UNITED STATES OF AMERICA

U.S. NUCLEAR REGULATORY COMMISSION

BRIEFING ON THE PROGRESS OF THE TASK FORCE REVIEW OF NRC PROCESSES AND REGULATIONS FOLLOWING THE EVENTS IN JAPAN

JUNE 15, 2011

9:30 A.M.

TRANSCRIPT OF PROCEEDINGS

Public Meeting

Before the U.S. Nuclear Regulatory Commission:

Gregory B. Jaczko, Chairman

Kristine L. Svinicki, Commissioner

George Apostolakis, Commissioner

William D. Magwood, IV, Commissioner

William C. Ostendorff, Commissioner

APPEARANCES

NRC Staff:

Bill Borchardt,
Executive Director for Operations

Marty Virgilio,
Deputy Executive Director for Reactor and Preparedness Programs

Charlie Miller,
Director, Office of Federal and State Materials and Environmental Management Programs and Chair of the Task Force

P R O C E E D I N G S

CHAIRMAN JACZKO: Well, good morning, everyone. The Commission will meet today to discuss the safety review that the agency launched in response to the events in Japan. This is the second in a series of three public meetings which we will hold, each one being held essentially 30 days from the time, 30 day intervals from the time of the start of the task force work, and so we anticipate in about a month from now having the final meeting and hearing the final report from the task force.

I think these meetings are a very good opportunity for the public to have an understanding of the progress and the issues that are being identified by the task force, and of course to update and keep the Commission informed of the task force progress.

During today's meeting, the staff will provide an update on the status of events in Japan, review actions that the NRC's already taken, and provide an overview of their progress in conducting the 90-day near term review. Although it is still too early to discuss possible recommendations today, I anticipate we'll focus on the task force's findings so far. And, as I said, the third and final of these meetings will happen next month, and we'll have, then, the final work of the task force, which I know they're working very hard on getting it to us in that timeframe.

Ultimately, then, this final report will pave the way for the longer term component of our safety review, which we expect to be completed about six months after it begins. As I've said before, I believe it's important that our safety review proceeds in a very systematic and methodical way, but with the appropriate sense of urgency, given the important safety issues that are being

examined.

So I want to thank the staff for all of their work so far to produce the content for this meeting, and obviously for the final report, which I know will be forthcoming. I'd offer my colleagues any comments they would like to make. Commissioner Svinicki.

COMMISSIONER SVINICKI: Thank you, Mr. Chairman. I'd just like to join you in acknowledging the staff's hard work. We'll hear from the task force lead today, but many dozens of NRC staff are supporting the task force in their work. And also, I know that many of our technical staff are remaining cognizant of emerging developments so that if the agency were to need to act in the nearer term, that will be brought to light as well. So I thank all of the staff for their dedication to this. Thank you.

CHAIRMAN JACZKO: Commissioner Magwood.

COMMISSIONER MAGWOOD: Just very briefly, I also want to add my thanks to Charlie and his team, and the others who have supported this task force. Very, very important that we go through this carefully, but as quickly as possible, as the Chairman indicated. Also wanted to pass my thanks to the staff that continue to support the people in Japan and their effort to recover from this terrible incident.

I do have great confidence that the Japanese will recover from this. They're doing a great job recovering already, and much infrastructure already has been rebuilt in rapid fashion. So I look forward to working with our Japanese colleagues to help them in their efforts, but also look forward to working with all of you to make sure that we're prepared for anything that may happen in the future in the United States. Thank you.

CHAIRMAN JACZKO: Commissioner Ostendorff?

COMMISSIONER OSTENDORFF: I'd just like to add my thanks to that of my colleagues to the task force, as well as the entire NRC staff.

CHAIRMAN JACZKO: With that, I turn it over to you, Bill.

MR. BORCHARDT: Okay, thank you. Good morning. Before we get into the discussion of the task force activities, Marty and I are going to give a brief update of activities in Japan and then the other activities going on within the NRC related to the follow-up to the events of Fukushima.

The conditions of Fukushima continue to improve. Over the last month, conditions of the reactor and the spent fuel pools, I would describe as being relatively static. And while full stability might be several months away, I think very good progress is being made. There's been notable progress over the last month in implementing the road map that has been put together by TEPCO and the government of Japan. For example, the recirculation cooling has been reestablished for Unit 2's spent fuel pool and the Units 1 and 3 pools have been switched to a normal injection path. Additionally, a ventilation system was installed in Unit 1 that has improved the environmental conditions in the reactor building.

By the end of the month, TEPCO should have a new water treatment system in place to process the significant amount of radioactive water that has accumulated on-site. Additionally, efforts are underway to reinforce the Unit 4 reactor building and the spent fuel pool. However, this progress is not without some new and emerging challenges.

Events like last week's temporary loss of power to the Unit 1 and Unit 2 control room and the recent heavy rains on-site pose new hurdles that

need to continuously be overcome. We have repeatedly witnessed the ability to adapt to these challenges and to overcome them, so these are not major setbacks, but just an additional complication, and an issue that needs to be addressed.

Over the last month, new indications and evidence have continued to enlighten our understanding of what really happened following the events on March 11. Early in the event, the staff was concerned that the Unit 4 spent fuel pool had become dry, resulting in the potential for a large radioactive release. And the latest information that we have, including recent video and water samples from the Unit 4 spent fuel pool indicates that the pool -- it's unlikely that the pool ever went completely dry. The staff welcomes this as very good news, as it's one indication that the event may not have been as serious as previously believed for Unit 4.

Early last week, the government of Japan released its IAEA report on the event. The report indicates that all three reactors, the cores, to some degree, are ex-vessel. The NRC staff has contemplated this scenario for some time, due to the duration of each of the reactors went without core cooling. However, it's still too early to tell, and we don't have specific evidence to show the exact condition, and how much of any of the cores went ex-vessel in those three units. And it's important to realize that, as more and more new information comes available, and I think this will continue for months to come, our understanding of the specific events and what actions need to be taken will be further refined.

Go to slide two, which shows the agenda for today's briefing. So, as I said, Marty's going to talk about some actions that we've taken to date, and

then Charlie Miller will discuss the specific activities associated with the task force review. I'll turn it over to Marty.

MR. VIRGILIO: Thank you, Bill. Good morning. As Bill indicated, what I want to do is provide you a little bit of an update to some of the activities we've undertaken since the last Commission meeting. If you recall, at the last meeting we talked about some temporary instructions, two temporary instructions that we had asked our Regional staff to follow up on. The first one we issued toward the end of March, March 23, which was Temporary Instruction 183. And that one focused on station blackout, 50.54(hh), which is large fires and explosions, and it also focused on external events.

What we learned from the issuance and conduct of our inspection activities, were there were deficiencies that we identified that could have caused any single strategy to fail. However, when you think about how these strategies are designed, no function was lost, and so that would have resulted in damage to either the fuel or the containment.

More specifically, if you look at what we found with respect to licensees' ability to mitigate a station blackout condition, there were a few cases where there were procedural and training deficiencies. When we looked at the capability of licensees to mitigate large fires and explosions, that 50.54(hh), some equipment, mainly pumps, were not operable when they tested, or they lacked test acceptance criteria. Some equipment was actually missing from the locations, or dedicated to other activities. And in some cases, plant modifications had rendered the strategies that were developed at the time unworkable. And when you looked at the external events and internal events of fires, floods, earthquakes portion of that Temporary Instruction, we found some equipment,

mainly pumps, wouldn't operate when tested, some discrepancies were identified with respect to barriers and penetration seals, and some equipment that was there to mitigate fires and station blackouts were stored in areas that were not necessarily seismically qualified or hardened against flooding.

The second Temporary Instruction, 184, which we issued toward the end of April, was focused on severe accident management guidelines. Recall that these guidelines were a voluntary industry initiative that was implemented in the 1990 timeframe. What we found from the review or inspections around that TI was that some of the procedures were neither available in all of the expected locations, some of the procedures appeared to be updated, but there wasn't a systematic process for ensuring they were updated periodically, and that, while personnel appeared to be properly trained, there wasn't systematic exercises at all facilities for these procedures.

All of this information is loaded on our website and available for the public to see. You can identify by plant which plant had one of these deficiencies identified. But again, on the whole, when you look at how this has all been developed, with strategies upon strategies that ensure functions are protected, we didn't find any cases where the, ultimately, the function could not be performed.

So much for the TIs. The next issue I wanted to talk about was the bulletin that we issued back on May 11, just the day before the last Commission meeting. That bulletin was focused on mitigating strategies and we issued that bulletin in order to make sure that we had the information we needed to assess the licensees' position with respect to these issues on mitigating strategies.

We just now have received our 30 day report. Recall, that bulletin

was divided into two pieces. Information we wanted immediately was an understanding of whether the equipment necessary to execute the strategies was, in fact, available, and then whether the strategies were, in fact, executable. And so far we've finished, I think, reviewing about 75 percent of the responses to the 30 day report. And we haven't seen any case where the equipment was not available or the strategy was not implementable.

Now, the 60 day report information will be coming to us later in, well, in mid-July, and that will provide information on maintenance testing, configuration control, and we'll take all of that information and fold that into our longer term review effort.

Moving on from the bulletin, we continue to support a number of international activities and interactions. If you look back last week, there was the G8 Summit, the G20 Ministerial Meeting, the NEA Forum, where we had a number of staff participating. We did participate on IAEA's fact finding mission to Japan. And we'll be participating in the upcoming, next week's IAEA ministerial meeting on the Fukushima events.

Looking ahead, there'll be a number of meetings in the fall, including the IAEA General Conference, the Nuclear Safety Convention Extraordinary Meeting, and a number of other forums where we'll be interacting with our international colleagues to make sure that we're sharing information around this event.

As Bill mentioned, last week the government of Japan issued its preliminary accident report to the IAEA, and that report provides, I think, a good summary of the sequence of events and some lessons learned. We currently have that report under review. Our initial assessment of that report is it is

consistent with our understanding of the events that transpired at Fukushima Daiichi following the March 11 earthquake and tsunami, and that, based on our preliminary review, it doesn't cause us to say that we need to take any additional actions beyond the TIs and the bulletins that I spoke about. And we'll do a more thorough review; what we want to do is make sure that we're positioned for the upcoming ministerial meeting at the IAEA to have more facts and more insights with respect to our review of that document.

Finally, what I want to do is recognize that the nuclear industry developed their strategic plan for following up to the Fukushima events. They developed that strategic plan and established a steering committee consisting of representatives from EPRI, IAEA, NEI, and others. And we'll continue to monitor those activities and continue to consider their input, along with the input of all the stakeholders, as we move forward in the longer term effort. That's all I wanted to say in terms of the background, and let me now turn it over to Charlie Miller.

MR. MILLER: Thank you, Marty. Good morning. The task force is making significant progress, and we've begun drafting our report. For today's presentation, it will not include every topic that we're looking at that might be included in a report, but rather I want to focus today on some key themes and some facts that support those themes. If I could please have slide five.

Since out last Commission meeting, the task force has been active in a number of efforts. We continue to receive excellent support from the headquarters and Regional staffs. We've had the benefit of additional briefings from agency experts on technical topics of interest. We've also received additional information and insights from our site team in Japan and our team here in headquarters that's supporting that activity.

Members of the task force visited two operating reactors and were able to make some observations from those visits. These observations were done; we observed some of the SAMG inspections that our inspectors were performing. We had the opportunity to meet with some corporate, and site staff, and NRC inspectors to explore various issues. Some of these include hardened wetwell vent design and operation for Mark 1 containment venting on the deployment of the B.5.b equipment at the sites and strategies for dealing with extreme flooding events.

We're building the background and evaluations to support the formulation of the task force recommendations. We're also evaluating inspections and the results of those inspections for insights to be factored into our report, and formulating our recommendations. Lastly, we're reviewing and evaluating input from staff members and maintaining awareness of information and developments for other domestic and international sources.

Slide six, please. As discussed in our May Commission meeting, the task force is following a systematic and methodical approach. It's consistent with defense-in-depth philosophy, and the task force is focusing on protection, mitigation, and emergency preparedness based on the insights from the Fukushima event. We're evaluating NRC programs for potential enhancements with the exception of incident response. NSIR is evaluating incident response as part of the line organization’s responsibilities. In keeping with these areas of focus, the task force has developed four themes for today's presentation.

May I have slide seven, please. The following four themes represent ideals relative to the application of defense-in-depth philosophy and regulatory framework. I'll touch briefly on each of these themes, and then, in the

following slides, I'll discuss facts regarding our current regulatory approach that are related to those themes in the context of the Fukushima event.

The first theme is that protection of equipment from the appropriate external hazards is a key foundation of safety. Second theme is that mitigation equipment and strategies that prevent core or spent fuel pool damage provide additional defense-in-depth. Next slide, please. Our third theme is that emergency preparedness provides further defense-in-depth by minimizing public dose should radiological releases occur. And finally, the NRC's principles of good regulation promote consistent, coherent, and reliable regulatory framework.

Slide nine, please. Now I'll expand on each of these themes by providing some related facts, beginning with protection of safety equipment from natural phenomena. Over time, the state of knowledge of natural phenomena and the state of the art of hazard analysis methodologies and tools have evolved. The NRC's rules and guidance regarding analysis of external hazards and definition of design bases for external hazards has evolved as well.

For example, the staff issued Regulatory Guide 1.60, “Design Response Spectra,” in 1973 to provide guidance on establishing safe shutdown of design bases earthquakes for nuclear power plants. Regulatory Guide 1.92, which is entitled, “Combining Modal Responses and Spatial Components in Seismic Response Analysis,” was issued in 1974 and updated in 1976. Reg. Guide 1.100, “Seismic Qualification of Electrical and Mechanical Equipment for Nuclear Power Plants,” was issued in 1976 and revised in 1977 and 1988.

Current operating plants, including some that were licensed before any of these guides were issued, as well as many licensed over the period that these guides were being developed and revised. Most of these guides have

been further revised in the last few years to prepare for the licensing of the next generation of reactors.

Slide 10, please. Due to the evolving nature of NRC's requirements, plants have different licensing bases and associated safety margins depending upon their time of licensing. Over time, the NRC has implemented several regulatory initiatives that have resulted in plant-specific actions to address external hazard vulnerabilities. For example, going back into 1977, the systematic evaluation program was initiated. And it was there to address a number of topics, including seismic events, floods, high winds, and tornadoes. The program included several plants that were licensed before a comprehensive set of licensing criteria, that being the general design criteria, had been developed or finalized. Vulnerabilities from external hazards were also addressed by generic safety issues like unresolved safety issue USI A46 regarding seismic qualification of mechanical and electrical equipment in the 1980s. And the individual plant examination program and both the IPE and the IPEEE, which was geared at external events, which was a program, it was in the early 90s.

Plant-specific actions were taken to address the vulnerabilities identified by these regulatory initiatives, resulting in increased safety margins. However, the resolution did not necessarily involve any update of the facilities' design basis external hazard. For example, the resolution of USI A46 resulted in modifications to seismically qualify equipment needed to bring the plant to a hot shutdown. Accident mitigation equipment was not included. This was determined to be a reasonable and cost-effective approach to ensuring the intent and general design criteria, too, was met, in lieu of requiring plants to meet the

criteria for protection from natural phenomena that was applied to newer plants.

Next slide, please. Theme two is that mitigation for long-term station blackout provides additional defense-in-depth. For station blackout to occur there must be multiple concurrent failures, including loss of multiple independent off-site power sources and redundant safety related on-site emergency generators. Beyond design basis external events, while low likelihood, have the potential to introduce common cause failures of AC power resulting in long-term station blackout.

Slide 12, please. Our current station blackout requirements do not address common cause failure of all on-site and off-site AC power sources and distributions. What I mean here is that the current station blackout rule handles off-site and on-site power availability independently. Regulatory Guide 1.155 contemplates the loss of power from grid failures and severe accident events such as snow, high winds, but it does not contemplate the loss of off-site power due to widespread natural phenomena, such as earthquakes or floods, that could impact both on-site and off-site power.

As a result, the regulatory guide assumes that the event causing the off-site power disturbance does not impact on-site power sources, and therefore, the availability of on-site power is based on historical reliability of the emergency diesel generators to start and perform their safety function when called upon. The current coping requirements are based on redundancy, and the reliability of on-site power, and the time to restore off-site power. The United States reactor coping times range between four and eight hours, which really assume a near-term restoration of AC power. In the case of an extreme external event, it might take days to restore AC power, as was the case at Fukushima.

Slide 13, please. Mitigation equipment required by 10 CFR 50.54(hh)(2), or the so-called B.5.b equipment, was required for long-term station blackout caused by a large area of the plant due to explosion or fire. If available, the B.5.b equipment and the mitigating strategies may provide additional margin and capability for long-term station blackout caused by other types of initiating events.

Slide 14, please. There are several factors affecting availability of the B.5.b equipment to mitigate a long-term station blackout caused by beyond design basis natural phenomena. Recent NRC inspections identified deficiencies at some plants in meeting current requirements. Marty touched on some of these. These include things like maintenance and availability of the required equipment, procedures and training for implementing extensive damage mitigation strategies. B.5.b equipment and strategies were put in place after September 11 to address large fire and explosions, as I mentioned.

As a result, the current requirements do not cover some elements of the Fukushima scenario, nor were they designed to do so. Licensees were not required to protect B.5.b equipment from natural phenomena; they were required to store equipment at a safe distance from the fire or blast. These locations may not be protected from flooding or seismic events. Licensees were also not required to have sufficient resources, staff, or equipment, for some aspects of a multi-unit event response.

Slide 15, please. If an event progresses towards a severe accident, severe accident management guidelines provide symptom-based guidance for the technical support center as supported by the plant operators to take actions to stabilize and recover from the accident. SAMGs, as they're

known, provide guidance to prevent or terminate core damage progression, maintain containment integrity, and minimize radioactive releases. They do not address spent fuel pool cooling. SAMGs were implemented in the 1990s as a voluntary initiative in response to SECY-88-012, and were not included in NRC's regulations.

Slide 16, please. Recent NRC inspections confirm that every site has established SAMGs. However, as a voluntary initiative, SAMGs did not get rigorous oversight by many licensees. This was confirmed by our inspection results. Inspections reveal inconsistent implementation of the SAMGs amongst licensees. Some of the issues identified concerned availability of SAMGs in a control room and a tech support center, inclusion of the SAMGs in licensees' configuration control and change management programs, and the degree to which licensees conduct training and exercises of SAMGs.

Example of specific inspection results were the following. And these are just a few illustrative examples. In some cases, the SAMGs were based on the revision zero of the generic SAMGs, and have not been updated to reflect the current revisions of the generic SAMGs. Some emergency response officers hadn't been trained, or allowed their SAMG qualifications to lapse. SAMGs refer to equipment in some cases that was no longer required to be functional.

Slide 17, please. Let me touch on hardened vents. To address concerns identified in Generic Letter 89-16 regarding containment over pressure during a severe accident, all Mark 1 BWR plants installed hardened wetwell vents and are part of the SAMG strategies. The hardened wetwell vents are not required by regulation, but they are described in the final safety analysis reports.

The NRC performed initial inspections, and they have been covered, in some cases, through inspection samples at some sites. However, there is not a specific inspection program requirement to inspect hardened vents.

Implementation followed BWR Owner's Group generic design criteria for hardened wetwell vents. Each licensee installed a specific configuration, and the designs vary in several aspects amongst the plants in some cases. Some examples, the number and location of the valves; the valve design and the means of opening the valves in the long-term station blackout scenario; accessibility of valves for manual operation; inclusion of rupture discs in the vent line or not. Connections to standby gas treatment systems, and connections between units. The BWR Owner's Group design criteria are based on loss of decay heat removal event, and were not specifically designed for operation during a long-term station blackout. Therefore, depending on the plant-specific design, it may be a challenge to open the vent path in scenario like the Fukushima accident. Next slide, please.

A third theme I'd like to discuss today is that emergency preparedness provides further defense-in-depth by minimizing public dose, should radiological releases occur. Existing EP requirements generally do not consider multiunit events. Staffing, facilities, equipment, and dose projection models are primarily based on a single unit event. Slide 19, please.

Additional Fukushima insights relate to emergency preparedness challenges during long-term station blackout. The station blackout could affect emergency notifications, such as alerting the public in an emergency on-site, communications capability on-site, and between a licensee and the government decision makers, and data transmission of plant status information to the NRC

and to the state responders. Fukushima highlighted information flow to decision makers is absolutely critical. Lastly, it is important that the public and the decision makers are informed about radiation safety principles to ensure that appropriate and prudent actions are taken to minimize the dose to the public, and this includes the appropriate use of potassium iodide. Slide 20, please.

Now, I'd like to shift gears a little bit and touch on NRC programs as my final theme today. The NRC's principles of good regulation promote a consistent, coherent, and reliable regulatory framework. The NRC has addressed emergent issues over time by adding specific requirements and endorsing voluntary initiatives. This has resulted in variability in the implementation. Both licensee and NRC programs depending upon the associated regulatory requirement. For example, emergency operating procedures, which are covered by NRC regulations, are included in operator licensing, while SAMG's are not required and are not included. Also, quality assurance and reliability assurance programs are not applied consistently to equipment installed to mitigate beyond design basis events, such as B.5.b equipment and alternate AC power sources. Slide 21.

With regard to our regulatory analysis guidelines, in evaluating potential new requirements, the staff tends to lean more toward the quantitative cost benefit aspects of the regulatory analysis guidelines rather than the qualitative defense-in-depth considerations. This can result in more weight to protection strategies, and less balanced approach to defense-in-depth. NRC treatment of voluntary initiatives, I'd like to touch on that, if I could. NRC regulatory treatment of voluntary initiatives is limited. For example, SAMGs are

not included in the routine inspections, as I'd mentioned, and SAMGs are not typically included in training for NRC inspectors. Slide 22, please.

I'll conclude my presentation today with an overview of our next steps. As was mentioned in the Chairman's opening remarks, we are going to formulate our recommendations for near and longer-term actions and propose topics for the longer-term review. In July, we'll have our report finalized and brief the Commission on July 19 of our report's findings and recommendations. Now, I'd like to turn the presentation back to Bill Borchardt, who's going to cover the staff plans for the longer term review.

MR. BORCHARDT: Thank you, Charlie. If you can go to the next slide, please. I just want to spend a moment talking about the activities related to the long-term review. We're in the process now of developing a charter, which will give direction to the staff on how to move forward with that activity. Clearly, one of the activities we're going to be doing is building upon the work of Charlie and his task force. They won't -- as hard as they're working; they're not going to solve every problem. They won't have all the information they need to make every conclusion and recommendation. The current thinking on how we're going to manage this activity is to form a steering committee that will be made up of a number of senior office directors from across the agency that will then provide oversight of line function activities, both related to the actions, which come from the short-term review and then also the conduct of specific topics, task groups, that will be formed to address individual technical issues. The steering committee will also provide strategic oversight of the implementation of the follow-on activities that come from both the short-term and the long-term reviews.

Another notable difference between the long-term review and the activities Charlie talked about is that we're going to look at all of the lessons learned to evaluate applicability to other NRC licensed facilities. So, it'll go beyond just the power reactor community. We'll also evaluate issues identified by the near-term task force, as requiring additional review to resolve gaps in the current state of knowledge or the sequence of events based upon what we know now, as well as those that require interaction with a broader range of stakeholders.

And then, finally, perhaps the most significant difference between this review and how we envision the long-term review is the breadth of stakeholder involvement in the long-term review. We expect to have, take advantage of much more open series of public meetings, involvement of the fullest range of stakeholders that we can have participate so that we can build the broadest base of understanding and come up with the best recommendations possible. That completes the staff's presentation.

CHAIRMAN JACZKO: Well, thank you Bill, and Charlie, and Marty, for your presentation. We'll start questions and comments with Commissioner Svinicki.

COMMISSIONER SVINICKI: Thank you to each of you for your presentations. I would like to start by returning to the very substantive report issued by the government of Japan. Marty, I think that you made some reference to this. It is an extensive document, but you've provided some preliminary reactions. First of all, that, in terms of the report's discussion of a high level chronology of events that there was nothing in there that particularly was surprising or inconsistent with the staff's understanding. But, the report also

identifies some initial lessons learned, I believe, in five categories. I don't know how much time the NRC staff has had to look at those, but are there any of the preliminary lessons learned that, given differences between perhaps Japan's regulatory approach and ours, or operational differences, would be areas that you could immediately say are not directly applicable here, or that we wouldn't need to probe deeply? And when I ask that, I'm thinking kind of specifically about emergency preparedness in the United States. Of course, we have a well-designed -- between FEMA and NRC and states and local governments, that's pretty well established. Is there, are there translatable lessons learned there? And I, and, again, I kind of look at emergency preparedness as an area where I think there might be differences between Japan and the US. But, in that area or other areas, are there differences between what Japan would identify as lessons learned and the areas that we need to look at as the U.S. regulator?

MR. VIRGILIO: The short answer is you're probably right, but it's too soon to tell. What's been challenging about the report is it lays out the sequence of events, and then it lays out the recommended corrective actions. And there's -- we're struggling to understand, and it may be just the way the report's constructed, what were the, you know, what were the rationale, if you will, for the recommendations? You go from the sequence to the recommendations, but you struggle with that center piece. And that's extremely important to understand, well, why do you jump to the recommendations that are there? And that's the part that we're trying to really analyze right now. So, that's why I say it's a little soon to tell.

COMMISSIONER SVINICKI: And I appreciate your mentioning that. I think there is a lot of complexity, not only for Japan to conduct that step in

building off of the chronology to the lessons learned or recommendations. I think that perhaps even becomes more challenging as regulators around the world in other countries want to look at any needed steps that they may need to take as regulators, because, again, we have this translation from a different system, a different regulatory system, a different, perhaps, approaches to operating these facilities. So, I appreciate that you're mentioning that the staff is attempting to understand how one has a, is rooted in the other, and I think that will be a real challenge, not only for Japan, but for all regulators, as they go to build that particular step.

And, Marty, I wanted to follow up with you, and I had asked you in the previous Commission meeting, you mentioned, again, today, that incident response lessons learned for the NRC is separate from Charlie's task force. It's an NSIR led activity. You were not able, in our last meeting, to give me some sense of the timeframe for that. Is that better formed now? Can you now tell me in what form and by what time NSIR will conduct that review?

MR. VIRGILIO: Yes. It is being conducted in parallel, and we, our current plan is to have that completed about the same time that Charlie completes the task force report in mid-July. It will probably take us a little bit longer to finish the documentation, so I expect that Charlie's paper to you on July 12 will actually lead the NSIR effort. Now, we also understand that there's a broader industry, inter-agency effort that's about to be launched as well, which we will be participating in. But we still haven't received the letter that kicks that off. But, we also expect that to be ongoing. So, that will be yet another piece to the puzzle.

COMMISSIONER SVINICKI: Thank you. Charlie, your slides, I think it was 9 and 10, but principally on slide 10, there's a discussion that I'm not sure I understand the overall message that you're presenting on, and it has to do with the fact that some of our requirements, and, I think, guidance, have built up over time, and therefore, there's an acknowledgement in your slide that reactor licensees in the United States have different safety margins and different licensing bases. And I think I understand that as a practical matter. That makes a lot of sense to me. I'm not sure what you're indicating, in terms of the task force's review, because on its face, I would look at it and say, well, if plants have different safety margins, it may be that beyond the margin that we require, a plant may have additional margin. And, in most cases, I would think a safety regulator would say, "Well, it's good," if they desire to have additional margin beyond what we require. Can you give me a better sense of, on those two slides, what are you trying to indicate? Is there some vulnerability inherent in the fact that there's different safety margins?

MR. MILLER: Well, I, Commissioner, the point that we were trying to make there is, if you try to look at a continuous theme throughout, the plants in the United States, as they have in all countries, have evolved over time, and if you look back to the beginnings of the implementation of our requirements and plants that were licensed before all of our current requirements were in place or our guidance was in place, a lot of what was done in the licensing process at that time was really being done as these things were being developed. So, plants got licensed to whatever was available at the time, with regard to regulatory guidance. And, as the state of the knowledge improved, as the state of the knowledge of the hazards has improved over time, as methods to evaluate those

things have improved, our knowledge has evolved over time. And, so, we just wanted to point out to the fact that various vintage plants, based upon what the knowledge was at the time, were licensed to those things. The design basis for those plants were set at the time that they were licensed. And, it's variable across the spectrum of the plants, depending upon their vintage. Also, we wanted to point out, also, through these slides, that as time went on, on specific cases where we identified something, we would go back and, if appropriate, have plants add features or add procedures or whatever was needed. But what didn't, was no requirement for plants to go back and have to, basically, go back and reestablish a design basis that's with current standards, or the hazards that go without it.

COMMISSIONER SVINICKI: And I know --

MR. MILLER: And they're licensed to the knowledge of the time.

COMMISSIONER SVINICKI: And I know some of the awkwardness of the meeting today is that you're not in a position to talk --

MR. MILLER: Yeah.

COMMISSIONER SVINICKI: -- about your recommendations --

MR. MILLER: Right.

COMMISSIONER SVINICKI: -- even though as a task force you'd begun to formulate those. So, I'll be sensitive to that and simply say that, where, in your response I think you could quickly find yourself swimming in the waters of backfit and other issues. So, I look forward to your report. I think these are very complex issues, and your response has given me a sense that what I thought you might have been signaling, you were signaling that that is something that the

task force is having to confront. And so, I appreciate that. And I won't press for any further details about it.

MR. MILLER: And we are confronting it. And I think the point we're trying to make is that we're having confronted that as a reflection, as an insight, we have to formulate what, if any, recommendations that come out of that. And so, it is an awkward time, because I don't want to lean so forward and give you a recommendation that isn't fully vetted, and that's what we're trying to do. We want to make it that the task force gives fully thought-out recommendations as we go along.

COMMISSIONER SVINICKI: Okay, and I appreciate that --

MR. BORCHARDT: Commissioner, if I could also emphasize just one point that as a fundamental basis of our inspection program, that the inspectors have reinforced to them continuously that their job is to inspect against the regulatory and the licensing basis of the plants. So that, although there's a number of voluntary initiatives, some of which Charlie's talking about on this topic, that the inspections staff doesn't inspect against that. That's not a legal requirement, and so we do not have the same kind of regulatory oversight on those enhancements that, you know, part of what Charlie's talking about, in response to your question.

COMMISSIONER SVINICKI: And I think the agency has acknowledged that, and, again, making public the results of the temporary instructions and other things. I think that we're trying to communicate that as best we can to the public in announcing those results. Bill, I would just close with you, you addressed the longer-term review and the approach there, and the question I would have, it's my understanding from those who, perhaps had first-

hand experience with the regulatory response to Three Mile Island, is that many of the actions that were identified immediately following the event were ultimately found to be perhaps not merited or maybe even not well-rooted in the events of Three Mile Island. Given that there is so much emergent information that I think will continue to come forward over, again, to be honest about it, over the years, I think, which is the nature of nuclear events, how do we avoid repeating that same history here in terms of Fukushima lessons learned?

MR. BORCHARDT: I think the key is having the broadest possible stakeholder involvement in the development of the recommendations. As we gather the information, we'll share it widely. They'll have public meetings or some form where all the stakeholders can participate, so that no one group of stakeholders, including ourselves, get into, on a path, the way we have our minds set on taking a certain approach and ignoring other prospectives and other evidence. And, I think today's NRC is much different than it was in 1980, as far as stakeholder involvement and public outreach. So, I think that will be the key factor. I think there's many different ways that we can accomplish that stakeholder involvement, and that's one of the details that we need to figure out. But the basic principle, I think, is essential.

COMMISSIONER SVINICKI: Okay. Thank you. Thank you again.

CHAIRMAN JACZKO: Commissioner Apostolakis?

COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman. I'd like to start, also, by thanking you for the work you are doing for the agency. I noticed, Charlie, that you didn't say anything about organizational issues that arose from the incident at Fukushima. The Japanese report to the IAEA does mention that there were issues with the roles and responsibilities between

national and local authorities, that kind of government. Is it because this is part of this other incident response review, or is it part of your task force?

MR. MILLER: Well, I -- it's probably some part of both.

COMMISSIONER APOSTOLAKIS: Some what?

MR. MILLER: It's probably some part of both, okay. The task force is looking at it from emergency planning perspective, and, of course, the incident response, basically, if you really look at that, it's implementing the emergency planning perspectives and requirements that have been put in place. And one of the big differences, I think Commissioner Svinicki touched on it, was the fact that in the United States, we have a very structured approach that has been developed over time for that, and not only by the NRC but by FEMA and the states, with regard to that decision-making.

COMMISSIONER APOSTOLAKIS: So you didn't say anything about it because you feel there is nothing for us to learn from Fukushima?

MR. MILLER: No.

MR. BORCHARDT: I wouldn't go that far. I think it's, you know, we didn't have the results of this report when we started the short-term task force. I think, as we develop these task forces under the long-term review that we'll have to decide whether or not, what I might call the organizational structure and relationship issues that are raised in the report from Japan, deserved our own analysis. I think it's, it could have been within the short-term review, but the timing wasn't right. We didn't identify it ourselves, so it didn't make it into the topics that Charlie's being asked to address. I don't expect it to be addressed by the NSIR review.

COMMISSIONER APOSTOLAKIS: Okay.

MR. BORCHARDT: So, I think if it does get reviewed, it'll be in the long-term.

COMMISSIONER APOSTOLAKIS: Okay. So it's something that is going to -- work somewhere?

MR. BORCHARDT: We certainly haven't closed the door to it.

COMMISSIONER APOSTOLAKIS: Okay. Regarding station blackout, you mentioned, Charlie, and we had the whole meeting here a couple of months ago, on station blackout, that the current coping requirement assumes near-term restoration of AC power. And there are also a few other things regarding SBO. Well, I'm wondering whether there is a lesson there for us. Why are we still assuming this? I mean, we have had blackouts in this country that lasted longer than eight hours. And, also, the other question of common cause failure of on-site and off-site power, yeah. Is there any lesson there? I mean, is our analytical capability limited that we cannot figure out those things? Why is there an issue, or, is it a cultural issue of how we approach things? And we say, "Oh, yeah, this is so unlikely, we're not going to deal with it." I'm a little perplexed why we're having in the books analysis of this type when, you know, we have made a big deal about common cause failures in the past. We have had evidence that blackouts last longer than, well, in that case, of course, it was off-site power, longer than eight hours. Why do we still assume things like that are now, in retrospect, unrealistic? And is there anything that we can learn from it?

MR. MILLER: Clearly, I think, based upon what the task force is looking at, there's things that we can learn from it, okay? But, if you go back in at least our review of the issue, as a task force, and, of course, we're just one group, the point that I was trying to make today was that if you look at station

blackout and the coping times, and you look at in the light of Fukushima, for example, we haven't really looked at it or thought about it from the context in the past that you could have an external event that would give you a common cause failure of both on-site and off-site emergency power. We dealt with it a little bit, I use the term stovepipe, okay. From the perspective of on-site, it was diesel generator reliability. Lots went into that with regard to the Reg Guide of how to figure out what that was. For off-site, it was pretty much focused on extreme, some extreme weather events. But, I think that there was a combination of thinking that went into that that those coping times that went in there, there was confidence that power of some sort would be restored within that time frame. And, I think the insight that at least the task force has at this point in time, is that Fukushima has shown that if you did get a very low probability, however, external event of that magnitude that did cause a common-cause failure of both, that restoration, you know, that the station blackout period could be a lot longer. So, what we're trying to do is to take that knowledge and figure out what is an appropriate recommendation to make as a result of that. So, from that perspective, I would say yes. I think the task force feels that there is a lesson learned, it's just formulating the right recommendation for where we go forward with that.

COMMISSIONER APOSTOLAKIS: If I may come back --

MR. MILLER: Okay.

COMMISSIONER APOSTOLAKIS: I do appreciate that --

MR. MILLER: Yeah, no, you asked --

COMMISSIONER APOSTOLAKIS: -- this happened at Fukushima, we're going to learn from it --

MR. MILLER: Yeah, yeah.

COMMISSIONER APOSTOLAKIS: -- but I'm trying to figure out whether there is another lesson regarding --

MR. MILLER: Okay.

COMMISSIONER APOSTOLAKIS: -- our own way of doing business, and why we, I mean --

MR. MILLER: I guess I respond to that from this perspective, and I don't mean to sound defensive on the part of the staff, but I mean, the staff prides itself in being a learning organization, and, at any given time, you know, our knowledge and the way we focus on things is based upon, you know, our thinking at the time. But our regulatory history has shown us over time that things come up that we didn't think about or didn't focus on that cause us to have to take a step back and take a look at it and say, "Well, what does this mean, and how do we have to go forward from this?" And I think that that's what we consistently challenge our self to do. We're not always omniscient. I don't think there's anything with regard to our culture that causes that to be the problem. But, I think if you go back and you look at it, and, at least, from my perspective, when I've gone back and looked at some of these things, I sort of say, "Well, I can see how the staff thought that way at the time, given what the state of knowledge is." And then the state of knowledge evolves over time. You kind of take a step back and scratch your head, and you say, "Gee, did we really cover the bases?" And I think that's what we're trying to do now with the insights. And that's going to go on for the perpetuity, as I see it, with regard to this industry and our regulations of it. There's always going to be insights that are going to be developed over time that cause us to have to do that.

COMMISSIONER APOSTOLAKIS: Now, another keyword in all this discussion is the word "voluntary," and we've found problems with equipment and so on. And we keep emphasizing that these are beyond design basis events, voluntary, and so on. And so, I'm wondering what does voluntary mean? Does it mean, for example, in SAMGs, that the industry came to us and said, "Hey, NRC, you haven't thought about this, but we thought about this, and we need some guidelines during severe accidents, and we are volunteering to develop SAMGs." Is that what voluntary means, or does it mean the regulator is thinking about, he's thinking about doing something so the licensees come back and say, "Well, wait a minute now. We are volunteering to do something about it." I think there's a big difference between the two. So, which one is it?

MR. MILLER: Okay. I'm going to give you the task force's perspective, okay? Others may disagree with what that means. We have spent a lot of time as a task force discussing voluntary and what it means and what it doesn't mean. Part of what we were trying to get through in my presentation today was, have requirements, have things that the NRC puts in place and regulates, and then you have a family of things that the industry has done on a voluntary basis. In some cases, I determined, you know, if we go back and look at the history of that, I really think it's related to issues that the NRC has discovered -- come upon. And then in looking at what would be the best way to implement the resolution of that, in some cases, it was through promulgation of requirements, additional requirements. In some cases, it was done through what I refer to as quasi-voluntary efforts, where we might issue generic communications that would strongly encourage the industry to take some action

or else, okay? And in those cases, the industry has taken up those actions and implemented things.

The hardened vents, for example, for Mark I containments was an example of such a thing. And then you have things like the SAMGs, where it was identified, I think, through our regulatory development and history that there was an issue here for severe accidents. And, in cases like that, the industry has to come to the NRC, and said, “We will take this on. We want to develop the procedures. We want to develop the guidelines.” And the NRC has accepted that as an approach. I think that the point that we were trying to make today as a task force, the insights that we got from the inspections that were done are when it’s done as a purely voluntary initiative, where the industry comes to us and says, “Let us take that on,” and the NRC has no regulatory oversight of that, because of the nature of that voluntary effort, that the pedigree of it and the continued attention to it isn't what it is in cases where there is regulatory oversight. And in many cases, that is just an insight that we've gained over time, and that's why the task force wanted the SAMG inspections. They weren't inspections for any regulatory compliance; it was purely an information gathering, to say what's the state of affairs?

And so we found some things, as Marty talked about, with the B.5.b stuff, which was a requirement, and then if you segue way to the SAMGs, we found some additional insights. And I think the industry has come to those same conclusions also. So it's the nature of things, and it is an insight, and I think we looked at it and said, well, gee, these things are important, and here's the facts. And that's what I'm trying to present today: the facts as we've developed them

so far. I don't know if that answers your question, but that's the way the task force is looking at this.

COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman.

CHAIRMAN JACZKO: Commissioner Magwood.

COMMISSIONER MAGWOOD: Good morning again. Bill, I'd like to sort of, maybe perhaps start, a little bit of a deep breath for a moment, and just sort of take a step back. We've said clearly on multiple occasions, U.S. plants are safe. And I wonder if you could characterize how you view the effort that we have underway with this task force and with the longer term review, and how the public should view the safety of U.S. plants as we go through this exercise. Because obviously as we go through these, we go through the TIs to look at, we do the inspections, we are finding things that, while we were not completely happy with, we want people to fix some things. But how should the public look at this? How should they think about the safety of the U.S. plants as this activity goes forward?

MR. BORCHARDT: Well, thank you, Commissioner. Based upon all the results that we have seen, that includes the results of these temporary inspections, the results of the ongoing regulatory oversight that the inspection staff in the Regions carry out every single day, we still have high confidence that the plants are safe to operate.

Probably the most important concept is this idea about defense-in-depth. And that is the idea that a plant can operate with a violation of technical specifications at any one time, with a piece of equipment being out of service, with not having all of the suggestions or requirements in the various things that

were evaluated as part of the temporary instructions. Perhaps they are not in perfect working order, but that, as Marty mentioned, the function, the important function of keeping the core cool, responding to events, mitigating events, would still be accomplished despite the occasional problems that have been identified. And then, of course, the corrective action programs that are very robust, in my view, and are in place, address the discrepancies as they're identified.

So, I think the public should recognize that we're looking hard, we're identifying issues. That's what we ought to do, that's a good news story for us, that we're finding problems and they are getting fixed. I think it's also important to recognize the industry is doing the same thing, and that no one's being complacent throughout this entire process.

COMMISSIONER MAGWOOD: Excellent. Thank you very much. When you look at the chain of events in Japan, which, as we've already discussed this morning, we are still trying to understand all the sequences and what exactly happened, and I think, as Commissioner Svinicki mentioned, it may be years before we really understand every aspect of this.

However, I think it's clear, and I should credit Commissioner Svinicki, I had a conversation with her earlier this week that sort of prompted this thought, that there's a lot of information that we're going to be able to obtain from understanding this accident. And it's not just information that will turn into regulatory actions through the processes we've discussed; it's information that will help us understand the behavior of the systems under very stressful conditions, you know, conditions where cooling is not available; where there is core melt, where there are releases. And as we understand that, how do we take that information and incorporate it into our understanding of how these systems

behave as we go forward to the longer term future? Do you have some thoughts about how the --

MR. BORCHARDT: Well, I'm quite confident there's going to be an international collaborative cooperation on taking all of this data, because all of the codes that are used by the various regulatory agencies are -- almost all of them are shared now. And there are cooperative agreements between our Office of Regulatory Research and their counterparts around the world that will take advantage of the data from a real world event to validate or to refine and improve the codes that we use to do analyses of core performance or radiological releases. So I think this is one of those activities that organizations such as the CSNI at the NEA will be focusing on for many years into the future.

COMMISSIONER MAGWOOD: Marty?

MR. VIRGILIO: Just to put a finer point on what Bill said, domestically we're about to sign an MOU with DOE to do just that: to take the data that we have and the data that we will obtain over the course of the next year or several years to advance our codes.

COMMISSIONER MAGWOOD: Excellent. I'm very happy to hear that. The -- you know, one of the things that has popped up in the, I think particularly in the Japanese media from time to time, has been stories about equipment failures resulting from the earthquake at Fukushima. You heard stories about failures with the vents, stories about cooling system piping cracking. Do you have any further insight to that? Anymore understanding about any of that at this point?

MR. VIRGILIO: The little bit that we get, bits and pieces, and I expect that we'll hear even more as the IAEA mission team rolls its report out.

But I think that the situation in Unit 1 was a lot worse than we had originally anticipated with respect to the complete loss of onsite and power, including both AC and DC, where it appears that it wasn't as bad in Units 2 and 3. That's a fairly new insight that we've picked up just within the last few days. The operation of the isolation condenser in Unit 1, which was on and off, on and off, also contributed, I think, to the, I think, maybe the more prompt or faster core degradation in Unit 1 then the other two units.

So, as Bill pointed out, as we've all talked about, more information is becoming available about the event, the sequence of the events, the equipment performance, as they gain access to the facilities.

MR. BORCHARDT: You know, I think it's really important that we, while we want to make progress and we want to move forward, that we're also patient to make sure we have the best information that we need to make a regulatory decision that's going to last for many, many years. And we need not just the plant condition, the equipment condition inside the plants, which we don't have an accurate understanding of, but I think we also need an understanding of what the operators were able to and not able to do, what they intended to do. So there's an extensive amount of interviews I would think would be very useful to have, from the people that were onsite, as they tried to conduct certain operations. Marty mentioned isolation condenser operations in Unit 1. Operators, you know, may or may not have tried to take certain actions at various times, and to understand what they did, when they did it, needs to be integrated with the physical condition that we identify once inspections are finally able to be conducted.

COMMISSIONER MAGWOOD: Thank you. Charlie, one item I

don't think I've heard you talk very much about has been the issue of estimating natural phenomena, that you have to postulate in order to have the design basis. One of the items that has come up, again, largely in Japanese media, has been the question about whether the size of the tsunami, the size of the earthquake, the position of the earthquake were correctly estimated. Have you given any thought, has the task force given any thought to that and projected it to our system? Are there any lessons learned for us in estimating these natural phenomena? Any lessons learned from that standpoint that you can identify at this point?

MR. MILLER: One of the points I was trying to make in my presentation, and maybe I didn't make it clear, is that if you look at the history of how we've gone back and had plants enhance their capability to deal with seismic issues or flooding issues, or whatever, is we really didn't go back and say, in any case, “You've got to, at some periodicity, reevaluate the hazard.” Of course, that was a big issue as it played out some in Japan. So the hazard that was the foundation of that, that created the design basis in many cases for these plants, while it may have remained the same with regard to the design basis, I think facilities have tried to look at other considerations, and so has the NRC.

So, for example, I mean, if you look at, with regard to earthquakes, for example, and as knowledge has evolved over time with regard to earthquakes, and the analytical capability to figure out what the magnitude of the earthquakes might be, and the knowledge. We've had programs that the licensees have had to implement with regard to making the seismic capability of the plants more robust, but that wasn't necessarily done based upon going back and saying: reestablish what the hazard is, and then have to go do that.

And so from that perspective, I think that something that the task force has come to understand, it's a question of, okay, now, from that, what if anything does the task force recommend as a reasonable response from a lessons learned perspective with regard to a recommendation? The state of knowledge constantly evolves for the tools that are available to evaluate these things, and that's part of what I was getting at with the licensing basis being different. Plants that were licensed and designed in the 1960s or in the early 1970s, the state of knowledge of how to predict those hazards is different than what it is today. The state of knowledge is much better today.

But what we have done as a regulator over that time is we have built a lot of conservatisms into the design of the plants so that there would be additional protection against that. So balancing those two and trying to figure out what the appropriate recommendation would be for the future is our challenge. And we will formulate and crystallize that with regard to a recommendation by the time we deliver the final report in 30 days.

COMMISSIONER MAGWOOD: Thank you very much. Just have one quick question for Marty, just to close. You mentioned that, in reviewing the SAMGs, that we -- you listed a variety of deficiencies. Have -- did the licensees take action to address all those deficiencies? Did they recognize them as deficiencies?

MR. VIRGILIO: Either they have corrected them or they're in the corrective action program. Yes.

COMMISSIONER MAGWOOD: Thank you very much.

CHAIRMAN JACZKO: Commissioner Ostendorff?

COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. I

add my thanks to my colleagues to you and your team here, and this very helpful briefing. I want to ask this of Bill, but please engage, Marty, Charlie, as I know you will. I had a chance to review, I didn't study in detail but did review the Japanese report to the IAEA and looked at their different recommendations, their 28 lessons learned and so forth, and didn't necessarily see anything there that was a big surprise to me, personally. Your task force has a much more in-depth knowledge, but I didn't see any things that were big surprises. I guess I have some, my concern, but a question about, philosophically, how the task force looks at the Japanese event, and how do we -- and I'll use an example: NRC has a history of using the philosophy of defense-in-depth. Let's just take the defense-in-depth as maybe the cornerstone for this question.

From your experiences in communications over the last three months with your international counterparts, and you've had a lot of those communications, I know, do you see any big philosophical difference between how the NRC is approaching Fukushima and how other countries with developed nuclear power programs are? Or with respect to how the IAEA, or NEA, or fill in the blank, other agencies, such that when we go down this path, I think Commissioner Magwood was kind of hitting on this a little bit as well, do we have an approach that is able to be communicated to the public in a commonsense fashion? So I would be interested in any thoughts you have. And that's kind of a broad question, but I'd appreciate hearing from you on it.

MR. BORCHARDT: Well, I think that there's a general similarity in the approach that the other international regulators are using as they evaluate the lessons learned. There's certainly very good coordination and communication. There was recently a meeting, as part of the Nuclear Energy

Agency that spent a day, very senior regulators, focusing on that topic. There is going to be a meeting called by Director General Amano next week in Vienna, which will include all of the nuclear power countries, as well as all the other member states of the IAEA that'll be able to participate, as well as a little over a year from now, there's going to be a special meeting of the Convention on Nuclear Safety that will focus exclusively on the lessons learned from Fukushima.

I believe by that time there will be good consensus on what the lessons are to be learned. How they are applied in each of the different regulatory schemes will be obviously different. I mean, there are some differences, well-known differences, between the U.S. approach and those approaches used by many other regulatory agencies around the rest of the world. The backfit rule being one of the specific examples of a process that the NRC uses that is not universally used. I mean, there's similar programs, to my understanding, in some other countries, but that is a noteworthy difference. The idea of periodic safety reviews, a 10-year review that's done in the majority of other nuclear power countries which is not done here, we go more for the continuous oversight and updating of requirements as required, is another.

So -- but those aren't new. We had discussions of those during the recent IRRS mission that was conducted here at NRC, so I don't see anything strikingly different or new that's a new revelation that causes any new uncertainty.

COMMISSIONER OSTENDORFF: Charlie, do you want to add anything to that?

MR. MILLER: Yes. This is Charlie's opinion, so I'll keep it at that.

In going back and looking at some of the international efforts, you know, the task force has tried to take a look at that, you've got the European stress test, you've got -- the Brits have put out a report on some of the things they're looking at. I think, from our perspective, the one difference that we have seen in the approach has been if you look, for example, at the European stress test, it was a detailed list of questions that were sent to the licensee to perform an evaluation, and the licensees would submit that to the regulator. And then there was going to be this evaluation of that. Seems to include having countries that are not the country where the plant is help look at what the results of that are.

I think the big difference, I think, on our side, has been that in the United States, the NRC has set upon having a task force to independently look at that right from the beginning, and try to pass some judgments, while our industry, in a parallel effort, is doing what they're doing with regard to some of the similar activities. So it'll be interesting to follow, as that plays out, how the information that's provided to the regulators in the European countries manifests itself into some of those things that Bill talked about.

COMMISSIONER OSTENDORFF: You have something, I'm sorry.

MR. VIRGILIO: I would just add that, if it's done right, the IAEA is about the change the IRRS process to conduct, as part of the missions, an evaluation of each country's response to the events at Fukushima. Bill will be able to test that in South Korea, I'll be able to test that in Canada over the next several months. And that is a process that might help us understand the adequacy, although everybody's taking different approaches. At the end of the day, can we say that, as a peer review service, that the approach that has been taken by any individual country is adequate.

COMMISSIONER OSTENDORFF: I'm going to shift gears a little bit. I just wanted to quickly refer to questions raised by two of my colleagues so far. I think Commissioner Apostolakis' comments on the questions of voluntary initiatives is a very appropriate one, and one that I think we'll be looking at very carefully based on your recommendation, so I just wanted to echo, I had a question along the same lines as my colleague here. I think Commissioner Svinicki's comments with respect to your slide 10 on the different licensing bases that have evolved over a period of time, and what the task force range of options might be with respect to how to approach that in a thoughtful way. I'm not asking you a question on that, but I did want to emphasize I'm also interested in that piece, because I know it's a tough problem.

Last week, I had a chance to go out with one of my staff members and visit an older BWR Mark I, and I went through and did not do a complete review, but did a walkthrough sample of the TI-183, 184 inspections with two residents. And I found that to be a very useful exercise in the plant to do that, and, Marty, I noted that -- and I had a chance to review the inspection results of that facility ahead of time so I could understand, you know, how do you get to this vent valve to operate it? Does it require a ladder? Can you get there with installed equipment? What do you do under cases of reduced lighting capability if you have loss of power? What do you do if you have X number of feet of water there that you have to wade through? So, I thought those kind of things in a hands-on approach was very helpful to raise my own level of knowledge. And I'm just -- I'm saying that from a standpoint, I think, talking to residents -- I've done this at two plants, one more detailed than the other. I think those inspections, my feedback to you, that those inspections, I think, have been very helpful, and I

think that's good to have that as a baseline to help inform the task force reviews.

I also note that some of those in the group here that have naval reactors experience where the best you can ever get is no deficiencies noted on an inspection finding, but there's also an element that an above average nuclear propulsion plant operating evaluation still has deficiencies in there. So, it might be determined to be an above average plant with 20 deficiencies noted during a casualty drill. So, I'll bring that up in trying to communicate -- this goes back to Commissioner Magwood's point -- how do you reconcile in the communications way, where we have these things in the areas of improvement, these things that could be done better with the notion that, I think Marty said, we've not found any cases where the function could not be performed. So, I think that communications piece that my colleague raised is really important.

And my last comment, and this is just, you know, individual Commissioner speaking on those. I'm looking forward to the report next month from the task force, and I just suggest that, I think we've had some discussions in the periodics, Marty, on this topic, for the Commission to act upon near-term recommendations, and I'm not prejudging on what any of those may be or if there are going to be some. I'm assuming there may be some there. But I think it would be very helpful when those near-term recommendations come up that the Commission also have some perspective, some situational awareness of what may be on the plate for the longer-term task force, so that there's a holistic integrated decision-making environment for the Commission to consider, to the extent that we have information. There will areas that will not certainly be ripe, but at least understanding somewhat about the longer-term review, I think, will help the Commission make decisions for the nearer term review. Thank you, Mr.

Chairman.

CHAIRMAN JACZKO: Thank you. I wanted to go back, Charlie, I think, to your comment about the differences in margin. And really, perhaps, I mean, it's an inconsistency in design basis, I guess, in a way. Maybe I would capture what you were saying. Is the task force looking at all about this in the context of relicensing? And obviously, at license extension time, we have an opportunity, although the Commission's not availed itself of that opportunity to, in a sense, re-baseline everybody's design bases, really, or licensing bases, I guess, at that point, so that everybody, you know, at that point kind of has a consistent understanding and a basis for what is the definition of safety, what is the definition of external hazards, what are the analysis that we should be looking at? Is the task force looking into that at all as a possible way to address this?

MR. MILLER: We haven't specifically looked at it in the perspective of whether it would be needed at the license renewal. We haven't got that specific. But what we're trying to really evaluate, Chairman, is what does that mean, okay? The plants are of different vintage. We believe that the plants are operated safely, okay. But it's like any technology. A newer version of it's probably going to have more features to it than an older version of it. So we want to make sure that we're comfortable that the things that we learn can be applied to the whole fleet of plants that are out there, as well as the future plants in a logical and methodical way so that we're comfortable that any vulnerabilities that might be assessed or gaps that are assessed are addressed. And that would probably be in a different way. I mean, we have a recognition you can't go back and rebuild the plant, okay. And so, there are some things being done.

But if you listen a lot to what we talked about today, there are a lot

of things out there that has been put in over time, some required, some voluntary. And I think one of our biggest principles in looking at this stuff is that for those things that are there, we want to make sure that it's going to be reliable and work when called upon because if it is, we have a lot of features here that can be called upon. And then, looking at from a learned organization, are there additional things that the task force would recommend that need to be done over that within reason. But we haven't been so specific to say, "Well, these things should be part of license renewal or not."

CHAIRMAN JACZKO: Well, thanks. I appreciate that answer.

MR. MILLER: Yeah.

CHAIRMAN JACZKO: Turning to a different topic, I think, Bill, you touched on the fact that, you know, understanding what the operators did and when they -- how they reacted while the equipment performed, that these are important issues. How do we reconcile that? I don't want to say reconcile, but how do we go about doing our job if the only way we're really figuring out if things work is when we have an accident to figure out whether things work the way we thought they were going to work? I mean, what are we doing to ensure that it doesn't come down to needing to have an accident to know how equipment is going to perform in adverse situations? I mean, it struck me a little bit as you said that, that these are things, in principle, we think we know. I mean, where is the gap in knowledge that tells us right now we don't know how a particular piece of equipment is going to operate in a seismic event or, you know, in this kind of environment?

MR. BORCHARDT: Well, I think on a practical matter, it gets done as the plant continuously reassesses its design basis. And, I mean, design basis

really outside of the way the regulator speaks of the design basis. But when they are continuously making plant modifications, either because a piece of equipment needs to be replaced, because it's obsolete, or it's worn out, and when they go through that work, they'll have to go look at, you know, the structural integrity of the piping. And then, they'll have to look at whether or not it's seismically qualified. And system engineers that are at each of these plants, or at least in each of the operators organizations go about their job. They're continuously challenging and reassessing the design of the system, which includes environmental qualifications. And so there's very many aspects of this that are ongoing.

Behind that, we have the NRC inspection program, which the, you know, the inspection staff will look at plant conditions, and they'll do detailed, you know, vertical slice reviews of safety importance systems and look at things like EQ. So, I mean, that's the way that it's currently done. When you get into the events like Fukushima of having multiple initiating events, that is -- like we mentioned, that goes beyond what we routinely look at and that would require -- to go in that direction, I think would require a Commission decision to go beyond the current licensing basis and the current regulatory structure. If we were to go and change the requirements of license renewal that we have just talked about might require a change to Part 54 because right now, it's looking at aging management and passive structures. If the idea was to do something different, that would clearly be a major policy decision of the Commission to change.

CHAIRMAN JACZKO: Well, thanks. Well, I, you know, I think as we look at this event and, I mean, it is interesting if we, you know, we put it in context. And we've done a lot of work over the years to establish programs, and

systems, and equipment, and organizations, and training to ultimately I think reduce the likelihood of seeing an event like this. And I think, you know, my reaction and what I seem to see in a lot of people in this industry is that this is a reflection on the fact that -- or it's been a moment of reflection because I think deep down, there was a belief that you would never see an event like this, that it just simply we had done everything to basically take this type of event completely off the table. And, obviously, we haven't, which, you know, and then I think as Commissioner Apostolakis was kind of perhaps hinting at this, if you just go back to the station blackout issue, you know, we still are saying 48 hours coping time, you know in the face of pretty clear and obvious evidence that that's not sufficient, and that evidence has been there prior to Fukushima-Daiichi.

So, you know, I mean, I think that there, you know, there is still probably something fundamental about how we're looking at these issues. I mean, you can trace, you know, much of what happened at Daiichi was not new. I mean, none of these things were unknown phenomenon. Seismic risk is a well-known risk. Station blackout, extended station blackout is well-known hazard. And we have, over the years, done things maybe halfway and maybe not all of the way to try and address these things.

So, I, you know, I hope, as we go forward, we'll do this in the way that, you know, does make these things ultimately successful for the long-term, and really get to a place in which we can really rule out these kinds of things from happening. And I mean, of course, you can never rule out everything, but, so, I -- it's just that I think it's certainly an important lesson, and it is an event that I think will teach us a lot.

I wanted to get to a specific question. We have in, and I think we may have touched on this at the last meeting, but one of the issues that, to me, I think we haven't talked about too much, but is really the different nature of this event. We've historically looked at things from the standpoint of, I mean, our basic risk metrics for core damage frequency, protect the core, you can't have a release unless you have core damage. If you have core damage, then you have additional contingencies on whether or not you've got to release. And we've generally looked at that in terms of concept of a large, early release as the type of metric that we use, at least for the existing fleet.

This was a very different event. I mean, it's an event with a long-term release, and that long-term release can be significant over an accumulated period of time. But our infrastructure is built around shorter-term releases, no matter what. I mean, I think the PAGs are all based on a 48 hour dose analysis for short-term protective actions.

Here, we may have had doses that exceed several rem, but not in a 48 hour period, but in a two week or three week period. So, to what extent, and maybe this is a question for you, Charlie, are we looking at that kind of fundamental aspect of just our basic metrics for looking at events and looking at how we're measuring safety in a way, you know, that idea of maybe perhaps a longer term mid-level release type of event, and how that can be affected, or how a population can be affected from that versus just a short-term large release, or, you know, in a core damage type of event?

MR. MILLER: The way that the task force is looking at that is we're trying to take a step back and say, "What do we need to do to make sure we're

protected against that so it doesn't happen?"

CHAIRMAN JACZKO: Yeah.

MR. MILLER: Looking at what happened in Japan, I mean, I think what we looked at from this perspective, we don't want to get to the point where there's a long-term release. So, how are our, you know, how are, how do we regulate? How are our current fleet of plants built? How are they operating? Is there enough there that we're comfortable that that won't happen? If not, what are the recommendations that we would make? We're fairly comfortable that we have a pretty robust regulatory system and industry in the United States. But further improvements potentially could get made, and we're trying to look at it from that perspective. So, that's where we're really focusing initially on protection.

Then, I'm looking at it from a mitigation perspective. Let's say you're wrong, okay. We want to make sure that there's enough thinking in there ahead of time that there's procedures, there's knowledge, there's training in place so that mitigating strategies can be plied and at a very timely manner to minimize the consequences of the events so that you don't get a long-term release, or that you can manage it, okay. If you protect containment integrity, or if you have appropriate methods that control releases, well, then, you're going to mitigate the consequences so that you don't get a long-term release. We would not want to put ourselves in a situation in this country that ended up there, so that's the way that we're trying to look at it as a task force.

CHAIRMAN JACZKO: All right. Well, I appreciate your comments and all of your comments. And, obviously, the questions and thoughts of the Commission. This is a very challenging task they have in front of you, and I

appreciate your efforts so far. And we'll look forward to meeting in the next, Bill, did you want to say something?

MR. BORCHARDT: If I could.

CHAIRMAN JACZKO: Sure.

MR. BORCHARDT: The next Commission meeting is in mid-July. As Marty alluded to, I'm going to be heading up the IAEA effort in South Korea during that time period. So, I just, with your indulgence, wanted to take a moment to thank the task force personally, but specifically Charlie Miller, who was a week or two away from retirement when I caught him in the hallway and asked him to head up this task force. And, he didn't hesitate after I released his arm from behind his back.

CHAIRMAN JACZKO: And it was intact at the time.

MR. BORCHARDT: And I can't thank him enough for making the personal sacrifice and delaying his retirement and doing this very important task. So, thank you very much, Charlie.

MR. MILLER: Thank you.

CHAIRMAN JACZKO: Well, thank you, Charlie, and we'll perhaps have an opportunity in July to say some more things. But, again, I want to thank everybody on the team for their work so far. This is a challenging task, and 90 days may seem like a lot of time to us, but as we wait patiently to see what you've done, but I suspect to all of you, it's about a millisecond. So, we look forward to the next meeting and getting the report and hearing your recommendations. Thank you

[Whereupon, the proceedings were concluded]