

UNITED STATES OF AMERICA  
U.S. NUCLEAR REGULATORY COMMISSION

BRIEFING ON NRC RESPONSE TO RECENT NUCLEAR  
EVENTS IN JAPAN

MARCH 21, 2011

9:00 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

NRC Staff:

Bill Borchardt  
Executive Director for Operations

## 1 PROCEEDINGS

2 CHAIRMAN JACZKO: Good morning everyone. The Commission  
3 meets today to discuss the tragic events in Japan and to begin to consider  
4 possible actions we may take to verify the safety of the nuclear facilities that we  
5 regulate here in the United States. People across the country and around the  
6 world who have been touched by the magnitude and the scale of this disaster are  
7 closely following the events in Japan and the repercussions in this country and  
8 many other countries.

9 Before we begin, I would like to offer my sincere condolences to all  
10 of those who have been affected by the earthquake and the tsunami in Japan.  
11 Our hearts go out to all who have been dealing with the aftermath of these  
12 natural disasters and we are mindful of the long and difficult road they will face in  
13 recovering. We know the people of Japan are resilient and strong and we have  
14 every confidence that they will come through this difficult time and move forward  
15 with resolve to rebuild their vibrant country. I believe I speak for all Americans  
16 when I say that we stand together with the people of Japan at this most difficult  
17 and challenging time.

18 The NRC is a relatively small agency with just about 4,000 staff, but  
19 we play a critical role in protecting the American people and the environment  
20 when it comes to the use of nuclear materials. We have our inspectors who work  
21 full time at every nuclear plant in the country and we are proud to have world-  
22 class scientists, engineers, and professionals representing nearly every  
23 discipline.

1           Since Friday, March 11, when the earthquake and tsunami struck,  
2 the NRC's headquarter operation center has been operating on a 24-hour basis  
3 to monitor and analyze events at nuclear power plants in Japan. At the request  
4 of the Japanese government and through the United States Agency for  
5 International Development, the NRC sent a team of its technical experts to  
6 provide an on the ground support, and we have been in continual contact with  
7 them since they deployed.

8           And within the United States, the NRC has been working closely  
9 with other federal agencies as part of the U.S. Government's response to the  
10 situation. Here in the United States we have an obligation to the American  
11 people to undertake a systematic and methodical review of the safety of our own  
12 domestic nuclear facilities in light of the natural disaster and resulting nuclear  
13 situation in Japan. Beginning to examine all available information is an essential  
14 part of our effort to analyze the event and understand its impacts on Japan and  
15 implications for the United States. Our focus will always be on keeping plants  
16 and radioactive materials in this country safe and secure.

17           As the immediate crisis in Japan comes to an end we will look at  
18 any information we can to gain experience from the event and see if there are  
19 any changes we need to make to further protect public health and safety.  
20 Together with my colleagues on the Commission, we will review the current  
21 status and identify the steps we will take to conduct that review. In the meantime  
22 we will continue to oversee and monitor plants to ensure that U.S. reactors  
23 remain safe.

24           On behalf of the Commission I want to thank all of our staff for  
25 maintaining their focus on our essential safety and security mission throughout

1 these difficult days. I want to acknowledge their tireless efforts and their critical  
2 contributions to the U.S. response to assist Japan. In spite of the evolving  
3 situation, the long hours, and the intensity of efforts over the past week, the staff  
4 has approached their responsibilities with dedication, determination, and  
5 professionalism, and we are all incredibly proud of their efforts. The American  
6 people can also be proud of the commitment and dedication within the federal  
7 workforce, which is exemplified by our staff every day. And again, I want to  
8 reiterate certainly on behalf of the Commission and all of us here in this room our  
9 sympathy with the crisis and the difficult situation for our friends and colleagues  
10 in Japan, and we look forward to continuing our efforts to provide them with  
11 assistance as they continue to deal with a very challenging situation, not only  
12 with the nuclear facilities but with many of the other impacts from this natural  
13 disaster in Japan. I would like to offer Commissioner Svinicki an opportunity to  
14 make some comments.

15           COMMISSIONER SVINICKI: Thank you Mr. Chairman. I want to  
16 add my voice to that of others regarding the great sympathy we feel over the loss  
17 and devastation due to the earthquake and tsunami in Japan. The dramatic  
18 images of the events at Fukushima, images that have riveted so many of us over  
19 the course of the past week, have an added dimension for us as a community of  
20 nuclear safety professionals because for us these images are not an abstraction.  
21 Many of us have traveled to Japan; we have toured the facilities of our Japanese  
22 colleagues. We have worked alongside them in support of the shared goal of  
23 advancing nuclear safety. The sense of anguish we feel as we desire so  
24 desperately to do something, anything we can, to help our friends and colleagues  
25 in Japan has been so clearly evident on the faces of the men and women

1 working here at NRC. We are heartsick over this tragedy. Some may  
2 characterize that our faith in this technology is shaken, but nuclear safety has not  
3 been and cannot be a matter of faith; it is and must continue to be a matter of  
4 fact. So today we continue the systematic evaluation of facts of what we know  
5 about what happened and what we don't know but will piece together in the  
6 coming months. Our objective is to confirm that our approach to the regulation of  
7 nuclear power in this country is comprehensive and correct while applying any  
8 lessons learned we can from these events. In taking the systematic and  
9 deliberate approach to this review that you have called for, Mister Chairman, I'm  
10 certain the Commission will achieve this objective. Thank you.

11 CHAIRMAN JACZKO: Thank you. Commissioner Apostolakis.

12 COMMISSIONER APOSTOLAKIS: I join the Chairman and  
13 Commissioner Svinicki in expressing my condolences to the people of Japan and  
14 I also second the Chairman's comments on commending the staff for its  
15 response to this accident. Thank you, Mr. Chairman.

16 CHAIRMAN JACZKO: Commissioner Magwood.

17 COMMISSIONER MAGWOOD: Thank you, Chairman. This is in  
18 many ways a very personal tragedy for me. I have many friends and colleagues  
19 in Japan. I have been in touch with several of them over the last week and a  
20 half. I've heard from friends in Tokyo worried about radiation and others in the  
21 North who are dealing with food shortages and gasoline shortages. Everyone in  
22 Japan is enduring continuing aftershocks, anxiety about the Fukushima and  
23 Daiichi plant, and difficulties in communicating with friends and neighbors, and a  
24 lot of uncertainty about what will happen next. I have one friend Erito who lost  
25 all her utilities for several days after the earthquake and is still waiting for water to

1 be restored. But in the aftermath of the earthquake, she is making new friends  
2 as people bond together to help each other and comfort each other and make the  
3 best of a difficult situation. Fortunately she found a kind neighbor who has a well,  
4 and so she has been able to get water and take it to her apartment on a daily  
5 basis.

6 I'm sure there's thousands of examples of people who are reaching  
7 out to each other, bonding as a community, and showing the kind of resilience  
8 that is going to be necessary to move forward. The scale of the tragedy is  
9 staggering and the toll on life and property has been terrible, but Japan will  
10 recover. But Japan will not stand alone and has not stood alone over the last  
11 week and a half. We in the U.S. are close friends to the Japanese people and  
12 I'm very, very proud of how our country has responded to this crisis and  
13 particularly proud of how the Nuclear Regulatory Commission Staff has  
14 responded as well. The staff has demonstrated both the expertise and the  
15 selflessness over the last 10 days and I applaud their outstanding efforts.

16 Today the Commission will receive an update on the nuclear  
17 situation in Japan, our response and our efforts to understand what has  
18 happened. There will be important lessons learned from the events at the  
19 Fukushima/Daiichi plant. It's essential that we identify them correctly and  
20 respond to them effectively. This meeting, I expect, will be the first of many  
21 Commission meetings as we engage to understand the issues and address  
22 those issues to ensure the safety of U.S. nuclear power plants. And I look  
23 forward to working with my partners on the Commission to do so. Thank you.

24 CHAIRMAN JACZKO: Thank you, Commissioner Magwood.  
25 Commissioner Ostendorff.

1                   COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. This  
2 is a vitally important meeting for the Commission and the country. I want to join  
3 my colleagues in extending my personal sympathies to the people of Japan. The  
4 consequences and loss of life in the earthquake and tsunami are simply  
5 devastating. Our thoughts and prayers are with all. I'd like to commend the  
6 Chairman, the Executive Director for Operations and the NRC staff for their  
7 efforts to date in supporting the NRC's monitoring assistance associated with  
8 these events. I appreciate the hard work ongoing 24/7 at the Op Center for the  
9 last 11 days. Along with my other colleagues here at this table, I've been very  
10 impressed with the technical competence and professionalism demonstrated by  
11 the NRC staff. I'm also grateful for the highly competent team of NRC detailees  
12 dispatched to Japan. While dismayed by this tragedy as a Commissioner, I am  
13 also extraordinarily proud of the commitment and professionalism of our team.  
14 The events that have unfolded at the Daiichi plant over the last 11 days are stark.  
15 On one hand, I believe that our existing licensing and oversight activities assure  
16 us that our commercial nuclear power plants in this country are safe. On the  
17 other hand, I know that we must, and that we most certainly will, conduct a  
18 thoughtful and rational examination of the NRC's regulatory framework with the  
19 information and lessons learned resulting from the incidence in Japan. As we  
20 head down this path together, I know this Commission will stay mindful of the  
21 challenges that face us. As stated by Chairman Jaczko several times in the last  
22 week and again today as echoed by the Commissioners, I fully support his call  
23 for a systematic and methodical review. We must also do this in a way that  
24 clearly communicates to the American people what this review means and what it  
25 implies for the safety of our existing nuclear power plants. Thank you.



1 CHAIRMAN JACZKO: Well thank you everyone. With that, we will  
2 turn it to Bill Borchardt, the Executive Director for Operations for the presentation.

3 MR. BORCHARDT: Thank you, and good morning. I would like to  
4 join in your expressions of condolences to the people of Japan. I and many of  
5 my colleagues on the NRC staff have had many years of very close and personal  
6 interaction with our regulatory counterparts and we would like to extend our  
7 condolences to them.

8 We are mindful of our primary responsibility to ensure the public  
9 health and safety of the American people. We have been very closely monitoring  
10 the activities in Japan and reviewing all available information to allow us to  
11 conclude that the U.S. plants continue to operate safely. There has been no  
12 reduction in the licensing or oversight function of the NRC as it relates to any of  
13 the U.S. licensees. Contributors to the conclusion that the current fleet of  
14 reactors and materials licensees continue to protect the public health and safety  
15 are based on a number of principles, including the Defense in Depth.

16 The fact that every reactor in this country is designed for natural  
17 events based upon the specific site that that reactor is located, that there are  
18 multiple fission product barriers, and that there are a wide range of diverse and  
19 redundant safety features in order to provide that public health and safety  
20 assurance. We have a long regulatory history of conservative decision-making.  
21 We've been intelligently using risk insights to help inform our regulatory process,  
22 and we have never stopped to make improvements to the plant design as we  
23 learn from operating experience over the more than 35 years of civilian nuclear  
24 power in this country. Some have been derived from lessons learned from  
25 previous significant events, such as Three Mile Island. We have severe accident

1 management guidelines, revisions to the emergency operating procedures,  
2 procedures and processes for dealing with large fires and explosions, regardless  
3 of the cause. We have a station blackout rule. We have a hydrogen rule for  
4 reactors and many others which I'll go into in a little more detail later.

5           But all of these relate in one way or another to the tragic events in  
6 Japan. In addition to all that we've done in the NRC and over the last week and  
7 a half and over the many years as I alluded to on rulemaking type activities, the  
8 industry is also performing many verification activities at this time to verify that all  
9 of these processes and procedures and rules that have been implemented are  
10 still valid. From a very high level, the NRC response centered from the  
11 Operations Center here in Rockville as well as the NRC team that's in Japan  
12 focuses on three major areas. The first is to support the Japanese government  
13 and our regulatory counterpart, NISA. Second is to gather information and  
14 assess that information for implications on the U.S. facilities. And the third is to  
15 support the U.S. ambassador in Japan with a level of nuclear expertise that the  
16 NRC is perfectly positioned to do. We are in fact mobilized to support the US  
17 government in responding to this event.

18           Notwithstanding the very high level of support, we continue to  
19 maintain our focus on our domestic responsibilities. And finally as my last point  
20 of introduction, we do not expect the releases of radioactive material that have  
21 occurred in Japan to have any effect on the health and safety of the U.S.  
22 population.

23           The next slide shows the agenda for this meeting. Given the time  
24 constraints, it'll be a relatively high overview of activities but the room has a  
25 healthy number of NRC staff that are available to explore any questions and

1 answers that you may have later. I'll now move to, let's say, a brief overview of  
2 the events.

3           On Friday, March 11th an earthquake hit Japan, resulting in the  
4 shutdown of more than 10 reactors. To our understanding, the reactors'  
5 response to the earthquake went according to design. There is no known  
6 problems to our knowledge with the response to that event. The ensuing  
7 tsunami, however, caused the loss of emergency AC power to six units at the  
8 Fukushima Daiichi site; and it's those six units that have received the majority of  
9 our attention since that time. Units One, Two, and Three, at that six unit site,  
10 were in operation at the time. Units Four, Five, and Six were in previously  
11 scheduled outages.

12           Immediately after the tsunami, there appeared that there was no  
13 injection capability into the reactor vessels on Units One, Two, and Three. On  
14 Saturday, March 12th, a hydrogen explosion occurred in Unit One; and then the  
15 following Monday, March 14th, a hydrogen explosion in Unit Three. On the 15th  
16 of March, on Tuesday, there were explosions in Unit Two and in Unit Four from  
17 hydrogen originating from, we believe, overheated fuel in the spent fuel pool.

18           At this time, it's our assessment that it's likely that Units One, Two,  
19 and Three have experienced some degree of core damage. Today, all three  
20 units appear to be in a stable condition, with seawater injection being used to  
21 keep the reactors cool. Containment integrity for all three units is also believed  
22 to have been -- is currently maintained. Grey smoke has emitted from Unit  
23 Three, which is the cause of the site evacuation that's been reported this  
24 morning. The source of that smoke is unknown, although there is indication that  
25 there's been no increase in temperature or in radioactivity.

1           On a sign of some promising news, TEPCO has been able to bring  
2   offsite power onto the site from a nearby transmission line. It is now essentially  
3   at the border of Units One and Two. There's early indications that there may be  
4   cabling problems -- electrical cabling problems within the units. So I understand  
5   that they're now in the process of laying some temporary cables to some of the  
6   pumps and valves inside of Units One and Two. Over the next day or two they'll  
7   be doing the same thing for Units Three and Four. There's two diesel generators  
8   that are currently running and supplying power to Units Five and Six.

9           Moving to the NRC response: Shortly after 4:00 in the morning on  
10   Friday, March 11th, the NRC Operations Center made the first call, informing  
11   NRC management of the earthquake and the potential impact on U.S. plants.  
12   We went into the monitoring mode at the Operations Center and the first concern  
13   for the NRC was possible impacts of the tsunami of U.S. plants on the West  
14   Coast.

15           On that same day, Friday, March 11th, we dispatched two experts  
16   to Japan to help at the embassy and begin interactions with our Japanese  
17   regulatory counterparts. By Monday, we had dispatched a total of 11 staff to  
18   Japan. As I said, the areas of focus for this team of 11 is to support the  
19   Japanese government and respond to requests from our regulatory counterpart,  
20   NISA, to support the U.S. ambassador and his understanding of the nuclear  
21   impacts of this event, and then third to help the information flow from Japan to  
22   the U.S. NRC so that we could assess the implications on the U.S. fleet in as  
23   timely a manner as possible.

24           We've had an extensive range of stakeholders that we've had  
25   constant interaction with, ranging from the White House, Congressional staff, our

1 state regulatory counterparts, a wide range of other federal agencies, and of  
2 course the international regulatory bodies around the world.

3 Our ongoing NRC response is that the NRC Operations Center  
4 remains in a 24/7 posture. This has involved the efforts of over 250 NRC staff on  
5 a rotating basis. In addition to the people that are staffing the Operations Center,  
6 there is hardly a person amongst the 4,000 people in this agency that aren't in  
7 one way or another contributing to the response, whether it's through information  
8 technology needs for the people in Japan, or the Region IV staff in Texas, which  
9 is backing up for the operations officers in our Operations Center to help maintain  
10 an information flow on the currently operating reactors in this country. The entire  
11 agency is coordinating and pulling together in response to this event so that we  
12 can provide the assistance in Japan and not miss any of our normal activities  
13 regarding domestic responsibilities.

14 In addition, we remain aware of U.S. industry efforts to provide  
15 assistance with their counterparts in TEPCO in Japan.

16 The U.S. Government has an extensive network of radiation  
17 monitors across the country. EPA's system has not identified any radiation levels  
18 of concern in this country. In fact, natural background from things like the rock --  
19 from rocks, sun, buildings, is 100,000 times more than any level that has been  
20 detected to date. We feel confident in our conclusion that there is no reason for  
21 concern in the United States regarding radioactive releases from Japan.

22 I'd like to focus for a few more minutes on the factors that go into  
23 assuring us of domestic reactor safety. We have, since the beginning of the  
24 regulatory program in the United States, used a philosophy of Defense-in-Depth,  
25 which recognizes that the nuclear industry requires the highest standards of

1 design, construction, oversight, and operation, but even with that we will not rely  
2 on any one level of protection for the entire purposes of protecting public health  
3 and safety. So the designs for every single reactor in this country take into  
4 account the specific site that that reactor is located and does a detailed  
5 evaluation for any natural event such as earthquakes, tornadoes, hurricanes,  
6 floods, tsunami, and many others.

7           In addition, there are multiple physical barriers to fission product  
8 release at every reactor design. And then in addition to that, there are both  
9 diverse and redundant safety systems that are required to be maintained  
10 operable and frequently tested by NRC regulations that ensure that the plant is in  
11 a high condition of readiness to respond to any scenario.

12           As I mentioned earlier, we've taken advantage of the lessons  
13 learned from previous operating experience, one of the most significant in this  
14 country, of course, being the Three Mile Island accident in the late 1970s. As a  
15 result of those lessons learned, we've significantly revised the emergency  
16 planning, the emergency operating procedures. Many human factors issues as it  
17 relates to how control room operators operate the plant. We added new  
18 requirements for hydrogen control to help prevent explosions inside of  
19 containment and we also created requirements for enhanced indication of pumps  
20 and valves.

21           We have a post-accident sampling system that requires -- or that  
22 allows -- for the monitoring of radioactive material release and possible fuel  
23 degradation. And of course one of the most significant changes is after Three  
24 Mile Island we created the Resident Inspector Program, which has at least two

1 full time NRC inspectors on site that have unfettered access to all licensees'  
2 activities 24 hours a day, seven days a week.

3           Also as a result of operating experience and ongoing research  
4 programs, we have developed requirements for severe accident management  
5 guidelines. These are programs that perform the "what if" scenario. What if all of  
6 this careful design work, all of these important procedures and practices and  
7 instrumentation, what if that all failed? What procedures and policies and  
8 equipment should be in place to deal with the extremely unlikely scenario of a  
9 severe accident? Those have been in effect for many years and are frequently  
10 evaluated by the NRC inspection program.

11           As a result of the events of September 11, 2001, we did a similar  
12 evaluation, and identified important pieces of equipment that, if, regardless of the  
13 cause of a significant fire or explosion at a plant, we would have pre-staged  
14 equipment, procedures, and policies to help deal with that situation. All of these  
15 things are directly applicable to the kinds of very significant events that are taking  
16 place in Japan. Over the last 15 or 20 years, there's been a number of new  
17 rulemakings that directly relate to Japan. There's a station blackout rule that has  
18 required every plant in the country to analyze what the plant response would be if  
19 it were to lose all alternating current so that it could respond using batteries for a  
20 while, and then have procedures and arrangements in place in order to restore  
21 alternating current to the site, and provide cooling to the core.

22           As I mentioned earlier, there's a hydrogen rule, which requires  
23 modifications to reduce the impacts of hydrogen generated for beyond-design  
24 basis events and core damage. There's equipment qualification rules that  
25 require equipment, indication equipment, as well as pumps and valves, to remain

1 operable under the kinds of environmental temperature, radiation conditions that  
2 you would see under a design basis accident. And then, going directly to the  
3 type of containment design that the plants in Japan of highest interest have,  
4 we've had a Mark I Containment Improvement Program since the very late  
5 1980s, which had installed hardened vent systems for the containment cooling  
6 and fission product scrubbing for all BWR Mark I's, as well as enhanced reliability  
7 of the automatic depressurization system.

8 I also mentioned earlier that we have emergency preparedness and  
9 planning requirements that provide ongoing training, and testing, and evaluations  
10 of emergency preparedness programs, in coordination with our federal partner,  
11 FEMA. And that entails extensive interaction with state and local governments,  
12 as those programs are evaluated and tested on a yearly basis.

13 Over the near term, the NRC activities are -- we will -- concurrent  
14 with the event evaluation that we're doing through the Operations Center and the  
15 team that's in Japan, we will be enhancing inspection activities through  
16 temporary instructions to our inspection staff, including the resident inspectors  
17 and the region-based inspectors in our four Regional offices, to look at the  
18 readiness to deal with both the design basis accidents and the beyond-design  
19 basis accidents.

20 We've already issued an information notice to the licensees to  
21 make them aware of the events, and what kinds of activities we believe they  
22 should be engaged in, to verify their readiness. And then we, every single day,  
23 assess whether or not there is some additional regulatory action that needs to be  
24 taken immediately, in order to address the information that we have, to date. The  
25 temporary inspection I've referred to is verifying that the capabilities to mitigate



1 conditions that result from severe accidents, including the loss of significant  
2 operational and safety systems, are in effect and operational. They're verifying  
3 the capability to mitigate a total loss of electric power to the nuclear plant.  
4 They're verifying the capability to mitigate problems associated with flooding, and  
5 the impact of floods on systems both inside and outside of the plant. And they're  
6 identifying the equipment that's needed for the potential loss of equipment due to  
7 seismic events appropriate for the site, because each site has its own unique  
8 seismic profiles.

9           The information that we gather from this temporary inspection will  
10 be used to evaluate the industry's readiness for similar events, and aid in our  
11 understanding of whether additional regulatory actions need to be taken in the  
12 immediate term. For a near term effort, we are beginning, very soon, a 90 day  
13 effort, that will evaluate all of the currently available information from the  
14 Japanese event, and look at it to evaluate our 104 operating reactors' ability to  
15 protect against natural disasters, to evaluate the response to station blackouts,  
16 severe accidents and spent fuel accident progression, look at radiological  
17 consequence analysis, and also look at severe accident management issues  
18 regarding equipment.

19           I expect that, coming out of this, we'll have the development of  
20 some recommendations for generic communications, either to make sure that the  
21 industry has a broad understanding of the events and the issues, as best we  
22 understand them. But also, as I mentioned earlier, that we would evaluate  
23 whether or not some regulatory action, perhaps in the framework of an order,  
24 would be required, in order to require the licensees to take some actions that  
25 they have not already done. I expect that this 90 day effort will include a Quick

1 Look 30 day report to the Commission, and of course we stand ready to brief the  
2 Commission as you desire.

3           In order to accomplish this Quick Look report, I think we will have  
4 limited stakeholder involvement in this activity, and that it will be done  
5 independent of industry efforts that might be ongoing. The idea is to just get a  
6 quick snapshot of the regulatory response and the condition of the U.S. fleet  
7 based on whatever information we have available. You know, I recognize that  
8 we have limited information now. More and more information will become  
9 available to us as we go along. But we wanted to do at least this Quick Look  
10 report, beginning very soon. And of course, consistent with the Commission's  
11 practices, the results of this report will be made public.

12           On the longer term, we'll be developing lessons learned that are  
13 somewhat dependent on when we begin to get a better understanding of the  
14 events and the results of the earthquake and tsunami in Japan. So, to some  
15 degree, it's difficult to precisely state when the start date for this longer-term  
16 review will begin. The review may include the involvement of other federal  
17 agencies, but it will certainly include interaction with those other federal agencies,  
18 because there's, obviously, the issue of emergency preparedness is a prime  
19 example of where we would interact with FEMA to have an effective review. And  
20 we would identify the lessons learned that need to be incorporated into any  
21 ongoing, long term agency action.

22           We'll evaluate all the technical and policy issues to identify  
23 additional research, or generic communications, changes to our reactor oversight  
24 program, potential new rulemakings, adjustments to the regulatory framework  
25 that should be conducted by the NRC. As I said, we'll evaluate inter-agency

1 issues, and also look for applicability to non-operating reactor facilities. I expect  
2 this longer-term report to have substantial stakeholder involvement, and the  
3 outcomes are likely to be along the lines of generic letters, bulletins, and potential  
4 rulemakings. So, in conclusion, I want to make it clear that we continue to make  
5 our domestic responsibilities of licensing and oversight of the U.S. licensees our  
6 top priority. There is an immediate short term and long term evaluations that are  
7 beginning, and that they will be influenced by our understanding of the events in  
8 Japan. With that, that concludes my presentation. I'm ready to answer any  
9 questions.

10           CHAIRMAN JACZKO: Well, thank you, Bill, for that very thorough  
11 presentation. We have a proposal in front of the Commission now to consider  
12 the options for the short term and the long term reviews, so we'll take a look at  
13 that and provide response in fairly short order. I would, again, just want to  
14 reiterate my thanks to the work that you and your team have done over the last  
15 several days, to deal with this situation, and the -- emphasize the importance of a  
16 systematic and methodical review, so that we do make sure that we approach  
17 these issues, and really get the facts, and make sure that we don't move in a  
18 direction that is based on early information, which often tends to be confusing,  
19 and sometimes conflicting. So I appreciate the work that you've done to this  
20 point. And I don't have any specific questions, at this time, but I would turn to  
21 Commissioner Svinicki to begin with some questions and comments.

22           COMMISSIONER SVINICKI: Thank you, Mr. Chairman, and thank  
23 you, Bill. I second the Chairman's comments about the tremendous efforts that  
24 you and all of the NRC staff members have made in supporting the agency's  
25 reaction to this event. There is a lot that we don't yet know, and so that becomes

1 a context, really, for the types of questions that we're able to ask about this event  
2 today. Very generally, I would ask you, in the staff's expert assessment, this  
3 morning, do you believe that the events occurring at Fukushima have stabilized,  
4 or is it reasonable to expect that events there will continue to be dynamic in the  
5 days and weeks to come?

6 MR. BORCHARDT: In my view, the fact that off-site power is close  
7 to being available for use of plant equipment is, perhaps, the first optimistic sign  
8 that we've had, that things could be turning around. We believe that the spent  
9 fuel pools on Units Three and Four, which had been two components that were  
10 of significant safety concern, that the situation there is stabilizing, that the  
11 containment in three, all three Units One, Two, and Three appear to be  
12 functional, and that there's water being injected into the reactor vessels in Units  
13 One, Two, and Three.

14 So I would say optimistically, things appear to be on the verge of  
15 stabilizing. This has been a very challenging event for us to understand the  
16 exact situation, because, as was alluded to, the information is sometimes  
17 conflicting, it's certainly not at the level that any engineer would like to have in  
18 order to do a thorough analysis, so we've spent a lot of the time trying to piece  
19 together our best understanding. But that would be my personal assessment of  
20 the situation on site now.

21 COMMISSIONER SVINICKI: Is it fair to say from that, then, that,  
22 based on what we understand now of the needs that most urgently need to be  
23 addressed there at the site, that those are being addressed, and that they have  
24 the status that you just described to me? Those are, of course, the items of  
25 highest interest. But it sounds also like, in the days and weeks to come, we will

1 certainly discover other conditions and things at the site, of perhaps a lower level  
2 of priority that we just don't know about right now.

3 MR. BORCHARDT: Yes. The radiation releases and the dose  
4 rates that we've seen on site, I think, were primarily influenced by the condition of  
5 the Units Three and Four spent fuel pools. And the water inventory questions of  
6 whether or not there was some fuel that was uncovered in the spent fuel pool  
7 was of significant concern. TEPCO, the licensee, and the Government of Japan  
8 have been making a concerted effort to address those issues. So that we're  
9 aware of.

10 I don't believe we have anywhere near a clear understanding of  
11 what the plant conditions are like within the reactor buildings. So, what kinds of  
12 electrical cabling has been damaged, what kinds of pumps and valves remain  
13 operable, is a significant unknown right now.

14 COMMISSIONER SVINICKI: Okay, thank you. You gave a very  
15 high level chronology of the events that occurred, as we know them. And it really  
16 ends up being a narrative of three events that are related to each other. First, of  
17 course, being the earthquake, the seismic event. Second, the tsunami, or, as we  
18 might have it in the United States, a flood surge, or some other flooding event,  
19 followed by the loss of power.

20 In terms of what we know now, and given that there are these three  
21 events in succession, do you think that our regulatory focus right now, for the  
22 review we're doing, is where it needs to be?

23 MR. BORCHARDT: Yes, I'm quite confident. We've looked at all of  
24 the information that we're getting from Japan. We've looked at the design basis  
25 for the U.S. reactors. We continue with the inspection program, and we have a

1 high degree of confidence that the 104 currently operating reactors, there's an  
2 adequate basis to assure adequate protection.

3 COMMISSIONER SVINICKI: Thank you. There's been some  
4 discussion of what we call Generic Safety Issue 199. And Generic Safety Issues,  
5 that's a program that we have at NRC for the continual evaluation of various  
6 safety-relevant issues. Could you talk a little bit about the ongoing nature, this is,  
7 Generic Safety Issue 199, was ongoing prior to the event in Japan. Could you  
8 talk about what was occurring there, and how the events in Japan may alter how  
9 we approach that generic safety issue, going forward?

10 MR. BORCHARDT: Occasionally, I think it's every five years or so,  
11 the USGS does a review of information which impacts the U.S. Government's  
12 understanding of seismic frequencies and issues associated with seismic.  
13 Recently they put out a report that talked about the seismic information for the  
14 East, the Central and Eastern United States. That information has been given to  
15 the industry. There's now both industry and NRC evaluation of that information  
16 to see if this new information, and in some places it's an increase in the  
17 frequency, expected frequency of a seismic event, would cause us to have to  
18 change the seismic design basis for the plants.

19 We did a, as we do every time we get any kind of new information,  
20 seismic or otherwise, we do a quick look to make sure that we don't believe  
21 there's any immediate information or any immediate need to take any regulatory  
22 action. If there was, we would certainly do that through the immediate imposition  
23 of new operating guidelines, or new systems, or potentially, even, requirement to  
24 shut the reactor down, until the issue was addressed.

1                   In this case, we did that review. We found no reason to take any  
2 immediate regulatory action. And so this is an ongoing review. I don't believe  
3 that what we've learned from Japan would cause a different type of analysis. It  
4 certainly puts a broader, brighter spotlight on the work we're doing, and that  
5 follow-up. But I'm confident that the approach we've been on is the right  
6 approach.

7                   COMMISSIONER SVINICKI: You described our role in the inter-  
8 agency response, and NRC-specific actions. Are we cognizant of, and working  
9 to understand and make sure that our efforts do not conflict with, any industry-to-  
10 industry systems that is going on? I'm not aware of Tokyo Electric Power  
11 reaching out to the U.S. nuclear industry, or nuclear utilities, since this is a  
12 technology that we have in the United States. Do we maintain a cognizance of  
13 that so that we can make sure that all efforts are coordinated?

14                  MR. BORCHARDT: We are aware that the industry-to-industry  
15 interaction has been ongoing at one level. Of course, there's many vendors and  
16 companies in the United States that have had ongoing business relationships  
17 with TEPCO, and the other generating companies in Japan. So at the working  
18 level, it has been going on ever since the event, and prior to the event.

19                  At a higher, coordinated industry-level, I would say we are still in  
20 the formulative stages of that interaction. We have had some discussions with  
21 the industry, U.S. industry, it's still evolving. So we're cognizant of what's going  
22 on, and trying to help, in a U.S. government role, facilitate the contacts, if you  
23 will, between the U.S. and the Japanese companies, in any way that we can.  
24 Because we think it would certainly be a potential benefit to TEPCO.

1                   COMMISSIONER SVINICKI: Thank you. And my last question to  
2 you is that, you mentioned our ability to issue very rapidly various types of  
3 generic communications to the industry, and in your prepared remarks you talked  
4 about the fact that we had already issued, I believe last week, an information  
5 notice. Could you describe generally, in that notice, what are we alerting the  
6 U.S. reactors to?

7                   MR. BORCHARDT: Well, the main purpose, from my perspective,  
8 and I might ask NRR to supplement my answer if I'm not quite complete, was to  
9 have a regulatory follow-up on the activities that we understand the industry has  
10 taken on their own to verify that the plant procedures and equipment for severe  
11 accidents, for the types of things I discussed that came out of the 9/11 event: that  
12 all of those pieces of equipment, temporary hoses, fittings, procedures, that all  
13 those things are, in fact, still in place, that the operators are cognizant of them,  
14 that they've been trained for whatever reason, to make sure that they haven't  
15 fallen into disuse because they haven't been used.

16                   So it was really a regulatory verification that the industry's initiatives  
17 on this front have, in fact, been taken, and that we will be following up on the  
18 results of those assessments, and doing our own sampling check, as we always  
19 do.

20                   COMMISSIONER SVINICKI: Okay, and so those were the items,  
21 based on what we know now, that we identified as being of the highest interest,  
22 at least in the immediate term, okay?

23                   MR. BORCHARDT: Yes.

24                   COMMISSIONER SVINICKI: Thank you. Thank you, Mr.  
25 Chairman.



1 CHAIRMAN JACZKO: Did you have any other questions?

2 Commissioner Apostolakis.

3 COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman. Bill,  
4 you mentioned that the -- well, first of all, we know that there is a number of Mark  
5 I BWRs in the United States, which is the same design as those in Fukushima.  
6 But you also said that in the recent past we hardened the venting valves of the  
7 containment. Have the Japanese done this?

8 MR. BORCHARDT: That, we're not clear on. I'm not sure; I can't  
9 really answer that question.

10 COMMISSIONER APOSTOLAKIS: I guess the question is, if they  
11 had done it, would that have affected the accident? And in what way?

12 MR. BORCHARDT: Well, it would not have affected the loss of off-  
13 site power, which is, right, the initiator. The hydrogen explosion aspect, though,  
14 possibly, is where the hardened vent would happen. There's two vent paths off  
15 of the U.S. Mark I containments. The preferred vent path takes suction, if you  
16 will, or has a release path from the airspace above a pool of water that's in the  
17 basement, it's in the torus of the Mark I containment, and that would allow for the  
18 steam that went into the torus to be scrubbed of fission products, so you would  
19 have a release; it would relieve the pressure, which is the main objective of the  
20 vent, is, you want to maintain the containment integrity. And it's preferable to  
21 vent it on purpose to get the pressure so that you don't have a catastrophic  
22 failure of the containment.

23 And so that release path is exterior to the plant. So it's at least my  
24 belief that you wouldn't have the hydrogen accumulation in the upper levels of  
25 the reactor building, which we believe is the cause of the explosions. Now, the

1 spent fuel pools on these designs are also on that same level, on the upper level  
2 of the reactor building. So it's, the hardened vent wouldn't do anything to help  
3 hydrogen that came from the spent fuel pool

4 COMMISSIONER APOSTOLAKIS: I see, okay. Now you also  
5 mentioned that we have extra equipment for beyond-design basis accidents that  
6 were installed, so-called B.5.b that were installed after the September 11  
7 attacks. Did the Japanese have any of those?

8 MR. BORCHARDT: Again, I'm not sure. I -- really, we're trying to  
9 get information, but I am not personally aware of the situation in Japan.

10 COMMISSIONER APOSTOLAKIS: Okay. Thank you. Some  
11 people are asking why did the Germans shut down their plants, or some plants,  
12 after the accident, and we did not? Are we less prudent than the Germans?

13 MR. BORCHARDT: No, I am not aware of the basis for the  
14 German decision to do that. I'm 100 percent confident in the review that we've  
15 done, and we continue to do every single day, that we have a sufficient basis to  
16 believe, to conclude that the U.S. plants continue to operate safely. So I -- we've  
17 asked ourselves the question every single day: Should we take a regulatory  
18 action based upon the latest information? And, because of the kinds of things  
19 that I outlined in my presentation, we have not reached the conclusion.

20 COMMISSIONER APOSTOLAKIS: Thank you. Now, of course,  
21 the seismic risk is at the forefront of the news. And we hear that -- well, first of  
22 all, our press releases emphasize that the seismic design is based on the  
23 horizontal ground acceleration at the plant. But, of course, most people think in  
24 terms of the Richter scale. And also we hear that the earthquake of magnitude 9  
25 at Fukushima had not been anticipated.

1                   Now, we say that in the United States, we design the plants by  
2 looking at the historical record, and then by, we add margins. Now I understand,  
3 or believe, that the strongest earthquakes in the United States have occurred  
4 east of the Rocky Mountains in the 1800s, and the magnitude was between 7  
5 and 7.7 on the Richter scale, something like that. So immediately you get the  
6 question, then, yeah, okay, you design against those, but look at Japan: What if  
7 you had an earthquake of magnitude 9? How does one answer that question? I  
8 mean, you can always ask, what if an earthquake of 9 and a half occurred. I  
9 mean, is there a rational way of addressing that?

10                   MR. BORCHARDT: Well, my explanation is one that I know you  
11 understand this, but we look at faults around the U.S., we have that information.  
12 We look at the historical record, look at what the maximum earthquake has been,  
13 and then, as with everything we do, we add margins. But we also look at the  
14 specific location in relation to the fault, and consider the kinds of soil and rock  
15 formations that are between the fault location and the site, and do an analysis to  
16 see what is the ground motion that would actually be seen at this site. And we  
17 design for an earthquake of a certain size, or a, you know, I'm falling into the trap  
18 of saying "an earthquake of a certain size", of a ground motion of a certain  
19 magnitude.

20                   But then, having said that, all of these other things: severe accident  
21 management guidelines, the B.5.b procedures, we have programs in place,  
22 equipment in place, that says, even if we were wrong, and the plants suffered  
23 this kind of serious event, we have, in fact, the activities, the equipment, ready,  
24 and practiced to respond to protect public health and safety. So I don't know if I

1 should throw a seismic lifeline here, if you wanted to get into any more detail on  
2 seismic issues.

3 CHAIRMAN JACZKO: And just say your name.

4 ANNIE KAMMERER: Thank you. My name is Dr. Annie  
5 Kammerer, I'm in the Office of Research. I think I'd like to make a couple of  
6 points. The first point is related to the ground motion in Japan. Recently, starting  
7 in 2006, the Japanese regulatory agency performed a study in which they looked  
8 at increased hazard, perception of hazard at the plants. And recently themselves  
9 did a reevaluation of the impact that potential increased hazard at the facilities,  
10 and actually were in the middle of this when this event occurred. As a result, a  
11 number of modifications were made to the plants.

12 At this point, it's not clear exactly what modifications the Fukushima  
13 plant had already had implemented. However, the ground motions for which the  
14 plant was reevaluated, is about .62G; the original design basis was about .37G.  
15 Based on the preliminary information that we have, .62G is in the range of the  
16 ground motions that were actually experienced by the plant, although they came  
17 from a different earthquake than was anticipated. The ground motions that, for  
18 which the plant was assessed, was a 7.1, very close to the plant. That's what  
19 produced the ground motions of 6.2.

20 So, one thing that we believe is that the ground motions at the  
21 plant, even though it was a different event, were not out of the range that they  
22 had already considered. It's less clear with regard to the tsunami. Currently, the  
23 Japanese Society of Civil Engineers is finalizing guidance, probabilistic tsunami  
24 hazard assessment guidance for Japan. And it was anticipated that the  
25 Japanese regulator would do a similar study for a tsunami hazard assessment at

1 the plants once that was completed. Unfortunately, because the guidance has  
2 not yet completed, it's not believed that they initiated that work.

3           So just to clarify, that even though this particular event was larger  
4 on the subduction zone than was anticipated, it probably didn't greatly exceed the  
5 ground motions. The one exception to that may be in the long period range.  
6 Because if you have a larger amount farther away, you get more long period  
7 content than would be anticipated from a 7.1 close in. The second question, or  
8 the second point is in regard to a seismic hazard in the United States. As was  
9 mentioned, we are undertaking a program, Generic Issue 199, which is looking at  
10 the potential impact to assess risk, given a perceived increase in the ground  
11 motion hazard in the Central and Eastern U.S., which was initiated by the new  
12 USGS seismic hazard mapping work that was done. And it's important to note  
13 that when the modern analysis techniques that are used are probabilistic  
14 techniques, those are the basis of the maps, and they account for basically all  
15 sources and the potential for all the different magnitudes that are capable of  
16 those sources, up to and including maximum magnitude events which, in many  
17 cases, exceed that which we have seen in the historic record. It was mentioned  
18 that the largest, the most widely-felt earthquakes in the U.S. were the 1811-1812  
19 New Madrid events, which we currently believe were about a magnitude 7. And  
20 yet, we do look at, particularly in portions of the crust of a potential for exceeding  
21 that. Of course, we also account for the likelihood that that event occurs. And  
22 that also accounts for background seismicity, which is common in the east, which  
23 is seismicity which cannot be attributed to a specific fault.

24           In fact, it's important to note that seismicity in the Central and  
25 Eastern U.S. tends to be in what we call seismic zones, which are not directly

1 attributable to a fault. And we account for all of the hazard in the seismic zones.  
2 One of the questions which has come up repeatedly is, how many plants are  
3 near faults? Or, how many plants are in moderate or high seismicity regions?  
4 And that's a very challenging question to answer, because these seismic zones  
5 are not well-defined boundaries. The faults that were the causative faults in the  
6 1811 and 1812 earthquakes have never been identified, in part because they're  
7 under a very deep -- the very deep sediments in the Mississippi region. And so  
8 we have to account for the uncertainty in the location, we have to account for the  
9 uncertainty involved in the maximum magnitudes. And all of that is incorporated  
10 in the hazard analyses that we undertake.

11           The Generic Issue Program is using the most state-of-the-art types  
12 of analyses, which do look at earthquakes, and include earthquakes beyond the  
13 design basis. So, in that way, we directly account for those potential sources and  
14 those potential earthquakes, which are not under our current licensing basis.  
15 And we're currently assessing the risk from the possible beyond-design basis  
16 events.

17           CHAIRMAN JACZKO: Well, thank you for that, Annie.  
18 Commissioner Apostolakis, did you have additional comments or questions?

19           COMMISSIONER APOSTOLAKIS: Yeah, I'd like to make one  
20 comment and then ask my last question. Annie mentioned several times,  
21 probabilities, even after we do the probabilistic analysis, we still have Defense in  
22 Depth in mind, which is the current way of looking at things. So it's not just, what  
23 is the most likely event that we anticipate, we always ask that question that Mr.  
24 Borchardt mentioned: what if we are wrong? And we take additional measures.

1 So I think that's very important, for people to understand it. Because, you know,  
2 probabilities, sometimes, are easy to attack.

3 One last question, thank you Annie. As you mentioned, the  
4 damage in Fukushima was not really caused by the earthquake; it was the  
5 tsunami that came afterwards. So the question now is: when we license our  
6 plants here, are we considering this one-two punch? Are we considering an  
7 earthquake followed by a tsunami, as appropriate? Or a major fire, or a flood,  
8 because tanks holding water fail? Because this secondary event seems to be,  
9 now, very important, and we have to account for it. So how are we approaching  
10 this issue in the United States?

11 MR. BORCHARDT: Well, the design basis includes many different  
12 analyses. I would just say one thing about the earthquake in Japan. We don't  
13 know what the impacts of the earthquake are inside of the reactor buildings,  
14 specifically, that's where most of the equipment of interest to us would be  
15 located. It may have survived perfectly well, and stayed perfectly functional, or  
16 there may be damage that we just don't know about. So we need to see what  
17 the inspection results are, once they have access to the plant.

18 But our reviews for the U.S. include, it's always very site-specific.  
19 So, you know, for earthquakes, if they are in a very soft soil environment, there's  
20 not a very challenging review that's required, or analysis that's required on  
21 earthquakes. But it might be that you need a storm surge for a hurricane, or a  
22 storm surge for a tsunami. But there are multiple -- you don't take every possible  
23 current event and pile them all together into one event. So it's done more on an  
24 event by event basis, so I don't know if --

25 COMMISSIONER APOSTOLAKIS: [inaudible] or something else?

1 CHAIRMAN JACZKO: Well, I think that, and Eric, maybe you could  
2 just answer the question. I think it's, more generally, how do we -- do we  
3 consider separate design basis events -- do we consider design basis events  
4 separately, or do we consider all design basis events simultaneously on a plant?

5 MR. LEEDS: Eric Leeds, Director of the Office of Nuclear Reactor  
6 Regulation. As Bill mentioned, we take into account whatever natural  
7 phenomena could occur at a particular site, whether it's a hurricane, a tsunami,  
8 an earthquake, a tornado, what have you. And we have them analyzed site-  
9 specifically. Now, I'm not exactly sure if I understand the question directly. Are  
10 you asking, a seismic event followed by a tsunami? Well, I know that we  
11 analyzed for a tsunami, we analyzed for the maximum storm surge, as Mr.  
12 Borchardt mentioned, and also what kind of a run-out would happen. Typically,  
13 tsunamis are triggered by an earthquake. So, one or the other, we would  
14 analyze for that. And we've done that for our plants on the coast.

15 COMMISSIONER APOSTOLAKIS: Thank you, Mr. Chairman.

16 CHAIRMAN JACZKO: And I would just echo, I think, Bill's  
17 comments. We are at a very early stage now, too, and detailed information, it's  
18 probably going to be some time until we have it. And so exactly the impacts of  
19 the tsunami and/or the earthquake and what their effects on the plant were will  
20 probably still take some time to understand. Commissioner Magwood?

21 COMMISSIONER MAGWOOD: Thank you. Good morning, Bill.

22 MR. BORCHARDT: Good morning.

23 COMMISSIONER MAGWOOD: Did you get some sleep this  
24 weekend.

25 MR. BORCHARDT: Not much.



1           COMMISSIONER MAGWOOD: Not much? I'm sorry. You'll get  
2 there at some point. There's been a lot of discussion in the media about -- that  
3 compares what's happening in Japan to Three Mile Island. And I, as I look at  
4 this, and again, we're so early in this, I tend not to think as much about Three  
5 Mile Island as I do 9/11. And one reason I think about that is because it seems  
6 to me that there are, certainly, a lot of lessons learned, a lot of technical details  
7 we'll have to sort out over time. But I wondered, also, whether, as in the case of  
8 9/11, is there a major conceptual "Ah-ha!" that's sitting out there in front of us?  
9 And I want to make sure we don't miss that forest while we're looking at all these  
10 trees.

11           And in the case of 9/11, it wasn't just simply, you know, that we  
12 need to do a better job protecting, you know, airplane cockpits, and lots of other  
13 security upgrades. It was a conceptual "Ah-ha!" that the threat is a lot different  
14 than we thought it was. Do you, as you look at this at this early stage, do you  
15 see a bigger message out there that we should be thinking about?

16           MR. BORCHARDT: I don't see a significant weakness now, but  
17 that's why we need to do this Quick Look review. And my personal view is that  
18 what we need to do is take some very experienced people that are both within  
19 the staff, and maybe take some even recently retired people that have expertise  
20 in the broad areas of design review and licensing, and let them just focus on the  
21 question of, is there something here that causes us to question these, the way  
22 we've applied Defense in Depth, and being risk-informed, and the various  
23 barriers of radiation release protection, and those kinds of things, and evaluate  
24 whether or not there's something different that needs to be done.

1           It hasn't actually occurred to me, if anything, it's given me a bit of a  
2 confidence, if you will, that all of those redundancies, and all of our processes,  
3 are paying off. I mean, it was maybe in the view of some stakeholders overly  
4 conservative, the way we've approached it, but I think we're seeing the value and  
5 the benefit of that approach that we've used for the last 35 years.

6           COMMISSIONER MAGWOOD: I appreciate that, and I agree with  
7 it. Let me give you some, just sort of, thoughts about where I think there might  
8 be some larger issues to think about. And that is, in looking at, as we've  
9 described them, again, we don't know all the details yet. But we do have the  
10 sense that the plant seemed to survive the earthquake. And we do have the  
11 sense that the tsunami's disabling of the backup power systems led to the  
12 situation that followed. But even beyond that, there's the fact that there was so  
13 much difficulty in bringing resources to the plant to recover from that situation.

14           When you look at our plants, we certainly have done things in B.5.b  
15 and other things to upgrade our ability to recover from site blackout; and we're  
16 going to be looking at those issues. But if you lose a lot of infrastructure, if you  
17 lose the ability to get to a site, if you lose hundreds of miles of transmission line,  
18 if you lose the ability to have rail transport, to move equipment around, that's  
19 something I don't know that there's been a lot of thought about.

20           And I wonder if you could reflect on that for a moment, because  
21 when I look at this event, I see a significant struggle over -- especially over the  
22 early part of this, to get the right resources to the plant to be able to recover from  
23 this accident. And even today, we still are struggling to hook up the AC power to  
24 Units One and Two, as you've described. When you think about this, and again  
25 we'll look at this in great detail as we go forward, do we even have the regulatory

1 scope to cover all the ground that needs to be covered, to assure that the  
2 infrastructure's in place to be able to recover from an accident like this?

3 MR. BORCHARDT: I think there's a couple levels that maybe I'd  
4 like to touch on in response to that question. The first is, and I have no idea what  
5 the situation is in Japan regarding their regulations and what they have in place,  
6 so I'm not implying whether they had it or didn't have these kind of things. But in  
7 the United States, I mentioned the station blackout rule, which is a rule that  
8 requires an analysis of what would happen at a plant and its coping strategy for  
9 dealing with a complete loss of all AC power. So that assumes that the diesels  
10 don't -- that you'd lose the transmission lines and the diesels don't start, and then  
11 they have to do an evaluation and it's a coping study, how they would be able to  
12 restore the plant. That has resulted in various approaches at different sites.  
13 Some have a gas turbine that is on the site that could be very quickly hooked up  
14 into the grid -- not into the grid, into the plant. There's others that have non-  
15 safety-related diesel generators. There are plants that have diesel fire-pumps so  
16 that there is a backup to a backup to a backup way to inject water into the core  
17 and into the spent fuel pool. So there's a regulatory construct that's required and  
18 mandated that type of activity.

19 From a U.S. Government perspective, coming out of 9/11, we had  
20 the Department of Homeland Security, which is positioned to orchestrate the  
21 entire federal response to an event of magnitude that, you know, you might be  
22 suggesting, that would happen so that the full resources of the U.S. Government  
23 would be able to use different resources to get temporary equipment to a site in  
24 order to provide electrical power, temporary diesel generators, that kind of thing.

25 And then the backstop for all of that, and I'm now leaving the kind of

1 federal regulatory requirement perspective, is that the U.S. industry, I think, is  
2 unique in the world, but also within industry in this country in that while on the  
3 one hand they're competitors, on the other hand they share operating  
4 experience, they have programs that they all contribute to, and they have an  
5 inventory of spare parts and equipment that can be very quickly brought to bear  
6 in responding to this kind of an event. So this is outside the regulatory purview, I  
7 want to make clear, but that is yet another backstop that would help a site that  
8 had a similar kind of problem respond to it in a quick and effective manner.

9           COMMISSIONER MAGWOOD: I appreciate that, and let me also  
10 echo your somewhat positive words about the industry. I think in this particular  
11 instance, actually, I think the industry in the U.S. and internationally has  
12 responded very, very well to this. I particularly congratulate INPO's efforts,  
13 through WANO, to work with international partners and also to take positive  
14 action here in the United States. I think they've done a good job, and I think NEI  
15 and others have worked together and I think individual companies have done a  
16 lot, so I congratulate the industry for reacting that way.

17           Let me move on to a little bit different subject. We've talked a little  
18 bit about hydrogen already this morning, and the measures we have to deal with  
19 hydrogen. Is it your understanding that all the hydrogen that led to the  
20 explosions came from the spent fuel?

21           MR. BORCHARDT: I wouldn't want to hazard a guess. It was  
22 certainly a likely source; whether it was all of it or not, I couldn't guess.

23           COMMISSIONER MAGWOOD: You've talked about this a little bit,  
24 but I want to give you a chance to sort of give a little bit more of a holistic

1 response to this. What measures are in place to prevent hydrogen from  
2 collecting and exploding in U.S. plants? Mark I's or others.

3 MR. BORCHARDT: Well, the hardened vent, of course -- the U.S.  
4 design approach is to protect the containment. It's to ensure the integrity of the  
5 containment, and if you can do that, even if you have fuel damage, then you can  
6 prevent the uncontrolled release of radioactive materials into the environment.  
7 And so this is -- Three Mile Island, for example, had core damage, a significant  
8 amount of core damage, yet the radiological releases were very limited from  
9 Three Mile Island, so there was negligible health effect from that accident. So  
10 hardened vents will allow the primary containment to stay intact and that's  
11 probably the single most important thing.

12 The other thing to maintain the containment is, for this particular  
13 design of containment, we've required, I think since the late 80s again, inerting of  
14 the containment. So it's filled with nitrogen, so if you don't have oxygen in the  
15 containment, even if you did have hydrogen in there, you're not going to have an  
16 explosion or a fire. So I think those are the two, probably the biggest ones, and I  
17 don't know if there's anything that we need to add.

18 COMMISSIONER MAGWOOD: Appreciate that. One more  
19 question, Mr. Chairman. Also to just give you a chance to clarify. I know there's  
20 a lot of chatter in the press over the weekend about the impact of 50-mile  
21 evacuation zones around U.S. nuclear plants. Could you sort of give the NRC's  
22 position on what the emergency planning requirements are, and why we're  
23 confident in what we have today? Can you please elaborate?

24 MR. BORCHARDT: We have, as part of the emergency  
25 preparedness construct in this country, a 10-mile emergency planning zone that

1 completely encircles every reactor plant in the country. That, in coordination with  
2 FEMA, who has an offsite emergency-preparedness role throughout the country,  
3 is routinely practiced. We have models that would do an analysis of what the  
4 release paths are; we take into account the meteorological conditions; and the  
5 NRC, I should be clear, the NRC does not make the recommendations regarding  
6 evacuation or any other protective action guidelines; that's the responsibility of  
7 the state government, so it would be the governor that would ultimately be  
8 making that decision. But we're in a position to provide independent assessment  
9 and advice to the governor in those kinds of circumstances.

10           The situation that led to the 50-mile guidance in Japan was based  
11 upon what we understood and still believe had existed, that there was degraded  
12 conditions in two spent fuel pools at the site, and in all likelihood some core  
13 damage in three of the reactor units. Based on the situation as we understood it  
14 at that time, we thought it was prudent to provide the recommendation to the  
15 ambassador to evacuate out to 50 miles in Japan. It was not based on the  
16 existing radiological conditions, but what at that time was a possibility. And so  
17 we thought it was the prudent, conservative suggestion. If those conditions  
18 existed in the United States, we would have made the exact same  
19 recommendation. But the idea that there might be some misunderstanding, that  
20 because we have a 10-mile EPZ, that would be the extent for what we would  
21 consider and what our emergency planning recommendations would be limited  
22 to, is not true at all. We would have done the exact same kind of analysis and  
23 gone through the same thought process to consider extending evacuation or  
24 whatever protective measures we thought were appropriate.

1 COMMISSIONER MAGWOOD: Thank you. Thank you, Mr.  
2 Chairman.

3 CHAIRMAN JACZKO: Commissioner Ostendorff.

4 COMMISSIONER OSTENDORFF: Thank you, Mr. Chairman. Bill,  
5 again I thank you for your leadership in this effort, and for the hard work and  
6 professionalism of your teams. It was helpful in your opening statement, where  
7 you talked about the history of the NRC post-Three Mile Island, post-9/11, as to  
8 what steps or additional measures were considered or in fact implemented; and  
9 so I think that history is very relevant to the near-term and longer-term efforts.  
10 Certainly there's Hurricanes: Andrew, Katrina that this country has faced. Also  
11 provide data points for various steps taken, whether they be specific to the  
12 nuclear field or external to the nuclear field. Does any of the experience from  
13 your career at NRC, do you have any significant lessons learned from the  
14 process, not the substantive technical details, but the process that was employed  
15 following these other significant events that would help inform the task force  
16 execution of its mission?

17 MR. BORCHARDT: Well I think it's very important that the task  
18 force keep the broad perspective of the regulatory framework that exists within  
19 the NRC, and the legal framework that exists within the United States. Because  
20 there is a temptation to, I think, try to pile in every good idea that exists into  
21 something that becomes unmanageable, and in the ultimate could actually end  
22 up being counterproductive to safety.

23 There was a degree of that, in my opinion -- this is only speaking  
24 my personal opinion -- after Three Mile Island, because when I started with the  
25 agency in 1983, we were still in the midst of following up the actions from the

1 Three Mile Island action plan. It was a NUREG-0737, and anybody who started  
2 in the NRC has that number burned into their brain because we spent enormous  
3 amounts of resources following up on those activities. Some of those fixes that I  
4 alluded to were absolutely instrumental in improving the safety in this country.  
5 Some were, I believe, if we had carried them all out, might have actually been  
6 counterproductive in a way, just not contributed to safety. They might have been  
7 a good idea in somebody's mind. So there needs to be -- after you go through  
8 the brainstorming and identification of all possible things to change, I think there  
9 needs to be a good evaluation, thorough evaluation, of what's the right thing to  
10 do, and in what kind of sequence and in what kind of timing.

11           COMMISSIONER OSTENDORFF: Okay. Well I'll just make two  
12 comments on that. One thing, just for information, you may be aware of this, but  
13 about a year ago the National Academies undertook a significant study for about  
14 9 or 10 federal agencies, to look at disaster resilience in this country, specifically  
15 from the context of inter-agency coordination, roles and responsibilities. But  
16 nothing there was, or to my knowledge is currently nuclear-specific. The extent  
17 of interagency coordination for various types of events in this country is a prime  
18 subject of that study. There may be some value in looking at that.

19           And refer to Commissioner Magwood's questioning on the  
20 transportation logistics support, which I completely agree have been issues here  
21 so far, in this particular response. One might take note of the Department of  
22 Defense's efforts, since the loss of the U.S.S. Thresher back in 1963. There's  
23 been a very operationally ready deep-submergence rescue vehicle, DSRV, on  
24 standby close to airplanes on the East and West Coast of the United States to  
25 provide a response. So other agencies, the point is, have gone through similar



1 analogues in looking at how they might deal with particular responses, and that's  
2 something just to note.

3           Also, kind of maybe staying a little bit on the big-picture historical  
4 nature of some of the prior NRC responses to these big events, it also strikes me  
5 that perhaps the audience or the recipients of these reports will be representing a  
6 broader cross-section than typical Commission meetings. Certainly we have  
7 nuclear industry, we have many of the same stakeholders from issue to issue,  
8 but in my personal opinion is that this is one where how we communicate to John  
9 Q. Public, the person that doesn't have a stake in the industry or is not part of  
10 one of the normal stakeholder groups, but also deserves and needs to receive a  
11 reply that they can understand, is really essential. Is there anything from your  
12 prior experience here at the NRC, either 9/11 or Davis-Besse or the 2003  
13 blackout, that you think would be in your initial thoughts on how we communicate  
14 so that people in the American public understand what the results are of these  
15 near-term and longer-term efforts?

16           MR. BORCHARDT: Well, and again this is just my view, my  
17 assessment, I think that especially in the long-term review that we do, we need to  
18 build in a meaningful engagement with all the stakeholders. They have an  
19 enormous capability to understand the most technical issues. Sometimes we  
20 think that capability doesn't exist, but it's in fact not true. And we have had  
21 enormously valuable input from a wide range of stakeholders. This is a little bit  
22 off of event response, but when we established the reactor oversight program --  
23 we did it 10 or 12 years ago -- we used just that kind of an approach. We  
24 brought in all kinds of different stakeholders from all different perspectives, and it  
25 was a very impressive end result that had everyone's buy-in. People who came

1 from pro-nuclear, anti-nuclear, and they all agreed that this was a good approach  
2 to perform regulatory oversight. I think the same kind of mindset is important to  
3 enter into this long-term activity, and start at the beginning. Where we get into  
4 trouble as a regulator is when we have our mind made up, or even if we don't  
5 have our mind made up, there's a perception we already have our mind made  
6 up, and then we begin the engagement. So I think we need to do it right from the  
7 very beginning, have it be a very open and transparent process.

8           COMMISSIONER OSTENDORFF: Thank you. I know as the  
9 Chairman indicated in his comments earlier, there's much we don't know.  
10 There'll be significant periods of time before we have full granularity, a lot of the  
11 details of what happened at Fukushima, but there's one area, if you'll just bear  
12 with me, that I do want to ask you about. I've been here not quite one year; I've  
13 spent very little time looking at spent fuel pools. When I go visit a plant, I'll go  
14 see the pool, and on some of these visits -- I've probably seen four, I think, in the  
15 last year. But I certainly don't have much background at all in the spent fuel  
16 pools. And recognizing that's been the focus of a lot of the concerns over the  
17 last 10 days, and that perhaps compared to our discussions, we have an  
18 emergency core cooling systems and GSI-191 and other issues that we don't  
19 spend a lot of time, as a Commission, really talking about that.

20           Is there any initial area of U.S. reactor plant spent-fuel configuration  
21 or operation that comes to your mind as warranting particular exploration in this  
22 task force?

23           MR. BORCHARDT: Well clearly, it's a very simple problem. All  
24 you have to do is keep water in the pool. The pool is an open vessel, and the  
25 only objective is to keep water in it. Even if, in a bad situation, it were to heat up

1 and you had boiling in there, as long as you kept the fuel covered with water,  
2 you're going to prevent the high radiological release. So I think what the task  
3 force needs to do is to go down the specifics of what happened in Japan, and  
4 then evaluate that to make sure that in fact, these things that we put into place  
5 after 9/11, for example, really would work under that scenario.

6 We have thought about things like making sure that the equipment  
7 you're going to use wouldn't be damaged in the event that caused the first  
8 problem, so you can't have everything staged exactly where it's ready to be  
9 used. There has to be some staging areas. But for example, on the tsunami or a  
10 flooding issue you wouldn't want the equipment now stored outside, right?  
11 Because it would be swept away. So you know, it's yet another "what if" to really  
12 help us explore and probe what the various scenarios are being, and make sure  
13 we have the highest probability of success. I think that's really the box we need  
14 people to be thinking in.

15 COMMISSIONER OSTENDORFF: That's very helpful. Thank you.  
16 Thank you, Mr. Chairman.

17 CHAIRMAN JACZKO: I'd ask at this point if there are any other  
18 questions that any of my colleagues have.

19 MR. BORCHARDT: Well at this point, can I just --

20 CHAIRMAN JACZKO: Sure, Bill.

21 MR. BORCHARDT: Can I just -- I'm not going to ask you a  
22 question.

23 [laughter]

24 CHAIRMAN JACZKO: I'm not sure I'd have answered it for you if  
25 you did.

1 [laughter]

2 MR. BORCHARDT: I do want to just take a moment and thank all  
3 the NRC staff that have responded to this event, all the people that are in the  
4 Ops Center -- we're doing our best to have a rotation of people in and out of  
5 there, but they're working very hard, very long hours. They're still doing their real  
6 job too, like I said, that's got to be our first priority. But I want to just make  
7 special note of the team of people that volunteered to go to Japan on no notice,  
8 that have been there working incredibly long, hard hours, working in a way that  
9 there is no operating procedure to operate. They have had to develop it on the  
10 go. So Chuck Casto happens to be the team leader, but there are many people  
11 that have worked very hard. We have sent another person over to help Chuck in  
12 that team-leader role, and there is the next wave of NRC employees that have  
13 volunteered, and they'll be leaving beginning, I think it's tomorrow. And then the  
14 last element of that group on Thursday. So I just want to make special note of  
15 their commitment and professionalism. Thank you.

16 CHAIRMAN JACZKO: Well thanks for that, Bill. I appreciate that,  
17 and your work as well, I think, as I've noted. At this point I would just offer that  
18 we do have a proposal that's been circulated that I think captures at a high level  
19 some of these ideas for a path forward, and I would certainly encourage that we  
20 move on that as promptly as possible. But I thought I'd offer at this time an  
21 opportunity, if anybody wants to make comments on that or any of the other  
22 issues that we have in front of us. Commissioner Ostendorff?

23 COMMISSIONER OSTENDORFF: I just thank you for convening  
24 this meeting today. I think it's been very helpful, and I know that we're all ready  
25 to move forward to take the actions we need to take.

1                   CHAIRMAN JACZKO: Okay. Well again I want to thank everybody  
2 for their efforts so far, and again, I just want to reiterate as we close that as many  
3 people on this side of the table have indicated, we have had, many of us, very  
4 close and personal relationships with colleagues in Japan, and our hearts go out  
5 to them as they continue to deal with this very difficult event, and we will continue  
6 to work to provide our colleagues and counterparts in Japan with assistance as  
7 they need it, to deal with the situation. And I think as Commissioner Magwood  
8 indicated, this is likely the first of many discussions we will have on this topic, and  
9 I look forward to continuing the discussion and continuing our focus on our  
10 important health and safety mission. With that, we are adjourned. Thank you.

11                   [Whereupon the proceedings were concluded]