 We also have the feedback process that already exists
10 as part of the update to ROP, so we believe that there's a sufficient and
11 mature existing program in the Agency to deal with the ROP
12 enhancements that might be necessary, so we think that it could be
13 closed now. Next slide.

14 So, this recommendation is associated with improved
15 training for inspectors and staff, in general, on severe accidents and, of
16 course, severe accident management guidelines. Several of these
17 training initiatives, they've already been completed, including
18 development of new courses, and also updating of the qualification
19 programs.

20 The Agency is also developing a course on severe
21 accident management guidelines, and we're currently in the process of
22 figuring out we can best incorporate that into the inspector qualification
23 program.

24 We plan on putting out information, a communication, if
25 you will, next year to Staff on severe accident guidelines on all the
26 training improvements that have been made, and where they can get

1 them. So, given the substantial progress that we've made here already,
2 given the fact that we have mature processes for how we incorporate
3 training into programs, we again feel that this could actually be closed
4 to the normal process. Next slide.

5 So, several of the EP recommendations that were in
6 the original plan are being addressed already, as included as part of the
7 mitigation strategies rulemaking. We've had a lot of discussions on
8 those, and you see those recommendations up here. Thus, we believe
9 that we should be able to close these particular recommendations
10 rather than track them separately, and we just close them to the
11 rulemaking activities.

12 Now going onto the next slide, we're going to transition
13 now from Group 1s now into Group 2s. Again, remember Group 2s
14 are, we still think that there's adequate basis to close them; yet, we
15 think we could also benefit from additional stakeholder input. So, we
16 want to actually wait to tell the Commission our final recommendation
17 until we receive that additional input.

18 The recommendation on this particular slide, it came
19 from the ACRS. It would have the NRC assess the need to operate
20 certain reactor and containment instrumentation such that it could
21 survive a beyond-design-basis event. The Staff has interacted with
22 domestic and international organizations on this. In fact, there's still
23 work going on now, and we've determined that, essentially, there would
24 be only a small additional safety benefit gained by imposing any new
25 requirements in this area.

26 We consider a number of factors. For instance, in

1 severe accident management guideline space there's already a
2 process to treat, you know, how you cross-check instrumentation, if the
3 instrumentation is available you rely on other instrumentation that might
4 give you indications. You have analytical techniques that you could rely
5 on, and certainly in the end, if all else fails, you can certainly take
6 certain actions like flooding up and things like that to deal with the
7 situation at hand.

8 Mitigation strategies not only provides defense, if you
9 will, against core damage, but it also provides that continuity of
10 instrumentation, so you went into the accident, you have your mitigation
11 strategies working for you, you have indications and readings from that,
12 so you know where the reactor is as you progressed if, unfortunately,
13 you progressed into core damage. So, that provides another layer of
14 defense there.

15 I would mention, also, that as part of the EA-13-109
16 order on Mark I and Mark IIs, depending on what their strategy is for
17 how they're going to implement the severe accident capable hardened
18 vents they would have to have instrumentation that would work in that
19 particular environment. And then I would finally mention that as part of
20 the Commission's order on the spent fuel pool instrumentation, the
21 requirement is that that instrumentation work in that environment. It's
22 going to be expected there, so high radiation fields and so on.

23 Finally, based upon information and analysis that was
24 done as part of mitigation strategies rulemaking, we also concluded that
25 if you were to try to go beyond this point, not only would it be difficult,
26 but it likely would not pass the backfit rule. So, given these reasons, our

1 initial assessment is that we close this recommendation. Again, we
2 want to interact with the ACRS on this. We've had some interaction with
3 them, but we'd like to have more engagement. We have plans for doing
4 that with them, other stakeholders, as well. And then we would come
5 back to the Commission in the March time frame to suggest finality for
6 this particular item. Next slide.

7 So, this recommendation would have us evaluate the
8 need for hardened vents on containments other than Mark I and Mark
9 IIs. A lot of the work in this area was deferred while the Staff worked on
10 the Mark I and Mark IIs through the EA-13-109 order, and also the
11 containment protection and release reduction rulemaking. Our SECY
12 paper lays out a containment assessment of the various items and we
13 think it would be unlikely that we could demonstrate that we need
14 further regulatory action for these. This is largely based upon, for Mark I
15 and Mark IIs already we think that the order deals with the protection
16 that the Commission was looking for. For other than those, there's
17 mitigation strategy capability that's required to be put in place, for
18 instance, like on Mark III containments. To meet the mitigation
19 strategies order, licensee have to put in additional heat removal
20 capabilities, if you will, by using portable power supplies and so on to
21 repower their suppression pool cooling pumps. On other containment
22 designs, we have other mechanisms. They'd have to do heat removal
23 so that you're achieving the same end result as what you're achieving
24 with the order on Mark I and Mark IIs.

25 We also, if you look at the containment protection and
26 release reduction regulatory basis that was put together, it shows that

1 these things are pretty much orders of magnitude below the quantitative
2 health objectives that were set by the Commission. So, likely, you
3 would have a hard bar again to get over to impose additional
4 requirements on licensees. Again, we'll engage -- our proposal is that
5 we would engage with the ACRS on this, and then we would get back to
6 the Commission. Next slide.

7 This recommendation would have the Staff evaluate
8 the need for further enhancements at hydrogen control. Again, this was
9 based upon insights from the accident. We have a whole host of
10 information from previous studies on hydrogen control, and we have
11 recent information from international sources on hydrogen control
12 practices that we participate in to the Office of Research. As with the
13 previous recommendation, again, the SECY goes through a
14 containment by containment comparison, if you will, on hydrogen
15 control, and we believe that it's unlikely that the need is there to impose
16 more requirements. This is based upon a couple of key components;
17 the adequacy of the existing requirements that are in 50.44 for
18 hydrogen control, that's with the inerting of the environments and things
19 like that. The fact, again, that the mitigation strategies provides this
20 additional layer against core damage, and then also helps with the
21 decay heat removal. You have the EA-13-109, as we already talked
22 about, that deals with the Mark I and Mark II situation. For Mark IIIs and
23 the ice condensers, as I mentioned, we have parts of the mitigation
24 strategy require you to repower the igniters with independent sources
25 so that they can deal with the situation. And then for the large dry ice, a
26 lot of study has been done to show that they can contain, if you will, any

1 hydrogen detonation that is expected to occur.

2 Again, the CPRR lends insight to the regulatory basis
3 that -- lends insights into where we are as far as qualitative health
4 objectives are concerned, so we believe that it could be closed. Again,
5 we would engage with the ACRS and other interested stakeholders and
6 finalize our assessment to the Commission. Okay, next slide.

7 We're going to transition now to the Group 3s. These
8 are the few recommendations where a lot of work hasn't been done
9 over the intervening time, and we're recommending that further analysis
10 needs to be done before we can make a final recommendation to the
11 Commission.

12 The first recommendation in this group; this, again,
13 came from the ACRS, was also included in the 2012 Appropriations
14 Act. It involves the reevaluation of external hazards other than the
15 seismic and flooding which we've been dealing with as part of Tier 1.

16 In addition to the reevaluation of seismic and flooding
17 hazards that was done through the 50.54(f) that was issued in 2012, the
18 NRC required licensees as part of mitigation strategies to look at other
19 external hazards as part of EA-12-049. And unlike seismic and flooding,
20 licensees evaluated using existing information, that is true. And they
21 weren't required to look at any significant change, if you will, in that
22 particular hazard, but they did look at it. They looked at the history of the
23 plant, the history of the local area on those types of conditions.

24 The original plan would have been a recommendation
25 to issue another 50.54(f) to all licensees to reevaluate these other
26 hazards; however, in looking at this again, we believe that the

1 recommendation can be addressed much more efficiently and
2 effectively by us taking a screening process, if you will, to the external
3 hazards. Similar to what you were saying, Commissioner, related to
4 what do we know about these hazards? It's not like we're totally in the
5 blind on it.

6 Basically, we would do a screening process. We would
7 look at all the hazards we think that should be included. In a sense,
8 we've already done that as part of Tier 1 activities, so that step is really
9 complete. We then apply a screening criteria to look at those hazards
10 for generic implications. For instance, could the hazard screen out
11 because we know that the plants are already robust against that type of
12 a hazard, so we could screen on something like that. We can screen on
13 a warning time type of thing where you have procedures in place.
14 There's ways to do that.

15 Then for those remaining ones that we couldn't screen
16 generically, at that point you might consider well, maybe we send out
17 specific 50.54(f) letters to that particular licensee to look at what can be
18 done, or what information do we have about that, and then we would
19 make a regulatory decision from there. We think that's a lot better than
20 just generically having the entire industry go out and look at all these
21 hazards. And we do have insights into what we think, you know, some
22 of the hazards, or one of the hazards, for instance, that maybe we need
23 to take a more focused look at as compared to just a more generic
24 approach.

25 So, there's still work to be done here. If the
26 Commission agrees with us, we would go off and develop that

1 screening process quickly. We believe that we can have that done and
2 have good information back to the Commission by the end of 2016.
3 Next slide.

4 This recommendation was for the NRC to require
5 licensees to reconfirm seismic and flooding hazards every 10 years, a
6 very arbitrary number. The recommendation was then subsequently
7 expanded to include all external hazards beyond just seismic and
8 flooding. The original plan as we proposed to the Commission back in
9 2012 was to do this through a rulemaking, but at the time we deferred
10 work until completion of the ongoing seismic and flooding, and we can
11 gain insights from there.

12 We now believe that this recommendation could be
13 addressed by enhancing our existing Agency processes rather than
14 developing a new rule to that. We think that the current process and
15 practices are generally effective. We've shown that through history, but
16 we also believe that there can be some proactive things that we can do
17 to enhance the existing process that would help us not only to be more
18 ahead of the curve, if you will, but also to be much more systematic so,
19 therefore, our regulations would be much more predictable and reliable.

20 We haven't worked out a lot of the details as to how we
21 would do this. We've had a lot of discussions on it, I can tell you that for
22 sure, but it would generally entail something along the lines of getting
23 more engagement with those federal agencies that have that
24 information, perhaps even industry organizations like EPRI and so on,
25 working on the front end with them to identify not only what the new
26 information would be, but what are the trigger mechanisms that you

1 would use to say okay, I want to actually take a reconfirmation of that
2 particular -- what would be the -- because information changes all the
3 time, but it's not necessarily that you might want to take a full-blown
4 reconfirmation. So, we would have to work out those types of details.
5 Certainly, we would leverage the information that we already have that
6 we've already learned from Tier 1, the things that we put in place
7 already to do that.

8 It would -- we recognize it would entail some up front
9 costs, and then recurring costs to do this, but we think in the end, this
10 actually would be more effective and it actually -- our estimate would be
11 in the long term it would be actually cheaper than the way we currently
12 do our business now. If the Commission agrees, we would put together
13 a plan, we would get something back to you by the end of 2016 to
14 suggest how this might work going forward. Next slide.

15 There's one emergency preparedness
16 recommendation we believe should remain open for further
17 assessment. The reason that we're suggesting it remain open is largely
18 due to the fact that we really haven't looked at this in any great detail
19 because we had higher priority work that was going on. The
20 recommendation involves the study of the efficacy of realtime radiation
21 monitoring on site and within the emergency planning zones.

22 The real concern from the NTTF, if you go back and
23 look at the report, is that if you had a station blackout or something like
24 that, and you lost those instrumentations would that not create an
25 impact to you? However, the NTTF itself in that report recognized that
26 field monitoring certainly remains a valid way to acquire radiation data.

1 We've had a lot of history with this. We've looked at this before. If you
2 go back and look through some of the documentation that we have,
3 what we're proposing is that we would go back, we would look at the
4 past historical evidence, we'd look at if there was any identified gaps
5 based upon what we know now from Fukushima. We would certainly
6 coordinate with the ACRS and other stakeholders, federal and state
7 organizations on what kind of information they have, and then we would
8 provide a recommendation back to the Commission by the end of 2016.

9 So with that, I'm now going to turn it over to Mike to go
10 through the international perspective.

11 MR. JOHNSON: Thanks, Jack. Slide 20, please.

12 So, on this slide we indicate, of course, that the NRC
13 continues to engage with our international regulatory counterparts, and
14 we do that through things such as participation in the Convention on
15 Nuclear Safety, and participation and peer review missions. We also
16 review the products of other regulatory organizations including, for
17 example, the Institute for Radiological Protection and Nuclear Safety,
18 IRSN. We review products of the Nuclear Energy Agency, for example.
19 And, of course, as I'll talk about in the next slide, we have done a
20 comprehensive -- or we've done a review of the comprehensive report
21 on the accident from the International Atomic Energy Agency.

22 As we've said or I've said in previous briefings, in
23 general, when we look across internationally, I think that our
24 approaches, I find that our approaches are similar with respect to the
25 increased protections that we would put in place, including insuring
26 protection against external hazards, enhancing mitigation in the face of

1 those hazards, and strengthening emergency preparedness
2 capabilities. Slide 21, please.

3 The NRC Staff is reviewing the IAEA report, the
4 Fukushima Dai-ichi report issued in August of 2015, and I want to note
5 that there were a number of folks who have actually had some
6 involvement in that product as it was being developed, so we've had
7 awareness all along as that report was being developed.

8 This slide shows a stack-up, if you will, of the IAEA
9 themes and actions that have been taken previously, or as a result of
10 the Near-Term Task Force recommendations and actions that we've
11 taken going forward. And, in general, I think that our actions line up
12 well with the recommendations identified in the IAEA report. In some
13 instances, our approaches differ, may differ but the outcomes are
14 equivalent. For example, in the area of insuring a reliable confinement
15 function, as you look around the world that has different meanings to
16 different regulators but, in essence, I think we all are moving in an
17 approach that will provide for reliable confinement that is containment
18 of radiological releases in the event of an accident.

19 As noted on the slide, some of the IAEA
20 recommendations had been addressed even before Fukushima as a
21 result of our regulatory structure and processes. For example, we've
22 long had an active operating experience program that has served us
23 well. The U.S. Government has had a program for responding to
24 nuclear and radiological incidents in the country. We think that process
25 continues to serve us well. We've strengthened it, we continue to
26 strengthen it. We tested it through Southern Exposure 15, and we've

1 identified Lessons Learned. But, again, we think we have had prior to
2 even Fukushima a strong foundation for going forward.

3 In other cases, the NRC completed post-Fukushima
4 safety enhancements to address the recommendations of the IAEA.
5 They are indicated on that table, and many of those things have been
6 talked about either by Bill with respect to Tier 1 items that have been
7 done and rounded out by things that we'll continue to do with Tier
8 3 -- Tier 2 and Tier 3 plans that we've just described, Jack just
9 described.

10 Overall, we believe that the NRC actions adequately
11 address most, if not all, of the IAEA recommendations. I want to temper
12 my enthusiasm with that statement a little bit. There are some
13 recommendations that are a little different. For example, there's a
14 recommendation regarding strengthening our understanding with
15 respect to radiation effects on non-human biota. That's a
16 recommendation that the Commission -- an area that the Commission
17 dealt with several Commissions ago in the mid-2000s, and took a
18 position with respect to whether or not we would provide protection for
19 flora and fauna, as opposed to providing protection for humans. And we
20 are lined up with the direction provided by the Commission a little bit
21 different than the recommendation in this international report. But as
22 you look at the 50,000-foot level with respect to the recommendations,
23 we line up very well in terms of our framework and the actions that we
24 are taking.

25 We will, of course, continue to participate in Lessons
26 Learned activities around the world as they go forward and learn from

1 them. We'll have with a questioning attitude, will not hesitate to raise
2 issues among the Staff and to the Commission should we find
3 something that we think warrants policy consideration for additional
4 requirements, if you will. So with that, I'll turn over to Vic.

5 MR. McCREE: Just a few closing thoughts. While
6 implementing the post-Fukushima safety enhancements we've made it
7 a priority from the outset to continue to maintain our strong focus on
8 operational reactor safety, and we've made continuous improvements
9 in safety as a result of the Lessons Learned from the Fukushima
10 accident.

11 We've made progress on each of the tier of the
12 recommendations, and want to briefly emphasize three points. The first
13 is, the nuclear plants in the United States are safer today. Plants are
14 coming into compliance with two of the Tier 1 orders, and the
15 reevaluated hazards are progressing with safety enhancements being
16 made along the way, as appropriate.

17 Secondly, we've resolved many of the Tier 2 and Tier 3
18 recommendations, and have resolution paths for the rest. And, thirdly,
19 we expect 2016 to be an extremely busy but a very fruitful year for the
20 Agency as most of the safety-significant recommendations are put into
21 place, and the remaining Tier 2 and 3 recommendations are resolved.

22 The next time Staff is scheduled to speak with the
23 Commission we plan to discuss the next phase of our response to the
24 accident which will include sun setting the Japan Lessons Learned
25 Steering Committee and other activities related to transitioning to the
26 line organizations.

1 As you know, the NRC continues to look for ways for
2 improving our efficiency and our effectiveness of our regulatory actions
3 and move towards completion of all post-Fukushima initiatives.
4 Although some work will extend past 2016, such as implementation of
5 the containment vent order, the end of 2016 will be an important
6 milestone for the NRC as we expect that the most safety-significant
7 recommendations will be in place by that time.

8 Thank you, and we look forward to your questions.

9 CHAIRMAN BURNS: All right, thank you, and I
10 appreciate the comprehensive overview the Staff gave this morning.
11 And we'll start the questioning with Commissioner Svinicki.

12 COMMISSIONER SVINICKI: Good morning to all of
13 you, and Jack, I commend you, you got through a lot of information. I
14 think one of these other gentleman ought to buy you lunch or
15 something, or perhaps they could answer all the questions. I was
16 looking at your presentation last night, and I thought oh, the transcriber
17 is going to have fun with that. He or she will probably just slow the tape
18 way down in order to develop the transcript. You moved pretty fast, but
19 you covered a lot of ground, and I appreciate that.

20 Commissioner Ostendorff and I, of course, have been
21 here since the events in Japan so we've sat across the table from you
22 and other NRC Staff over the course of that time, and we have had a
23 chance to see the progress made, and the evolution of our thinking on
24 some of the initial Near-Term Task Force recommendations.

25 At the NRC's Regulatory Information Conference
26 earlier this year, I mentioned the fact that in looking at the U.S.

1 response and the U.S. NRC response to the events in Fukushima as a
2 whole, that I was proud, and I didn't say that as a matter of personal
3 pride. I think I'm proud of the thoughtful, and methodical, and deliberate
4 approach from the President, again requesting that NRC in its
5 independence take a quick look and move forward on actions to the
6 Congress, which although we've had very intensive and vigorous
7 oversight of our activities, the Congress has left us the breathing room.
8 They have not legislated as a general matter on what they thought
9 should be done as a regulatory response to the events. And I think that
10 the Staff as a result of being given that breathing room has taken an
11 approach that looked at what are those areas that would yield the
12 immediate significant risk reduction. I know we've moved away in
13 recent years from talking much about laying the measures that we've
14 taken kind of over a risk reduction curve because we're so precise that
15 we got, I think, hung up in what percentage is it, Tier 1 accomplished 85
16 percent of the risk reduction, but I'll be imprecise since it's laying it on
17 me, not on the Staff.

18 The majority of the safety enhancement and risk
19 reduction came from the Tier 1 items. And, again, that's not a happy
20 accident or a coincidence, or anything else. That was our intention, and
21 our design, and so we sit here -- again, in the spring we'll be five years
22 from those tragic tsunami and earthquake, and I think that again we can
23 all feel some sense that we began with the intention of being at this
24 point, and there's been a lot of talk about exhaling and inhaling. I got a
25 little hung up on that with the last panel. I started the consistent practice
26 of yoga in January of this year, so trust me, I know about the importance

1 of breathing, as we all do, and focusing on the breath. But in any event,
2 I'm not sure whether we're inhaling or exhaling, but I think we can step
3 back and look at where we are, and feel that we are where we intended
4 to be.

5 And lo and behold, so we get the Tier 2 and Tier 3
6 proposal from the Staff, and again you sit there and say this is so
7 interesting that in proposing strategies on the remaining action on Tier 2
8 and Tier 3 items, the NRC Staff is finding that our approach to these
9 items, if you address one, you have inevitably taken some approach
10 towards addressing others, and they're very linked with each other. But,
11 again, you could sit back and marvel at that, or you could simply
12 recognize that it is the logical outgrowth of our very deliberative
13 approach to working on these items. So, there has been a relentless
14 desire to track these as individual recommendations.

15 I think at this point in time, the Staff's most recent paper
16 on Tier 2 and Tier 3 makes clear, at least to me, that you can't really be
17 looking at all of these individual recommendations as items. I think that
18 we have, and we should feel good about this, a very holistic approach to
19 looking at our regulatory framework, taking action in a prioritized
20 fashion. And so, lo and behold, when you do that, what do you find out
21 about Tier 2 and Tier 3? You find that you have captured much of the
22 effect that those originators of those recommendations, whether it's the
23 Near-Term Task Force, or the ACRS, or other stakeholder groups, or
24 other NRC Staff that didn't serve on the Task Force, they had an
25 intention about something that needed to be addressed, but you don't
26 go out and take a regulatory action just on one of those items without

1 affecting the other items. So, I think that I find all of this very reinforcing,
2 the logic and the methodical and deliberate nature of it.

3 So, I just wanted to provide that commentary, but also
4 note for the benefit of the NRC Staff that as I approach my review and
5 deliberation on the paper on Tier 2 and Tier 3, it is my intention to vote
6 in a way that if you have convinced me on Group 2. Now we've got tiers
7 and groups, so I think our government is showing a little bit here
8 because we're getting into the binning in terminology, but for Group 2
9 where the Staff continues to conclude that closure is appropriate but it
10 wants continued engagement, in my vote I intend to approach it that if
11 your arguments have satisfied me, it would be my view that a
12 subsequent Commission vote on the Group 2s would be unnecessary.
13 So, I just want you to know. That's just speaking for my vote individually.

14 Now, the Group 3s are a different matter because you
15 are indicating that the jury is a bit out on those. So, in those cases I think
16 that if you determine that action is needed, it would be again my
17 threshold that you should return to the Commission with something that
18 would receive their deliberation and affirmation. But, again, that's how
19 I'm approaching that.

20 I do note that we received the ACRS letter on the paper
21 yesterday. There's a couple of items where I think they suggest that it
22 may be beneficial, if not necessary, to do additional work. Again,
23 Svinicki's view of the world. I'm going to ask you to -- you are at a
24 balance point there. It's my view, and I've talked to some of you about
25 this individually as you were developing these recommendations on
26 Tier 2 and Tier 3. You can always be adding additional analyses to the

1 decision record, and there is -- we want a very clear and transparent
2 decision record on how we disposition. And I think that's some of what
3 led to this paper, because we wanted to begin to put that framework in
4 place, because we do not want people 15 years from now saying
5 whether or not they agree with how we dispositioned these items, our
6 basis for doing so should be clear, and available, and transparent.

7 That being said, you do have to strike a balance point
8 as the Staff in terms of yes, additional analyses could be added to the
9 decision record, but we are in a Project AIM environment, so I think
10 you're going to have to make some choices there.

11 On the radiation monitoring during an accident, which
12 is one of the ones you continue to look at, I would urge you, again just
13 as a single member of the Commission, that you continue to
14 acknowledge the whole of government approach to an event, you
15 know, where FEMA's offsite responsibilities come in. I think that it would
16 be not advisable for NRC to get overly elaborate in our role and not
17 acknowledge that there is a much broader U.S. response. Mike, you
18 mentioned that our country has had a response to -- a plan for
19 responding to radiological events for some years. Chairman Burns and
20 I were looking at roles and responsibilities after the Southern Exposure
21 event exercise that the U.S. had, and I brought him a paper from what
22 was it, 1975, that was in a SECY paper about NRC and roles and
23 responsibilities with us, DOE, ERDA, and others. So, just I urge you to
24 look at that holistically.

25 And then in my last minute and a half I was going -- so
26 I violated what I said earlier. I was going to ask Jack principally to

1 respond to this. We heard Mr. Lochbaum ask a really good question
2 that we should all think about, his slides for mitigating strategies. What
3 are the chances the strategies will be deployed successfully? You don't
4 have to lay a numeric on that, but what is the Staff's view and comfort
5 level with mitigating strategies being deployed successfully?

6 MR. DAVIS: We believe it's pretty high, and I base that
7 upon the fact that -- and perhaps it's that Dave just doesn't have
8 visibility of this. They are doing validation and verification exercises on
9 these things. We've asked them to look at certain pieces of equipment,
10 and we look at the margin to what they have to do. So, if there's a lot of
11 margin in something we say then we think there's just probably a high
12 likelihood that that will be successful. If it's close, then we usually go
13 back through the other process and challenge them on that particular
14 strategy. So, we're feeling pretty good about that. We have the
15 inspections coming, the TIs, so we can learn further from that, as well.
16 But we think that we're in a pretty good place.

17 Certainly, we're going to have to decide on what the
18 overall drilling, if you will, and exercising will be, and what frequency we
19 should do that. That's still being debated.

20 MR. JOHNSON: Thanks, Jack, a really complete
21 answer. And I would just add a number of those features, including
22 exercises, for example, gets codified in the proposed rule and final rule
23 ultimately on mitigating strategies, so we think long term we'll have
24 assurance that not only will they be able to comply with the order, but
25 they'll be able to maintain that compliance going forward through
26 activities, responsibility of the licensee, and then effective oversight.

1 COMMISSIONER SVINICKI: I do want to second
2 something we heard on the previous panel because it is an admonition
3 of mine, and I ask about it at nuclear power plant sites. It's my view on
4 training and exercising that operators and responders should train and
5 exercise principally for events that they have a higher probability of
6 encountering over the course of their careers, so the types of events
7 that they might have to respond to, or as an operator the types of
8 anomalies and plant conditions. So, I have asked -- I've taken to asking
9 at sites if they have any concern or worry as training and exercising
10 requirements are developed that that -- for beyond-design-basis events
11 that may come at the expense of more routine training. To date, they've
12 all told me that they're not concerned about that, but I think that over the
13 course of the coming decades, the safety regulator should keep
14 checking in on that point. I think it's important.

15 MR. McCREE: And, Commissioner, I've asked that
16 same question when I visited sites, and I believe about three years ago
17 you had a representative from PROS here, a senior reactor operator
18 from Sequoyah, if I recall correctly, who asked that same question, but
19 to a site. Every one I've visited in the interim has -- they've been actively
20 involved in establishing the procedures that assure a balance in their
21 training, and they're comfortable with where they are.

22 COMMISSIONER SVINICKI: Okay, thank you. Thank
23 you, Mr. Chairman.

24 CHAIRMAN BURNS: Thank you, Commissioner.
25 Commissioner Ostendorff.

26 COMMISSIONER OSTENDORFF: Thank you,

1 Chairman. Thank you all for your presentations.

2 I'll have some comments and maybe a couple of
3 questions here for the panel, but I want to start out by completely
4 agreeing with the eloquent statement by my colleague, Commissioner
5 Svinicki, on a couple of things that I think are worth repeating. And I'm
6 not going to --

7 COMMISSIONER SVINICKI: I didn't mention putting
8 on my big boy pants. Commissioner Ostendorff and I have joked about
9 that, that sometimes in life you've got to put on your big girl pants, and
10 your big boy pants.

11 COMMISSIONER OSTENDORFF: Exactly. But there
12 are three points that I was going -- three points that Commissioner
13 Svinicki made that I think are really, really important here. One is to
14 recognize the safety-significance of what's been done in Tier 1. Two, to
15 take a holistic approach to looking at the disposition of the remaining
16 Tier 2 and Tier 3 items. And three, and I could not have said it better, we
17 are where we intended to be. And we talked about this the last four and
18 a half years. That, to me, is not by accident, and it's, quite frankly, a
19 result of the Staff's great effort, but it was not a small piece of this that
20 we had a Tier 1, Tier 2, Tier 3 strategy going back to the fall of 2011 for
21 a very good reason, as Commissioner Svinicki just highlighted. So, I
22 want to thank my colleague for articulating what I think is probably
23 perhaps the most important point that I take away from this meeting as
24 an individual Commissioner.

25 So, let me go -- I've got a couple of comments here.
26 One, Mike, I want to take this opportunity to personally thank you for

1 your leadership of this effort. And as Tony Pietrangelo noted, not done
2 yet. But you've been not a 10K, not a marathon, something greater than
3 an Iron Man for three and a half years here since you took over for
4 Marty, and I just want to acknowledge you publicly for your leadership
5 and that of your team and the Steering Committee, and the JLD, and a
6 lot of people here in this room, and a lot of people that are not here in
7 this room, and including the Regions who have been very key
8 participants here. So, thank you.

9 Bill, I wanted to comment on -- just applaud you for the
10 application of learnings within NRR, and in your role here on the
11 flooding and seismic evaluations where you've made some appropriate
12 adjustments. I know I talked to Cindy Peterson when she and I were
13 traveling last week, and I know that Cindy is out there today as Region
14 III Administrator, had visited Monticello with you, I believe, here
15 sometime this year, and that I note that there were some readjustments
16 done in the flooding strategy of Monticello after they had already
17 developed this large bin wall approach, so the fact this has been a
18 dynamic, not a static evolution I think is significant.

19 Jack, I add my thanks to that of Commissioner Svinicki
20 to the work on the paper. I mean, I think in a short time, relatively short
21 time period you and your team have really made significant
22 contributions in trying to bring this set of issues together. That's
23 irrespective of how I may vote as an individual Commissioner, but I just
24 want to acknowledge the hard work and the thoroughness of your
25 team's efforts.

26 I wanted to also, Jack, point to your Slide 6 where I

1 think you made a major point, and it's learning for me. In the Tier 2 and
2 Tier 3 resolution paths, the evaluations must consider among other
3 things existing requirements. And this goes back to Commissioner
4 Svinicki's point about this is a holistic effort, not just what's happened in
5 Fukushima, but what were the existing regulatory actions that were on
6 the plate. So, I note, and the Chairman talked about this earlier in the
7 first panel with the maintenance rule. And I note in my visits with Mark
8 Dapas to ANO, and with Dan Dorman to Pilgrim looking at the impact of
9 our, I think a very rigorous reactor oversight process. It had nothing to
10 do with Fukushima, quite frankly, the visits we made. So, I think taking
11 acknowledgment in this holistic way of what's already on the books,
12 what already is required to be taken, is a very significant piece of this.

13 When I look at the comprehensiveness of the
14 component design basis inspections, nothing to do with Fukushima, but
15 it's an in-depth deep look every three years for about three weeks now
16 at a plant, and its design, and its configuration. So, this building block
17 approach, Jack, that you have put on Slide 6, I want to commend you
18 for it, but also say I don't know that we talk enough about this externally.

19 And Mike, you and I talked about this before about the
20 need to really articulate, step back, take a 300,000 foot view of the
21 nuclear enterprise, how we regulate, but there's lots of different piece
22 parts that, you know, are outside of Fukushima. Like I said, we have
23 blinders on. We need to take into account all the different things we're
24 looking at.

25
26 I go to Slide 10, and I wanted to make a comment,

1 make an observation. And, Jack, you focused most of your time on that
2 slide talking about ERDS and so forth. And I will note a comment that I
3 had from Eric Leeds maybe three years ago where he had commented
4 on his experience, quite frankly, in Japan before Fukushima looking at
5 emergency preparedness exercises. And I've had a chance, as other
6 Commissioner colleagues have, to be an ET team lead here. In the last
7 18 months I've done a hostile action-based event at Diablo Canyon,
8 and then more recently just last month for Nine Mile Point and
9 Fitzpatrick. And I think as Commissioner Svinicki noted, this national
10 response framework involving FEMA is something we don't talk much
11 about, but it's a huge differentiating piece, I think, between ourselves
12 and this country, and most other countries. And the notion that we are
13 part of a larger emergency preparedness response network, it's not just
14 the NRC out there by ourselves. It's with FEMA, and the state partners,
15 and we exercise this routinely. I note that when we did the emergency
16 preparedness hostile action-based event for Diablo Canyon, Mark
17 Dapas was out there as a site team lead with a full set of folks from
18 Arlington, Texas to exercise that capability. Dan Dorman was there in a
19 likewise fashion back in the third week of October when we had the one
20 at Nine Mile Point and Fitzpatrick, so the site team presence from the
21 Regions, the significant staffing here in this Ops Center across the
22 street by NRC headquarters Staff, and the fact that we demonstrate
23 and exercise that on a regular basis. We were doing that before
24 Fukushima, but highlights the importance of us making sure that we
25 keep that in view of the big picture here.

26 Let me turn to a question now, Jack. I know you said

1 we could talk for five minutes here, maybe ask a question, so I will. I
2 wanted to discuss on Slide 17 a bit the notion for evaluation of other
3 natural hazards. And I know we talk -- you know, Bill has talked about
4 seismic, talked about flooding, we've had a lot of Commission
5 engagement on those two primary hazards. I say primary at least from
6 the standpoint of learnings from the Fukushima earthquake and
7 tsunami. I note that the flooding evaluation, lots of discussions the
8 Commissioners have had an individual briefings with Staff going back
9 to flooding SECY paper earlier this year, late last fall, local intense
10 precipitation, LIP, is part of the flooding piece. We already required
11 tornado missile hazard protection. We have tech specs that cover hot
12 water/cold water issues for operating plants and ultimate heat sync. So
13 I guess I'm trying to -- knowing that we've already dealt with seismic and
14 flooding, and we already have requirements for tech specs for a lot of
15 the parameters that might affect the ability to provide cooling. I really
16 wanted to make sure that I kind of bore down on this area. What do we
17 expect to learn from any additional work in this area? Can you give a
18 couple of examples?

19 MR. DAVIS: Yes. So, in some cases we know that
20 some of the hazards like tornado winds may have gone down from what
21 we've originally designed plants to, so in some sense that's a good
22 positive. Right? We have more margin and safety. There's other areas
23 that we're aware of, like for instance hurricane wind-driven missiles
24 might be more intense than what we previously thought. So, there may
25 be some like that that we should take a look at, and just make sure that
26 the severity of what we thought it was previously hasn't substantially

1 changed.

2 I think the other benefit that you get by doing this
3 screening process, which I think is pretty -- not very research-intensive.
4 Perhaps, I should say it that way and the Agency has taken on itself to
5 do. It documents this all in one place that we've looked at all of these
6 external hazards, here are the ones we looked at, here's the basis for
7 why we think it works, acceptable or not acceptable. And we have that
8 as a reference document available. Again, I know it's more adding to
9 the documentation record, but certainly it's one I think that it would be of
10 benefit to the Agency.

11 COMMISSIONER OSTENDORFF: Do you expect
12 there to be any substantial safety enhancements that would pass the
13 backfit rule as you're looking at this body of work?

14 MR. DAVIS: I don't know. I'd probably lean towards
15 probably saying no based upon, again, as we talked before about the
16 multiple layers that we've added since Fukushima with mitigation
17 strategies and so on. But, again, I don't know, if we went through that
18 process --

19 COMMISSIONER OSTENDORFF: That's fair
20 response. Mike, do you want to say anything else on that? No, okay.

21 All right. The last -- I have two other comments, and I'll
22 close. Mike, I appreciate your slide on the IAEA report on Fukushima,
23 and I think that -- I'm not surprised at what you had to say there,
24 because I do have a lot of respect for the scope and
25 comprehensiveness of the approach taken by the Staff and by industry
26 post-Fukushima. If one were to sit back, and I made this comment on

1 the first panel, look at what are your reflections on the experience, one
2 can imagine how we would be in a bad situation perhaps as a regulator
3 if we had waited until the summer of 2015 when the IAEA report came
4 out for us to move forward. And that's not a criticism of the timing of the
5 report at all, but I think it just kind of re-solidifies the notion that we
6 moved out very quickly when the Near-Term Task Force report, that
7 group was stood up here in March of 2011. And that we oftentimes can't
8 wait, whether it be for an IAEA or an NEA, or National Academy of
9 Sciences report, and I think that a real strength of this Agency is that the
10 Commission, and Commissioner Svinicki and I were involved in these
11 discussions four and a half years ago. We had confidence in our Staff's
12 ability to come forward and take a hard look at these issues. I think it's
13 real credit to NRC Staff that there is by and large significant consistency
14 with IAEA Lessons Learned. So, just a comment, but thanks for making
15 that point today.

16 The last thing I'll mention, and this, Jack, goes back to
17 your area, is the Commission has this paper before us. We'll end up
18 voting on it at some point in time in the near future. Will come through
19 the Commission SRM, and I would just note that because of -- primarily
20 from what Commissioner Svinicki said, but we need to make sure that
21 the communications externally on however we end up take into account
22 the Tier 1 safety action items, the holistic nature of the entire
23 comprehensive approach taken by the Staff and the Commission,
24 because there will be some that say well, the ACRS raised this. You
25 didn't accept that, or well, this was not in the Near-Term Task Force
26 report but it came up as an add-on, which I applaud Mike for you and

1 your team being all inclusive, but being all inclusive doesn't mean that
2 everything is going to be accepted. And it's important to make sure we
3 keep the communications challenge ahead of us. Thank you all.

4 CHAIRMAN BURNS: Thank you, Commissioner.
5 Commissioner Baran.

6 COMMISSIONER BARAN: Thanks. I have some
7 additional questions on Tier 2 and Tier 3. Jack, you've been doing a lot
8 of the work on this, so if you want me to pester Bill Dean instead, I can
9 do that. I'll let you guys decide who's going to respond to these. All right,
10 it's Bill's turn.

11 And this is following up on part of the conversation that
12 Commissioner Svinicki was having with you all about Group 2 and
13 Group 3. So, Group 1 the recommendation is to close those now. Group
14 2 and Group 3 there may be additional analysis in the future. Is the Staff
15 planning to come back to the Commission to seek a vote on closing
16 those out, or any additional actions on the Group 2 and Group 3 items?

17 MR. DEAN: So, thanks, Commissioner. Our intent was
18 recognizing that we thought we had more -- some more work to do to
19 interact with some stakeholders on the Group 2, that there would be an
20 opportunity to come back before the Commission with the results of that
21 interaction, whether that would be in the form of information, or whether
22 that would be in the form of decision making. I think maybe we can talk
23 about that depending on what the interactions are. I think Group 3,
24 certainly we intended to come back to the Commission for guidance.
25 We would come forward with recommendations and then seek
26 Commission input and direction on those recommendations.

1 COMMISSIONER BARAN: Okay. And, I guess, this
2 just raises the question for the Group 2 then. If this is a preliminary
3 analysis of the recommendation about how you think you're going to
4 come out in Group 2, but you have more work to do, it's kind of strange
5 to ask the Commission to vote now to close out something you haven't
6 finished the analysis on.

7 MR. DEAN: No. I would offer -- I don't know that we
8 think there's more work to do in terms of analysis. I think in the Group 2,
9 we would probably -- we would say that we think that we're at a point
10 that we don't feel like we need to do more, but we feel that we owe it to
11 various stakeholders that have interests in those to be able to have a
12 dialogue with them about the rationale behind why we believe we don't
13 need to do more work on these, and to assure that there isn't something
14 else that emanates out of that discussion that maybe we didn't
15 consider.

16 MR. DAVIS: Yes, I would agree with Bill. For instance,
17 in the ACRS we've met with the subcommittee, the Fukushima
18 Subcommittee, we've also met with the Full Committee, but we did it
19 holistically. We went over all these issues pretty quickly, so we just
20 thought it was appropriate to go back to them and go through some of
21 these items that were of particular, like instrumentation issues in more
22 detail and say here was our rationale, here's why we think it can be
23 closed now. Are we missing anything, if you will? So, it's not that we
24 think the recommendation would likely change, but we wanted to make
25 sure we did that part before --

26 COMMISSIONER BARAN: Okay. Let me go -- let's go

1 into a little more detail on a few of these items, starting with the
2 recommendation to assess the need to require the installation of
3 hardened vents for containments other than Mark I and Mark IIs. The
4 Commission, of course, required hardened vents for Mark I and Mark
5 IIs on the basis of adequate protection. In the paper, the Staff
6 concluded that a requirement for hardened vents for other
7 containments, including ice condensers is unlikely to meet the backfit
8 threshold of being a cost-justified substantial safety enhancement.

9 Can you all talk about whether the Staff did analysis
10 how the benefits of hardened vents for ice condensers compare to the
11 benefits of hardened vents for Mark Is and Mark IIs?

12 MR. DAVIS: Well, we achieved the same end result, I
13 guess I would say it that way. The differences in the containment
14 designs between Mark I and Mark IIs, and going to Mark IIIs ice
15 condensers, and large dry ice and so on, there's different volumes are
16 involved. They are dealing with the situation of over-pressure and
17 over-temperature in different ways, so you achieve the same result as
18 what the order required for Mark I and Mark II. You just do it in a
19 different manner. Right?

20 COMMISSIONER BARAN: What's that manner?

21 MR. DAVIS: So, for Mark IIIs, for instance, right?
22 They are going to repower their suppression cooling pumps through
23 alternate means. Right? So, they have -- they're bringing in portable
24 pumps, those types of things to keep it cool.

25 With regard to Mark Is and Mark IIs, they're doing it
26 through venting capability. Right? So --

1 COMMISSIONER BARAN: Okay. But is there an
2 analysis that compares the core damage frequency or the large release
3 frequency between Mark Is and Mark IIs with vents and these other
4 containments if you had vents?

5 MR. DAVIS: I'd have to ask the folks from Research.
6 We have a whole bunch of examples that we went through, or
7 scenarios that we went through when we did the CPRR regulatory
8 basis. And I just don't know if that comparison was done or not. Bill,
9 could you answer?

10 MR. RECKLEY: Bill Reckley. Really most of those
11 numbers, if you go back to previous studies, either through the
12 containment protection improvement program that we did in the '80s,
13 NUREG-1150, so we have access to most of the numbers that you're
14 referring to in terms of core damage frequency and containment
15 challenges. For the large dry, we have the recent SOARCA work, and
16 so we did basically go back. We didn't do studies for this particular
17 paper, but we tried to take advantage of all the studies that have been
18 done over the last 20 or 30 years, actually.

19 COMMISSIONER BARAN: So, how do we know that
20 hardened vents for ice condensers, for example, aren't necessary for
21 adequate protection given that the Commission found that hardened
22 vents were necessary for adequate protection for Mark Is and Mark IIs?

23 MR. RECKLEY: Well, in matters of adequate
24 protection we're always going to defer to the Commission.

25 COMMISSIONER BARAN: Which is why I'm asking
26 are ice condensers comparable to Mark Is and Mark IIs in terms of --

1 MR. RECKLEY: Not in terms of that safety concern.
2 Because of the small volumes of the Mark Is and IIs, they were going to
3 need to respond quicker and use vents in order to prevent an
4 over-pressure situation. And they always included vents within their
5 strategy to do that.

6 Mark IIIs ice condensers have developed different
7 strategies, be it as Jack mentioned, the alternate cooling of the
8 suppression pool in Mark III, or the containment sprays in the ice
9 condensers. They've come up with alternate means that when we look
10 at it and consider it within the standards that we have for a substantial
11 safety improvement under the backfit rule, we don't believe that you're
12 going to get there, to do more than what they're already doing.

13 COMMISSIONER BARAN: I guess from my point of
14 view is when I read the paper as missing is the comparison between
15 Mark Is and Mark IIs, and the other containments, principally ice
16 condensers and Mark IIIs that would allow the Commission to conclude
17 that those are not also categories of containments that would require as
18 a matter of adequate protection hardened vents.

19 MR. RECKLEY: Okay. And we have a statement in
20 there, here or there, but obviously we could elaborate on that --

21 COMMISSIONER BARAN: This analysis is there.
22 There's analysis that provided that shows the difference.

23 MR. RECKLEY: We believe it is.

24 MR. McCREE: And we can provide a fuller analysis if
25 that would help you, Commissioner. But I think in essence it does rely
26 on sort of the discretion that Bill has had. So, for example, for large dry,

1 as Jack made the point, large dry doesn't need to vent, for example, as
2 an adequate protection measure, an ice condenser relies on ice and
3 doesn't need to vent as an adequate protection measure. So, that's
4 different from a Mark I that had vents. The adequate protection
5 measure was to make those vents be able to function in the event of
6 this Fukushima-like event such that they could prevent core damage,
7 those kinds of things. So, we've got the analysis. I think it's described to
8 some extent in the paper. We can elaborate --

9 COMMISSIONER BARAN: Let me ask one more thing
10 before we move on to another topic. The Staff's currently evaluating ice
11 condenser containments as part of SOARCA, ice condenser plants part
12 of SOARCA. Why would we close this item before finishing that work?

13 MR. BOWMAN: Jack, do you want me to --

14 MR. DAVIS: Yes, go ahead.

15 MR. BOWMAN: So, I'm Greg Bowman. I'm the Branch
16 Chief in JLD. Just for clarity, the Group 2 recommendations which this
17 is one of, we're not proposing to close now. We're proposing additional
18 interaction over the next four or five months before we close it. And
19 those studies would be part of what we consider in that time period.

20 COMMISSIONER BARAN: Yes, but we just heard that
21 the Staff isn't anticipating that the recommendation is going to change.
22 It's not really Group 2, it's Group 1-B, which is we have to talk to some
23 people before we close this. So, why would we put it in that category
24 before SOARCA is finished?

25 MR. BOWMAN: I would categorize it differently. I think
26 the Group 2 recommendations, we believe we have enough information

1 to support closure, but we also feel there's benefit to those interactions.
2 Those interactions could change our conclusion. We don't believe that's
3 the case, but that's a possibility.

4 COMMISSIONER BARAN: Okay.

5 MR. BOWMAN: If it wasn't the case, we wouldn't -- we
6 would just recommend closing.

7 COMMISSIONER BARAN: Okay, thanks. Let me ask
8 also briefly about the Task Force Recommendation to evaluate whether
9 each plant's emergency response data system or ERDS should have
10 an alternate method of transmitting data to NRC that does not rely on
11 hardwired infrastructure that may be unavailable during a severe
12 natural disaster. According to the paper, the Staff has concluded that an
13 alternative method of data collection or data transmission won't pass a
14 backfit analysis.

15 Let me just start with a basic question here. Does
16 ERDS today provide a substantial safety method?

17 MR. DEAN: I would offer that given the fact that we
18 can -- first of all, what our role is in emergency response, which is an
19 advisory capacity, not an operational or decision making capacity, and
20 given the fact that many times we've been able to successfully
21 participate in emergency exercises where ERDS is not available, I
22 would say no. That would be my perspective.

23 COMMISSIONER BARAN: So, your view is today
24 ERDS does not provide a substantial safety benefit?

25 MR. DEAN: That would be my perspective.

26 COMMISSIONER BARAN: Okay. I guess if that's -- do

1 the rest of you agree with that? Is that the Staff view, that ERDS, which
2 is a regulatory requirement does not provide a substantial safety
3 benefit?

4 MR. McCREE: As a former Regional Administrator and
5 I echo Bill's perspectives, there's value in having the data, but there are
6 alternative ways of obtaining that information for the decision making
7 role, if you would, or the advisory role that we have during an
8 emergency. So, I would not characterize it as providing a substantial
9 safety benefit that without it, NRC would be precluded from fulfilling its
10 mission, again, in the event of an emergency.

11 COMMISSIONER BARAN: Well, let me ask this. So, in
12 1991 NRC found that requiring ERDS was a cost-justified substantial
13 safety enhancement. The Commission concluded that requiring ERDS
14 would "provide a substantial increase in overall protection of public
15 health and safety by insuring far more accurate and timely flow of data
16 for the NRC to fulfill its role during an alert or higher emergency. The
17 direct and indirect costs as estimated for the implementation of this rule
18 are justified in view of this increased protection." That's no longer the
19 Staff's view? I mean, I guess that was the Commission in the
20 rulemaking in 1991 saying that, but that's not the current view?

21 MR. McCREE: I would -- I'm reluctant to disagree with
22 that assessment. I do recognize it was characterized as an
23 enhancement.

24 MR. HOLIAN: Brian Holian, Director of Nuclear
25 Security Incident Response. Commissioner, I think the Staff comes
26 down on the fact that in '91 the history was to -- we studied looking at

1 and putting ERDS in, and it's a safety-related system also. And that was
2 not done. This recommendation now is to have backup power, make it
3 safety-related so you -- that's the recommendation under Fukushima.
4 So, it's a little different premise in '91. The information is available, one
5 train, I mean, one way of transmitting it here, you don't have
6 safety-related, you know, Appendix B criteria for two power supplies.
7 So, that's where I would cut that difference. I agree with what the Staff
8 has said, that it's good to have information; however, we rely on the
9 operators in the control room, we rely on our residents that are on the
10 phone with us, multiple ways. Commissioner Ostendorff mentioned we
11 staff the Operations Center with 70 people, many of those have been
12 licensed at facilities, understand the plant response. So, the
13 differentiation I like to make is back in that rulemaking there was a study
14 done, should we make it safety-related, which would be this
15 redundancy that was the Fukushima item that we're now revisiting. And
16 we claim that we do not need that additional enhancements to ERDS.
17 Does that help?

18 COMMISSIONER BARAN: I'm not sure, but thank you.

19 MR. JOHNSON: And I think that's sort of the delay that
20 we -- you saw on this side of the table was reflective of the fact that this
21 activity isn't looking at whether or not we would go forward from a status
22 quo of nothing to ERDS. We have ERDS, ERDS functions well.
23 Licensees have through the virtual private network provided the
24 capability, increased capability for us to get information, for example,
25 about accidents as they unfold, things that are -- situations that are
26 unfolding at the plant. That's all fundamental.

1 What this is looking at is, how much further do you go
2 with respect to ERDS? And is that a substantial increase? Would that
3 provide a substantial increase? So, that's where we're focused in this
4 activity, and so as we've discussed, we need to close that out with the
5 Commission's permission.

6 COMMISSIONER BARAN: Well, I need to wrap-up
7 because I'm way over and I appreciate my colleagues tolerating that.
8 But I guess the question that presents is, as you say, Mike, is if ERDS --
9 we're requiring ERDS now. It's in place, it's working. I was under the
10 impression that as an Agency we thought it had some value, and if
11 that's the case, wouldn't we want it to work reliably in the situations
12 where you really need it, which is in the case of a severe natural
13 disaster, for example?

14 MR. JOHNSON: So, I think you heard us say,
15 hopefully, that we think it adds value. You asked substantial and took us
16 back to the 1991 decision. Today we would say it adds value. The focus
17 that we're trying to put on this issue is, are there additional things that
18 we would do to increase the reliability of ERDS, for example? And so
19 that's a slightly different question.

20 COMMISSIONER BARAN: Okay. I'm going to break a
21 record for people --

22 MS. UHLE: Okay. Yes, this is -- oh, go ahead.

23 COMMISSIONER BARAN: No, no, go ahead.

24 MS. UHLE: All right. Jennifer Uhle. I'm the Director of
25 Office of New Reactors, and I would just add that in the 1991 time
26 frame, we didn't have the availability of cell phones. And although we

1 know that in natural disasters there is the concern of cell phones not
2 being available. They do put in place the portable cell towers, so if you
3 were to look at '91 time frame and the communication availability there
4 versus what we have today, I think there's -- you know, it's apples and
5 oranges, which I think contributes to the perhaps view that the backup
6 systems are not needed, and that we would have other means of
7 communication, if necessary.

8 COMMISSIONER BARAN: Okay. Thank you.

9 CHAIRMAN BURNS: Again, I want to thank you for
10 your presentations this morning. To echo comments of a couple of my
11 colleagues this morning, is I appreciate that much of the work that we're
12 doing, you know, particularly as we move through our -- we're
13 integrating it with insights we get from other type of work. And one of the
14 examples I think comes to mind is to emphasize it, Jack, you mentioned
15 in terms of offsite radiologic monitoring and some other activities that
16 would be included in emergency response. And I think, for example,
17 this is a good example with the recent experience with Southern
18 Exposure, emphasizes and perhaps has greater Lessons Learned for
19 us. Because, again, although it's an exercise, it enabled, and I think the
20 strength of it was asking us to look at circumstances beyond, you know,
21 an accident artificially induced, somewhat artificially contained, and see
22 what happens during that time. But to start to think beyond the 18 or
23 24-hours that would occur, taking it out a week, 30 days, 180 days to
24 start thinking about some of these other things in addition to the
25 mitigating the potential accident itself, but looking at the response in
26 several areas. So, I think for us, I think that's an important thing to

1 continue as we integrate this work that has been focused in the
2 post-Fukushima effort.

3 Again, the ongoing evaluation of operating experience,
4 and our experience in other areas to maintain safety, and to assure
5 improvement, where necessary, and to ask ourselves the questions of
6 value-added where necessary, as well.

7 I want to ask you -- I want to come back to Dave
8 Lochbaum's point, and get a reaction from the Staff. Dave, again
9 paraphrasing very briefly, talked about what he saw as a gap between
10 the design basis and the beyond design basis areas. And I want to
11 give you an opportunity to respond to that, and sort of give me a Staff
12 perspective on where you -- you know, your reaction to that, and what
13 you see either that's in place, or where we need to focus to assure that
14 there are, in fact, no gaps.

15 MR. DAVIS: So, it's obviously a good point to
16 consider. Right? That you have the seamless transition, if you will,
17 between design basis and beyond design basis. The inspection folks
18 have constantly looked at that as we're putting in mitigation strategy
19 looking back at does that impact the design basis? Does it unintendedly
20 impact the design basis? For anything that's relied on from a beyond
21 design basis standpoint, it's not a willy nilly. Right? It has to be
22 controlled, we have the documentation in place that they would follow
23 similar to a 50.59 if they wanted to make changes to it, and there are
24 certain activities they'd have to come back to the Agency to ask for a
25 change in that strategy. So, we think that it works fairly seamlessly.
26 We've considered, as you all have mentioned the word holistic, we've

1 considered our existing programs and how that fits together with what
2 we're doing in Fukushima space.

3 And certainly, again, we're going to be looking at this
4 as we go out and start these inspections in earnest coming up now in
5 February, where we're going to start looking at how these things work.
6 But, again, inspection folks have been doing this for some time already
7 of looking at how does the Fukushima activities impact the safety of the
8 existing plants?

9 CHAIRMAN BURNS: Okay.

10 MR. JOHNSON: Can I just add to Jack's very good
11 points? There was something in the discussion that left me -- in the first
12 panel that left me wanting to say or clarify that there's nothing -- FLEX
13 strategies, mitigating strategies are not optional, they're not voluntary,
14 they're required, they're required by the order. The order requires
15 beyond design basis protections to be in place.

16 Now to Jack's point, there does have to be an
17 integration across what is maintenance, control or maintenance, what
18 does configuration look like for a beyond design basis system or
19 strategy? How does that compare to maintenance protection that
20 needs to be in place for a design basis? That has to be worked out,
21 clarified in the guidance, codified in the rule that's before -- the
22 proposed rule that's out for public comment now. But at the end of the
23 day, we will insure that the requirements of the order as captured in the
24 rule provide for the ability of a plant to maintain and restore core
25 cooling. And I'm going to repeat the tenets of what's captured in the
26 order. But there's nothing optional about that, and will not allow gaps.

1 Licensees won't be able to not meet, not maintain, not provide for a
2 configuration commensurate with, again, the status of that equipment
3 or those strategies as being beyond design basis.

4 CHAIRMAN BURNS: Okay, thanks. One question, it's
5 probably -- I'm sorry, Jack, it will probably be you again. But this
6 question, and I realize you all are still doing some thinking about this,
7 about having a periodic review say on the natural hazards versus
8 relying -- and I'm going -- I know -- I mean, that's a -- there's a healthy I
9 think debate or consideration and dialogue on that question.

10 What -- in terms of the burden let's say it puts on us
11 versus say the industry, that's one aspect. But another aspect in
12 term -- that's one aspect. Another aspect is, I think some of the
13 panelists have commented that there is from the standpoint, which is
14 consistent with the basic regulatory framework we do of ongoing
15 evaluation and ongoing assessment. Maybe you could elaborate a little
16 more about the thinking or the debate, even if it's the one going on in
17 your own head about that right now, and where you see that going.

18 MR. DAVIS: There's no denying that we believe that
19 our current processes are effective, and I said that in my presentation.
20 However, a lot of the things that -- for instance, we were in a good place
21 with seismic because we had been doing previous work. But in flooding,
22 we had to do some effort, if you will. And a lot of what we knew was
23 because of the work that we had done because of new reactors. So, we
24 recognized from that that, you know, if we were just a little bit smarter
25 about leveraging our programs in a little better way, we could get ahead
26 of that, and that not only would bring predictability, if you will, to the

1 industry and to our external stakeholders, but it also in the long run we
2 believe would cost less than it was every time an accident happens and
3 we, you know, gear up, if you will, to deal with that particular problem.
4 So, there's probably ways to tweak the current program in such a way
5 that we would get that benefit for very little cost.

6 MR. DEAN: No, I was just going to offer that I think
7 what -- we believe we've got the framework, as Jack indicated, to be
8 able to do this. I think what we need to provide is a better expectation
9 and guidance to our Staff in terms of where do we want them to be in
10 terms of proactive. We have all sorts of SLs in this Agency with great
11 technical knowledge and skills, and they're intertwined and interact with
12 various other federal and international partners, so really what we need
13 to do is put an appropriate framework in there that basically helps them
14 as you accumulate information, when should you come to us with some
15 reflections on maybe we've had enough information, or that says we
16 ought to take a more in-depth look at this.

17 CHAIRMAN BURNS: Okay. Jennifer?

18 MS. UHLE: Yes, really quick. Jennifer Uhle, the
19 Director of the Office of New Reactors. And I would say the most
20 important piece that we are doing would be to recognize that as we
21 maintain these connections with the other federal agencies and other
22 let's say USGS and standards development organizations, that it's
23 important that we understand when the hazards have changed, but
24 what we need is not necessarily that the hazard has changed, but what
25 does that mean in terms of change in safety significance at the plant?
26 And so, one thing that we're doing is coming up with a means of doing

1 that, of taking say a change in the hazard and then using what
2 information we have to then turn that into a delta CDF or a delta LERF
3 value, and that is critical for us going forward to be efficient.

4 CHAIRMAN BURNS: Okay, thank you. I'm sorry, Jack.

5 MR. DAVIS: I'm sorry. In my presentation when I was
6 talking about what are the trigger mechanisms, that's exactly -- Jennifer
7 is exactly right. It's when do you take action? You're always getting
8 new information all the time, but when is it sufficient enough that you'd
9 want to take a regulatory action?

10 CHAIRMAN BURNS: Okay. One final comment. We
11 made a couple of comments with respect to international efforts, and
12 one thing I think, as Commissioner Ostendorff noted, we took
13 substantial steps soon after the accident, as did other countries and
14 groups, and I think one thing to understand, too, about the IAEA report,
15 in a sense it is a -- in some way is a synthesis of what has been done
16 internationally in the European Union and other places in this country
17 that may still be places sort of leading forward that may need to be
18 looked at.

19 One of the things my last question might be, is there
20 international research that we're participating in that's still related to the
21 accident, and what is that focused on, and what might we expect, or
22 when might we expect that to come from that?

23 MR. LEE: This is Richard Lee from the Office of
24 Research. We continue to engage with NEA activities big time on
25 Fukushima. For example, the continued analysis headed by Japan on
26 the benchmarking the Fukushima accident. We finished Phase 1,

1 Phase 2 is about to begin for the next phase in terms of looking at
2 the -- not just the releases but outside what does it do to the land and
3 contamination, and so forth.

4 Also, the NEA also have a senior group of activities
5 that will be wrapped up very soon within three months identifying what
6 else that as an international community what they would like to do in
7 terms of filling the gaps in the knowledge.

8 Apart from them under the Cooperative Severe
9 Accident Research Program that we have run for a long time, we have
10 access to all the regulatory agency in different countries, the research
11 being undertaken or to be taken, especially in the area of hydrogen. For
12 example, the European Union has their projects, so did the NEA has
13 their projects, which we have -- we can participate and have access to.
14 But in the meantime, the Koreans are stepping up their program of
15 hydrogen research, so did China, so did Japan, which we have all -- it's
16 just beginning, so we will be engaged with them on every aspect of it.

17 And just remember that the -- after the TMI accident,
18 the U.S. took the lead for two decades in closing out a lot of severe
19 accident research. But that didn't -- but the European Union, the
20 European countries start to take a lot of interest in scaling up their
21 severe accident research, and they are at the point that they have
22 accumulated even more knowledge. Based on those, we're able to
23 assess the uncertainties in our predictions of severe accidents
24 progress, or whatever the case is. Now you can see that the Asians are
25 stepping up following the European because they are increasing the
26 nuclear program, so you can see it's mostly natural progression of

1 these countries taking interest in this. We will continue to monitor those.

2 CHAIRMAN BURNS: Okay, thank you very much.
3 Mike.

4 MR. JOHNSON: And just beyond that, beyond the
5 research, I sort of -- I think through the presentations we sort of alluded
6 to other areas where we would stay attuned. For example, as the
7 Japanese get insights about health effects, we'd want to be attuned to
8 those kinds of things as we -- as they have learned a lot about what
9 happens with a lot of water, and the treatment of radiological waste, and
10 we'll get insights from that. They've had to deal with fuel in the pool that
11 was damaged, and those kinds of things. So, we'll stay attuned to all of
12 those insights, not necessarily those that just could potentially result in
13 new requirements, but things that sort of broaden our sense of
14 knowledge with respect to what operating experience is in the
15 unfortunate situation where you would have an accident like occurred in
16 Japan.

17 CHAIRMAN BURNS: Okay, thank you. That concludes
18 the question. My other colleagues have anything? Well, again, I want to
19 thank the Staff, and I want to thank our first panel with representatives
20 from the Union of Concerned Scientists, Nuclear Energy Institute, and
21 Arizona Public Service for their presentations this morning. It's been a
22 good dialogue and discussion on where we are, and where we -- some
23 things that are still on our plate. So, keep up the good work, all. Thank
24 you, and we're adjourned.

25 (Whereupon, the proceedings went off the record at
26 12:06 p.m.)