UNITED STATES OF AMERICA

U.S. NUCLEAR REGULATORY COMMISSION

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

AUGUST 7, 2012

9:00 A.M.

TRANSCRIPT OF PROCEEDINGS

Public Meeting

Before the U.S. Nuclear Regulatory Commission:

Allison M. Macfarlane, Chairman

Kristine L. Svinicki, Commissioner

George Apostolakis, Commissioner

William D. Magwood, IV, Commissioner

William C. Ostendorff, Commissioner

APPEARANCES

External Stakeholders:

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

Casey Pfeiffer, President, Professional Reactor Operator Society

Christopher Paine, Nuclear Program Director, Natural Resources

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

NRC Staff:

Mike Johnson, Deputy Executive Director for Reactor and Preparedness Programs and Longer-Term Steering Committee Chairman

Eric Leeds, Director, Office of Nuclear Reactor Regulation

Jim Wiggins, Director, Office of Nuclear Security and Incident Response

Brian Sheron, Director, Office of Nuclear Regulatory Research

Dave Skeen, Director, Japan Lessons-Learned Project Directorate, NRR

P R O C E E D I N G S

CHAIRMAN MACFARLANE: Good morning everyone. Like to welcome all our stakeholders, staff, media, members of the public, and of course our staff who are here for today's meeting. I'm pleased to be here for my second Commission meeting and over the past month I've been learning an awful lot, getting to know my fellow Commissioners and the NRC staff as well. And, it's a fantastic place, I'm enjoying it very much. Today is the eighth Commission meeting on the events that took place in Fukushima, Japan on March 11, 2011.

We're going to hear about the status of actions taken in response to the lessons learned from Fukushima Dai-ichi, including an update on the NRC staff's progress in addressing the near-term task force's recommendations and other action items. We're going to hear about actions from the nuclear industry and perspectives from the public. Would any of my Commission colleagues like to make any remarks before we begin? No? Okay, great. Then, we will turn right now to the panel presentations. We do have a long morning. And I think we're going to take a -- just a heads-up, we're going to take a five-minute break between the two panels, okay? So, we'll start with our external panel presentations. Every panelist, let me remind you, has 10 minutes. I'm going to keep you to that 10 minutes. Sorry. But, anyway, otherwise we can't hear from everybody. And we'll be here all day. So, we're going to begin with Jim Scarola who is the Executive Director for the U.S. Industry Fukushima Response. Mr. Scarola?

JAMES SCAROLA: Thank you very much. Thank you. I certainly appreciate the invitation this morning and as representing the industry today, I'll tell you that we continue to value the many opportunities for input to ensure that

we get the lessons right as we move forward in implementing the activities coming out of Fukushima. In the slides this morning, I have a number of things that I have as background. I'll move through that background fairly quickly and move really into the areas going forward that we see as most significant and still to be resolved.

Starting out on slide two, I assume that they -- they'll be up here, is that this effort on behalf of the industry has really been unprecedented in our history in terms of the level of collaboration that the industry by all our sectors has worked together, and that has been done through our strategy that we put together called the Way-Forward. The bullets here in front of you really represent our high-level goals of that. And I'll just point out a couple of things.

First, as we started out this effort, there was significant support being provided over to Tepco, at the site of Fukushima, both from the technical standpoint, strategy, procedures, equipment. And this was to coordinate those efforts. And we also set out a goal right up front recognizing that this could, in itself, be a significant distracter to daily operation. And we said as a steering committee, we cannot allow that to distract us from the daily operation at the facility. This should add to safety, not detract from it. We also went about, early out in validating our existing capabilities for both design-basis events as well as events that were beyond the design-basis, mainly our capabilities around the order that came out following 9/11 under B.5.b. And then we continued to assess and provide guidance to the industry on the priority of lessons learned and making sure we continue to assess lessons learned as more information and facts come about.

As you turn over to slide three, these are all the sectors of the

industry that have been involved from the steering committee. I won't go through those in detail. But our focus has been on timely execution. We recognize that the analysis of the event in itself does not provide an incremental improvement in safety, it's rather executing and delivering on results. So, our focus has been to prioritize and get actions in place that in fact have made a change in the level of safety as quickly as possible at all our nuclear plants in the U.S. The next several pages as you go through slide four and slide five for the major accomplishments to date.

Just emphasizing a couple of those, the B.5.b readiness inspections. We actually ran equipment, we ran hoses, we validated the procedures that were in place and our ability to carry out those actions that were defined following the events of 9/11. We also have gone through periodic maintenance and drills in using those activities and validated that we have maintenance in place on that equipment, to continue the state of readiness.

We also, early out, as you look to slide five, to the bottom of slide five, FLEX equipment, and this is the equipment that we defined early out in the process that would help provide some options to our emergency response organization in dealing with an event that was beyond the current design-basis. We looked at equipment and it was mainly focused in on the delivery of cooling water and power for the facility. So, we developed a subset of equipment that we thought would be important to yet set up an additional layer of defense and purchase orders were set for that. Equipment is arriving at all the sites, we have much of the equipment on-site already, but is now arriving. And that in itself provides our emergency response organization another option in terms of defense for beyond design-basis event.

Now, we don't have all the procedures in place on utilization of that equipment, but we still do have very qualified, highly trained individuals in our emergency response organizations that would utilize that equipment if faced with an event of the magnitude that we saw over in Japan. Also, at the bottom of page five is the industry protocol. And this also has been unprecedented in our past. So, this is a protocol document that was signed out by the head of EPRI, the head of INPO, and the head of NEI in representing all the sectors of the industry that provide the appropriate guidance for response and responsibilities in an event that is beyond the current design-basis.

As we move over to slide six, I start to cover the work that is in progress. And I won't go into any detail on slide six, I will just point out on slide seven that integration work has started in the emergency operating procedures, the severe accident management guidelines, and so on, with the FLEX equipment. So, one of our objectives here is that we don't abandon the strategies that were laid out in those emergency procedures, but we compliment them with yet another success path, as developed by the FLEX equipment. So that integration is very important work, it is being done by owner's groups that represent the different technologies that we have in the U.S. sectors to make sure that there is a level of specificity to deal with each technology as appropriate. We are also, the last bullet on page seven shows that we're continuing to work on organizational lessons.

So, this past week INPO issued a document on the organizational lessons out of Fukushima. We've been reviewing all the root cause reports that have been published. The Japanese Diet Report, the INPO Organizational Lessons Learned. Many other societies have put out reports and we continue to

review those to look at our current action plan and see if there are gaps that need to be closed. So I just want to make sure that that's -- that I mention that, because that is a continuing effort of the steering committee.

Remaining issues. I'll highlight a couple here downstream dam failure. So, the industry believes that we need to analyze downstream dams, but we believe that the timing of doing that is appropriate to do at the time that we analyze for a loss of ultimate heat sink. The timing of this is important, again, from the scope control standpoint. We have the actions in place for the walk-downs on flooding as well as re-analysis now commencing on all the flooding work, and we believe that the downstream dam would be best suited to be coupled with the loss of ultimate heat sink because that, in fact, is what the objective is.

Now, while we do that, we also recognize that we've got equipment in place under FLEX that would assist us in being able to deal with downstream dam failures. And as we continue this analysis, we would validate that we have the right equipment or whether additional equipment would be necessary. As I move over to, you can see, the filtering strategies, I know that you're aware that we continue to have discussions on the right filtering strategies and we are actively engaged in that. And then also design-basis updates.

So, let me close out in my last minute here with just some focus on what we believe is necessary to deliver on improved safety in the U.S. fleet. First of all, we continue to remind ourselves as a steering committee that we cannot look past all of the other improvement activities that we have going on. Many of them of significant importance, such as operator fundamentals. And they cannot take a backseat to the lessons learned at Fukushima uniformly. So, we think that

the integration is very important in continued prioritization. We also recognize that now the activities are hitting the field.

So, a lot of the work that has been done to date has been done by technical specialists throughout the industry. Small subsets of experts that were brought together and laid out what work needs to be done. Now, that work is being integrated with our operating staffs at the facilities and more than ever we have to be mindful of the operational focus at those facilities. Believe scope control will continue to be an important aspect as we move forward. We're going to add scope appropriately. But we need to recognize and continue to recognize that there is a collective benefit as well as collective burden at the tasks in front of us. So, I'll finish with just thanking the Commission again for the opportunity to have input today and look forward to our discussions.

CHAIRMAN MACFARLANE: Thank you very much. Okay. Next, is Casey Pfeiffer, who is president of the Professional Reactor Operator Society. Mr. Pfeiffer?

CASEY PFEIFFER: Thank you and good morning. And again like to extend a thanks for inviting us today to talk about our operator issues. And that's pretty much what our presentation is going to be on, is operator issues, the impact that we've seen and the impacts that we see could affect us in the future.

To the next slide, slide two, just a quick introduction of PROS. PROS is the Professional Reactor Operator Society, and not only am I the president of PROS, I also have a reactor operator license at Sequoyah Nuclear Plant, TVA, so that's my regular job. Our mission is to serve individuals involved with the safe nuclear operations and we're here today to give our feedback and opinions on what we've seen so far from the Fukushima recommendations.

Next slide, slide three. Our talk is really – presentation is really divided up into two aspects, the current operator impacts and the future operator impacts and concerns. The first of the impacts is training. The industry has already with the Fukushima recommendations and the INPO crew performance evaluations, has already given us more focused training on multiple events. So, that's a positive that we've seen, that the industry's already gone ahead and done. Recommendations 8.1 and 8.4 for emergency operating procedures, severe accident mitigating guidelines, and extensive damage mitigating guidelines will have major effects on operators. This is due to the training time that we'll have to have in order to become proficient at these procedures.

The Recommendation 8.1, if you go to the next slide, changing the EOP technical guidelines, that will require more training time and for the operators, we already attend normal, requal five to six weeks a year. Most of us six and that's not really counting like on, you know, on the job training and stuff that we get through emails and operating experience. Our training cycles are already very full of packed stuff that we have to require training. I went to training last week and we had a SOERs that INPO has made our training staff go over with us, we had one on Chernobyl last week, and we usually have to cover those every couple years. And so our training time with simulator and our abnormal operating procedures and our system training time is already very crammed together and we're -- we need to make sure that we do not get so focused on the Fukushima recommendation training that it causes some of our other training to not be as covered as thoroughly as it should.

And that is one of our recommendations is that the Fukushima recommendations could lead to issues with operator proficiency on higher

probability events and stuff like secondary transience, abnormal operating procedures which could lead into bigger events. So we recommend a balance of training time between the Fukushima training and what we have already.

Next slide, slide five, another positive aspect from the training is that since Fukushima and the recommendations is that it's helped operators in training discuss the possibility of beyond design-basis events. We used to -- we just talked about it when we were doing our rep drill, our EP drills and now we more or less incorporate into the training, so that's another thing that the industry positive coming from the recommendations. On the next slide, there's been four events since Fukushima that have challenged the operators. The Browns Ferry tornadoes, the Fort Calhoun flooding, the North Anna earthquake, and the couple Byron loss of off-site powers. The operators have performed well and also the plants have performed well on these events, these challenging events, that to make sure that there was no further, you know, degraded accidents from the issues, you know, the Browns Ferry tornadoes, I was Sequoyah on that day. And, you know, when they lost their off-site power and all three of their units tripped, you know, Sequoyah was pretty much the only site that was keeping the grid in southeast Tennessee from having blackouts. So, it was a pretty intense day when you have to go in and out of the abnormal operating procedure, tornado warning nine times during the day from eight o'clock in the morning until you left that night.

The next subject for the current operator impacts is the operator staffing plan. Recommendation 9 states that facility emergency plans address prolonged station blackout. Looking at the Recommendation 9, it does talk about an EP or emergency preparedness, but the utilities need to have a plan or to

include operators and maintenance in that, because most of the EP responders are usually for staffing the operational staff, OSC and technical staffs, and to have operators and maintenance come in to be the ones that actually implement the strategies that are coming from the OSC and TSCs, the technical committees that come on the emergency preparedness plan.

Next slide, slide eight, are now the future operator concerns. The equipment cost is the first one. PROS is concerned that the NRC mandated Fukushima improvements may redirect resources away from existing programs, modifications, and upgrades requested by operators. We, as operators know that the utilities only have a certain amount of money, they can go beyond what they're budgeted for, but we know that there is not a finite source of money for these improvements and PROS is concerned that with the Fukushima upgrades, some of this money could be cost -- could be taken away from stuff that the operators needs to operate the plant safety, and for equipment reliability issues.

The next concern, slide nine is the surveillance requirements for newer equipment, I know most of this new equipment's not going to be in the technical specifications, but it's still probably going to have to be tested every once in a while to make sure it's in working condition. And for instance, for the B.5.b upgrade at Sequoyah, I know we do a -- we have a station blackout generator and we have a surveillance test on it once a month, the operators will perform that. And I know that we probably can't do all the surveillance requirements, but that's a concern since the surveillance requirements take time to do and if you get the plant operators out where they are doing surveillance requirements instead of monitoring their equipment, it could be -- lead to some burns at the plants.

And the last one, for operator concerns is the new equipment modification current effects on current plant design, PROS's concern is that the plant modifications in new equipments required to meet the Fukushima requirements could cause unanticipated problems for operators. I have a couple examples in my slide, the next slide that the flood barrier was built around a pump, thermal barrier booster pump, which is important for reactor coolant pumps and there was no ladder to get over it, so the operators couldn't get to valves that were required in abnormal operating procedures or emergency operating procedures, so as PROS recommends that when we start building some of these new barriers that we need to look at the equipment around and make sure that it's not affecting stuff that operators would need to operate during abnormal and emergency operating procedures.

And I'll conclude here that as operators, we're only beginning to see the beginning of the Fukushima recommendations and PROS agrees that these recommendations will be an improvement for safety margins at U.S. facilities. The current operator impacts are training, which have mostly been positive so far, and the operator staffing, we know that at some plants that, you know, staffing could be a challenge for operators at events like this. And for our future operator concerns, there are equipment costs, surveillance requirements, and modifications that could cause effects on current plant design. And lastly, about the -- our unique perspective is from an operator's standpoint is that we are the people who are going to be implementing these procedures and they have to work for us because if they look good on paper here at the NRC space and industry space, but when it gets time for the event to come, if it's not work for us, it could cause the events to be even worse. And just like to conclude, I'd like to

thank the invitation again to speak this morning.

CHAIRMAN MACFARLANE: Great, thank you very much. That was very informative. Now, we're going to hear from Chris Paine, who's the nuclear program director at the Natural Resources Defense Counsel. Hi, Chris. Go ahead.

CHRISTOPHER PAINE: Yes. Thank you for inviting us today. Thank you for inviting us today, and I can't possibly go through my full 56-slide presentation --

CHAIRMAN MACFARLANE: Thank you.

CHRISTOPHER PAINE: But I encourage you to, if you've read it, to ask questions about any of those slides during the question session. But I will try to be responsive to your charge to provide public interest perspective on NRC's actions and stakeholder involvement in response to the Fukushima accident.

Slide four, please. We believe that NRC has strayed quite far from the intent of its statutory framework. Under the AEA, the primary -- that's the Atomic Energy Act -- the primary vehicle for stakeholder involvement is supposed to be -- for nuclear safety -- is supposed to be the licensing process. In compensation for a federal monopoly on regulating nuclear power, the Atomic Energy Act granted states and citizens the right to challenge each and every licensing decision. And citizen safety concerns should be adjudicated in licensing proceedings. But by the steady accretion of exclusionary rules, the NRC has insulated the licensing process from citizen nuclear safety concerns including post-Fukushima safety concerns. Structure discussions and information centers like the present one are now the preferred mode for

interacting with the public.

There's a large gap in perception between internal and external views of the NRC's efficacy. I know the common view around here from having attended several of these sessions over the last year is that NRC is the number-one rated place to work in the federal government and senior staff briefings rarely fail to convey an aura of confidence that their efforts represent that best achievable within the currently available resources, that's usually the qualification. So, it's always, if a safety issue is not being dealt with adequately, it's because there's not enough resources available, not because the staff or the industry is doing something wrong. What the public sees, in contrast to the internal view that the NRC has about its operation, is that an extensively impartial staff is almost always perfectly aligned with industry's opposition to 100 percent of safety contentions and citizen proceedings to intervene in licensing proceedings. I doubt that you would find this degree of alignment with industry's positions in any other regulatory agency. It is truly astonishing.

Do state and public interveners in the view of the agency really offer nothing of value to the agency? I mean, I think if you go back and look at the history of licensing interventions, you will find many historical examples where that's not true, including the basic requirements for emergency core cooling which emerged in licensing proceedings. And in other public proceedings of the Atomic Energy Commission. But the public and press perception of the NRC is of a captive agency. And it's cemented by a very high moat of industry protective rules. I just want to explain how we perceive these rules, because you may not, being on the inside, understand exactly how the public feels about them.

There are highly prejudicial and technically demanding contention admissibility standards that the public must meet within 60 days of a licensed application being filed. Within 60 days, you have to go out, gather all your technical support, all of your affidavits, and file them to meet a very highly restrictive set of standards, pleading standards. These pleading standards don't apply in a civil court where you have a basically notice pleading. So right there, there's an enormous hurdle that citizens don't have to deal with in dealing with other agencies and then dealing with the courts. And there's a wide latitude for licensing boards to interpret these pleading standards and to subjectively determine when they have been met. So this is the first very big moat that the public has to contend with if they want to participate in their statutory right to engage in the licensing process.

And the agency's NEPA -- slide eight please -- the agency's NEPA procedures violate due process and place gratuitous burdens in cost on ordinary citizens, and if you don't understand those procedures, I'd be happy to explain in the question/answer session. They differ substantially from other agencies, and much more burdensome. The agency depends -- over relies on simplistic, technically erroneous and quickly out-dated generic NEPA determinations, which then may endure for 15 or 20 years. I mean, the generic environmental impact statement on relicensing is a case in point, it's 15 years old. Its analysis of alternative energy possibilities, for example, is completely obsolete. And there's a problem of unbalanced legal resources. Large teams of NRC industry attorneys typically face off in a licensing proceeding against a single intervener attorney, if the interveners can afford an attorney at all.

I don't think this was really the way the framers of the Atomic

Energy Act envisioned this process would work because in return for the federal monopoly that you got to regulate nuclear power, the framers of the Atomic Energy Act really believe that citizens and states would get to participate in this process and over the last several decades, they've gradually been squeezed out. Even New York State is struggling to find the legal resources to deal with the relicensing of Indian Point. I mean, under the current system, industry can literally buy the results, the licensing results it wants. Just getting to the starting line, we just done this in the Limerick proceeding, it can cost a citizen intervener $100,000 just to get to the starting line of getting one admitted contention.

The path forward through adjudication in the hearing process, Commission appeals, and ultimately appellate court review, is very long and very costly. Industry has $400 an hour attorneys on retainer, written off as a business expense to help them navigate and manipulate the process. And as I noted, it's two against one in almost every proceeding. NRC attorneys frequently pile on and echo the industry arguments.

We know -- a paralyzing penchant for paper in this agency that makes most of its deliberations and proceedings impenetrable to average citizens and even to ordinary lawyers and even to the industry itself; and that's why the industry has a cadre of specialized lawyers to help it interpret what it's doing. And the Fukushima response to date is regrettably consistent with this NRC penchant for churning paper with a notable dearth of on-the-ground actions to increase the safety margin against severe accidents.

Now, I just want to deal with one compelling example of why the public just so distrusts this agency, and that's the Commission's first official act after the accident: to relicense Vermont Yankee, an almost identical unit to the

units that exploded at Fukushima. Ten days after the accident, you relicensed Vermont Yankee. This tone deaf action clearly, in my view, did not meet the reasonable assurance standard under the IAEA. On March 21st, this Commission could not have possibly known the role, if any, of inherent BWR design flaws may have played in the accident; the role, if any, that unregulated hardened vents or other Mark I equipment failures may have played in the accident. So the decent thing to do in that circumstance would have been to defer relicensing until the post-Fukushima safety inspections could be conducted, and the relationship between license extension and Fukushima upgrades could have been rationally determined by the agency.

On slide 14, the post-Fukushima stakeholder involvement to date, it really offers little other than opportunity to comment and convey concerns. There's been no meaningful opportunity to adjudicate important Fukushima safety issues. And with respect to how the Commission treats stakeholders, it's clear that, as Orwell, his memorable phrase put it, "Some stakeholders are more equal than others." And exhibit A is the way the order, the mitigation strategies order, is completely wrapped around the NEI FLEX proposal.

So our top-line findings. Seventeen months after the accident, only three of 12 recommended near-term orders have been issued. Only two of seven recommended rulemakings have been barely initiated via ANPRs. The planned time tables for implementation of upgrades are leisurely to indeterminate for all issues. And there's a fuzzy and uncertain upgrade with the relicensing process, which remains so far unperturbed by the accident. Thank you.

CHAIRMAN MACFARLANE: Thanks, Chris. Great. Okay. And on to last, but certainly not least, David Lochbaum, who is director of the Nuclear

Safety Project for the Union of Concerned Scientists. Go ahead, David.

DAVID LOCHBAUM: Thank you and good morning. UCS appreciates this opportunity to present our views on this important topic. Slide 2 please.

Fukushima was not entirely a surprise. Instead it was yet another disaster caused by assuming that the severity or frequency of hazards would be less than they actually were. When one aims high and misses, people may still be protected. When one aims low and misses, people pay a steep price. The only surprise is why we continue to aim low. Next slide please.

The hallmark of nuclear safety is defense-in-depth barriers, but aiming low on every one of those barriers sets the stage for a single challenge overwhelming all the barriers regardless of their number. Had Fukushima not aimed low on just one, just one of these five barriers, we'd likely not be here today. Slide 4, please.

So the primary lesson from Fukushima is: don't aim low. Or if one has to aim low, then one has to make certain that lower standards still provide adequate protection. In other words, second guessing after the next disaster should not be easily blamed on bad decision-making today. Next slide, please.

On hydrogen control, buildings blowing up must not be the first clue to workers that hydrogen is collecting in places. Yet many buildings in our plants today lack hydrogen-monitoring instrumentation that clearly needs to be fixed. Next slide, please.

This is a schematic of a boiling water reactor. Routine airborne releases are filtered by the off-gas system shown on the lower right of the schematic. Airborne releases during design-basis accidents are filtered by the

standby gas treatment system in the upper center. Airborne releases during severe accidents are not filtered as shown in the lower left. So when the hazard is very likely the greatest, we provide the least protection of the public. That's simply unacceptable. Next slide, please.

There's simply no justification, no reasonable justification, to require airborne releases to be filtered during routine operation and design-basis accidents but to tolerate unfiltered releases during severe accidents. It was wrong before Fukushima, it's wronger now. Next slide, please.

This is the NRC's list of priorities five days into the Fukushima disaster. The condition on units 1, 2, and 3 were far worse than reached at any time during the Three Mile Island accident; yet the highest priority of the NRC was the Unit 4 spent-fuel pool. The 408 irradiated fuel bundles in dry storage at Fukushima that day were not even on the NRC's list of priorities, let alone on top of it. We're doing a pitiful job of managing spent-fuel hazards, and we have to fix this before we pay a high price for aiming so low. Next slide, please.

Three -- slide 10, please. The spent-fuel pool hazard was so dire and so real that desperate measures were taken at Fukushima. Water was dropped from helicopters and sprayed from water cannons on fire trucks below. One did not need water pistols or fans for the much lower hazard of dry cask storage at Fukushima. There's a lesson here, if we would only open our eyes and our minds. Next slide, please.

Slide 12, please. The NRC may share some of the guilt in the federal government's failure to provide a repository for spent fuel more than 50 years after the first civilian nuclear power plant began producing it. But allowing that guilt or whatever other excuse is offered, to continue and expose millions of

Americans to unnecessarily elevated risks is unacceptable and must be fixed. Next slide, please.

This is a picture of some of the dry casks at Fukushima after the tsunami. They did not get much TV coverage or Twitter time because they posed almost zero threat to anyone at any time. Shame on us if we continue to store irradiated fuel in overcrowded spent-fuel pools rather than in safer and more secure dry storage. Next slide, please.

I'm making a formal allegation, under the NRC's allegation program, that the Pilgrim Nuclear Plant in Massachusetts and the Cooper Nuclear Plant in Nebraska do not comply with federal safety regulations and general design Criterion 44 and in 10 CFR 50.49 because the safety-related cooling system for their reactor buildings cannot handle the decay heat loads in their spent-fuel pools following a design-basis accident. This is not a beyond-design-basis problem; it is a problem right here, right now. These are safety violations that must be fixed. Next slide, please.

The NRC is currently setting the stage for a nuclear Eastland. The Eastland capsized while tied to the dock in Chicago, killing more passengers than died on the Titanic. The Eastland capsized largely due to the weight of lifeboats and davits, added per federal law after the Titanic disaster. The NRC proposes to rely on high-volume water sprays or makeup to spent-fuel pools as a last resort. Let's not replace a nuclear disaster caused by a natural tsunami with one caused by a human-made tsunami. Next slide, please.

Records obtained under the Freedom of Information Act reveal that the NRC went to great lengths to ensure that its staff going to Japan had potassium iodide, even though their work stations were more than 10 miles away

from the stricken site. Americans deserve that same protection and consideration. Next slide please.

Last year, Millstone and Pilgrim each experienced operator mistakes during routine plant operations. Those mistakes caused the operators to literally lose control of the reactor core's power levels. It's aiming very low to assume that operator performance will magically be better under the stress of severe accidents while they implement seldom-seen procedures. Next slide please.

We must aim higher by recording formal NRC evaluations of zero-accident procedures, and the operators' proficiencies in using them. I've heard many people say that the few operators currently required in control rooms already have too much on their plates and would be distracted by their focus on making money for plant operators. If so, the owners can use some of those profits to hire more operators so that there'll be some folks in the control rooms trained to protect the public during severe accidents. Next slide please.

We learned from the Freedom of Information Act documents that many state officials queried the Nuclear Regulatory Commission following the 50-mile evacuation recommendation. If that demonstrated that the NRC would publically second-guess protective action measures called for by their governors -- next slide please -- that question seems valid. We hope that its answer is not that the NRC will remain silent when it disagrees with measures being taken to protect the public. We recommend the biannual emergency exercises periodically include the NRC pretending or simulating disagreement with the state's protective action measures to test how such differences would be reconciled. Thank you.

CHAIRMAN MACFARLANE: Great. Thank you, David. You got us ahead of time here, so -- thank you all, thank you very much for your presentations; really appreciate the input. We're going to start off with questions from the commissioners now, and we'll start off with Commissioner Ostendorff. Caught you drinking, Bill.

COMMISSIONER OSTENDORFF: Thank you, Chairman. Thank you all for being here today; I think this is a good example of hearing very different perspectives depending upon organizations one comes from and represents, I think that's actually very healthy for us to hear very diverse views and different perspectives, so thank you for your candor, and your remarks. I'm going to start out with Jim and ask a question, but I'm going to ask everybody else to provide a response as you desire. The Fukushima Task Force report, the 90 days report under Dr. Miller came out July of 2011, and we had a Commission meeting in here I think July 21st of 2011, or close to that. So it's been a little bit over a year since the report came out. Jim, you noted the INPO lessons learned of the sequence of events that came out in, I think, November of 2011. We've had ANS, ASME reports, the Japanese Diet report that came out here recently; so the question I have for you -- but others please respond as well -- what's the biggest takeaway you have over the last 12 months of based on any new information that's come out subsequent to the original near-term task force report or any big surprise, aha moment kind of thing?

JAMES SCAROLA: Thank you for the question, as I can't tell you that it would be a big surprise, but I think, like previous events, whether they've been in our industry or outside our industry, initially, the information that comes out is usually focused in on the hardware and the technical aspect, and what I

find is that the broader lessons are really in the organizational lessons, and I think we're seeing the same thing now as we start to understand a little bit further what the dynamics were for that country as well as for the decision-makers through that event. I believe that our approach has been validated by some of the later analysis that has been done, including the Japanese Diet report, where it points to some of the strengths that we have put in place over the years, here in the United States that if put in place over there would have benefitted them. So, at the highest level for me is operator knowledge and operator fundamentals. My take away is that we continue to restrict our thinking with our ability to predict what nature might throw to us.

COMMISSIONER OSTENDORFF: Okay.

JAMES SCAROLA: And while we need to do that in our basic designs, fundamentally, the knowledge that we have and the training that we provide to our emergency response organizations is the differentiator that I think giving them more options for response with equipment, such as what we're doing with FLEX and their knowledge will be the ultimate success path.

COMMISSIONER OSTENDORFF: Okay. Casey, do you have something you want to add?

CASEY PFEIFFER: I don't have anything to add here.

COMMISSIONER OSTENDORFF: Chris, do you have anything?

CHRISTOPHER PAINE: Yeah, I think we've learned more about -- and there's some alarming parallels, really, with some of the things that have happened here. Japan began its revaluation of seismic hazards in 1979. They had three separate cycles of studying seismic upgrades to Japanese plants, and yet they failed to implement most of those -- the implications of those analyses.

The emergency diesel placement in the basement of the turbine building; that was noticed by safety regulators, but it wasn't implemented. So, and you can go on and on with characteristics of the Fukushima Dai-ichi plant and other Japanese plants where the Japanese noticed problems and issues but then didn't act because the relationship between the regulator and industry was such that they didn't really have the power to act. They may have had the on-paper power, but culturally and within their system, they didn't act. And I see a lot of that kind of restraint here; I see a lot of studies constantly reevaluating issues, like the seismic hardness question. But I don't see the changes to the existing units. And even after Fukushima, we have now this very attenuated seismic reevaluation process that isn't going to produce any changes at plants until in some time in the next decade.

COMMISSIONER OSTENDORFF: Let me ask a question, Chris, if I can just piggy back on your response there. With respect to the orders and the request for information that the NRC issued in March of this year, specifically, the seismic and flooding evaluations, seismic and flooding walk-downs, are there particular comments that NRDC has provided as part of a public meeting process or to our staff that had changes that you would recommend?

CHRISTOPHER PAINE: Yes, we did provide those last October, and I believe they were ignored. We thought that the -- and I think Commissioner Apostolakis got into this in one of the sessions, we recommended that the seismically induced flood and fire hazard, be integrated within those walk-downs and within the seismic reevaluation. I mean, why defer the issue to a PRA that won't be done for eight years. I mean, it just doesn't make sense. I mean, sure, you're not going to understand every possible chain of events that might occur

without doing a PRA, but you certainly, by doing a walkthrough, if you're focused on that issue, you're going to notice some of interactions between say the fire protection system and safety-related electrical components, and you're going to do something about those.

COMMISSIONER OSTENDORFF: Thank you, Chris. Dave, the broader question, do you have any response to that?

DAVID LOCHBAUM: I think the INPO's October report last year that the Commission cites as kind of a base mark provided some of the answers to questions I asked but didn't know the answer to; how difficult it was for the workers to implement some of the measures that were taken. I knew that the earthquake and the tsunami caused some infrastructure damage at the site, I didn't know the extent of that until I read the INPO report that explained why certain things took so long. And I think the lesson here is that we can have good time lines on how long it takes workers to go from A to B, but if those are developed on fair days, sunshine days, as opposed to the worst case, then things may take much longer. We need to quantify what's the impact of taking an extra half hour or whatever to take a step that might be due to our well intentions, but our inability to take those steps in a timely measure.

COMMISSIONER OSTENDORFF: Okay. Thank you. Casey, let me go back to you. I really think it's encouraging to me that we have the operators represented here to you, because I completely agree with your comment that at the end the of the day you and your colleagues have to be able to execute procedures, take out emergency actions, et cetera, et cetera, so I thank you for highlighting that very important point to today's meeting. Let me ask you just a broad question; I know that you have several future operator

concerns on your slides. Do you feel like you have an adequate vehicle or process as an operator to voice concerns back through your chain of command, to your licensee, and your colleagues who are also operators? Do they have vehicles to express these concerns to ensure that we optimize the outcome for training, so that there's a proper balance?

CASEY PFEIFFER: I think for some of the issues, we probably have the right vehicle, but for other issues, we probably are lacking on that, probably depending on what the issue is on the training, depend on how it would get resolved, so I would say probably for some issues we do have the right avenue to get them worked out but for others probably not.

COMMISSIONER OSTENDORFF: Well I encourage you to continue to be actively engaged in that area. I can remember when I was in active duty on a 688 submarine when the submarine force installed the steam plant casualty modifications on the 688 class submarines, and it took a number of years to install these modifications, and there's some glitches that occurred during that time period, and no change like this will ever be without some types of problems or hurdles.

Dave, if I can turn to you, to your spent fuel pool comments, do you think -- I know you're aware of the Office of Research, NRR spent fuel pool scoping study and what it's trying to achieve. Do you feel like the Commission should make a decision on de-inventorying pools more quickly prior to that study coming out?

DAVID LOCHBAUM: As long as that decision is to do it then yes. If the decision is not to do it then I would --

COMMISSIONER OSTENDORFF: And do you think the

Commission has all the information it needs right now to make that, because your slides certainly hint at that?

DAVID LOCHBAUM: Oh definitely. If you look at the actions the NRC Commission has taken since -- even before 9/11 -- after 9/11 the orders that went out were triaged, reactor operators -- reactors first, spent fuel pool second, dry cask storage five months later. If you look at the inspection guidance that went out after Fukushima the NRC inspectors were tasked with looking at the reactor core cooling and spent fuel pool cooling, not to look at dry casks. If you look at the orders that were issued early this year in the NRC's Task Force Report they include specific recommendations to better protect the reactor core, better protect the spent fuel pool; there's not one word about dry cask storage. The Commission and the NRC staff knows that dry storage is safer and more secure than spent fuel pools. We need to do it. If we don't -- if you don’t know that answer, if that's the honest decision we don't understand how you can keep approving applications to increase the storage capacity of the pools. If you don't know whether they're safe or not how could you make that decision?

So we think you know enough to make those decisions we think you also know enough where this stuff needs to be today.

COMMISSIONER OSTENDORFF: Thanks, Dave. Thanks, Chairman

CHAIRMAN MACFARLANE: Thank you, Bill. So it's my turn next, and I have a bunch of questions; let's see how far I go. So let me start this way and start with David and pick up the spent fuel pool issue again. And note that I've read some industry writing that critiques the idea of moving spent fuel into

dry casks at an accelerated rate because of worker exposures. What's your reaction to that?

DAVID LOCHBAUM: Well the industry's gone to shorter and shorter refueling outages, which is done by moving fuel from the reactor cores to the spent fuel pools sooner than it used to be where there's increased worker doses with that activity that didn't bother the industry one iota when it happened. More recently the Indian Point licensee requested a plan that the NRC approved to transfer fuel from, I think, Unit 3 to Unit 2 then put it in the cask in Unit 2 because they don't want to spend the money to upgrade the crane for Unit 3; there's increased worker doses for that activity. But anytime money is the answer, the worker doses aren't a concern to owners. When they want to stop spending money, like putting more fuel in the casks, all of a sudden worker doses become an issue.

So until they're consistent across the board on how they treat workers and their safety I'm going to remain, not skeptical, opposed to that nonsense.

CHAIRMAN MACFARLANE: Okay, thanks. So let me to turn to Chris. First of all let me assure you that I find interveners and the critiques you have to offer to be very valuable, so I think, you know, if we didn't have the interveners and their critiques we wouldn't want to really operate in that world; so I appreciate your input. And I do share your concern about making NRC documents more transparent and accessible, and I've made that one of my goals for the agency; so hopefully you'll see some changes there.

But let me go to a question for you and that has to do with some of slides you didn't get to, and that's on filtered vents. And, you know, this is an

issue that we're thinking about here and I'd like to hear your view on, you know, you make a case for using them but, you know, there's always pluses and minuses. And so what are some of the drawbacks to using filtered vents?

CHRISTOPHER PAINE: I'm not a filtered vent expert by any means. I arrived at those conclusions by examining what other countries have done, especially in Europe. And the conviction after Chernobyl that a risk-informed approach to something like the problem of venting in a serious accident just didn't make sense; all the European regulators just took a deterministic approach to it. This was a risk that needed to be mitigated. I mean if you look at the first plant that did it I think was Barsebäck in Sweden; they're right across the channel from Copenhagen and, you know, they just -- it was almost a political impossibility not to do it.

And the -- I guess the risk with filtered vents is you got, I mean, the concern -- I don't know if it's a risk or not, I think that's an engineering question -- is you're going to have a fairly large containment penetration. And for a high capacity filtered vent, which I think is what is needed; you got to go beyond the eight inch diameter pipes of reliable hardened vents. Because -- and I deal with this issue in detail in my slides so I don't want to repeat it all here, but basically the thinking behind filtered vents is you need -- in the case of a severe accident you need to provide yourself with the most options. And not being able to vent early when people are still in the EPZ, when you really may need to do, especially to do that, especially in a very fast-moving accident, a large break loss of coolant accident, where you can get, you know, hydrogen production in a matter of -- I mean we're talking hundreds of kilograms of hydrogen production in a matter of minutes in such a fast-moving accident then you really do need that

prompt venting capability, and it needs to be filtered because the folks are not going to be out of the EPZ.

CHAIRMAN MACFARLANE: Okay, thanks. Okay, good still have more time. So let me turn to Casey, and Jim you can -- I'd like you to weigh in on this issue, too, but this is something that David brought up at the end of his remarks, or some time in his remarks, but is seems like maybe adding more operators might meet some of your concerns. What's your attitude towards that? Would adding more operators help?

CASEY PFEIFFER: I think at some plants they are short-staffed and I think that adding operators would, you know, help the plants' staffs out.

CHAIRMAN MACFARLANE: Okay, Jim to you have a --

JAMES SCAROLA: I don't disagree -- I'm sorry -- I don't disagree is the -- when you talk about the operating staff we will add operators when it's appropriate, we have in the past, we will in the future. So I don't think that that's the question that -- I think we have to get through the analysis to determine what is necessary in terms of staffing. We're still in the strategy standpoint of developing the appropriate procedures. When we have the procedures and we understand what it takes to be proficient in execution, and it goes beyond operators; it may not just be operators that are executing these procedures, it may security officers. That being proficient to execute our plan we will staff accordingly to do that and we have in the past. So I don't think that there's a hesitation there.

CHAIRMAN MACFARLANE: Okay.

JAMES SCAROLA: Now the only other thing that I would say is that the operators, themselves, the staffing may not be the bottleneck; it may end

up being simulators, it may end up being modeling on the simulators. Our simulators at each of the stations right now run 24 hours a day, seven days a week to support the proficiency that we see right now on the design basis. So we've got to understand if there is a proficiency need that is through the operators where that fits in appropriately. And I think that the actions that have been promulgated right now will get us to that point.

CHAIRMAN MACFARLANE: Did you want to weigh in?

CASEY PFEIFFER: I would also like to add that it's -- operators, for field operators, it wouldn't take a long time to add them, but for licensed operators it's at least a three year process from when they hire in before they could even get their reactor operator license and, you know, it's -- I graduated in chemical engineering is what my bachelor of science is in; getting an NRC license was almost as difficult as that -- with all the information you have to have to pass the simulator and written test that we have. So it's just not as saying, "Yeah, we need more operators," and we agree with that, but to get them is a little more difficult --

CHAIRMAN MACFARLANE: Right, you have got to plan.

CASEY PFEIFFER: Yeah.

CHAIRMAN MACFARLANE: David, did you want to jump in on that at all?

DAVID LOCHBAUM: Well I think the point that industry struggles with is if it's not required --

CHAIRMAN MACFARLANE: Right.

DAVID LOCHBAUM: -- a severe accident management guidance cert is a voluntary initiative, and some will and some won't. That's why we think

the NRC needs to mandate a minimum level, so it brings everybody up to or above that level and doesn't allow this spectrum of results that we've seen today.

CHAIRMAN MACFARLANE: Okay. All right. In my two minutes, let me jump to this issue. We might have to take it up again, but you mentioned the FLEX approach.

JAMES SCAROLA: Yes.

CHAIRMAN MACFARLANE: I'm just beginning to learn about the FLEX approach. I'd like to learn a lot more. One thing I understand -- correct me if I'm wrong -- is that the FLEX approach -- that you're thinking about one facility for the entire east coast?

JAMES SCAROLA: No, it was that if -- in looking at FLEX, we started out with each unit having a set of FLEX equipment. So every unit in operation today will have equipment on their site that goes beyond the current design requirements to be able to deal with an extreme event.

CHAIRMAN MACFARLANE: But then you also need an outside staging area?

JAMES SCAROLA: Yeah, then beyond that is we will have a response capability outside that plant to deliver equipment, additional equipment, as necessary. We have proposals right now that have been submitted to the industry. We're evaluating those proposals. Some are for single locations, some are for multiple locations, up to about five locations. We haven't decided what the right approach is yet. There's some benefits and drawbacks on both sides, but the real focus that we have is the timeliness of that response capability, and in order to have the appropriate timeliness it requires additional facilities then we will put additional facilities in place.

CHAIRMAN MACFARLANE: Okay. Did you want to comment on that?

CHRISTOPHER PAINE: I don't -- we don't find FLEX credible. We don't think it's a faithful implementation of the task force report and its recommendations. The task force recommended that severe accident mitigation be brought under the ROP, the Reactor Oversight Program, and be formally regulated. That's not occurring. That's the -- almost the antithesis of what is occurring. There's been no determination, as the task force recommended, on minimum coping times or the extended 72-hour coping time. Both of those are variables now that are running free and may or may not receive future NRC action, and here we are 17 months after the accident. It would think -- I would think that extending and creating a minimum baseline coping time is a no-brainer for the Agency, but others have a different view. Apparently the senior staff has a different view.

CHAIRMAN MACFARLANE: Okay.

CHRISTOPHER PAINE: And the self-powering options that should be studied and I've seen no attention by the Agency to self-powering of the emergency turbine pumps, steam power pumps. You can put a permanent magnet motor on the shaft end of those and extend the coping time for not eight hours but a week. As long as you have decay heat to run those turbines, you'll have electricity to control the valves.

CHAIRMAN MACFARLANE: Okay.

CHRISTOPHER PAINE: You know? And the speed controls. So, I mean, there are obvious things that could be done and that should be mandated by the Agency, rather than letting everything be subsumed under this FLEX

approach.

CHAIRMAN MACFARLANE: Thank you. Thanks, that was very helpful. Now I think it is -- Commissioner Svinicki is up.

COMMISSIONER SVINICKI: Thank you. I want to join in thanking each of you for your presentations, and I know also that you and your organizations have been very involved in the, I think many -- at this point many dozens of meetings that the NRC staff has held, and I'm very appreciative of your sustained engagement, in that I realize it's a tremendous amount of effort and activity that your organizations have to support. So I appreciate you consistently participating in that on a sustained basis.

My colleagues have covered some areas that I might have asked about, and have also asked some good questions. I have a few clarifying questions from the presentations that were given and maybe a couple of things to pick up on, either questions that were asked or answers that were given already. Jim, I wanted to start out -- your slide four had talked about the fact that B.5.b equipment readiness has been affirmed by inspection, and of course there were walk-downs of B.5.b equipment in the early months after the Fukushima events, but my memory is that there were instances at sites -- some instances at some sites where B.5.b equipment readiness was actually found to be challenged in some way, that things were maybe not where they had been originally placed or in a condition to be utilized in the -- for the means intended. So we've gone through this process of walking down all this equipment again and reestablishing its readiness. What would you say, though, in terms of any kind of assurance or ability to rely upon this, and now if we add in the FLEX equipment, what is the approach to making sure that we don't see the same kind of, again,

overtime stuff if it's not permanently affixed, it migrates, or it's not found in the same condition? How do you respond to that process going forward?

JAMES SCAROLA: I think that is one of the lessons that we have. When we look back at our implementation of B.5.b and the equipment associated with that, is that we did not establish in many cases the appropriate ongoing maintenance and surveillance program. That is what -- if you'd look there -- is one of the bullets that we have is putting in place, even with all the FLEX equipment coming in, a periodic program that maintains the equipment and actually surveils the equipment. So I think that that's the key to it, is that we were short-sighted, certainly, with the B.5.b equipment. Those deficiencies that we did identify there in the walk-downs have been corrected at all the stations.

COMMISSIONER SVINICKI: And it’s through this process that you're putting in place, that is what would give you the assurance that you wouldn't have that same incident occurring in the future? And is this also the walk-downs and maintenance, though, that Casey was mentioning as a concern, as far as who's going to do all that?

JAMES SCAROLA: Yes, it -- they're one in the same. The programs would be consistent with what we have in our design-basis equipment, our installed equipment. We run that periodically, we surveil it periodically, and the operators are involved in that. I wouldn't say that it's operators alone. It will extend beyond that because the maintenance of that equipment involves our maintenance personnel and, in many cases where the equipment is located in a remote area, regional centers, is we will actually have a service that will provide that, and we're establishing the requirements for them to periodically test their capabilities, not just the equipment.

COMMISSIONER SVINICKI: I wanted to pick up on the coping time question, and I'll follow on from my discussion about the equipment. Is it possible as FLEX equipment is acquired and put in place and then the procedural aspects of this are addressed and enshrined and trained to, how specific can you get in the effect on coping time, in terms of analytics and evaluations that you can do? How -- I guess the question sometimes becomes like, you know, how many decimal places? How sure can you get about enhancements to coping time, in terms of the FLEX strategy?

JAMES SCAROLA: I think when we look at our coping times, it all depends on the base assumptions at which you start with. So from the fundamental standpoint, loss of all AC power at the site is usually our starting point for what we look at in coping times and we're looking at the decay times on batteries. We can go through and we do have specific calculations at each of the sites that look at the capacity of those batteries under normal configurations. There are additional actions that can be taken, if diagnosed early that you are in a specific event, to offload loads on those batteries to allow the batteries to last for a longer period of time. So we can get very specific from a calculations standpoint, and then it's a matter of us deciding what is the appropriate margin on that specificity.

COMMISSIONER SVINICKI: I think my question went to the further periods of time, not the immediate -- again, the purpose of FLEX, is it not, is to have an enhancing effect on coping time? My question is how specific can you get about that enhancement and how much reliance can you have on it going forward? Is it always going to be like a range, then? Your enhancement to coping time is going to have to be fairly broad range?

JAMES SCAROLA: I think, in terms of enhancement to coping time, we see many of these strategies are indefinite because of the capacity to, after initial hookup and after initial fuel sources are depleted, that we will have the regional response centers capable of providing the additional time. So we don't see on the back end that once we have the strategy in place and hooked up that we see a limit to that time period. It will depend on what is the infrastructure in place around that plant at the time, how can we get additional fuel to the site, is it by flying in tanks, is it by trucking things in? So there are variabilities there, but we don't see those as obstacles that we can't overcome with the regional capacities.

COMMISSIONER SVINICKI: Okay. Casey, I think -- I wanted to touch on -- you had a couple of examples of how occasionally plant modifications are made and it's done in a way that is not helpful to operator actions that they might have to take. Do you have a sense of -- it would seem to me -- I don't know that PROS necessarily has input to planned modifications at plants, but I would think that operators, as part of an operations department or certainly engineering -- where are your opportunities to provide input to those kinds of planned modifications as operators, prior to their being implemented? And can you give me a sense? You gave two examples, but is this, you know, widespread concern, or were those just two noteworthy examples you were using to point out the significance of operators having input to this process?

CASEY PFEIFFER: Well, those two examples are just the examples we have found and, like I say we are concerned with, you know, a lot of the design stuff that's going to come out with the Fukushima recommendations in the FLEX, that we need to have in the back of our mind that is not going to

affect, you know, current plant equipment that the operators may have to manipulate on other accidents and surveillance requirements. We do have some input to when there's design changes but probably not as much as some operators would like. Lot of times we, you know, if there's a design change, we really don't find out about until it's towards final, you know, stages of implementation. I sounds like with the FLEX we'd probably be involved with it as it's going in, and which we should be involved with it as it's being, you know, placed into the plants to make sure that these issues -- or possible issues with manipulating the equipment that we need to manipulate during other accidents or other conditions.

COMMISSIONER SVINICKI: Okay.

DAVID LOCHBAUM: Can I briefly add to that --

COMMISSIONER SVINICKI: Certainly.

DAVID LOCHBAUM: It reminds us similar to the evaluations that were done for safety modifications and security modifications. We petitioned the NRC to include an interface between those two because they were done -- siloed before. Right now, design-basis modifications are done with very detailed and robust review for these kind of things, but the voluntary FLEX-type initiatives are done with a different review. Each robust but the cross-checks and the potential counterintuitive things are not being flushed out. If you integrate them you're more likely to catch those things.

COMMISSIONER SVINICKI: Okay, that's very helpful. I appreciate you mentioning that differentiation for the level of maybe engineering analysis or operational analysis that's down there. And I wanted to ask -- I only have a minute now, but I was going to ask the entire panel to build off of

Commissioner Ostendorff's question about looking at the evaluations that have been done since the events in Fukushima and were there any kind of surprise moments or anything like that. I had wanted to ask a question from slightly different angle, which is that NRC continues to participate in a lot of international discussions and what they call "extraordinary meetings" on the Fukushima events where I think we have an opportunity to advocate for specific evaluations or information to be done either in Japan or by international review groups to bring further information about both the event itself and how it was responded to, that various countries then can have access to some of these evaluations and use that in their own national responses to this. Is there any of these areas where important questions that maybe have not yet been evaluated, that NRC, as they participate in these international fora, that we could be saying our important things to be evaluated going forward or questions that we would like to have answered for ourselves. And I know I'm slightly over my time, but, just quickly if you had some quick thoughts you wanted to share on that, Chris.

CHRISTOPHER PAINE: Yes. We think that there's a rather significant discrepancy in the whole question of hydrogen management and hydrogen control, hydrogen mitigation between European regulators and the NRC. And those discrepancies are not explained or understood, at least in the U.S. context. And, for example, current computer models don't adequately predict hydrogen production in European severe accident experiments. The CORA and the LOFT 2 experiments that -- from, I believe, the late- to mid-80s -- mid- to late-80s. And, so the whole question of differential protection, I mean, European and Russian reactors are loaded down with recombiners and igniters and U.S. reactors generally are not. And, you know, what does this mean about

this issue? So that's one, I think, reconciling hydrogen mitigation and control standards globally and understanding why other countries take the issue more seriously than we apparently do, is important.

The other thing is funding. I mean, the current IAEA efforts on post-Fukushima nuclear safety, the U.S. contributions, I believe, are -- we're 500,000, where another 700,000 might be provided, whereas other countries like Japan are kicking in tens of millions. So the U.S. financial contributions on that whole effort are just pathetic at this point.

COMMISSIONER SVINICKI: Okay, thank you, David.

DAVID LOCHBAUM: I alluded to in my presentation, but I think the issue of instrumentation availability or unavailability is a bigger issue. During the accident they struggled with what was the level, what was the various pressures. In this country we've done a good job with level after TMI. I think we have some lessons to be learned for the other instrumentation, the key parameters that we need to continue monitoring.

COMMISSIONER SVINICKI: Thank you. Jim.

JAMES SCAROLA: I think, to me, I would turn to the infrastructure. So it's not the specific issue and how that issue gets vetted. I think we can vet it once we get the issue to the table. But the infrastructure that's set up to vet issues, I think, is what's most important. Forums like what we have today, I don't think are present in the international community. So when I look at full-time, on-site, independent inspectors that have free reign to go look at safety systems, depth of safety systems, readiness, 24 hours a day, 7 days a week, that is not common in the international community. When I look at continuously evaluating things like our design-basis reviews that have been conducted through SSFIs or

CDBIs in the past, that infrastructure needs to be recognized, and the value of that in what it means for true safety, I think, still needs to get the attention in the international community.

COMMISSIONER SVINICKI: Okay, thank you. Thank you, Madam Chairman.

CHAIRMAN MACFARLANE: Thank you very much. Okay, onto Commissioner Apostolakis.

COMMISSIONER APOSTOLAKIS: Thank you, Madam Chairman. I found the diversity of views that were expressed this morning very interesting. I will start with Mr. Scarola. I read the letter from NEI dated June 8 of this year from Mr. Hymer to Mr. Skeen, where it says, quote, “The Tier 1 items when completed will achieve as much as 90 percent of the safety benefit from all recommendations,” end quote. In another place, it says, "The implementation of Tier 1 items may address Tier 2 or Tier 3 issues." The question to you is, do you agree? And if so, how do you know it's 90 percent?

JAMES SCAROLA: I cannot give a precise number, but I do agree that each of these issues has overlapping benefit. And I think that that's really the point of that letter, is that we need to understand that overlapping benefit before we commission new activities. So when I think about things like our discussion on venting, filtering, well, many of the actions that we are taking and promulgated here will -- are set up to prevent us or mitigate from getting to that point entirely. And I think collectively, we need to understand that we can discuss an issue in its own silo, and we can come to a conclusion that that issue has merit and benefit, but unless that issue is put into the perspective of all the other activities that are going on, I think we can misappropriately give an issue a

priority for this industry that is not appropriate. So the message there that, I believe, is the underlying message is that Tier 1 we believe are taking the predominant benefit and if we look at that collectively, it's from that collective benefit that we should continue to evaluate the next issues in Tier 2 or 3.

COMMISSIONER APOSTOLAKIS: Yeah, I cannot disagree. Yeah, I can't disagree that when we look at Tier 2 and 3, we should look at them in a holistic way, you know, the benefits. But one may read this letter -- and I also heard other people insinuating that, like the industry's going to fight Tier 2 and 3, that, you know, maybe push them far into the future because 90 percent of the benefit, we have already received. It's not 90, it's 85 percent.

JAMES SCAROLA: Let me respond to that. First, I will tell you that the industry is not backing off one bit on getting the lessons learned. The industry has been advancing the lessons learned here, even the latest report that INPO put out is the industry has led getting to the organizational lessons. We understand the value of that, but we also believe that it continues to be extremely important, as leaders in this industry, to prioritize so that we don't inappropriately displace the focus of our operating facilities.

COMMISSIONER APOSTOLAKIS: And I'm glad to hear that. Now moving on, you just mentioned the organizational lessons in coming to FLEX. The ACRS wrote a letter last July 17: quote, "By its nature, the FLEX program will require substantial on-site and off-site mobilization of personnel and resources under unusual, challenging conditions." The question is, do we understand what can go wrong under these unusual and challenging conditions or are we assuming that yes, the equipment will be transported and everything will be fine? What can go wrong and what are the consequences of it going

wrong? Do we have an understanding of that?

JAMES SCAROLA: I think to give a definition clearly, we can't give it that specificity but we can have ranges of external events that we know that we would have to cope and deliver on. Placement of where that equipment is located on-site is getting that consideration. So where do we place that additional equipment? And we have multiple sets of additional equipment so that we're not placing it all in one location. Then the mobilization from off-site. That is part of what we will evaluate in our staffing studies. What's the required response time and then what are the ways in which we can get additional support to that station?

COMMISSIONER APOSTOLAKIS: And I understand that. My question is, in pursuing to do these things, I mean, things may go wrong. I mean, we don't know what the context will be. Is it going to be a major earthquake, maybe followed by a flood or a fire? Could it be a hurricane? What puzzles me is that we take a small locker, okay, independently of these things, and we beat it to death. The operator's going to do this and that and this pump won't start and all that, and here we're talking about a massive operation, and we're saying, "Oh, we'll make sure it works," you know, we will have enough equipment. We have airplanes, helicopters. It seems to me the level of attention is not the same. I would expect to see some scenarios that, you know, we'll say, yes, we're trying to transport equipment from here to there, and these are the different conditions we may encounter. These are the different mistakes that may be made. And I don't see that. I mean it's a very high level, almost arm-waving, I don't put it down, but almost arm-waving argument that it will work. Am I -- I'm not convinced. I'm sorry. [laughs]

JAMES SCAROLA: Let me first start out with saying that the design-basis equipment, it is very specific. It's very specific to the event, right? And we go through a lot of detail as you speak to, on the design-basis equipment. And it is our best minds and our best capability to predict nature with our design-basis equipment. We took the direction under FLEX to say, what if we can't predict nature? How do we have more optionality available to our trained and intelligent emergency response organizations? So can I tell you that we have thought through every scenario? I cannot, but I can tell you that as a result of putting that in place, we have added more success paths that may survive an unplanned event of nature on the extreme ends. And that's what our purpose is: multiple locations both on-site, multiple regional centers and a level of collaboration in this country unprecedented in this industry to be able to turn to my neighboring utility and say, "I need this. Can you get it to me?"

COMMISSIONER APOSTOLAKIS: And I am very pleased to hear that. Just think that you should take the extra step of looking at the possible --

JAMES SCAROLA: I accept your challenge.

COMMISSIONER APOSTOLAKIS: Yes. Mr. Paine, I was -- I received your slides yesterday, and I must say I was greatly disturbed to read about your views of this agency. I will try to understand better your complaints and I will talk to my staff and the NRC staff to clarify a few things. But in the effort of -- this effort of clarification, I'm wondering, do you have an example of where you were pleased with the way the NRC acted so I can learn from it?

CHRISTOPHER PAINE: Yes.

COMMISSIONER APOSTOLAKIS: Okay.

CHRISTOPHER PAINE: We were very pleased with the agency's

near-term response to Fukushima.

COMMISSIONER APOSTOLAKIS: You mean the 90-day report and --

CHRISTOPHER PAINE: The 90-day report, the mobilization the agency took to deal with the accident. Yes, we were pleasantly surprised. And by the integrity of the way the NTTF recommendations interlocked and created a real path forward for dealing with these problems. You know, part of our disappointment is that that report and the logic of its structure was immediately disassembled and parceled out and it's lost -- the interlocking nature of the recommendations has been lost. For example, recommendation 1. There was a reason the task force put it as 1. Do you create an extended design-basis for severe events or not? And it seemed to us that the first lesson of Fukushima is yes, you create an extended design-basis and you start to regulate these problems just the way you regulate design-basis events. And so the agency's completely lost that approach.

COMMISSIONER APOSTOLAKIS: Well, but you are aware, of course, that our staff is working on Recommendation 1 and they will come back in February --

CHRISTOPHER PAINE: Right, but in the meantime, all these other piecemeal correctives are going forward. And the whole point was, you know, if you have a framework to guide it -- and, you know, everything from the quality control criteria in the regs in Part 50 to, you know, considering how the various stages of your process either reinforce or undermine each other. This whole question of coping time, and now we seem to be talking about investing money in the downstream portions of the process rather than in the near-term problem,

which would alleviate resorting to the downstream process by extending the plant's initial coping capability. You know, they have a separate recommendation on that as far as I can see. It's just disappeared.

COMMISSIONER APOSTOLAKIS: I'm not sure it disappeared but --

CHRISTOPHER PAINE: Okay.

COMMISSIONER APOSTOLAKIS: Your point is well made. Thank you very much. Thank you, Madam Chairman.

CHAIRMAN MACFARLANE: Okay, and Commissioner Magwood.

COMMISSIONER MAGWOOD: Thank you, Chairman. Given the subject today, it's interesting to reflect on, you know, my visit with Commissioner Ostendorff and our staffs to Fukushima back in January and recall that the staging area that one goes to before going on-site was the campus where Japanese soccer teams trained, what they call J Village. And so it's, you know, attribute to the Japanese ladies' soccer team that they've progressed so far in the Olympics and I'd wish them well, if not for the fact that they were facing in the U.S. women coming up soon for the final, so I hope they enjoy their silver medal. [laughter]

One of the -- welcome all the speakers. I think you've done a fantastic job, it's been an excellent session. This is actually, I think, the first time Mr. Paine has joined the Commission in the discussions since I've been here. I don't think you've been at the table when I was here and don't remember you being here, but...

CHRISTOPHER PAINE: I honestly don't remember --

COMMISSIONER MAGWOOD: Yeah, I don't think so. That's

probably how you've managed to store up 56 slides to present to us today. And I join Commissioner Apostolakis because he raised a lot of interesting issues. One I wanted to signal some agreement is your comments about contention admissibility, something I've heard from a variety of stakeholders, it's something I've talked with some of my colleagues about. You know, I invite you if you do have some specific examples -- or not specific example but specific changes you would recommend that we consider, I'd like to talk to about that more or less informally, just to see if there's some paths forward we could consider.

Your -- I also agree, by the way, with your paralyzing penchant for paper. You should see my desk right now. It's certainly paralyzed and there's a lot of paper around here. This, I'm afraid, is the nature of the business, but I recognize it can be a barrier, and it’s one I think we do try to deal with, but...

CHRISTOPHER PAINE: I just think there are probably the things you can do. I mean the way, for example, the decisions were made to move forward with the orders that were issued were very broad brush. I mean, so broad brush it's impossible to determine their meaning. And then you have draft guidance that comes out, and the draft guidance basically references industry documents, industry-written documents. That's three sets of documents for any citizen to actually understand what it is you're required to do or what you're asking of the industry. It's three documents the industry itself has got to look at. I mean I think, you know, at the end of the day, you need to write regulatory requirements that are clear and that are pretty self-contained, because this chain of documents -- I mean, every time the NRC says anything, you notice the staff publishes a list of references. It can go one for two pages. I mean, instead of stating what it is, they simply state the references on which it's based. I mean, I

think that whole culture of just throwing every document into the tank to make sure you've covered your base is inappropriate. It's not the way to regulate and I hope it changes.

COMMISSIONER MAGWOOD: I appreciate that comment. Again, invite you to, for more discussion on some of these issues. Mr. Lochbaum, you -- in your comments you made, I think you said a former allegation on a couple of merits, have you submitted something formally to the agency or is this the first time it's --

DAVID LOCHBAUM: This is the first time on those plants.

COMMISSIONER MAGWOOD: Okay, then we should, Chairman, just assure that that issue is formally picked up by the agency and meeting records should reflect Commission's interest in seeing this follow through. So make sure that gets dealt with. You also made a very interesting comment regarding the ability of operators to respond in event of an emergency under adverse conditions and I do recall reading the INPO timeline when it was going through the issues that the operators at Fukushima were facing: darkness, smoke, all sorts of, you know, damaged equipment. I think that is a concern and I wanted -- that’s not a question for you; this more question for Mr. Pfeiffer. What's your response to that? How do operators -- how are operators trained now to deal with adverse conditions? Have you ever been trained to deal with an environment that's filled with smoke, when the lights are off and there might be a fire nearby. Have you been through training of that nature?

CASEY PFEIFFER: I would actually just add something to our simulator at Sequoyah for the lights to go out and we do have, you know, most of our control rooms have emergency back-up supply lights that are off of batteries.

So we wouldn't be in total darkness if, you know, events for at least a while if events were to happen. But we have started being trained in, you know, darkness, at least, I have at Sequoyah. I don't know about the other people in other industries or other facilities. Now, smoke, we've never really been trained in smoke. We are SCBA qualified. We do that every year. I could probably say that we've never -- I don't know of anyone that's ever actually done a simulator session with a SCBA, which is a self-breathing apparatus on, like they did at Fukushima.

COMMISSIONER MAGWOOD: Well, you know, I've talked with operators, plant staff, and they -- and talking with them about the emergency procedures and SAMGs and many of them are expected to go to different locations at the plant. Sometimes, you know, disconnect and reconnect piping. You know, not insignificant activities, turn valves, climb ladders. I mean, there's things they have to do under certain circumstances. And if these actions need to be taken in an environment where there might be a fire nearby, there might be a collapsed wall, there might be smoke, there might be alarms, there might be -- who knows what's going on. Don't you feel that that's something operators should experience before being expected to implement, as Mr. Lochbaum was saying, these very sometimes complex procedures?

CASEY PFEIFFER: I would say that a lot of the places that the -- in the field that the operators need to manipulate stuff, there's already ladders and stuff staged that are specific for that equipment so they don't have to, you know, go to a ladder station that may be across the room. There's actually equipment that's right there at the place they need to manipulate.

COMMISSIONER MAGWOOD: But the stress environment --

CASEY PFEIFFER: My only thing for that would be I don't know how you would simulate that. You'd had to have built something that would simulate a fire, simulate smoke and you know...

COMMISSIONER MAGWOOD: Well, you know, there's -- first responders do it all the time. I mean, we have facilities across the country. In fact, I visited one recently at Texas A&M University Disaster City where they have, you know, simulated, you know, collapsed buildings, where they have the smoke and they have the alarms, they have the screaming people, I mean. Why don't we do that?

CASEY PFEIFFER: That could be something that we could bring up too.

COMMISSIONER MAGWOOD: David, looks like you wanted to jump in.

DAVID LOCHBAUM: Well just -- years before, I joined USC I was an observer doing a drill conducted at the Grand Gulf Nuclear Plant, and they were -- I was with a team that was going out to fix emergency diesel generator. The room was -- if that had been the condition, the room would have been dark. None of the people had flashlights. When I pointed that out they were all bigger than me and they said they weren't walking back to get the flashlights. But, as far as the simulator work, I used to teach on the simulator for you guys at your simulators. You simulate in the control room, operator’s response, and you can simulate loss of lights and things like that. But many activities in the field, you don't simulate because you don't have that part of the plant simulated. So that -- you can test part but not all, and the chain is only as strong as its weakest link. So I think it's difficult. I agree with Casey. It's very difficult to artificially subject

the operators to that kind of stress and that kind of training. But to the extent that we can, yeah, I think it benefits everybody.

CHRISTOPHER PAINE: I just wanted to add high-temperature environments.

JAMES SCAROLA: We do currently train our fire brigades in the manner in which you talk about, where we actually have the facilities that they go into real burn situations, real smoke situations. Part of the lessons coming out of the latest report from INPO are looking at the decision making under stress conditions, and we are picking that up as an industry to go look at the situations and say, okay, what more can we be doing from where we are today.

COMMISSIONER MAGWOOD: I appreciate that. Amazing how much time goes by quickly when you're asking these questions, but it does seem to be that when you consider the lessons learned after 9/11, when you look at what the first responders are now doing in their training in rescue operations, especially after reading the INPO timeline, it's hard to see the distinction between what an operator might need to do under certain circumstances and what a fire brigade member might need to do under certain circumstances. And as Commissioner Ostendorff, he explained in some of his training, he's had as a naval officer -- sometimes you're expected to do very complex things under very adverse conditions. If you hadn't experienced it before, it's difficult to know how well you're going to carry out your duties the first time you're in a fire, the first time you're in elevated temperatures, the first time you're in a smoke-filled environment. I do think this is something that, you know, that we, on the regulatory side and also on the industry side, we need to take very seriously. I think David raised an interesting point. Well, my time is up so I'll relinquish my

other six questions for now.

CHAIRMAN MACFARLANE: Well, I think this has been a very productive session and I think we would all benefit from more informal conversations with all of you. But let me adjourn us for just a five-minute break while we switch panels and everybody can get up and stretch their legs. Thank you very much.

[break]

CHAIRMAN MACFARLANE: Okay. I think we're set to begin again. Now we're going to hear from the NRC staff. And I'm going to turn it over to Mike Johnson.

MIKE JOHNSON: Good morning, Chairman and Commissioners. The purpose of this briefing is to update you on the NRC's efforts to implement the lessons learned from the Fukushima Dai-ichi accident. With me today at the table are Jim Wiggins, who's director of nuclear security, Office of Nuclear Security and Incident Response, Brian Sheron, who's director of the Office of Nuclear Regulatory Research, Eric Leeds, who's the director of Nuclear Reactor Regulation. All three members -- they are all three members, of course, of the steering committee that we've established. Also at the table is Dave Skeen, who is the director of the Japan Lessons Learned Project Directorate. I should note that other members of the steering committee are behind me in the well, and I'd also like to recognize the Japanese Lessons Learned Directorate and others of staff, managers and staff, who have really been the backbone of our efforts to date. Next slide, please.

As it's been pointed out, we last briefed the Commission in October of 2011, and since that time, we've covered much ground. I'll provide an

overview of the agency's lessons learned efforts. Following that, Dave is going to talk about Tier 1 and Tier 2 and provide a status update. And then, following that, Dr. Sheron, Brian, is going to provide an overview of our Tier 3 efforts and, in fact, delve into two specific examples to provide greater detail for the Commission. Next slide, please.

I'm pleased to report that we've made significant progress in learning lessons from Fukushima. I believe that we've made real plans, and the staff has taken real actions. And these efforts are already leading to enhanced safety at the plants. We certainly recognize the role of the Commission in terms of establishing the policy direction that we have undertaken. That has really been -- set the stage for the process that we've been able to make to date. And, of course, we would not have been able to make progress without the frequent productive engagements that we've had with all of our external stakeholders. We've benefited from that. We've, in addition, engaged the Advisory Committee on Reactor Safeguards and benefited from their diligent reviews and insightful recommendations. We've also briefed the National Academies, in preparation, to help them with their study on lessons learned of the events of the Fukushima nuclear plant. May I have the next slide, please?

This next slide and the slide after really provide the major milestones in the plan to identify and implement Fukushima lessons learned. On July 13, in SECY-12-0095, we provided Tier 3 plans. We also provided a six-month status update of where we are with respect to implementing Tier 2 and Tier 3 issues. And, as you can see in this slide, we are on schedule with implementing the Tier 1 issues, and we're making continued progress on Tier 2 and Tier 3. Next slide, please.

Looking forward, from final issuance, or issuance of the final guidance for implementing the requirements in the orders and completing the seismic and flooding walk-downs and completing the EP staff and communication evaluations, all the way through to final implementation of all the actions, as you can see, we still have a lot of work to do. I'll just point out the plans are good. No plans are perfect, and we're going to need to remain open as we move along to learning lessons and revising and reevaluating, readjusting our plans to make sure that we continue to implement the lessons learned. Next slide, please.

In pursuing our lessons learned efforts, we've continued to adhere to several principles. Among those principles are, first and foremost, that we don't distract either our focus or the focus of the plants from operating -- operational safety. Those were points that were made, I think, very well by the panelists in the previous panel. We also want to make sure that we don't displace work that is of greater safety benefit or higher priority or that is necessary for continued safe operation of the plants. I'm pleased to report that we continue to make progress on activities such as the National Fire Protection Association, NFPA 805, and Generic Safety Issue 191: assessment of debris accumulation on pressurized water sump performance. And, of course, earlier this year, we issued first combined licenses for Summer and Vogtle. So, as you can see, we do continue to do other high-priority activities. Lastly, we need to move forward promptly, and we need to make sure that we get it right the first time. May I have the next slide, please?

This slide provides definition of the tiers. I won't -- I'll keep it for reference, but I'm not going to touch on it. Next slide, please.

I want to mention just three items that are not really the focus of today's briefing but are related nonetheless. One is consideration of filter vents. Consideration of filter vents is a part of Recommendation 5.1, which is a Tier 1 recommendation to order licensees to include a reliable hardened vent on BWR Mark I and Mark II containments. The order for reliable hardened vents was issued, of course, in March. The staff continues to make progress in evaluating the policy and the technical issues associated with providing filter vents and also making those hardened vents severe accident capable. We will provide recommendations to the Commission in November with respect to these issues.

We're also making progress on the near-term task force Recommendation 1 that was addressed, talked about to some extent in the previous panel. That recommendation really is for the establishment of a logical and systematic regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations. I'm using, really, the language in the near-term task force, that report that refers to that item. The staff will provide the Commission with a set of recommendations in February of 2013. We have been engaging with stakeholders in terms of working -- our efforts to be able to deliver on that product.

And then, finally, though not associated with NRC's lessons learned efforts, the staff has underway an assessment related to agency -- how the agency considers economic consequences in our regulatory framework. We plan to provide this assessment, including options and a recommendation, to the Commission later this month. May I have the next slide, please?

And, with that, Dave will now provide a detailed presentation of the agency's status on the Tier 1 and Tier 2 items, Dave.

DAVE SKEEN: Thanks, Mike. And good morning, Chairman and Commissioners. We're pleased to have this opportunity to brief you on the status of the Tier 1 and Tier 2 activities this morning. Overall, I believe that the staff has made remarkable progress since last fall to implement the Tier 1 activities, and the operating reactor licensees are currently on schedule to make the necessary Tier 1 safety enhancements at the U.S. plants within the five-year goal.

I would like to note that we have benefited greatly from the extensive interactions and input from a wide range of stakeholders over the last several months to get us to where we are today. We would not have gotten this far if we -- without the cooperation of all those who have been involved in the multiple public meetings that we have held. As this first slide indicates, these are the Tier 1 activities. There's three orders, three requests for information, two advance notices for proposed rulemaking, and then I'll talk about each one of these in a little bit more detail. Next slide, please.

This table provides an overview of the status of the three orders. This is to implement the mitigating strategies and the enhanced spent fuel pool instrumentation at all the plants in the U.S., as well as the hardened vents at the boiling water reactors of the Mark I and Mark II containment designs. Following Commission's approval, we issued these orders on March 12th of this year. The staff then had significant interactions, again, with the stakeholders to develop the draft implementation guidance before we issued the drafts for public comment at the end of May. Thanks in large part to utilizing the expert technical staff from the major NRC program office from across the agency as well as within the regions in all of our technical working groups, and the concerted effort by our public stakeholders and the industry over the last few months, I'm happy to report

that we are currently on schedule to issue the final guidance documents for all three orders by the end of this month.

Subsequently, within six months after the final guidance is issued, licensees will submit to the NRC their plans for implementing the requirements of the orders at each of the nuclear power plants. The goal is to implement the order requirements for all operating reactors within two refueling outages, but no later than December 31st of 2016. And although this slide focuses primarily on the operating reactors, I would also note here that combined license holders for new reactors must also implement the orders prior to initial fuel load, and the licensees with construction permits must implement the orders before receiving a license to operate. Next slide, please.

The mitigating strategies order requires licensees to develop strategies and procure equipment to address beyond design basis natural phenomena that could result in a prolonged station blackout that affects all the units at a site. This order is intended to ensure that there is redundant and versatile equipment available to provide defense-in-depth to address a number of external event scenarios, not just the particular actual sequence that occurred during the earthquake and tsunami at Fukushima.

The order requires a three-phase approach for mitigating the beyond design basis external events. In the initial phase, licensees are required to use installed equipment and resources to maintain or restore core cooling, the containment, and spent fuel cooling capabilities. During the transition phase, licensees are required to provide sufficient reportable on-site equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from off-site. And in the final phase,

requires the licensees have access to sufficient off-site resources to sustain these functions indefinitely.

After the order was issued in March, the staff held several public meetings to discuss this draft guidance to help ensure that the orders will be implemented consistently by all the licensees. The industry submitted the draft guidance document for NRC review, and our endorsement, based on the results of the discussions that we've had in the public meetings. In May of this year, after we did some review and had some comments and exceptions to what the industry proposed, we issued the draft guidance for public comment. Since May, the staff has continued to hold public meetings, and the industry has revised the draft guidance to incorporate many of the exceptions that we identified. We are currently on track to issue the final guidance by the end of this month. Next slide, please.

The second order requires licensees of BWR plants with Mark I or Mark II containments to have a reliable hardened vent. The need for containment venting to overcome -- to remove decay heat and control containment pressure within acceptable limits following beyond design-basis events has been identified through many technical safety studies. And licensees with Mark I plants voluntarily installed these vents many years ago. This order will make the vents mandatory for both the Mark I and Mark II containments and require them to be operable under a range of conditions, including a prolonged station blackout.

The staff developed the draft guidance that was issued for public comment in May, and it lays out an approach that is acceptable to us to meet the requirements of the order. Since that time, we have continued to meet with

stakeholders to address their comments and to refine the draft guidance, and also, we are currently on track to issue this guidance by the end of the month.

As Mike mentioned earlier, the questions about whether we require additional design parameters to assure functionality of the containment vent system under severe accident conditions and whether to require filtration of the containment vent paths are currently being evaluated by the staff, and we are making good progress on the technical analysis for these issues. As we requested in the recent COMSECY that we delivered to the Commission in July of this year, and which was just approved by the Commission yesterday -- we thank you for that -- we need a little more time to perform some of the additional severe accident computer analysis in order to thoroughly evaluate the potential safety benefit of such requirements, and we will provide the recommendations to the Commission in a notation vote paper by the end of November. Next slide, please.

The third order requires licensees to install reliable instrumentation to measure the spent fuel pool level to facilitate decision-making in the event of an accident. During the accident at Fukushima Dai-ichi, the lack of reliable information about the water level in the spent fuel pools contributed to concerns about possible radiation releases due to uncovering the spent fuel in the pools and adversely impacted the prioritization of emergency response actions at the site. The instrumentation being required by this order will allow operators to monitor the water level in order to take timely action to add water to the pool if it becomes necessary. And similar to the mitigating strategies order, the staff intents to endorse industry guidance that provides an acceptable approach to meet the requirements of this order. Again, the industry has submitted the draft

guidance for our review. We had some exceptions, some concerns, and we put those into the draft guidance that we issued back in May, and we got public comments back on that, and we're currently evaluating those comments, and we expect to issue the final guidance again by the end of August. Next slide, please.

In addition to the three orders, the NRC also requested additional information from licensees to help us determine if additional regulatory action is needed to ensure nuclear power plants are protected against seismic and flooding hazards, and also whether enhanced communications and staffing for emergency preparedness is needed. To collect this information, we issued a request for information under our regulations contained in the 10 CFR 50.54(f), which requires licensees to provide information to the NRC.

The first request for information asked licensees to perform the seismic and flooding walk-downs. We requested that licensees develop a methodology and acceptance criteria and to perform these walk-downs against each plant's current seismic and flooding design basis. Any performance deficiencies that are identified through the walk-downs are expected to be addressed by the licensee's corrective action program. This past May, after we had multiple public meetings to discuss the draft guidance, the industry addressed many of the NRC's comments, and we endorsed the final walk-down guidance by the end of May. In addition, we also developed temporary instructions for our inspectors to guide their inspection activities, and we provided training to the NRC inspectors to help ensure uniform implementation of the walk-downs at all plants. The seismic and flooding walk-downs began in July and are scheduled to be completed at all the plants by the end of November. NRC headquarters staff was able to attend and observe the first seismic walk-

down in early July, and we will also be observing one of the upcoming flooding walk-downs in just a few weeks. Next slide, please.

We also requested that licensees reevaluate the seismic and flooding hazards at their sites using present-day requirements and guidance and describe any actions that they are taking or plan to address any vulnerabilities that they identify. The results of these reevaluations will help us determine if additional regulatory actions are necessary. Again, in May, we issued a letter that prioritized the reactor sites across the U.S. into three bins, and we assigned the schedule for completion of the flooding reevaluations to be completed over a three-year period between 2013 and 2015. If the reevaluated flood hazard exceeds the existing design assumptions, the licensees will perform an integrated assessment within two years. For the seismic reevaluations, the majority of reactor sites are located in the central or eastern United States. And the reevaluations for these sites are due by September of 2013. For the four reactor sites that are in the western U.S., the reevaluations are more complex, and they will be due by March of 2015. Similar to the flooding reevaluations, if the reevaluated seismic hazard exceeds the existing design assumptions, a risk evaluation will be performed. The due date for the risk evaluation will be based on the extent to which the reevaluated hazard exceeds the design basis. We are continuing to hold the public meetings with stakeholders to finalize the flooding and seismic hazards reevaluation documents, and we are on schedule to complete this by November of this year. Next slide, please.

The third request for information concerns two aspects of licensee emergency preparedness. We requested licensees to provide an assessment of the communication systems and the equipment used during an emergency to

ensure that power to this equipment is maintained during a large-scale natural event that results in a prolonged station blackout. We also requested that licensees provide an assessment of the staffing needed to respond to a large-scale natural event that could affect all the units at the site at the same time. In May, following multiple public meetings, again, and with significant comments from the NRC, we endorsed an industry guidance document that describes an acceptable method for licensees to respond to this request for information. The industry subsequently proposed an alternative implementation schedule for the staffing assessment that took into account the implementation deadlines required in the recent emergency preparedness final rule, as well as the dependencies on the implementation of the mitigating strategies order that I discussed earlier. As a result, the communications assessment is due in October of this year, and the first phase of the staffing assessment is due in April of 2013. The second phase of the staffing assessment will address multiple unit events, and that will be due four months prior to the final implementation of the mitigating strategies order. Next slide, please.

The last Tier 1 activities that we're working on right now are rulemakings, and they're associated with station blackout and an integrated on-site emergency response procedure. The staff issued an advance notice of proposed rulemaking for potential changes to the existing station blackout rule on March 20th of this year, and also a new rule to integrate on-site emergency response procedures on April 18th of this year. The public comment periods for these rules have now closed, and the staff is currently reviewing the comments and will use the results of them to review -- the results of the review to inform the development of the regulatory basis for the proposed rules.

For the station blackout rulemaking, the staff is evaluating revisions to the existing rule to require enhanced capability to mitigate a prolonged station blackout. The Commission has directed that the rulemaking be completed within 24 to 30 months, and the staff is on track to meet that deadline. The emergency response rulemaking would create a new rule to better coordinate the effective transition between the various emergency response procedures at nuclear power plants. Currently, the emergency operating procedures, the severe accident management guidelines, and the extensive damage mitigation guidelines are stand-alone documents designed for different emergency situations and are not required to be well-coordinated. This rulemaking is on schedule for completion by May of 2016. Next slide, please.

There's three Tier 2 activities that include the spent fuel makeup capability, some additional emergency preparedness regulatory actions, and an assessment of natural hazards other than seismic and flooding. The enhanced spent fuel pool makeup capability is a follow-on activity to the implementation of the spent fuel pool level instrumentation order. And the staff plans to initiate rulemaking to address this recommendation once we have gained some insights from the Tier 1 activities, which include implementation of the mitigating strategies orders, also the ongoing station blackout rulemaking, and then the seismic and flooding hazard reevaluations.

The Tier 2 emergency preparedness activities would require licensees to develop guidance for multi-unit dose assessment capability and to hold training and exercises for multiple-unit and prolonged station blackout scenarios, and to practice the identification and acquisition of off-site resources for such scenarios. Would also ensure that they have sufficient emergency

preparedness equipment and facilities to deal with multiple-unit and prolonged station blackout scenarios. Let's see. Oh. The staff originally intended to issue an order to address these additional EP issues, and then later, as we considered it, we thought that perhaps we would incorporate these additional EP issues into the Tier 3 rulemaking effort. And we requested from the Commission that they approve this change. And so I'm not as quite as pleased to say that we got your direction on that, and we understand, and we are going to go back and look now to see if we should indeed continue to try to incorporate it into the rulemaking, or perhaps we'll take other action. So there'll be a discussion at the steering committee level with that, and we'll get back to you quickly with that -- with our thoughts on that. And that's the end of my presentation.

BRIAN SHERON: Good morning. I'm Brian Sheron, director of the Office of Nuclear Regulatory Research. And I'm going to try and quickly go through the Tier 3 items. Anyway, as a refresher, Tier 3 issues are those that require further staff study to support a regulatory action and have associated shorter-term action that needs to be completed to inform a longer-term action and are dependent on the availability of critical skill sets or are dependent on the resolution of the NTTF Recommendation Number 1. On this slide -- if I could get the first slide; that's it -- and the next one, we've listed a collection of the Tier 3 issues. The majority of these issues are from the near-term task force report. However, there are a few issues resulting from recommendations of the NRC staff, and the agency's Advisory Committee on Reactor Safeguards. And, in total, we've got more than a dozen Tier 3 issues, ranging from assessment of potential safety issues, for example, seismically induced fires, to potential design changes, for example, reactor containment instrumentation, to changes in NRC

programs. An example there is the training of NRC staff for severe accidents. Next slide.

This slide lists the other half of the Tier 3 issues. Staff's assessment of the Tier 3 issues was an agency-wide effort overseen by the Japan Lessons Learned Steering Committee. The effort began shortly after the Tier 1 orders and requests for information were issued last March. This is appropriate as the agency's focus continues to be on the implementation of the Tier 1 issues. To address the Tier 3 issues, we assigned an agency SES manager with programmatic responsibility for the technical area to champion the effort -- to champion the efforts. They are responsible for developing the program plans and will lead implementation of the program plans as we move forward. Working groups of staff across the agency, including the Office of Research, NRR, NRO, NSIR, and NMSS, came together to define the issues and develop the program plans. They engaged external stakeholders to solicit comments and brief the ACRS. In June the ACRS issued a letter reporting on Tier 3 issues and concluded that the plans have been developed appropriately at this stage.

As we continue to evaluate the issues and implement our plans, we expect the plans will evolve based on information we learn and continued feedback from our stakeholders. The complete collection of program plans is contained in our July 13th paper to the Commission, which is SECY-12-0095. I wasn't planning on addressing each of the Tier 3 issues, but we are prepared to engage in discussions as the Commission would desire. Rather, I'll discuss in more detail two illustrative examples of the Tier 3 issues. Next slide.

First one is hydrogen control and mitigation. Hydrogen gas is a

byproduct of chemical reactions that occur between the zirconium cladding on the fuel rods and the steam in the reactor that occurs during the course of a severe accident. Its production and the potential impact on reactor safety are well known. Following the Three Mile Island accident in 1979, the NRC and international reactor safety organizations aggressively pursued assessment of the safety challenges that hydrogen presents and put in place requirements to deal with it. For the public, the most likely defining moment of the Fukushima Dai-ichi accident was the explosion of the reactor buildings due to ignition of hydrogen gas. The resulting damages to the reactor buildings and the sites considerably challenged recovery and mitigation efforts.

As a result, we have put together a plan to evaluate our understanding of the safety challenges that hydrogen gas presents. Using information available from the Fukushima Dai-ichi site, existing studies, and further analyses, we plan to assess all aspects of the generation, transport, distribution, and combustion of hydrogen gas. We will evaluate the impact on both containments and other buildings. We will continue to evaluate all information that becomes available from the accident and engage our stakeholders as we carry out this assessment. Using this information, we will assess the sufficiency of our current requirements and determine whether any changes are needed. Could I have the next slide, please?

The other item I wanted to talk about quickly was the transfer of spent fuel to dry cask storage. Spent fuel is currently stored at reactor sites across the U.S. in spent fuel pools and in dry casks. We have safety requirements governing the storage of spent fuel in both spent fuel pools and the casks and conduct routine inspections to ensure continued safety of the stored

spent fuel. Over the years, the agency has conducted studies of the storage of spent fuel and confirmed that the likelihood of accidents from spent fuel pools or dry casks are acceptably small. Nevertheless, there continues to be significant stakeholder dialogue regarding the relative safety of one means of storage versus the other.

As a result, the staff identified the potential expedited transfer of spent fuel from the spent fuel pools to dry casks as a Tier 3 issue. The purpose of this assessment is to evaluate the safety benefits and detriments that would occur from the expedited transfer. As an initial step in this assessment, the Office of Nuclear Regulatory Research initiated the spent fuel pool scoping study last year. We have briefed the ACRS on the study and, earlier this year, received direction from the Commission on additional technical aspects to be included in the study, and we are proceeding with this assessment. A complete assessment of the impacts of expedited transfer of spent fuel to dry casks would also need to consider issues associated with increased handling of dry cask storage and the ultimate disposal of the spent fuel. As such, operational and radiological risks from the movement of the fuel to dry cask storage would need to be considered, and the potential implications of multiple movements of the spent fuel due to the potential for repackaging. There are uncertainties in these areas and limitations in being able to fully address these issues. The staff should also consider any impacts on the Department of Energy's cask standardization program and whether there are compatibility issues of casks that could be used and the future repository design. And that completes my discussion, so I'm going to turn it back over to Mike.

MIKE JOHNSON: Thanks, Brian. So, on behalf of the staff, I want

to thank, certainly, the Commission for the opportunity to update you on our status in implementing the lessons learned activities. As you heard today, we've made and continue to make significant progress. We are on schedule to date. Having said that, I do want to reemphasize the fact that there is much to be done. Sobering thought, actually, the amount of work to be done between implementing these plans and making sure that those enhancements are, in fact, finally enacted at plants. We think that stakeholder engagement has been important, and we're going to continue that stakeholder engagement. And, in addition to that, we're going to continue to learn lessons as we go forward, and we'll adjust the plans, come back to the Commission as necessary to get approval, as appropriate, as we go forward. With that, that completes the staff's presentation. We're ready to answer your questions.

CHAIRMAN MACFARLANE: Great. Thank you, guys. That was very informative. And, again, we're going to start with Commissioner Ostendorff.

COMMISSIONER OSTENDORFF: Thank you, Chairman. Thank you all for your presentations. I'm going to make a few comments just before I get into Q&A here. I will have some questions for you. I guarantee you. But I think it's helpful to sit back and look at, retrospectively, where we've been over the last 17 months or so, and I think I'm going to start off with that approach. I remember sitting here with Bill Borchardt and three of my colleagues to my right in March of 2011, and one of us asked Bill, "What was the biggest lesson learned from the agency's experience at Three Mile Island?" And Bill clearly said, "The failure to have an integrated prioritized approach." And a lot of the actions taken after Three Mile Island were good actions, but there were a lot of things done that were required of industry that did not really add any safety value in the long run,

perhaps negatively impacted implementing those other things that were of higher safety value. And I bring that up because I think that was the foundational premise for the Commission to support Marty Virgilio and Bill Borchardt at that time in looking at a steering committee approach to integrating prioritized recommendations of the near-term task force. And again, three of the four colleagues to my right, who were here during that time period, fully supported the steering committee process. And I think -- my personal view -- and it's going to lead to a question -- my personal view is that process has been effective in helping to ensure that we are taking the more urgent steps quickly but also not acting absent technical regulatory analysis. And so at a high level -- I'm going to ask Mike this question, is the steering committee approach working? Has it been a solid process? Were there, in retrospect, concerns of how it's operated?

MIKE JOHNSON: Thanks, Commissioner. I think I would say the steering committee process has been tremendously valuable, both enabling us to tier, if you will -- that is to develop a triage with respect to how we go after these actions -- but also to be able to vet and reach decisions with respect to how we move forward on individual actions. The near-term task force report captured the result of the fine work that was done. We've been able to build on that work through the steering committee process, and maybe I'll get a chance to talk about specific examples. But I think, as a result of this activity, we've been able to add value, add discipline, and move forward with respect to implementation of the lessons learned.

COMMISSIONER OSTENDORFF: Please, if you have an example you want to highlight, please do so.

MIKE JOHNSON: An example that comes to mind is -- relates to

mitigating strategies in the SBO order. For example, the near-term task force report had a Recommendation 4.2 that really was focused on SBO rulemaking -- or, I'm sorry, the B.5.b activities of making sure that those B.5.b activities were under order, such that we could assure that they were in place and could work against design basis accidents. The steering committee, in terms of going after that initial order that became that mitigating strategies order, looked beyond that specific recommendation to reach out and capture some of the recommendations for 4.1. That was the station blackout rulemaking. So we put in place -- or proposed to the Commission, the Commission ultimately approved a further reaching order beyond what was recommended by the near-term task force report, and that grew out of our deliberations, consideration of what needed to be done and triage about what order that ought to be done in.

COMMISSIONER OSTENDORFF: Okay. Thank you. Let me ask this question of Dave, but others, Eric, if you want to chime in here, please feel free to. I want to get to another high-level issue, and that was, again, the majority of the Commission last summer -- or, excuse me, last fall, put the Recommendation 1 on an 18-month track to be done in parallel with, but not to preclude, moving forward with other, more urgent actions. This is somewhat speculative, but I think it's an important enough issue, because there's been criticism in the press, criticism in the first panel today -- why didn't you get Recommendation 1 done right now? How would you have been able to move forward, let's say, with the March orders of this year if you had not been able to do those prior to resolving the Recommendation 1?

DAVE SKEEN: Yeah, thanks for that question, Commissioner. In my view, I don't see how we would have gotten any of the orders out the door if

we would have had to wait for -- it's basically a policy decision we're going to have to address in Recommendation 1, and I think that was what the Commission's concern was. If we waited 18 months to at least come up with a policy decision on how to address that, that we would be doing nothing to enhance the safety at the plants, and we would be 18 months to two years after Fukushima and not be moving down the road to make safety enhancements, so I don't know how we would have gotten there, if we had tried to work on Recommendation 1 at the same time.

COMMISSIONER OSTENDORFF: Jim, and then Eric on that, yeah.

JIM WIGGINS: Yes, Commissioner. Earlier on, actually I remember one of the first meetings we had after we'd gotten the near term task force report, that Bill Borchardt held, we were talking about Recommendation 1, and what the thinking was at that meeting is as we worked our way through the rest of the recommendations, it would tend to illuminate what the answer to Recommendation 1 would actually have to look like, and in fact I would contend that that's exactly what happened. When you start looking at things like FLEX equipment or the 4.2, however you want to call it, we call it FLEX because that's what the industry term is. It seems to work. This equipment needs to be reliable, not safety related, but what the heck does that mean? What are the parameters of reliability? When you're hearing things like do there need to be procedures for maintenance and surveillance testing? We're talking about the parameters of what happens once you access an event, or a sequence, or an activity into what eventually would be the Recommendation 1.

Now, this is a little bit of betting on the comes a little bit of what I

see to be the future. We're doing a lot of the work in the middle and in the end. We put the infrastructure in to take care of the requirements that end up coming out of the consideration, both for industry, we put the infrastructure in for inspection, in there. One of the things we have to deal with is how to you access a sequence, or an event, or an activity into it. How do you define which things you point at? So, I would contend is that the thing is that the Recommendation 1 has in fact been working its way through, on all of the things that we've been doing.

COMMISSIONER OSTENDORFF: That's pretty helpful. Thank you, Jim. Eric --

ERIC LEEDS: I agree with all that was said.

COMMISSIONER OSTENDORFF: Okay, well good. I'll just comment in this -- before I ask another question. I'll tell you, I visited -- all my colleagues here on the right -- Chairman just visited a nuclear power plant just yesterday, I believe. Everybody's been aggressively visiting. I've visited six plant sites in the last eight weeks. I know that we're all looking at B.5.b, portable DC battery charging capabilities, cable runs, equipment, so forth, and I've come to more fully appreciate the need to really look at this, because it's not a one size fits all approach at all, and as a comment, I think your request to the Commission, Dave, for us to take a little more time on this filtered vent question was very appropriate, because I think the last thing we want to do is to go off half cocked and not have the information we need as a Commission to make solid decisions. So, I applaud your pushing back, and we didn't agree to delay the other piece. So, it's a, you know, I think the system is working as it is, and I think it's important for us to keep those big picture principles in mind as to how the

staff is interfacing with the Commission.

I want to provide an opportunity, perhaps, for anybody who wants to comment. I'll ask Mike and Dave, perhaps, to comment on the remarks made in the first panel. This dealt with -- the following is from Chris Paine's viewpoint and I really appreciated to hear from Chris, but he said FLEX is not credible. It's not faithful to near term task force. It's not being brought under the ROP and minimum coping time may not be formally promulgated. I'd be curious if you have any response to any of those comments made in the first panel.

MIKE JOHNSON: Let me start and then others will chime in. It is true. It's certainly true that those mitigating strategies are important. They're essential, essential lesson learned, and they have to be put in place to be implemented, and in fact, they have to be put in place in a way that is lasting. Lasting meaning that when we go back and look 10 years from now, they're still in effect, and lasting meaning that if we go and find as a regulator that they're not being implemented, we have teeth with respect to being able to go after those items, and that's the approach that we're taking in terms of the efforts that are being undertaken, that we'll find acceptable with respect to what the industry plans to do with respect to complying with that order. So, we have the requirement in place. We have a detailed set of guidance that the industry proposed, that we found acceptable. Our finding acceptable will complete that task in August. That will be implemented. When plans come in, we'll look at those plans on a plant specific basis to see, and we'll write a safety evaluation, and then going forward, we have the regulatory teeth, the regulatory tools to go after those specific actions, to make sure they are implemented, and to hold licensees accountable if they're not.

COMMISSIONER OSTENDORFF: If I can just -- Chairman, just 15 seconds to follow up with this. Do you envision there will be a -- as things are tending right now, on station blackout on a minimum coping time, do you see us ending up with a promulgation of some standard?

MIKE JOHNSON: Thanks for that. So, with respect to minimum coping time, again, we all recognize that we need to strengthen the current station blackout rule that provides for coping time. The approach that we have, that we've captured in the order, I think, is a more performance-based approach to coping time. It doesn't rely on us calculating a coping time as the station blackout rule now provides. It provides for this phased approach that I think is the reasonable way to look at -- a better way, actually in a performance-based construct, to look at how we want these mitigating strategies to be implemented. What's there in terms of the installed capability of the plant and how long will that take. Will it take the plant to the point where portable equipment on site can be brought to bear by the operators on site, and then beyond that, how much time does that need -- is needed there to be able then to bring folks from off-site, equipment from off-site to provide indefinite coverage? I think that's a better performance-based approach. Of course, we'll take that on in a rulemaking activity, and we'll end up in a -- again, treating coping time or the phased approach in consideration in helping end up with that rule.

COMMISSIONER OSTENDORFF: Thank you. Thank you, Chairman.

CHAIRMAN MACFARLANE: Okay, my turn. So, let's stick with the FLEX issue, and, you know, I was interested in the previous panel in that there was a discussion about, you know, what the -- I think Commissioner Apostolakis

brought it up, you know, what variety of scenarios was looked at, and, you know, was it really just arm-waving for some of this stuff. And it occurred to me that this is something that we do need to really consider very carefully, especially if the industry is considering very few external facilities for equipment to go to in the FLEX plan, and of course what immediately comes to mind is Katrina, okay? And the disagreement that existed between the states and the federal government, the lack of communication, and the complete and utter mess that Katrina was, and I think we have to consider that kind of situation existing, and so I'm wondering if you guys are going to be looking at that scope or not.

ERIC LEEDS: If you don't mind, Chairman, I'd like to take that. I'm really glad that you raised Katrina, because that's one of the things that comes to my mind, when we talk about FLEX and what we're doing here, and the way that we're going. If you recall in the July 11th meeting, Commission meeting, I talked to you about how I view the importance of operating experience as a feedback loop to the regulator. Well, I'd like to remind the public and the media, because it wasn't covered. When Hurricane Katrina, you know, devastated New Orleans and hurt a large swath of the Gulf Coast, there were three nuclear power plants that were impacted by Katrina. One of the plants, Waterford, was less than 20 miles from New Orleans, right on the coast, all right. Parts of the grid were gone for weeks, all right. That plant survived. During that time period, we had regional folks there. We had headquarters folks here, and it survived for a number of reasons, and it didn't have a grid. They survived indefinitely. They had the capability to do that, because you were able to bring in fuel from off-site.

One of the things that Dave Skeen talked about when he described mitigating strategies, he talked about the goal as indefinite, not a coping time. I

think coping time is an antiquated thought. I really do, and I may be provocative here, and a lot of folks may disagree with me. I think we should be aiming for indefinite. I think that these plants need to be able to sustain whatever type of a disaster, whether it's a Katrina, whether it's a Fukushima, or more, and we've got to think in a much broader term. Now, having said all that, I don't even know if I answered your question, Chairman.

[laugher]

CHAIRMAN MACFARLANE: Well, I put it on the table, but I think that, I mean I'm very comforted by the indefinite discussion.

[laughter]

JIM WIGGINS: If I could add a point also. As an example of how the effort, even in Tier 1 is integrated, there is a piece in 9.3 about staffing of the emergency response organization to handle multiple units long-term station blackout. A lot of that's code words. The emergency response organization really is everyone on-site that's engaged in mitigation of the accident and taking the emergency planning functions that have to be considered. One of the elements that we have in the guidance for how industry is going to approach the staffing piece in 9.3 considers the idea about what staffing is necessary to not only get the installed equipment working, in other words, you need control room crews, technical support center folks, things like that for organizing. But we're looking at what staffing is necessary to put the second phase in place, which is the equipment around the site, and what's necessary to get the third phase in. We're talking about limited accessibility to the site. The guidance has a certain prescribed amount of time that you say you got to be able to handle it, without an assumption that you're going to get any help from off-site in terms of even

operators -- additional individuals.

Now separately, industry is making some plans as I understand it, to get that third echelon of equipment, arguably people, in also. I know that we've had a meeting with FEMA that representatives of industry that's working that remote operation that you're talking about. I kind of refer to it as a depot-level kind of activity. We've made some connections in there, to try to clock exactly in this area: How would the federal government be in a position through its emergency response methodologies to facilitate getting the equipment in? We have a regulatory role in that, but we also have a facilitation role in the overall management of emergencies in the country. So, we've been trying to work it from both ends.

CHAIRMAN MACFARLANE: Great, okay, just a comment and then a question, because Dave brought up specific issues of hydrogen control and then spent fuel transfer. So, just quickly on hydrogen control, you know, based on the discussion this morning, I hope you guys fold into your examination, the practices that other countries used in this area. I'd be interested to see a comparison, and then on to the spent fuel transfer. A question I have, you talked about expedited spent fuel transfer. I want to understand what you mean by expedited, how do you define it, and then when you consider the operational and radiological risks of transferring spent fuel casks, you know, based on, again, the discussion from this morning's panel, I would urge you to please also consider the risks in a broader sense. So in other words, how do they compare to other activities done at the plant, as Dave Lochbaum mentioned, something like shortened refueling outages, that kind of thing. So, how do you define expedited transfer?

BRIAN SHERON: Oh, sure. Yes, because my offices is doing the study --

CHAIRMAN MACFARLANE: Okay.

BRIAN SHERON: I would define expedited as just that where utilities would be required to remove fuel from a pool earlier, or sooner than they would normally under a voluntary type of a situation. A lot of times, you know, once fuel has been in the pool about five years, it's cooled sufficiently that it could be air cooled, and therefore moved to a dry cask --

CHAIRMAN MACFARLANE: Yes.

JIM WIGGINS: But a licensee may not choose to move it at that point, but leave it in the pool. So, expedited would mean perhaps moving fuel that is cooled sufficiently to dry casks, earlier than perhaps the utility had intended.

CHAIRMAN MACFARLANE: Okay, still a little vague, but --

ERIC LEEDS: Can I address the hydrogen control issue that you raised Chairman?

CHAIRMAN MACFARLANE: Yeah, sure.

ERIC LEEDS: Brian and I are both active at the Nuclear Energy Agency over in Paris. Brian's the chair of the CSNI and I'm vice chair of the CNRA. Don't ask me what they stand for.

CHAIRMAN MACFARLANE: [laughs] I was going to say, you know, you guys on the acronyms here, I need to get the jar out.

ERIC LEEDS: His is the research group and mine is the regulators group, but one of the things that both of our groups agreed on with our European colleagues is to go back and take a look at what every country's doing for

hydrogen control, hydrogen movement, recombiners, the efficacy of the different tools that we have available, and this was readily agreed to with all of our international colleagues, because we all want to take another look at that issue. One of the previous panel members mentioned that some of the European plants use hydrogen control. Some of them do, some of them don't. We all had questions as regulators, and so that is something that we're pursuing on the international level.

CHAIRMAN MACFARLANE: Great, great. Glad to hear. Okay, and then a final question, I guess will be so, these seismic and flooding walk-downs have been started? Any early results that you can tell us about? Any surprises? Any --

DAVE SKEEN: Like I said, they just started early July. We haven't heard anything of any major significances coming back from the regions. As the licensees are doing their walk-downs, our inspectors are out there observing and doing the walk-downs along with them, right, as a part of their inspection process, and we haven't heard anything other than it seems to be that the licensees are following the guidance that was issued. So, that's a good thing in our mind, but we will look forward to seeing the reports. The licensee is required to report to us, when they get the walk-downs done. So, we'll look at those and then there will be subsequent inspection reports that will come in as well from our inspectors. So, so far, too early to tell. I guess I would say that we haven't heard anything that says that they're finding anything of significance, so far.

MIKE JOHNSON: And I would hasten to add, and thanks, Dave. We will find things. Plants will find things as a result of the walk-down and the corrective action programs. We'll find things as a result of our inspection. We'll

deal with those in the reactor oversight process going forward. So, it's still early, but I think it's good. We're making good progress.

CHAIRMAN MACFARLANE: Good, good. Okay, great. Thanks, you guys, and now, Commissioner Svinicki.

COMMISSIONER SVINICKI: Well I add my thanks to each of you for your presentations and for all of the NRC staff who support you in the achievements that you've briefed us on today. I appreciate that Commissioner Ostendorff started off by talking about the fact that occasionally you need to step back 17 months out, as we find ourselves from these initial events. I know that we continue to track our progress against the near-term task force's framing of the issues, but I think that it would be very difficult to deny the fact that all that the staff has done, the many dozens of public meetings and stakeholder engagement has really continued to build the foundation for the actions that we're taking moving forward. And although we track a lot of our progress against the near-term task force, just what I call kind of a score sheet of the recommendations, the way that they framed them, the way that they accounted and broke them down into sub-elements.

It is a lot -- we have a lot more knowledge to draw from. We have national/international meetings that we've been to. We've had again, a tremendous stakeholder engagement, and a lot of public participation, and I don't think that it's necessarily appropriate for us to freeze any historic moment in time and say, "That was when we knew all we needed to know, and that was the point at which we needed to kind of stop our engagement." And I think I predict moving forward, particularly if you think about the history of learning from Three Mile Island, we'll continue to be evolving and shaping our understanding of these

events, I think quite literally for decades. That doesn't mean that we don't take near-term actions. It means that we have to keep that open questioning attitude and the open mind to -- I think we'll continue to learn things that surprise us about these events, and I think we may find that some of our early understandings were not accurate or well informed, and so we have to at least be open, I think, to be consistent with our organizational values. We have to be open to that possibility going forward, and that's what I sense from the steering committee.

I've read or looked at the slide decks from a number of our public meetings. I've tried to read meeting summaries that we put on our websites from those, and I think that even if we had members of the original near-term task force, you know, presenting to us today, I think that many of them would be hard-pressed not to acknowledge the fact that we have advanced their work very significantly since they issued that report. So, that was -- just wanted to kind of reflect on that consistent with Commissioner Ostendorff's point, that we need to step back and think about where we've come from and where we're going.

I think that Mike and Eric would be disappointed if I didn't mention that the most recent six month status report from the staff talked about continuing to have a separate organization for Fukushima-related nuclear safety, as opposed to other domestic related nuclear safety that we do around here. The staff has indicated that we will continue the Japan Lessons Learned Directorate for at least until 2015. I think at this point, you said through the end of 2014. It's viewed that we should continue to have a separate organization, and I've talked, I think, to a number of NRC senior managers about this privately. I don't know what the right answer is, but the reason that I keep mentioning reintegrating

Fukushima-related nuclear safety with our day to day nuclear safety that we've been doing is that I do think that it becomes difficult to do, as the staff has pledged, is a high priority. You said we want to assure that we do not displace work that has a greater safety benefit, is higher priority, or is necessary for continued safe operation of nuclear power plants. We also heard that pledge from Mr. Scarola on the first panel. I think that's difficult to do when you have it in a separate organization, and that.

So, maybe I'm just too elementary in my approach to this, but I think we need to capture the benefits that early on having a separate organization provides, but at some point, and I'll ask our capable Director of Nuclear Reactor Regulation if you have to integrate all these activities, if you have a separate steering committee prioritizing work, and a separate organization carrying out a lot of these things are occurring at operating reactors, the same as you have other, you know, operational and oversight activities going on there. Do you really feel that there are no impediments right now to truly integrating this work with other work, even having a separate organization for it?

ERIC LEEDS: Commissioner, it is a challenge. It's a constant challenge, and it's not easy, but it's the job. It's what we have to do. I think we've done a lot of things that have made it work and that continue to make it work. I'm really am appreciating having a steering committee. You know, the Fukushima Lessons Learned Directorate is technically in NRR, not Research as it says there. It's technically in NRR. So, Dave comes to all my meetings, you know, with all my other division directors, and he's part of NRR, and the steering committee, you know, the weight that these guys take off of my shoulders by providing their expertise and their help is invaluable to me. So, the way that

we've currently have it set up I think is working, and I would hate to lose the rest of the steering committee, and have it all on these shoulders. These guys are heavyweights. They take a lot of weight off of me.

MIKE JOHNSON: Can I just add, and your question that you raised is a good question that we need to be mindful of, and get back to the integration that you have in mind, or the alignment that you have in mind. I think we've been -- the current alignment actually facilitates the decisions that we've had to make. We've had to make decisions across, for example, operating the new reactors, for example. We've had to fold in the direct support of research in a number of these initiatives going forward. So, from that perspective, this current organization works. Ultimately though, when it comes down to implementation, there will come a time, probably sooner maybe than some people would talk about, where we need to get back into that alignment, and we're certainly thinking about that. The other point I would make is just quickly, is that as we implement, we're already beginning to build that realignment back to the line, if you will. The regions are doing inspections. The regions do inspection. They're already picking up that work. When the integrated plans come in, it's project managers who do project management for the sites, are going to pick up those activities, and shepherd through the safety evaluations, for example. So, some of that is going to happen as we go forward.

COMMISSIONER SVINICKI: I appreciate that, and I know as you and I have discussed, we have to at least envision that point in time where it is fully back in our organization as it's existed, which again, has as its core nuclear safety. So, there's not some kind of different flavor of nuclear safety here. It's all one and at the end of the day, we're talking about the same regulated facilities.

So, I appreciate your saying now that as you frame decisions, and move forward, and work on implementation, that we're beginning with that end in mind, because that's how we'll get there. Otherwise, we'll find ourselves in 2016 and 2017, and say, "Oh, at some point we wanted to reintegrate this." So, it's really the foresight that I'm arguing for us to have that objective in mind.

The other question that I really wanted to get to was, I was reading the materials in preparation for this meeting, and noticed there is concern. I'm not sure if our external public interest group representatives were able to get to this in their presentation, but I think that both of them had expressed concern with the NRC having deployed experts to Japan with traveling, with KI, with potassium iodide tablets, and that perhaps that posed an inconsistency in the agency's view about that as a prophylactic measure. So, when I was aware that that was happening, my thought was that we weren't certain in early days when we were -- the government of Japan indicated a willingness to have us send experts. Certainly the U.S. Embassy and Tokyo was interested in having us send experts. I thought that we -- the exact location that these people would be located, would they perhaps be requested to go into Fukushima and look at anything. My memory tells me that we weren't 100 percent sure. We wanted to send people as ready and equipped as we could possibly, and to minimize any burden on the host country. We didn't want them to show up there and need all kinds of things.

So, that was my understanding, but you guys were much closer to it. Is that the reason why, even though ultimately our experts were in Tokyo, they were deployed with the KI tablets, and perhaps other measures, dosimeters and other things. I don't know what all we sent them with. I saw it as a prudent

measure. I regret, you know, personally as a member of the Commission, if this now causes a view that we have some different standard for government employees and public citizens, but I think there was a very different reason here. Could you elaborate on that?

MIKE JOHNSON: Yeah, Commissioner, I regret also if there is a perception that we were somehow giving NRC employees special treatment, if you will. It is exactly as you recollect. We didn't know what we were going to end up asking these folks to do, and how close they were going to end up having to go to the plant, and it was in that context that we provided KI to those individuals. Dave was there. He can certainly weigh in, but that's -- your recollection is exactly correct, and I again regret if there's some misperception about why we did that, or that -- the fact that we did that, be associated with some statement that we would be singling out NRC employees for special treatment, that we ought to then forward to the general public.

COMMISSIONER SVINICKI: Thank you. Jim, did you want to --

JIM WIGGINS: And I would offer a -- I understand that from the outside, it could look like this was different and there's a disparate treatment, but frankly, my regional experience indicates it's a routine thing for the site teams to pack KI for the staff, and there's a difference. We're trained to make a distinction between having it with us and taking it. There's a separate decision that's made by, in this case, the site team leader, the director of site operations, whatever the term is in the particular -- where they are in the response, there's a separate decision made about taking KI, but we take it with us because it's a logistics issue. In Japan, the logistics is just amplified 10 times. It's a long trek to get it there, so --

COMMISSIONER SVINICKI: Okay, thank you. Thank you all for your clarification. Thank you Madam Chairman.

CHAIRMAN MACFARLANE: Okay, Commissioner Apostolakis.

COMMISSIONER APOSTOLAKIS: Thank you Madame Chairman. I guess one comment is that the diversity of views that were expressed by this panel pales compared to the diversity of the previous panel. I mean you guys seem to agree on everything, as you should.

MIKE JOHNSON: Actually, Commissioner, if you witnessed some of our standard committee meetings --

COMMISSIONER APOSTOLAKIS: I know.

[laughter]

So, Mike, do you agree that 90 percent of the benefit comes from Tier 1?

MIKE JOHNSON: I appreciated your question, and your clarification, and actually Jim's answer, I think it is certainly true that there's a significant amount of benefit to be achieved from Tier 1 actions. I don't know that I could stand behind a quantification of how big that benefit is, but we did go through a triage activity. We wanted to do the most important stuff first, and I think we made the right decision.

COMMISSIONER APOSTOLAKIS: I'm coming to FLEX. I quoted the ACRS, under unusual challenging conditions, does the staff feel that -- the staff understands what can go wrong in trying to transport equipment, and so on, and what the consequences of those wrong things could be?

MIKE JOHNSON: I'm going to start in and I'm going to watch my steering committee members, fellow steering committee members help me out.

Your points, sir, are great points with respect to making sure that we appropriately understand what these strategies are and how they'll be implemented. The guidance, I've looked very carefully at the guidance that has been developed and that we've endorsed, are endorsing, and expect to endorse, I guess I should say, with respect to how those strategies get developed. We think there's a detailed methodology to do that. Those strategies cause the plants to think about diversity, because things can go wrong, and redundancy, because things can go wrong. We want them to do comprehensive procedures then based on those strategies, and we think that will take them a good ways. Associated with that, they have to identify the necessary staff and the training that that staff requires, and then make sure that that training is conducted, and then ultimately, they have to practice those activities, and so the guidance for developing those strategies is important, and it causes you to think about things that can go wrong. At the end of the day though, that's a tall order, is your point, and that's one that we'll need to pay attention to as we go forward.

ERIC LEEDS: And if I can add, I agree with everything that Mike said. I just want to add another nuance. When I was in Switzerland last November, I was there for an IRS, and we went and took a look at the depot that they'd already established. There are only five nuclear power plants, and they established a depot at a military base, and I was talking with my colleagues about what are they requiring, what's the timeline for getting the equipment there, how are they going to ensure that the procedures at the plants know how to install it, that the equipment can be used at all these, and so we're not the only ones facing this issue. Our international colleagues are facing this issue.

We, Brian and I, again, we will engage, and we have engaged with

our counterparts overseas, so that we not only gain the lessons learned here in the U.S. talking with our licensees, but finding out what our colleagues are doing overseas, and what their lessons learned are, and we'll continue to feed that back into the process.

JIM WIGGINS: My opinion on this is actually there are two phases that kind of behave somewhat differently. You have an external phase, which is related to getting the stuff transported, and that's -- we've done some thinking in that area, but I think with what's been discussed this morning is an internal, an in-plant phase. I don't know that we've spent much time on it, but if I had to have a starting point, the types of equipments that you're talking about, which I'd like to call the 4.2, rather than B.5.b for the reason that B.5.b's for a different whole scenario, and the task force said if you had that type of equipment -- if you had that equipment in, it would have been helpful, but 4.2 actually says here's potentially a completely different, or a suite of equipment that's different. Any rate, you got the equipment. It's just a question of where's the phase boundaries. The first phase is installed. The second phase is temporary equipment on-site. Some of these things that you've discussed about problems internal to the plant may influence what things are permanently installed with a remote operational capability versus stuff that you have to look up in the plant, but I don't know that we spent a lot of time thinking about that. We have to spend probably more time on the external piece, getting the stuff from the storage areas and into the facility.

COMMISSIONER APOSTOLAKIS: But at some point, somebody will think about it.

MIKE JOHNSON: Yes, we're thinking about it, absolutely.

COMMISSIONER APOSTOLAKIS: I got the impression from what I've been hearing over the years, that the risks from dry cask storage are similar to those from spent fuel pools, and that maybe the risk to workers from one to the other argues against moving the stuff to dry casks. Now, I got the impression though from Mr. Lochbaum's comments earlier, that when we act as an agency, we are acting as if the dry casks are safer. Is there a discrepancy there?

MIKE JOHNSON: No, I don't believe there's a discrepancy in the way that we're acting. We've said all along and acted as though whether your store fuel in a pool or whether you store it in a cask, it's safe. When you look at the nexus to Fukushima, again, we've been very careful to make sure that we take on actions in this group, with respect to the nexus of Fukushima, Mr. Lochbaum's points are right. We didn't -- the Fukushima didn't -- the accident did not challenge the cask. Ultimately, it didn't challenge the pool, but during that time where we were in the op center, those early days, we didn't know, and so we've gone after that with respect to the order, with respect to instrumentation level. So, you know, there was a nexus to Fukushima that caused us to worry about the pools. We had this activity that is this Tier 3 activity that Brian described, where we are going to look and see if there is benefit, significant benefit from expedited, Chairman, sorry, removal from the pool, to dry cask storage. We're going to continue to look at that, but when you look at where we've been as an agency, we've been for a long time with the perspective that whether you store it in the pool -- you can store it in the pool safely. You can store it in the cask safely, and we've not actually compared those.

COMMISSIONER APOSTOLAKIS: Now, coming back to my question about what can go wrong, yesterday we approved your request to turn

in the paper on filters, in November. So, that extra time will be used to also tell us where the filters are useful, what accident sequences the filters are not helping with, and so on?

DAVE SKEEN: Yeah, I'll take the first shot, and then Brian can pick up. Yeah, the main purpose of the extension was to run a few more models under different scenarios, to see where the filters help and where do the filters not help so much, and so, that's kind of what we're trying to do, so we can get a complete picture to the Commission on here's what filters give you, and here's what filters don't give you.

COMMISSIONER APOSTOLAKIS: That would be very useful.

BRIAN SHERON: The other thing to is that at the steering committee meeting, we had, it was probably about a month or so ago, the industry indicated that they felt there might be other alternatives to filtered releases that don't involve filtered vents, okay? And we asked them, you know, do you have analyses, do you have -- can you show us, and so in fact I think, as Mike said, tomorrow, there's a meeting with the industry all day, to hear the results of their analyses, you know, which I believe under -- as I understand, don't involve actually filtered vents, but perhaps using other methods to filter any potential releases. The other thing too is that, you know, the more I've looked into it, you know, working through, the -- under the scenarios in which a filtered vent actually works, it can be a little complex in terms of when they have to operate, under what conditions.

Remember, you're going to pressurize the containment first, just during the meltdown portion. The hydrogen alone might pressurize it to the point of going beyond the failure pressures, say in a Mark I. So, you may have to

actually vent earlier, you know, so you're not actually -- what you need to vent is not just the radioactive effluent that's coming, but also just the hydrogen, to make sure it doesn't lift the drywell head, for example, and go into the reactor building.

COMMISSIONER APOSTOLAKIS: But, why do we have these questions and the Europeans don't seem to? I understand they have installed filters. So, what -- why do we have a different attitude? Are we more thoughtful? [laughter]

JIM WIGGINS: I think we are thoughtful, whether relative -- no, I'm not going to answer that, but I think we're thoughtful, and what we've learned over our time here, at least the folks at this table, is what sounds like a great idea at the beginning, might have some unintended consequences that you have to really think about.

COMMISSIONER APOSTOLAKIS: So, they didn't consider the possible --

JIM WIGGINS: No, no. Well, our people have gone over to talk to them, and that's part of the information gathering we're into. I mean, a lot happened quickly, I think on filtered vents, in my recollection after Chernobyl, and we looked at it at some level back then, but I think we need to do a thorough review. That's how we -- at least that's how I was trained we make licensing decisions here. We have a thorough analysis before we decide that this is what we need to do, and I think one of the things that we keep learning is you have to consider -- you have to really, really think through whether it was unintended pieces to this that -- I'm not saying that there are, but I think it just causes us to be cautious.

COMMISSIONER APOSTOLAKIS: I don't think it would be

appropriate in your paper, to talk about why they did it and why we're still thinking about it, but the question will come to my mind. So, if you can address a little bit…

MIKE JOHNSON: We can address it, Commissioner, and the discussion that we've sort of been having is one that you will tee up in the filtered vent paper to one extent, but one that will come to certainly the forefront, as you consider economic consequences. If you consider, for example, if a country was of the perspective that they didn't want to see land contamination, that would cause them to do things differently than perhaps we would do, in our country with our regulatory structures, and that issue, that's why those issues are related, and that's why when we get those, we'll tee that up for you.

ERIC LEEDS: I just want to clarify. It makes you very uncomfortable to talk about what other regulators do and their reasoning for it. I don't want to represent what other regulators do, because there are a lot of different things that affect them, and they have different systems, but just for fullness, pretty much the majority of the Asian countries with nuclear power plants did not require filters. The majority of European countries, but not all, did require filters, and for the rest of the world that I didn't talk about, it's really a mixed bag, whether they did or not. I know our Canadian colleagues right across the border just had their first plant put a filtered vent on their containment, but their other plants don't have it, and I don't know what their plans are going forward. So, it is a difficult issue. I think what one of my colleagues had to say, we need to provide you the best technical information that we can for making that decision, but ultimately, that decision will be yours to make.

COMMISSIONER APOSTOLAKIS: Thank you very much. I'm

looking forward to reading the paper.

CHAIRMAN MACFARLANE: Commissioner Magwood.

COMMISSIONER MAGWOOD: Thank you, Chairman, and thank all of you for your presentations today. It's been a -- I think Commissioner Ostendorff says, it's 17 months. I haven't counted it up, but if it has been 17 months, it seems a lot shorter than that in a way, but a lot of work has been done, and very good work, I think. I recognize that not every decision the agency has made has made every stakeholder happy, as we heard in the earlier panel, but I think that any objective observer that looked at where we were when this started and where we are today would have to say a great deal of effort has gone into this activity, and that there has been substantial work completed, so I congratulate you for that.

And that said, there are some things that I think as we go forward with this, there will be a danger, I think, because I know you folks are so mission-oriented, that once you start moving in a direction, there'll be a tendency to not want to revisit things as you go forward, which is a natural instinct of any good manager, but I do think that it is good to rethink these things from time to time, just to make sure we haven't missed something in that respect. I would just, you know, ask you to make sure that members of the lessons learned directorate and the steering committee have an opportunity, if they haven't already seen the presentations that we presented this morning, just to put those ideas in their head so they have a chance to think about it, and if maybe they'll be a, you know, let's think about this a little bit more. I think it's just worth that discipline.

And one comment that I've heard from several people over the last several months has been that if you look back at some of the decisions that the

agency has made in the past with regard to the use of voluntary activities versus regulated activities, some of those things are now being reversed. One in particular, I think Mr. Scarola has mentioned, this morning mentioned some, you know, some of the issues with the SAMG implementation, and training. I think his term was short sighted in some respects and we need to do that better, B.5.b implementation, the surveillance of that equipment, hardened events, voluntary activity there. A lot of that's being reversed now. We're putting a heavier and heavier regulatory footprint on all those activities, and now we have FLEX, and several of my colleagues already talked about this. I won't revisit everything they've mentioned, but, you know, FLEX is in large respect, a voluntary activity that has connections to regulated activities. Can you explain, in your view, what the footprint ought to be and what you think it will be when it comes to FLEX, and how FLEX's surveillance of equipment, training, the contracts or whatever is used to move the equipment around, could you give us your story on how you think that footprint will look from our standpoint?

MIKE JOHNSON: Sure, Commissioner. I'll start and then I'll get help from my colleagues. FLEX is -- well, the mitigating strategies order requires licensees to have strategies in place to deal with beyond design-basis events, to restore, maintain, you know the story. Those strategies, the integrated plans that each licensee must put in place to meet that order, gets submitted to us in February, and we'll review each of those plans, and then we'll write a safety evaluation that provides our review, the staff's review, consideration of those plans, and the licensees plan to implement those plans. So, we will have -- that will be our regulatory tool, compliance with the order, will be our regulatory tool, to ensure that those activities get carried out, and the order, incidentally, just

doesn't ensure that they have it there, but it ensures that they have -- they're able to maintain it, that they're trained to implement it, for example. That it is lasting is what I talked about.

So, we already have, with respect to the order, we have the regulatory footprint. I think the challenge will be for us to continue, and then we'll put that in our oversight process going forward. We've already had a conversation, Eric and I, and the regional administrators had a conversation. Jim had a conversation last week, in fact, in terms of how we capture those activities beyond the initial follow-up that we do on these orders, into the routine reactor oversight process going forward. So, that's the footprint that we'll have in place, with respect to these particular strategies. Now, the FLEX, the guidance that the industry has prepared has expectations required with respect to treatment, and quality, and testing, and all those kinds of things that we've reviewed, that we'll complete our review of, and issue final guidance that when we find that to be acceptable. So, I really want to dispel the notion that FLEX is voluntary, that the notion of FLEX, this idea of FLEX was a result of some good thinking on the part of the industry. We're going to capture that actually within our footprint, and ensure that going forward, that we have-- that that gets implemented at the plants as we go forward.

JIM WIGGINS: Moreover, whether it's the order or the request for information, there will be eventually some type of rulemaking that would codify these things. Orders will not stand forever, just as we did with the post-9/11 orders. In fact just last week, we were talking about what the rulemaking might look like for 4.2, almost in the context of what the station blackout rulemaking might evolve to. So, you know, also the same holds for the 50.54(f) or the RFI,

the request for information letters. Those letters -- we made the decision way back to go that way, and there was a reason we did that, but they're playing out in terms of they're not options. Licensees do not have options on those issues. They have to -- they told us that they were going to do certain things. So, we'll hold them accountable to that statement under those options. There's no reason for me to believe that they're not going to follow. In fact, the early signs are, they are following ours, the things that we wanted to do, but eventually say the EP issues, the emergency planning issues. Eventually, there's going to be one fairly large emergency planning rulemaking, is going to codify all these things running through 9.3, or in Recommendation 9, and maybe some aspects in 10.11. That's what the ANPR is about, for the latter stuff, but it will be a rulemaking that will codify, and that will put it in place.

COMMISSIONER MAGWOOD: Eric, were you going to add something?

ERIC LEEDS: Agree with both of them, with everything that was said by Mike and Jim has to be inspectable, has to be enforceable. The one thing I would add is that I'd like to see the equipment exercised during the EP exercises, that you all participate and we participate. I mean I could see scenarios that get us there, so.

COMMISSIONER MAGWOOD: That would be perhaps part under, captured by rule at some point, captured by regulation --

JIM WIGGINS: There's already a -- and the task force 9, whether it's 9.1 or 9.2, and some of the things in 9.3 would adjust the exercise programs. So, that kind of thing could be considered in it.

I wanted to make a point too, since the inspection keeps coming

up, and this may be a subtlety, unless you've actually been in the inspection business a bit, but for every one of these actions, whether it's an order or a request for information, you notice the staff said, Eric or Mike said the staff will be writing safety evaluation reports. There's a reason for that. That's to facilitate the inspection five to 10 years from now. It's to make sure that the inspectors can understand what the staff found acceptable, and the licensee's initial response, which is usually the biggest challenge in doing inspections of these areas that are not particularly cut and dry, and had some type of judgment in how thing were assembled. We've learned that through the past, but we're writing safety evals so we can capture what the staff found specifically in the licensee's actions that were acceptable, and that will facilitate inspection forever at this point.

COMMISSIONER MAGWOOD: All right, thank you. Let me jump to a completely different question. Mr. Scarola mentioned some concerns regarding downstream dam failures and ultimate heat sink. Can you explain where we are with that, because it did seem to me that we were going to be focusing on ultimate heat sink a bit later, but somehow it seems to have moved up. Can you explain how we got where we are and what we're doing?

MIKE JOHNSON: I'll start and Dave will help me. I think if you go back and look at the Commission paper in the March timeframe, that promulgated the orders and request for information, we had a statement in there that was unambiguous with respect to our perspectives, about how we would handle ultimate heat sink, and it says that with respect to the systems, you know, the impact of these events on the systems, that would be Tier 1, with respect to the loss of the heat sink, that would be Tier 2, I guess, except for flooding, except

for flooding.

We recognized that if the flooding event would also take out your ultimate heat sinks, some downstream dam for example, that we wanted to treat that with respect to Tier 1. So, we wanted to treat that and with the flooding reevaluation that we're going to do, looking at Scott and Neil just for a nod, just a nod. So, that's what we intended.

Now, we've had a lot of conversations. We've all done a lot of work. We got to a point where we said in one of these meetings, you know, we're not lined up in terms of what we thought was the original intent, and how, as you heard from Jim's perspective, how does that align with where we ought to go. Our perspective and we had a joint steering committee meeting very recently, and we said we really do want to do it the way that we laid it out in that Commission meeting, but we want to talk. We want to see if the industry has a perspective about how to do that. We asked about the number of units that would be impacted, the number of sites that would be impacted. I think it's important to recognize whether it impacts the fleet or some small section of the fleet, so we can deal with those in an extraordinary manner, perhaps. So, it's an issue that we're working. We'll work through it, but that's the short story.

COMMISSIONER MAGWOOD: So, that's interesting. So, you consider the failure with downstream dams to be part of a flood event, even though it's downstream?

DAVE SKEEN: To the extent that the flooding event can cause that downstream dam failure, yes. If you have to redo your flooding analysis and you've determined that for whatever reason your design-basis flood was not sufficient, and if that same flood can take out the downstream dam, then yes, you

could lose your ultimate heat sink. So, that's where the staff came from --

COMMISSIONER MAGWOOD: Well, that's true, but that's not what Mike just said. I just want to make sure I understand.

MIKE JOHNSON: I'm sorry, that's what I thought I said.

COMMISSIONER MAGWOOD: Okay, so basically downstream dam failures as a result of flood --

MIKE JOHNSON: Yes.

COMMISSIONER MAGWOOD: -- not a result of something else?

MIKE JOHNSON: Right, just the flood.

COMMISSIONER MAGWOOD: Interesting, okay.

BRIAN SHERON: Just so you know, that's an potential generic issue that's being prioritized right now, and that is -- yeah, because 204 -- generic issue 204 was the upstream dam failure, and the question was what about downstream, because if you lose a downstream dam, you may lose the ultimate heat sink. It drains out --

COMMISSIONER MAGWOOD: Right, no question --

BRIAN SHERON: -- and that's being evaluated as a potential generic issue right now.

COMMISSIONER MAGWOOD: But I guess what I hear from -- what I now understand is that there's -- we sliced the downstream dam failures into different categories, a particular type of downstream dam failure that we're now looking at in the ultimate heat sink context.

MIKE JOHNSON: That's correct, and that's what that Commission paper enclosure two, page one says.

COMMISSIONER MAGWOOD: I'll go back and check that out

again. Thank you. Thank you, Chairman.

CHAIRMAN MACFARLANE: Okay. I'm going to ask the other Commissioners if they have further comments. No? Okay. All right, then I do appreciate all the presentations today. I thought we had an excellent session of presentations and Q&A, and I think we've shed more light on the activities and the issues on the post-Fukushima work that the NRC has been doing, and with that, I think we will adjourn the session. Thank you very much.

[Whereupon, the proceedings were concluded]