

Caponiti, Kathleen

From: Poehler, Jeffrey *NRR*
Sent: Wednesday, March 16, 2011 1:02 PM
To: Cusumano, Victor *NRR*
Subject: RE: Japan Updates

Thanks for sending these – the spreadsheet is especially informative.

Jeffrey C. Poehler
Sr. Materials Engineer
NRR/DCI/CVIB
(301) 415-8353

From: Cusumano, Victor *NRR*
Sent: Wednesday, March 16, 2011 9:25 AM
To: NRR_DCI Distribution
Subject: Japan Updates

- From the Tepco (the utility) as of today (VERY detailed press release):
<http://www.tepco.co.jp/en/press/corp-com/release/11031608-e.html>
- From Japan Atomic Industrial Forum (JAIF) detailed spreadsheet with unit/system status at-a-glance: [complete summary PDF](#)
- JAIF main site (english): <http://www.jaif.or.jp/english/index.php>

Vic

VICTOR CUSUMANO
TECHNICAL ASSISTANT

NRR/DCI
Phone: 301.415.4011
Location: 0-09C10

NRR
From: Orenak, Michael *NRR*
Sent: Wednesday, March 16, 2011 2:30 PM
To: Jessup, William; Armstrong, Aaron
Subject: FW: Developments in Japan

See the bottom email of this chain...

From: Wolfgang, Robert *NRR*
Sent: Wednesday, March 16, 2011 2:17 PM
To: Billerbeck, John; Bedi, Gurjendra; Farnan, Michael; Huang, John; Orenak, Michael
Subject: FW: Developments in Japan

FYI

Bob Wolfgang
Senior Mechanical Engineer
U. S. Nuclear Regulatory Commission
301-415-1624

From: Lingam, Siva *NRR*
Sent: Wednesday, March 16, 2011 1:52 PM
To: Wolfgang, Robert; Karipineni, Nageswara
Subject: RE: Developments in Japan

See the e-mail from John Boska. Situation in Japan is much worse now, and is not going to get better based on this e-mail.

From: Broaddus, Doug *NRR*
Sent: Wednesday, March 16, 2011 1:26 PM
To: Blechman, Paula; Clayton, Beverly; Gratton, Christopher; Lingam, Siva; Mozafari, Brenda; Orf, Tracy; Paige, Jason; Saba, Farideh; Sola, Clara; Thorpe, April
Subject: FW: Developments in Japan
Importance: High

Joe Giitter briefed the DORL management team on the current situation in Japan, and how it is/will impact our activities. The situation is getting worse, and the NRC response is continuing to increase. Below is a summary of the meeting prepared by John Boska. I will discuss further during our branch meeting tomorrow. In the meantime, please let me know ASAP if you are working on any actions in the following areas:

1. Containment design issues (e.g., containment peak pressure, primary/secondary ventilation and filtration, cooling, and leak rate testing).
2. Containment combustible gas control.
3. AC/DC power (e.g., emergency diesel generators, Station Blackout (SBO) and batteries)
4. Seismic issues
5. Flooding (tsunami, seiche, and river system)
6. Emergency core cooling systems
7. Ultimate heat sink
8. Fuel design (e.g., structural capacity and seismic design)
9. Spent fuel pool design (cooling, criticality, rack strength, and structural capacity)
10. Peak cladding temperature limits
11. Emergency planning

c/a

Please also indicate when the action is expected to be completed.

As indicated in the summary below, Harold Chernoff is developing a list of actions that may be considered sensitive given the events in Japan. Once we have the list, a determination will be made what action to take on the actions. At this time, we should continue to work on the actions until we hear otherwise. The one exception is that we may hold issuance of actions that are ready to be issued now.

As indicated in the summary, let me know if you are interested in assisting with the ops center activities.

Also, Allen will be working on a Commission briefing to be held next week concerning the Japan event, our response, and path forward. He may need assistance on that effort, if anyone is interested.

I will update you when I get any additional information.

Doug

From: Boska, John *NRR*
Sent: Wednesday, March 16, 2011 11:31 AM
To: Guzman, Richard
Cc: Pickett, Douglas
Subject: Developments in Japan
Importance: High

Rich, please review and comment, for distribution to our branch.

In a briefing with Joe Giitter that just ended, we were informed that the situation is now much worse in Japan. The walls of the Unit 4 spent fuel pool have collapsed, and there is no water in there. There were a large number of fuel assemblies in the pool, and the fuel may no longer be intact. The radiation levels are increasing so much that it may prove difficult to work on the other 5 reactors at the site, which could lead to more fuel damage and releases.

The NRC plans to man the Operation Center (OC) 24/7 for a long period of time, and other NRC task groups are being established. A generic communication is being prepared to go to our licensees. Joe Giitter will be working an 8 hour shift in the OC (3pm-11pm), but he will try to be in his office for a couple of hours each day before going to the OC. Allen Howe has been assigned to help prepare for a Commission meeting on reactor safety. Nelson has been assigned to lead a communications team for NRR.

If you have BWR or spent fuel expertise, and would like to volunteer for a shift in the OC, please let me know. They are trying to set up a rotation of working 4-5 days, 8 hours per shift, then a couple of days off. Also, as more of our technical experts get assignments, it may be difficult to complete licensing actions. Giitter and Nelson recognize this, and said that the Japanese response will take priority over the metrics. Also, Harold Chernoff is compiling a list of licensing actions (ready to be issued) that may be sensitive (spent fuel pool rerack, reduced containment testing, etc.) that will have to be approved by the NRR LT prior to issuance. Please let Harold know if you have anything that may meet the criteria.

John Boska
Indian Point Project Manager, NRR/DORL
U.S. Nuclear Regulatory Commission
301-415-2901
email: john.boska@nrc.gov

Valentine, Nicholee

NAR → From: Regan, Christopher, *NAR*
Sent: Wednesday, March 16, 2011 2:38 PM
To: Astwood, Heather; Craig, Jocelyn; Dinitz, Ira; Dusaniwskyj, Michael; Harwell, Shawn; Hopkins, Jon; Lois, Kosmas; Pittiglio, Clayton; Purdie, Michael; Quinones, Lauren; Richter, Brian; Rodriguez, Veronica; Simmons, Anneliese; Simpson, JoAnn; Szabo, Aaron
Subject: FW: **Update 1:15pm March 16** Information on the Japanese Earthquake and Reactors in that Region

FYI. I'd take the fact sheet about the spent fuel pools with a LARGE pinch of salt. Based on the events of today they are somewhat...inaccurate.

Chris



UPDATE AS OF 1:15 P.M. EDT, WEDNESDAY, MARCH 16:

NEI has posted an updated version of the fact sheet [Used Nuclear Fuel Storage at the Fukushima Daiichi Nuclear Power Plant](#). Also available is a new fact sheet called [Industry Taking Action to Ensure Continued Safety at U.S. Nuclear Energy Plants](#).

As always, please go to <http://resources.nei.org/japan> for the latest updates.

Click [here](#) to unsubscribe

Caponiti, Kathleen

From: Taylor, Robert *NR*
Sent: Wednesday, March 16, 2011 2:43 PM
To: Droggitis, Spiros; Decker, David *CA*
Subject: Chairman Testimony

Can you guys share the Chairman's written/oral remarks from today's hearings?

C/4

Hiland, Patrick

From: Hiland, Patrick *MRK*
Sent: Wednesday, March 16, 2011 2:59 PM
To: Thomas, George; Farzam, Farhad; Hoang, Dan; Sherbini, Sami
Cc: Brown, Eva
Subject: Early Morning Request From Reactor Safety Team

Importance: High

Thank you all for your willingness to discuss potential possibilities in support of the NRC Team in Japan. Your communication with myself and/or Ms. Eva Brown at 5:30 a.m. today was very important. For your information, we were communicating directly with GE and Naval Reactors at the same time. Bottom line was that in 30 minutes we did what we could to respond to the request. Most of the suggestions made were similar to NUREG 1353, but your few minutes helped us speak with some confidence. Thanks.

Caponiti, Kathleen

From: Taylor, Robert *MR*
Sent: Wednesday, March 16, 2011 3:01 PM
To: Decker, David
Cc: Droggitis, Spiros; Powell, Amy; Schmidt, Rebecca
Subject: RE: Chairman Testimony

Thanks.

From: Decker, David *DCD*
Sent: Wednesday, March 16, 2011 3:01 PM
To: Taylor, Robert
Cc: Droggitis, Spiros; Powell, Amy; Schmidt, Rebecca
Subject: RE: Chairman Testimony

Rob,
Here is the written and oral testimony. During the Chairman's oral testimony he provided details about what we believe the status of each of the 6 reactors at Fukushima is. This information is not in the attached oral statement, and I'm not sure where the info came from. I suspect it's what's in the latest situation report.

From: Taylor, Robert *MR*
Sent: Wednesday, March 16, 2011 2:43 PM
To: Droggitis, Spiros; Decker, David
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c/b

Caponiti, Kathleen

From: Taylor, Robert *NKR*
Sent: Wednesday, March 16, 2011 3:01 PM
To: *OFA* Harrington, Holly; Burnell, Scott; McIntyre, David; Brenner, Eliot
Subject: **FW: Chairman Testimony**
Attachments: NRC Chairman Jaczko Testimony for 031611 Hearing.docx; FINAL - GBJ oral statement 031611 .docx

FYI

From: Decker, David *OCA*
Sent: Wednesday, March 16, 2011 3:01 PM
To: Taylor, Robert
Cc: Droggitis, Spiros; Powell, Amy; Schmidt, Rebecca
Subject: RE: Chairman Testimony

Rob,
Here is the written and oral testimony. During the Chairman's oral testimony he provided details about what we believe the status of each of the 6 reactors at Fukushima is. This information is not in the attached oral statement, and I'm not sure where the info came from. I suspect it's what's in the latest situation report.

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Sent: Wednesday, March 16, 2011 2:43 PM
To: Droggitis, Spiros; Decker, David
Subject: Chairman Testimony

Can you guys share the Chairman's written/oral remarks from today's hearings?

STATEMENT
BY GREGORY B. JACZKO, CHAIRMAN
UNITED STATES NUCLEAR REGULATORY COMMISSION
TO THE
HOUSE COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEES ON ENERGY AND POWER, ENVIRONMENT AND THE ECONOMY
MARCH 16, 2011

Mr. Chairmen, Ranking Members Rush and Green, and Members of the Subcommittees, I am honored to appear before you today to discuss the Fiscal Year (FY) 2012 budget request for the U. S. Nuclear Regulatory Commission (NRC) and to respond to any questions that you may have. During the past few weeks, I've had an opportunity to meet with a number of you and your staff. I appreciate these conversations and your interest in the NRC's work. I look forward to working with all of you as this session of Congress continues.

The NRC is an independent Federal agency established to license and regulate the Nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment. Our critical mission entails broad responsibilities for the agency. The NRC currently licenses, inspects, and assesses the performance of 104 operating nuclear power plants, as well as many fuel cycle facilities and research and test reactors. Furthermore, nuclear materials are in use at thousands of hospitals, universities, and other locations around the country. Each of these facilities and materials users presents different challenges for the NRC and requires that the NRC develop and sustain a diverse array of regulatory capabilities. The safety and security of these facilities and materials is, and always will be, our number one priority.

The NRC's Safety goal is to ensure adequate protection of public health and safety and the environment. The agency's safety program objectives are to prevent the occurrence of any nuclear reactor accidents, inadvertent criticality events, acute radiation exposures resulting in fatalities, significant releases of radioactive materials and significant adverse environmental impacts. The Security goal is to ensure adequate protection in the secure use and management of radioactive materials. The security program objective is to prevent any instances in which licensed radioactive materials are used in a hostile manner in the United States.

The NRC can be proud of its strong track record and our recognition by the international community as a leader in regulating the nuclear industry. The Commission cannot give enough credit for the NRC's effectiveness as a regulator to the NRC's diverse, hard-working, talented, and dedicated staff. The Commission is continually impressed by their expertise, experience, diversity, and commitment to public service.

It is important that the NRC maintain our commitment to continuous improvement. That has long been a defining value of the NRC and a key to our success in meeting our important safety mission. We have a responsibility to the public to always try to do better – whether by planning and prioritizing to allow for more timely implementation of agency actions by licensees, or by communicating more effectively to better engage stakeholders in agency decisions.

We also, however, have an additional imperative, in light of the prevailing budgetary climate and the strong desire by many to see federal agencies do more with less. No matter the outcomes of these current budget decisions, the agency must continue focusing on the critical task of how to make the most efficient use of our funds. The NRC must ensure that we are in

the strongest possible position to efficiently and effectively use our financial resources to meet our mission.

In this area, as in many others, good process is the key to good outcomes. In accordance with the Government Performance and Results Act, the NRC is taking steps to improve our strategic planning and annual performance plans in order to achieve greater alignment of goals and performance across the agency. As part of the NRC's efforts to build a Strategic Acquisition Program, we are taking steps to ensure agency contracting initiatives are implemented in a more timely and efficient manner. We have resources dedicated to other business process improvements including the Transforming Assets into Business Solutions (TABS), a task force focused on identifying the most efficient, effective and cost-conscious manner for the NRC to accomplish its corporate support functions.

These initiatives allow us to fully meet our safety and security responsibilities while also effectively reviewing applications associated with a renewed interest in the construction of new nuclear power plants and applications to construct and operate facilities that are part of the nuclear fuel cycle. The NRC is actively reviewing 12 combined applications to construct and operate new nuclear power reactors. Five different reactor designs are referenced in these applications; the NRC is currently reviewing the design applications for certification. If these design certifications are approved they will be available to be referenced in future COL applications, and thereby make those reviews more straightforward. The NRC is also performing safety, security, and environmental reviews of facility applications, a uranium deconversion facility application, and applications for new uranium recovery facilities.

With these efforts as a backdrop, the agency has formulated its FY 2012 budget to support the agency's Safety and Security strategic goals and objectives.

Specifics of the FY 2012 Budget Request

The NRC's FY 2012 budget request is organized by business lines within our two program areas: (1) Nuclear Reactor Safety, and (2) Nuclear Materials and Waste Safety Programs. The NRC's proposed FY 2012 budget for both programs is \$1,038.1 million, including 3,981.0 full-time equivalents (FTE), which represents a decrease of \$28.7 million, including an increase of 0.8 FTE, when compared to the FY 2010 funding levels. The funding levels reflected above also support the Office of the Inspector General (OIG). The OIG FY 2012 proposed budget of \$10.9 million includes resources to carry out the Inspector General's mission to independently and objectively conduct audits and investigations to ensure the efficiency and integrity of NRC programs and operations and to promote cost-effective management.

Pursuant to the provisions of the Energy Policy Act of 2005, the NRC's FY 2012 budget provides for 90 percent fee recovery, less (1) appropriations from the Nuclear Waste Fund, (2) appropriations to implement Section 3166 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, (which pertain to waste incidental to reprocessing), and (3) appropriations to conduct generic homeland security activities. Accordingly, \$909.5 million of the FY 2012 budget would be recovered from fees assessed to NRC licensees and applicants. This would result in a net appropriation of \$128.6 million, which is a decrease of \$26.1 million in net appropriations when compared to the FY 2010 funding levels.

Nuclear Reactor Safety Program

The Nuclear Reactor Safety Program encompasses NRC efforts to license, regulate, and oversee civilian nuclear power, research, and test reactors in a manner that adequately protects public health and safety and the environment. This program also provides high assurance of the

physical security of facilities and protection against radiological sabotage. This program contributes to the NRC's Safety and Security goals through the activities of the Operating Reactors and New Reactors Business Lines, which regulate existing and new nuclear reactors to ensure their safe operation and physical security. Overall resources requested in the FY 2012 budget for the Nuclear Reactor Safety Program are \$800.8 million, including 3,032.9 FTE. This funding level represents an overall funding decrease of \$8.0 million, with an increase of 48.4 FTE when compared with FY 2010 funding levels.

Within this program, the Operating Reactors Business Line supports the licensing, oversight, rulemaking, research, international activities, generic homeland security, and event response associated with the safe and secure operation of 104 civilian nuclear power reactors and 31 research and test reactors. The FY 2012 budget request for operating reactors is \$521.3 million, including 2,064.4 FTE. This represents an overall funding decrease of \$20.5 million, including 26.3 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- conduct technical review for 950 licensing actions, including complex actions such as license amendment requests from power reactor licensees adopting the requirements for performance standards for fire protection, often referred to as National Fire Protection Association (NFPA) 805
- review extended power uprate requests for increasing electric generating capacity and one improved standard technical specification conversion
- conduct 13 active, high- and medium-priority rulemaking activities
- conduct critical research and test reactor project management functions pertaining to license renewal application efforts, and applications to produce medical isotopes
- continue reviews of 12 license renewal applications
- conduct inspection activities for the 104 operating nuclear power reactors, including the component design-basis inspections, fire protection inspections, and generic issues inspections (approximately 100 per year)
- continue the Resident Inspector Pipeline Initiative to maintain an experienced and stable onsite inspection presence of qualified resident inspectors at the 104 nuclear power reactors

- conduct domestic and international security reviews and support for screening approximately 3,000 national and international operational events, with detailed evaluation of approximately 200 of those events
- carry out cyber security evaluations, as well as 24 force-on-force security inspections to complete a 3-year cycle for inspecting power reactors
- evaluate licensee emergency preparedness during biennial exercises

The resources within the Operating Reactors Business Line reflect a decrease in license renewal activities because of schedule changes, and the reduced number of applications that will be under review.

The New Reactors Business Line supports the licensing, oversight, rulemaking, research, international activities, and generic homeland security associated with the safe and secure development of new power reactors from design, site approval, and construction to operational status. The FY 2012 budget request for new reactors is \$279.5 million, including 968.6 FTE. This represents an overall funding increase of \$12.5 million, including 74.8 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources will support include the following:

- perform licensing and hearing support for 15 combined licenses, including two new combined license applications during FY 2012
- certify one design certification amendment, continue licensing reviews, rulemaking, or both on five applications and begin pre-application review on a new design
- review two early site permit applications and begin review of one new application expected in FY 2012
- develop and implement the construction inspection program
- inspect the four reactors expected to be under construction
- continue licensing and oversight activities for the construction of Watts Bar Unit 2
- conduct 15 domestic and international vendor inspections of component manufacturing quality
- conduct pre-application activities for two small modular reactor designs
- perform an acceptance review and initiate a design certification review for one small modular reactor
- continue the implementation of the Next Generation Nuclear Plant licensing strategy, which was developed in accordance with the Energy Policy Act of 2005

- continue to develop the regulatory framework that integrates the use of risk insights into the review process and support the resolution of key policy and safety issues associated with small modular reactors

The New Reactors Business Line shows an increase primarily driven by construction oversight of two new potential reactors under construction (for a total of five) and by development of the workforce to support inspection of up to an additional six reactors in future years. In addition, resources increase to support the review of new advanced reactor applications, increased pre-application interactions with prospective applicants, and funding for the one-time build-out of a new Headquarters office building.

Nuclear Materials and Waste Safety Program

The Nuclear Materials and Waste Safety Program encompasses the NRC's responsibility to license, regulate, and oversee nuclear materials and waste in a manner that adequately protects public health and safety and the environment. This program's goal is to verify the safety and security of materials and waste and protection against radiological sabotage, theft, or diversion of nuclear materials. Through this program, the NRC regulates uranium processing and fuel facilities; research and pilot facilities; nuclear materials users (medical, industrial, research, and academic); spent fuel storage; spent fuel storage casks and transportation packaging; decontamination and decommissioning of facilities; and low-level and high-level radioactive waste.

Overall resources requested in the FY 2012 budget for the Nuclear Materials and Waste Safety Program are \$226.5 million, including 868.5 FTE. This funding level represents an overall funding decrease of \$20.7 million, including 49.6 FTE, when compared with FY 2010 funding levels.

Within this program, the Fuel Facilities Business Line supports licensing, oversight, rulemaking, research, international activities, generic homeland security, and event response associated with the safe and secure operation of various fuel facilities, such as conversion, enrichment, and fuel fabrication facilities, and nuclear fuel research and pilot facilities. The FY 2012 budget request for fuel facilities is \$55.2 million, including 226.5 FTE. This represents an overall funding increase of \$0.6 million, including 18.2 FTE, when compared with FY 2010 funding levels.

Examples of activities that the requested resources would support include the following:

- licensing and oversight activities associated with fuel facilities and licensees with greater than critical mass quantities of special nuclear material
- operation and maintenance of the Nuclear Material Management and Safeguards System database and the Nuclear Materials Information Program
- emergency preparedness, security, and licensee performance reviews
- licensing, certification, inspection, oversight, environmental reviews, research, adjudicatory, enforcement, allegation, and other regulatory activities associated with new and operating fuel facilities, including uranium conversion and enrichment and fuel fabrication
- completion of mandatory hearings on the uranium enrichment license applications for the AREVA centrifuge and General Electric-Hitachi laser enrichment facilities
- licensing review of the International Isotopes depleted uranium deconversion facility
- oversight of construction activities at the proposed Mixed Oxide (MOX) Fuel Fabrication Facility and commencement of construction of the AREVA, General Electric-Hitachi, and International Isotopes facilities

The Fuel Facilities Business Line resources increase to account for the significant construction activities planned at the MOX facility; the commencement of construction at the AREVA centrifuge and General Electric-Hitachi laser enrichment facilities, and the International Isotopes depleted uranium deconversion facility; and to reflect staffing required at resident inspector offices. Resources also increase to support rulemaking activities regarding the potential licensing of reprocessing facilities. These increases are offset by the completion of the licensing and environmental reviews of the AREVA and General Electric-Hitachi license applications, as well as the completion of the licensing and environmental reviews for the International Isotopes depleted uranium deconversion facility application.

The Nuclear Materials Users Business Line supports the licensing, oversight, rulemaking, research, international activities, generic homeland security, event response, and State, Tribal, and Federal program activities associated with the safe and secure possession, processing, handling, and use of nuclear materials for the many and diverse uses of these materials.

Resources also support the National Materials Program and the Agreement State activities. The FY 2012 budget request for nuclear materials users is \$92.1 million, including 347.1 FTE. This represents an overall funding increase of \$0.4 million, including 9.1 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- completion of 2,500 materials licensing actions and 1,000 routine health and safety inspections, including naturally occurring and accelerator-produced radioactive material and security inspections
- event evaluation, research, incident response, allegation, enforcement and investigations, and rulemaking activities to maintain the regulatory safety and security infrastructure needed to process and handle nuclear materials
- materials activities related to State, Tribal, and Federal programs, including oversight, technical assistance, regulatory development, and cooperative efforts
- operation of the National Source Tracking System, a secure, Web-based, nationalized central registry designed to enhance the accountability for radioactive sources
- development of the Integrated Source Management Portfolio, which consists of the National Source Tracking System, the Web-Based Licensing System, and the License Verification System
- reviews of 135–180 import/export of nuclear equipment and material license applications
- investigations into 45–55 allegations of materials-related wrongdoing

The Nuclear Materials Users Business Line resources increase slightly because of adjustments made within the business line to cover emergent activities. Overall, a slight increase resulted to address the workload associated with the implementation of the Integrated Source Management Portfolio major information technology system, which consists of the National Source Tracking System, the Web-Based Licensing System, and the License Verification System.

The Spent Fuel Storage and Transportation Business Line supports the licensing, oversight, rulemaking, research, event response, and international activities associated with the safe and secure storage of spent nuclear fuel and safe and secure transportation of radioactive materials. The FY 2012 budget request for spent fuel storage and transportation is \$41.2 million, including 152.4 FTE. This represents an overall funding increase of \$7.4 million, including 29.7 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- review of license requests for site-specific independent spent fuel storage installations (ISFSIs), dual-purpose (storage and transport) casks, transportation security plans, and route approvals to support safe and secure domestic and international transportation of radioactive materials, regulatory requirements for full-core offload capability at operating reactor sites, and transfer of spent fuel to ISFSIs to support reactor decommissioning
- regulatory improvements to the proficiency and effectiveness of the licensing, inspection, and enforcement programs associated with storage and transportation of spent nuclear fuel
- inspection of storage cask and transportation package vendors, fabricators, and designers to ensure safety
- resolution of technical issues associated with allowance of burn-up credit for transportation and storage casks and the transportation and storage of high burn-up fuels (greater than 45 gigawatt-days/ metric tons of uranium)
- interaction with the International Atomic Energy Agency and other international regulators to inform the development of the regulatory framework for transportation of radioactive materials, long-term spent fuel and high-level waste storage, deferred transportation, and ultimate geologic disposal

The Spent Fuel Storage and Transportation Business Line resources would increase to develop the information necessary to evaluate extended long-term storage of radioactive material.

Resources are provided for a risk-informing gap study to identify methods, data, decision criteria, and regulatory actions that are needed to implement a regulatory framework for very long-term (more than 120 years) dry spent fuel storage that is enhanced by risk insights.

Resources will also support a scoping study for a generic environmental impact statement for ensuring protection of the environment from such spent fuel storage. Resources will also be provided to conduct research on technical issues associated with this storage, and to coordinate

with international partners on options for harmonizing international standards for certification of transport packages and licensing of storage cask designs.

The Decommissioning and Low-Level Waste Business Line supports the licensing, oversight, rulemaking, research, and international activities associated with the safe and secure removal of a nuclear facility from service and reduction of residual radioactivity to a level that permits release of the property and termination of the NRC license. The FY 2012 budget request for decommissioning and low-level waste is \$37.9 million, including 142.6 FTE. This represents an overall funding decrease of \$0.3 million, including 7.6 FTE, when compared with FY 2010 funding levels. Examples of activities that the requested resources would support include the following:

- project management and technical reviews for decommissioning activities for 10 power reactors, 10 decommissioning research and test reactors, 24 decommissioning materials facilities, 21 inactive Title I decommissioning, 11 Title II decommissioning, uranium recovery facilities, and five sites that are under general license with the U.S. Department of Energy (DOE)
- interfaces with licensees, applicants, Federal and State agencies, the public, other stakeholders, and Native American Tribal governments
- 8 environmental reviews and 11 safety reviews (hearings included) in support of licensing and oversight of uranium recovery facilities
- oversight of certain DOE waste determination activities and plans for waste incidental to reprocessing consistent with the NRC's responsibilities in the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005

The Decommissioning and Low-Level Waste Business Line resources decrease reflect a refocusing of long-term waste research activities and adjustments made to the contract, travel, and training needs and other carryover balances for waste incidental to reprocessing work.

The High-Level Waste Repository Business Line supports activities associated with DOE's Yucca Mountain geologic repository application. This activity terminates in FY 2011. No resources are requested in FY 2012 for this business line.

In the FY 2012 budget structure, the New Fuel Facilities and Operating Fuel Facilities Business Lines were merged into the Fuel Facilities Business Line.

Mr. Chairmen, Ranking Members, and Members of the Subcommittees, this concludes my formal testimony on the NRC's FY 2012 budget request. On behalf of the Commission, thank you for the opportunity to appear before you. I look forward to continuing to work with you to advance the NRC's important safety mission. I would be pleased to respond to any questions that you may have. Thank you.

STATEMENT
BY GREGORY B. JACZKO, CHAIRMAN
UNITED STATES NUCLEAR REGULATORY COMMISSION
TO THE
HOUSE COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEES ON ENERGY AND POWER, ENVIRONMENT AND THE ECONOMY
MARCH 16, 2011

Mr. Chairmen, Ranking Members Rush and Green, and Members of the Subcommittees, I am honored to appear before you today on behalf of the U.S. Nuclear Regulatory Commission. Given the events that are unfolding overseas, my opening remarks will focus on the crisis in Japan, and I have additional information on the Fiscal Year 2012 budget that I have submitted for the record.

I would first like to offer my condolences to all those affected by the earthquake and tsunami in Japan over the last few days. My heart goes out to those who have been dealing with the aftermath of these natural disasters.

I want to publicly acknowledge the tireless efforts, professionalism and dedication of the NRC staff in reacting to the events in Japan. This is just another example from my 6 ½ years on the Commission of the dedication of the NRC staff to the mission of protection of public health and safety. The American people can be proud of the commitment and dedication within the Federal workforce, exemplified by our staff every day.

While the NRC regulates the safe and secure commercial uses of radioactive materials in the United States, we also interact with nuclear regulators from around the world. Since Friday, the NRC's headquarters Operations Center has been operating on a 24-hour basis to monitor events unfolding at nuclear power plants in Japan. Since the earthquake hit northeastern Japan last Friday, some reactors at the Fukushima No. 1 plant have lost their cooling functions, leading to hydrogen explosions and rises in radiation levels. Two NRC experts on boiling-water reactors have already been deployed to Japan as part of a U.S. International Agency for International Development team, and they are currently in Tokyo. Since then, the Japanese government has formally asked for assistance from the United States as it continues to respond to the situation. Another NRC team is scheduled to land today.

Within the U.S., the NRC has been coordinating its efforts with other Federal agencies as part of the government response to the situation. This includes monitoring radioactive releases and predicting their path. Given the thousands of miles between Japan and the United States, Hawaii, Alaska, the U.S. Territories and the West Coast are not expected to experience any harmful levels of radioactivity.

Examining all available information is part of the effort to analyze the event and understand its implications both for Japan and the United States. The NRC has been working with several agencies to assess recent seismic research for the central and eastern part of the

country. That work continues to indicate that the U. S. public remains safe; we will continue to work to maintain that level of protection.

U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area. The NRC then adds a margin for error to account for the historical data's accuracy. This means that U.S. nuclear power plants are designed to be safe based on historical data from the area's maximum credible earthquake.

The NRC remains attentive to any information that can be applied to U.S. reactors. Our focus is always on keeping plants in this country safe and secure. As this immediate crisis in Japan comes to an end, we will look at whatever information we can gain from the event and see if there are changes we need to make to our own system. Within the next few days, I intend to meet with my colleagues on the Commission on the current status and to begin a discussion of how we will systematically and methodically review information from the events in Japan. In the meantime, we continue to oversee and monitor plants to ensure that U. S. reactors remain safe.

The NRC will continue to monitor the situation and provide updates via press releases and our public blog. The NRC also stands ready to offer further technical assistance as needed. We hope that this situation will be resolved soon so that Japan can begin to recover from this terrible tragedy.

Cartwright, William

From: Brown, Frederick *NR*
Sent: Wednesday, March 16, 2011 3:15 PM
To: Kobetz, Timothy *NR*
Subject: FW: Action: Consider potential on-site activities in near-term

Importance: High

Tim,

Your action. How quickly can we do a TI out for review?

From: Brown, Frederick *NR*
Sent: Wednesday, March 16, 2011 11:17 AM
To: Roberts, Darrell; Clifford, James; Croteau, Rick; Jones, William; Croteau, Rick; Darrell Roberts; James Clifford; Jones, William; Kennedy, Kriss; Shear, Gary; Troy Pruett; West, Steven
Cc: Vegal, Anton; Wilson, Peter; Miller, Chris; Weerakkody, Sunil; OBrien, Kenneth; Reynolds, Steven; Munday, Joel; Moorman, James; Christensen, Harold; Westreich, Barry
Subject: Action: Consider potential on-site activities in near-term
Importance: High

On the DRA call today, I'm going to float the potential for either a smart sample or a TI to look at the following areas:

- Licensee verification of 50.54(hh)(2) current status and readiness;
- Licensee verification of SBO current status and readiness consistent with their coping strategy;
- Licensee verification of Internal and External Flooding design features consistency with their licensing basis; and
- Licensee verification that their 50.54(hh)(2) equipment would survive a seismic event undamaged.

If you have thoughts, I'd like to hear them, and you may want to prep your DRAs.

Thanks,
Fred

Howe, Allen

From: Howe, Allen, *NRP*
Sent: Wednesday, March 16, 2011 3:47 PM
To: *AA* Harrington, Holly; Wittick, Susan
Cc: Ruland, William; Leeds, Eric
Subject: RE: Draft Scheduling Note for Japan event 3-16-2011

Apologies for the rapidly developing story. Right now the story is that this will be a public meeting. I will also call Susan.

From: Harrington, Holly, *PA*
Sent: Wednesday, March 16, 2011 3:36 PM
To: Howe, Allen; Wittick, Susan
Cc: Ruland, William; Leeds, Eric
Subject: RE: Draft Scheduling Note for Japan event 3-16-2011

Allen – can we get more information. Eliot seems unaware of this. Is it public/nonpublic?

From: Howe, Allen
Sent: Wednesday, March 16, 2011 2:10 PM
To: Harrington, Holly
Cc: Ruland, William; Leeds, Eric
Subject: FW: Draft Scheduling Note for Japan event 3-16-2011
Importance: High

Holly – I appreciate the challenges you are facing right now with the blizzard of requests coming to your office. I am coordinating a Commission briefing on the Japan event to be conducted as early as Monday. The draft scheduling note is attached. We are reaching out to impacted offices to prepare for the brief. I have Eliot Brenner as a speaker to discuss communication challenges. What is needed is a POC who can engage in preparations to develop slides and talking points for Eliot. The POC is needed ASAP.

Thanks for your help - Allen

From: Howe, Allen
Sent: Wednesday, March 16, 2011 1:18 PM
To: Merzke, Daniel; Andersen, James
Cc: Leeds, Eric; Ruland, William; Giitter, Joseph; Boger, Bruce; Grobe, Jack; Virgilio, Martin; Weber, Michael; Borchardt, Bill; Brenner, Eliot; Schmidt, Rebecca; Doane, Margaret; Holian, Brian; Brown, Frederick
Subject: Draft Scheduling Note for Japan event 3-16-2011

Dan/Jim – attached is a rough draft scheduling note for the Commission meeting. Eric Leeds has reviewed it and approved. We are coordinating support for the meeting, which could occur as early as Monday. Please keep me updated on any developments.

Thanks - Allen

Pascarelli, Robert

From: Chernoff, Harold, DORL
Sent: Wednesday, March 16, 2011 4:41 PM
To: Broaddus, Doug; Campbell, Stephen; Carlson, Robert; Chernoff, Harold; Kulesa, Gloria; Markley, Michael; Pascarelli, Robert; Salgado, Nancy; Singal, Balwant; Pickett, Douglas; Boska, John
Cc: Meighan, Sean; Mahoney, Michael; Nelson, Robert; Howe, Allen; Giitter, Joseph
Subject: Final Process - Near-term considerations for selected licensing activities
Attachments: Enhanced Handling Final.pdf

BCs:

What follows is the finalized process for enhanced handling of selected near-term licensing activities along with a proposed list of subject areas where enhanced handling measures would be applied. The intent of this process is to ensure appropriate treatment of licensing activities that may be affected by the evolving situation in Japan subsequent to the March 11, 2011 earthquake/tsunami.

Please communicate this process with your staff and ask them to apply this process to all Selected Licensing Activities (see definition of this term below).

Effective immediately - each Selected Licensing Activity shall be screened using the pdf form located at:

G:\ADRO\DORL\DORL TA\Japan work screening\Enhanced Handling Final.pdf

As we discussed, the form is intended to be completed with brief responses. The form should be filled-in by the PM up to the demarcation line above the BC block. At this point the PM should click on the submit button at the top of the form. This will forward the form to me. I will have the form processed through the BC and DORL Director inform the affected parties of the final disposition.

Definitions

Licensing Activities – This term includes all licensing actions, as well as, controlled correspondence (e.g., 2.206 issues and Congressional correspondence). This does not include meeting notices or RAIs.

Selected Licensing Activities – Any Licensing Activity that directly involves one of the subjects in the Selected Licensing Activities Subject Reference List.

Near-term – Any Licensing Activity with a planned completion and/or issuance on or before April 8, 2012 (note that this initial period of applicability may be modified by the Director DORL).

DORL Director Notice (DDN) – Concise summary of the anticipated disposition of a Selected Licensing Activity. This summary shall include:

1. the facility name;
2. a description of the Selected Licensing Activity;
3. a recommendation from the applicable PM and BC regarding the Selected Licensing Activities processing method (i.e., normal processing or deferred processing);
4. an assessment of the affect of the recommendation on the licensee and other stakeholders;
5. a discussion of potential insights that may be gained from deferred processing; and,
6. a discussion of any adverse impact on agency performance.

Process

1. PM shall develop a DORL Director Notice (DDN) as soon as practicable but at least one week prior to intended disposition of a Selected Licensing Activity.
2. PM shall complete the DDN up to the demarcation line above the BC block and click on the submit button.
3. Designated DORL staff will process the DDN through the BC and DORL Director.
4. DORL Director shall either endorse the recommendation or direct another processing method. Designated DORL staff will document this determination on the DDN and inform the affected parties of the final disposition.

Selected Licensing Activities Subject Reference List

1. Containment design issues (e.g., containment peak pressure, primary/secondary ventilation and filtration, cooling, and leak rate testing).
2. Containment combustible gas control.
3. AC/DC power (e.g., emergency diesel generators, Station Blackout (SBO) and batteries)
4. Seismic issues
5. Flooding (tsunami, seiche, and river system)
6. Emergency core cooling systems
7. Ultimate heat sink
8. Fuel design (e.g., structural capacity and seismic design)
9. Spent fuel pool design (cooling, criticality, rack strength, and structural capacity)
10. Peak cladding temperature limits
11. Emergency planning

DORL Director Notice - Licensing Activities Requiring Enhanced Handling

Facility Name(s):

Description of Licensing Activity:

PM/BC Recommendation for Processing:

Assessment of the Effect on the Licensee and stakeholders:

Insights Gained from Deferred Processing:

Adverse Impact on Agency Performance:

Submit form after providing the above information.

Branch Chief Concurrence Date:

Disposition by Director:

New Disposition and Basis (if above is "Change to"):

From: [NRC Announcement](#) -055
To: [NRC Announcement](#)
Subject: General Interest: Media Interest on Monday's Commission Meeting
Date: Friday, March 18, 2011 5:34:13 PM

NRC Daily Announcements



Highlighted Information and Messages



Friday March 18, 2011 -- Headquarters Edition

[General Interest: Media Interest on Monday's Commission Meeting](#)

General Interest: Media Interest on Monday's Commission Meeting

The Office of Public Affairs expects a considerable amount of media attention at the White Flint Complex on Monday morning for the Commission meeting on March 21, 2011. NRC staff are likely to see cameras and reporters positioned outside the building. They are being coordinated by the Office of Public Affairs.

Questions or concerns should be directed to 301-415-8200.



(2011-03-18 00:00:00.0)

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CHU

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Khanna, Meena

From: Saba, Farideh *NRK*
Sent: Wednesday, March 16, 2011 5:21 PM
To: Khanna, Meena; Manoly, Kamal
Subject: FW: MSNBC article on earthquake risk to US plants

Farideh E. Saba, P.E.
Senior Project Manager
NRC/ADRO/NRR/DORL
301-415-1447
Mail Stop O-8G9A
Farideh.Saba@NRC.GOV

From: Orf, Tracy *NRK*
Sent: Wednesday, March 16, 2011 7:47 AM
To: NRR_DORL_LPL2-2 Distribution
Cc: Howe, Allen
Subject: MSNBC article on earthquake risk to US plants

http://www.msnbc.msn.com/id/42103936/ns/world_news-asiapacific/

Howe, Allen

From: Howe, Allen, *ARR*
Sent: Wednesday, March 16, 2011 6:00 PM
To: Dion, Jeanne, *RES*
Subject: RE: Assistance with Commission Brief

Jeanne – I should know more after the EDO alignment meeting tomorrow. This was from a brainstorming session that Marty Virgilio provided. My take on it is that we may ultimately take away some lessons learned from this event regarding initial preparedness, immediate response, any unanticipated phenomena and possible research such as what we did after Chernobyl.

Allen

From: Dion, Jeanne, *RES*
Sent: Wednesday, March 16, 2011 5:28 PM
To: Howe, Allen; Deegan, George
Cc: Moore, Scott; Piccone, Josephine; Jackson, Deborah; Turtill, Richard; Brock, Kathryn; Frazier, Alan; Wittick, Susan
Subject: RE: Assistance with Commission Brief

Yes- we can. We have staff with expertise in severe accidents (SOARCA) and health effects branch.

Can you provide more information on the agenda item ("advance our understanding of safety and risk")- RES is noted as the lead for the item.

Thanks- Jeanne

From: Howe, Allen, *ARR*
Sent: Wednesday, March 16, 2011 5:22 PM
To: Deegan, George; Dion, Jeanne
Cc: Moore, Scott; Piccone, Josephine; Jackson, Deborah; Turtill, Richard; Brock, Kathryn; Frazier, Alan; Wittick, Susan
Subject: RE: Assistance with Commission Brief

Thanks George – Susan Wittick is coordinating for OPA.

Jeanne – can RES address the consequence projections?

Thanks - Allen

From: Deegan, George, *FSME*
Sent: Wednesday, March 16, 2011 5:18 PM
To: Howe, Allen
Cc: Moore, Scott; Piccone, Josephine; Jackson, Deborah; Turtill, Richard; Brock, Kathryn; Frazier, Alan
Subject: FW: Assistance with Commission Brief
Importance: High

Allen- I think our two emails may have crossed with one another (see my earlier response). I think RES would be best on Consequence Projections, not FSME. We may have some input to provide regarding Communication Challenges (since we serve in a liaison capability with States). If you'd like, I can check with our folks and see if they can develop some talking points to support Eliot's part of the presentation.

From: Howe, Allen, *NAH*

Sent: Wednesday, March 16, 2011 5:09 PM

To: Dion, Jeanne; Williams, Donna; Bajwa, Chris; Wittick, Susan; Shropshire, Alan; VandenBerghe, John; Deegan, George; Milligan, Patricia

Cc: Meighan, Sean; Hall, Randy; Boska, John

Subject: Assistance with Commission Brief

Importance: High

I am looking for assistance to pull together background information, slides, key messages, talking points and possible Q&A for the Commission briefing on the Japan event. The briefing is likely to happen Monday. Looks like a busy weekend. A rough draft outline is attached with leads for the areas. Please keep in mind that the meeting will be public and the information will be at a fairly high level. If you know of a point of contact that is best suited to address the information, please let me know.

I am working to schedule a meeting tomorrow afternoon @1:30 to flesh this out. I will send out a scheduler with a bridge line.

Thanks - Allen

5

Caponiti, Kathleen

From: Taylor, Robert *MR*
Sent: Wednesday, March 16, 2011 6:58 PM
To: Harrington, Holly *OPA*
Subject: FW: Updated talking points
Attachments: QUAKE_TP_3_16_.docx

I have this up on WebEOC. Might want to make the Regional PAOs aware.

From: Taylor, Robert *MR*
Sent: Wednesday, March 16, 2011 6:52 PM
To: Brenner, Eliot *OPA*
Cc: Harrington, Holly; McIntyre, David; Burnell, Scott; Coggins, Angela; Powell, Amy
Subject: Updated talking points

Eliot,

We understand from Angela Coggins that the Chairman may be doing press soon. We have updated the attached talking points in response to new media inquires (see bullets 2 and 4 regarding radiation plumes and CBP actions).

Regards,
Rob

OPA

TALKING POINTS

JAPAN NUCLEAR SITUATION

As of 3/16/2011 6:45 p.m. EDT

- Based on calculations performed by NRC experts, we now believe that it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate. Our recommendation is based on NRC guidelines for public safety that would be used in the United States under similar circumstances.
- Given the results of the monitoring and distance between Japan and Hawaii, Alaska, U.S. Pacific Territories and the U.S. West Coast, the NRC expects the U.S. to avoid any harmful levels of radioactivity. The NRC is aware of various internet postings depicting modeled radiation plumes for the ongoing events at the nuclear power plants in Japan. All of the models the NRC has seen are based on generic assumptions regarding the potential radiation release from the plants and as such are unable to predict actual radiation levels away from the site. The NRC is working closely with our federal partners to monitor radiation releases from the Japanese nuclear power plants.
- The NRC continues to believe, based on all available information, that the type and design of the Japanese reactors, combined with how events have unfolded, will prevent radiation at harmful levels from reaching U.S. territory.

- In accordance with established protocols, U.S. Customs and Border Protection (CBP) employs several types of radiation detection equipment in its operations at both air and sea ports, and uses this equipment, along with specific operational protocols, to resolve any security or safety risks that are identified with inbound travelers and cargo. Out of an abundance of caution, CBP has issued field guidance reiterating its operational protocols and directing field personnel to specifically monitor maritime and air traffic from Japan. CBP will continue to evaluate the potential risks posed by radiation contamination on inbound travelers and cargo and will adjust its detection and response protocols, in coordination with its interagency partners, as developments warrant.
- The Japanese government has formally asked for U.S. assistance in responding to nuclear power plant cooling issues triggered by an earthquake and tsunami on March 11. The NRC has eleven staff on the ground in Japan as part of the USAID team.
- The NRC is coordinating its actions with other federal agencies as part of the U.S. government response. The NRC's headquarters Operations Center was activated at the beginning of the event and has been monitoring the situation on a 24-hour basis ever since.
- The NRC is always looking to learn information that can be applied to U.S. reactors and we will analyze the information that comes from this incident.
- The NRC is working with other U.S. agencies to monitor radioactive releases from Japan and to predict their path.
- U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster.

- The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area. The NRC then adds a margin for error to account for the limitations on historical data. In other words, U.S. nuclear power plants are designed to be safe based on historical data to predict the area's maximum credible earthquake.

Caponiti, Kathleen

From: Taylor, Robert, *NRK*
Sent: Wednesday, March 16, 2011 7:25 PM
To: Harrington, Holly; Burnell, Scott; McIntyre, David *OPA*
Subject: Talking Points w/SFP info
Attachments: QUAKE_TP_3_16_.docx

All,

The ET has blessed a new talking point regarding the status of the Japanese SFPs. Note that this talking point has a date stamp due to the potential that the event can evolve.

Will post the attached to WebEOC.

Regards,
Rob

OPA

TALKING POINTS

JAPAN NUCLEAR SITUATION

As of 3/16/2011 7:15 p.m. EDT

Update: Addition of bullet on status of SFPs

- Based on calculations performed by NRC experts, we now believe that it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate. Our recommendation is based on NRC guidelines for public safety that would be used in the United States under similar circumstances.
- Given the results of the monitoring and distance between Japan and Hawaii, Alaska, U.S. Pacific Territories and the U.S. West Coast, the NRC expects the U.S. to avoid any harmful levels of radioactivity. The NRC is aware of various internet postings depicting modeled radiation plumes for the ongoing events at the nuclear power plants in Japan. All of the models the NRC has seen are based on generic assumptions regarding the potential radiation release from the plants and as such are unable to predict actual radiation levels away from the site. The NRC is working closely with our federal partners to monitor radiation releases from the Japanese nuclear power plants.
- The NRC continues to believe, based on all available information, that the type and design of the Japanese reactors, combined with how events have unfolded, will prevent radiation at harmful levels from reaching U.S. territory.

- [Status as of 7:00pm on 3/16] The NRC is closely monitoring the condition of the spent fuel pools at the Japanese nuclear power plants. Our current understanding, which is based on the best available information provided to NRC reactor experts in Japan, is the following:
 - Unit 4 – The SFP is likely dry and the integrity of the spent fuel pool is in question.
 - Units 2 & 3 – Steam is escaping which indicates that boiling is likely occurring in the spent fuel pool. The current water level of the pool is uncertain.
 - Unit 1 – The status of the SFP is unknown.

- In accordance with established protocols, U.S. Customs and Border Protection (CBP) employs several types of radiation detection equipment in its operations at both air and sea ports, and uses this equipment, along with specific operational protocols, to resolve any security or safety risks that are identified with inbound travelers and cargo. Out of an abundance of caution, CBP has issued field guidance reiterating its operational protocols and directing field personnel to specifically monitor maritime and air traffic from Japan. CBP will continue to evaluate the potential risks posed by radiation contamination on inbound travelers and cargo and will adjust its detection and response protocols, in coordination with its interagency partners, as developments warrant.

- The Japanese government has formally asked for U.S. assistance in responding to nuclear power plant cooling issues triggered by an earthquake and tsunami on March 11. The NRC has eleven staff on the ground in Japan as part of the USAID team.

- The NRC is coordinating its actions with other federal agencies as part of the U.S. government response. The NRC's headquarters Operations Center was activated at the beginning of the event and has been monitoring the situation on a 24-hour basis ever since.

- The NRC is always looking to learn information that can be applied to U.S. reactors and we will analyze the information that comes from this incident.
- The NRC is working with other U.S. agencies to monitor radioactive releases from Japan and to predict their path.
- U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster.
- The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area. The NRC then adds a margin for error to account for the limitations on historical data. In other words, U.S. nuclear power plants are designed to be safe based on historical data to predict the area's maximum credible earthquake.

Giitter, Joseph

From: Giitter, Joseph *NRR*
Sent: Wednesday, March 16, 2011 7:48 PM
To: *NRR* Leeds, Eric; Howe, Allen; Ruland, William; Boger, Bruce; Grobe, Jack
Cc: Brown, Frederick; McGinty, Tim; Hiland, Patrick
Subject: RE: Brain-storming upcoming Commish meeting
Attachments: Eric Leeds Remarks.docx

Eric - I took a stab and putting some thoughts together. It needs a lot of work, but it is a start.

From: Leeds, Eric *NRR*
Sent: Wednesday, March 16, 2011 1:34 PM
To: Howe, Allen; Ruland, William; Boger, Bruce; Grobe, Jack
Cc: Brown, Frederick; McGinty, Tim; Giitter, Joseph; Hiland, Patrick
Subject: Brain-storming upcoming Commish meeting

Allen/all -

I will undoubtedly need your help in crafting the staff's messages for the upcoming Commission meeting on the Japanese event. If there is a public part of this meeting, and there probably will be, it will be a good opportunity for us to get out the message that we have requirements in place for severe accident management, 50.63 SBO, flooding, 50.54hh(2), Mark I containment improvements, etc. Please brainstorm how we can make that part of our message to the Commission. A lot of what I think we need to do with our licensees, at least in the near term, is to verify what they are already required to do. It might make a good message for the public.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

2/16

Draft Remarks for Eric in Preparation for the upcoming Commission Meeting on the event at the Fukushima Daiichi Plant in Japan

There will undoubtedly be many lessons learned in the months to come as we learn more about the tragic events at the Fukushima Daiichi plant in Japan. However, one of the early lessons is that events can occur that you didn't anticipate—either in the deterministic design basis of the plant or through probabilistic risk assessment models. That is why the fundamental approach to defense in depth is crucial to ensuring that safety is achieved, even under extreme circumstances, such as those experienced at the Fukushima Daiichi plant.

Of course, defense in depth starts with the design of the reactor. In the 1980s the NRC undertook a program to determine if any actions needed to be taken, on a generic basis, to reduce the vulnerability of designs to severe accident challenges. As part of this effort, the NRC looked specifically at the BWR Mark I containment design and identified a number of plant modifications that substantially enhance the ability of the design to prevent and mitigate the consequences of severe accidents. These recommendations included installation of a hardened vent that allows operators, in accordance with their emergency procedures, to relieve pressure from the containment to avoid exceeding the containment pressure limit. At this time the NRC also concluded that continued reliance on pre-existing capability—which was a non-pressure-bearing vent path—could jeopardize access to vital plant areas or other equipment and create an impediment to implementing a successful accident management strategy. Furthermore, the NRC determined that implementation of reliable venting capability and procedures can reduce the likelihood of core melt from accident sequences involving loss of long-term decay heat removal, such as a station blackout event. Finally, it was concluded that the hardened vent provides assurance of a pressure relief path with significant scrubbing of fission products which would result in lower releases, even for containment failure modes not associated with pressurization, such as liner meltthrough. All U.S. BWRs with the Mark I containment design have installed hardened vents (need to verify).

The NRC also identified certain containment performance improvements that licensees should “seriously consider” individual plant examinations in addition to the implementation of a hardened vent. These improvements included an alternate source of water injection into the reactor vessel to reduce the likelihood of core melt due to a station blackout or a loss of long-term decay heat removal, and an enhanced reactor pressure vessel depressurization system that could be operated in an extended station blackout after station batteries have been depleted. (Need to say something about the extent to which licensees have implemented this).

- 2 -

Also, in the 1980s--specifically in 1988-- the NRC concluded that additional regulatory requirements were justified in order to provide further assurance that a loss of both offsite and onsite emergency ac power systems—a station blackout condition--would not adversely affect public health and safety. Studies conducted by the NRC have shown that the hardware and procedures that have been implemented to meet the station blackout requirements have resulted in significant risk reduction and have further enhanced defense in depth. However, we plan to carefully evaluate the lessons learned from the events in Japan to determine if enhancements to the station blackout rule are warranted.

One of the most significant lessons learned from the Three Mile Island Accident in 1979 was that operating procedures need to be symptom based and less prescriptive. Procedures that previously directed operators to take a series of actions based on a pre-established accident were replaced with

procedures that directed operators to maintain the critical safety functions-- such as keeping the core covered and cooled. Emergency procedure guidelines that address conditions well beyond design basis accidents and can be used for severe accident management were also developed. Operators routinely practice these procedures on a plant specific simulator to ensure that they can be implemented for a wide range of accident scenarios, including a station blackout scenario.

More recently, since the 9/11 terrorist attack, NRC has required licensees to implement procedures and pre-stage equipment that would allow operators to ensure critical safety functions are met even under extreme conditions involving fires and explosions. NRC routinely evaluates the ability of licensees to implement these strategies. (Need more detail here.)

Mention steps that INPO has taken in their level 1 directive and our corresponding regulatory footprint— whatever it might be.

From: [Johnson, Michael](#)
To: [Holahan, Gary](#)
Subject: RE: Appreciation and Continued Mission Focus
Date: Friday, March 18, 2011 9:50:00 PM

Yes. Great idea.

From: Holahan, Gary
Sent: Thursday, March 17, 2011 9:47 AM
To: Johnson, Michael
Subject: FW: Appreciation and Continued Mission Focus

I would wish for more info ... but the message is good ...?a model???

Gary

From: Schwarz, Sherry **On Behalf Of** Leeds, Eric
Sent: Wednesday, March 16, 2011 5:05 PM
To: NRR Distribution
Subject: Appreciation and Continued Mission Focus

During this period of heightened activity in response to the events in Japan, I want to take the time to let you know how much I value the work that all of you do in NRR. Some of you are providing key support in emergency response, while others are performing the equally vital day-to-day regulatory duties. Throughout these distracting times abroad, it is so important to keep our focus on the safe operation of nuclear power plants here in the United States. Whether you are involved with licensing actions, technical analysis, budget preparations, or administrative functions to help us execute our essential regulatory work, your continued dedication and commitment are vital for us to maintain our mission of protecting the American public's health and safety.

I know that there can be anxiety and stress as events unfold; take time to take good care of yourself. To keep informed, there will be periodic updates from the EDO, and I encourage you to stay abreast of the agency's public announcements and blog at www.nrc.gov. As regulators, we excel at our steadiness in protecting people and the environment. Again, thanks for all you do.

Eric

4/17

Heida, Bruce

Heida, Bruce

From: Mitman, Jeffrey, *NCR*
Sent: Wednesday, March 16, 2011 9:51 PM
To: Ferrante, Fernando
Subject: RE: Japan status *NCR*

Follow Up Flag: Follow up
Flag Status: Flagged

Fernando, the presentation went well. It was attending by 15 or 20 people which is about average for the conference. There were two series of questions. The most interesting was about whether there was some way to taken into account additional dam parameters into consideration when calculating the failure frequencies. I'm not sure I succeed in convincing the questioner that I believed that was not possible. But we may have been talking past each other as she may have been trying to say that a better dam specific frequency could be derived using engineering analysis/judgement.

No one from Duke appears to be here and there was no connections drawn to Jocassee. There does appear to be some stirring interest in external flood analysis among PRA contractors driven by utility interest. They no we are looking and thinking about external floods. The big topic of interest here has been seismic due to the Japanese earth quake. Everyone refers to the Fukushima plant problems as being driven by a quake when it is clear to me that it was flood that caused the damage to the electrical and service water systems.

Of course there is also a lot of interest (and complaining) about fire.

Jeff

From: Ferrante, Fernando, *NCR*
Sent: Wednesday, March 16, 2011 8:48 AM
To: Mitman, Jeffrey
Subject: RE: Japan status

Jeff, give me a call when you can, I am interested to know how the presentation went.

From: Mitman, Jeffrey
Sent: Tuesday, March 15, 2011 10:23 PM
To: Circle, Jeff; Ferrante, Fernando; Chung, Donald; Pohida, Marie; Vail, James
Subject: FW: Japan status

Excellent link.

From: Lai, Sandra, *RES*
Sent: Tuesday, March 15, 2011 2:56 PM
To: Mary Drouin; Sancaktar, Selim; Mitman, Jeffrey; Zoulis, Antonios; Lachance, Jeffrey Lynn; 'Willard Thomas'; Gordon, Matthew; Dennis, Matthew L; Mills, Daniel
Subject: Japan status

http://www.jaif.or.jp/english/news_images/pdf/ENGNEWS01_1300189582P.pdf

Sandy Lai
Reliability and Risk Engineer
U.S. Nuclear Regulatory Commission
RES/DRA/PRB

Heida, Bruce

cl18

Cohen, Shari

From: Leeds, Eric, *NRR*
Sent: Wednesday, March 16, 2011 1:14 PM
To: Virgilio, Martin; Weber, Michael, *EDO*
Cc: Borchardt, Bill; Boger, Bruce; Grobe, Jack; Ruland, William; Johnson, Michael; Sheron, Brian; Evans, Michele
Subject: NRR Actions: near-term
Importance: High

Please see below. NRR has assembled a team, led by an SES manager to evaluate near term actions for the agency's response to the Japanese event. At this time, we are considering inspection as well as a generic communication and a review of "sensitive" licensing actions". I will keep you informed as we go forward I have discussed the current situation in Japan with the RAs and our preliminary thoughts for regulatory actions going forward.

We have also prepared a scheduling note for the commission meeting for next week. We will send it to you.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

From: Brown, Frederick, *NRR*
Sent: Wednesday, March 16, 2011 11:32 AM
To: Leeds, Eric; Boger, Bruce; Grobe, Jack
Subject: FW: Action: Consider potential on-site activities in near-term
Importance: High

FYI

From: Brown, Frederick, *NRR*
Sent: Wednesday, March 16, 2011 11:17 AM
To: Roberts, Darrell; Clifford, James; Croteau, Rick; Jones, William; Croteau, Rick; Darrell Roberts; James Clifford; Jones, William; Kennedy, Kriss; Shear, Gary; Troy Pruett; West, Steven
Cc: Vegal, Anton; Wilson, Peter; Miller, Chris; Weerakkody, Sunil; OBrien, Kenneth; Reynolds, Steven; Munday, Joel; Moorman, James; Christensen, Harold; Westreich, Barry
Subject: Action: Consider potential on-site activities in near-term
Importance: High

On the DRA call today, I'm going to float the potential for either a smart sample or a TI to look at the following areas:

- Licensee verification of 50.54(hh)(2) current status and readiness;
- Licensee verification of SBO current status and readiness consistent with their coping strategy;
- Licensee verification of Internal and External Flooding design features consistency with their licensing basis; and
- Licensee verification that their 50.54(hh)(2) equipment would survive a seismic event undamaged.

If you have thoughts, I'd like to hear them, and you may want to prep your DRAs.

Thanks,
Fred

Cartwright, William

From: Howe, Allen *MRR*
Sent: Wednesday, March 16, 2011 1:18 PM
To: *EDO* Merzke, Daniel; Andersen, James
Cc: Leeds, Eric; Ruland, William; Gitter, Joseph; Boger, Bruce; Grobe, Jack; Virgilio, Martin; Weber, Michael; Borchardt, Bill; Brenner, Eliot; Schmidt, Rebecca; Doane, Margaret; Holian, Brian; Brown, Frederick
Subject: Draft Scheduling Note for Japan event 3-16-2011
Attachments: Scheduling NoteMar2011_JapaneseEvent agh 3-16-2011.docx

Dan/Jim – attached is a rough draft scheduling note for the Commission meeting. Eric Leeds has reviewed it and approved. We are coordinating support for the meeting, which could occur as early as Monday. Please keep me updated on any developments.

Thanks - Allen

Draft: 3/16/11

SCHEDULING NOTE

Title: BRIEFING ON JAPANESE EVENT and US RESPONSE (Public?)

Purpose: To provide the Commission a status on the recent event in Japan, and to provide an overview of staff actions to date, early planned actions

Scheduled: March XX, 2011
9:00 am

Duration: Approx. 2 hours

Location: Commissioners' Conference Room OWFN

Participants:

Presentation

NRC Staff Panel

50 mins.*

Bill Borchardt, Executive Director for Operations

15 mins.*

Topic: Overview of Japanese Event and U.S. response

Mike Weber, Deputy Executive Director Materials, Waste, Research, State, Tribal and Compliance Programs

10 mins.*

Topic: Potential consequences; what will be seen in U.S.

Marty Virgilio, Deputy Executive Director for Reactor and Preparedness Programs

10 mins.*

Topic: Situation assessment for U.S. reactors and applicants

Elliot Brenner, OPA

5 mins.*

Topic: Communication Challenges

Eric Leeds, Director, NRR

10 mins.*

Topic: Path forward; Near term and longer term

Commission Q & A

30 mins.

Discussion – Wrap-up

5 mins.

Break

10 mins.

Closed session

Strategy and agenda planning

Documents:

Staff background material due to SECY: March __, 2011.

Slides due to SECY: March __, 2011.

Cohen, Shari

From: Leeds, Eric, *NER*
Sent: Wednesday, March 16, 2011 1:34 PM
To: *NER* Howe, Allen; Ruland, William; Boger, Bruce; Grobe, Jack
Cc: Brown, Frederick; McGinty, Tim; Giitter, Joseph; Hiland, Patrick
Subject: Brain-storming upcoming Commish meeting

Allen/all -

I will undoubtedly need your help in crafting the staff's messages for the upcoming Commission meeting on the Japanese event. If there is a public part of this meeting, and there probably will be, it will be a good opportunity for us to get out the message that we have requirements in place for severe accident management, 50.63 SBO, flooding, 50.54hh(2), Mark I containment improvements, etc. Please brainstorm how we can make that part of our message to the Commission. A lot of what I think we need to do with our licensees, at least in the near term, is to verify what they are already required to do. It might make a good message for the public.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

Howe, Allen

From: Howe, Allen, *NRR*
Sent: Wednesday, March 16, 2011 1:42 PM
To: Ruland, William
Subject: RE: Planning for upcoming, short notice Commission meeting

Thanks Bill

I left a voice mail with Alex Marion.

From: Ruland, William, *NRR*
Sent: Wednesday, March 16, 2011 1:19 PM
To: Williams, Donna; Uhle, Jennifer; Sheron, Brian; Moore, Scott; Miller, Charles; Brenner, Eliot; Haney, Catherine; Dorman, Dan; Wiggins, Jim; Evans, Michele; Doane, Margaret; Mamish, Nader
Cc: Johnson, Michael; Holahan, Gary; Leeds, Eric; Grobe, Jack; Howe, Allen
Subject: Planning for upcoming, short notice Commission meeting

Folks,

Attached find a early draft of a scheduling note for a Commission meeting that may be held as early as this coming Monday, March 21st. NRR has been assigned as the lead to pull the meeting together. As you could imagine, this will take some effort. To help with coordination, please provide me a contact so that we can draw on your expertise and help to make this happen. Alan Howe, currently deputy director of DORL, has the lead to pull this together.

I know you have many questions. I'd ask for your patience as we try to get this done. I'll keep you updated through the contact that you provide to us.

Thank you very much.

Bill Ruland

Howe, Allen

From: Howe, Allen *NAR*
Sent: Wednesday, March 16, 2011 11:22 AM
To: *NAR* Cheok, Michael; Holian, Brian; Ruland, William; Wilson, George; Lubinski, John; Thomas, Brian; Quay, Theodore; Nelson, Robert; Giitter, Joseph; Brown, Frederick
Subject: Outline from today's emergency LT attached
Attachments: Commission Meeting Outline.pdf

open & closed

Commission Meeting Outline

NRC Response to Core Damage Accident in Japan

Current Status of Fukushima Daiichi

- Reactors
- Spent Fuel Pools

Consequence Projections

NRC Response Objectives

- Support of US Citizens in Japan
- Support of the Japanese Government
- Advance Our Understanding of Safety and Risk

NRC Response Actions

- In Japan
- At HQ

US Government Response

- NRC Partners and Stakeholders

Challenges to Success in the Response

- Information
- Coordination

Situation Assessment For US Reactors and Applicants (JCO)

- External Events
- Severe Accidents

Path Forward and Priorities

- Near Term Actions
 - In Support of Response
- Longer Term Actions
 - Lessons Learned From this Event
 - Resolution of GSI 199

What's not getting done

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Kulesa, Gloria

From: Kulesa, Gloria, *NRR*
Sent: Wednesday, March 16, 2011 12:02 PM
To: Broaddus, Doug; Pascarelli, Robert, *NRR*
Subject: Here is the NRC story on staff sent to Japan

Eight more experts from the NRC are being sent to Japan to help that country respond to its nuclear emergency. They join two other NRC staff who were dispatched Saturday. All NRC staff members are acting as part of a U.S. Agency for International Development assistance team, and are being sent at the request of the Japanese government.

The additional team members include more reactor experts, international affairs professional staffers, and a senior manager from one of the NRC's four region offices. They come from NRC headquarters and regional offices in King of Prussia, Pa., and Atlanta, Ga.

The team will do whatever is necessary to understand the status of safely shutting down the affected Japanese reactors; better understand the potential impact on people and the environment; and, if asked, provide technical advice and support through the U.S. ambassador.

The team is led by Charles A. Casto, deputy regional administrator of the NRC's Center of Construction Inspection, and members will be in communication with the Japanese regulator, the U.S. Embassy, NRC headquarters, and other government stakeholders as appropriate.

We'll keep you up to date on their experiences. They are expected to arrive Wednesday, Japanese time.

Cohen, Shari

From: Leeds, Eric, *NRR*
Sent: Wednesday, March 16, 2011 12:56 PM
To: Virgilio, Rosetta; Piccone, Josephine *IFSME*
Cc: Miller, Charles; Moore, Scott
Subject: FW: INPO EVENT and Chairman Questions
Attachments: 23QuestionsOPA3_16.docx; INPO Event Report (IER) L1-11-1.pdf

Importance: High

Josie and Rosetta,

Attached are two documents which may help you in your meeting tomorrow. The 23 Q&As may help in communications with our stakeholders. The INPO Event Report is sensitive info and CANNOT be shared outside the agency. However, it gives you an idea of the areas that the staff is examining – station blackout, severe accident response I flooding etc. I spoke with the RAs this morning and they understand the sensitivities and will discuss with their RSLOs.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

From: Nguyen, Quynh, *NRR*
Sent: Wednesday, March 16, 2011 12:44 PM
To: Leeds, Eric
Subject: INPO EVENT and Chariman Questions
Importance: High

Again, it's a work in progress... but SharePoint will help to unclog our email system.

<http://portal.nrc.gov/edo/nrr/NRR%20TA/FAQ%20Related%20to%20Events%20Occuring%20in%20Japan/Forms/AllItems.aspx>

From: Nguyen, Quynh, *NRR*
Sent: Wednesday, March 16, 2011 11:48 AM
To: Meighan, Sean
Subject:
Importance: High

Questions and Answers for OPA:

March 15, 2011; 8:50 pm

1. Can this happen here?

The events that have occurred in Japan are the result of a combination of highly unlikely natural disasters. These include the fifth largest earthquake in recorded history and the resulting devastating tsunami. It is highly unlikely that a similar event could occur in the United States.

2. I live near a nuclear power plant similar to the ones having trouble in Japan. How can we now be confident that this plant won't experience a similar problem?

U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area. The NRC is confident that the robust design of these plants makes it highly unlikely that a similar event could occur in the United States.

3. Has this crisis changed your opinion about the safety of U.S. nuclear power plants?

No. The NRC remains confident that the design of U.S. nuclear power plants ensures the continued protection of public health and safety and the environment.

4. With all this happening, how can the NRC continue to approve new nuclear power plants?

It is premature to speculate what, if any, effect the events in Japan will have on the licensing of new nuclear power plants.

5. What is the NRC doing in response to the situation in Japan?

The NRC has taken a number of actions:

- a. Since the beginning of the event, the NRC has continuously manned its Operations Center in Rockville, MD in order to gather and examine all available information as part of the effort to analyze the event and understand its implications both for Japan and the United States.
- b. A team of 11 officials from the NRC with expertise in boiling water nuclear reactors have deployed to Japan as part of a U.S. International Agency for International Development (USAID) team.

- c. The NRC has spoken with its counterpart agency in Japan, offering the assistance of U.S. technical experts.
- d. The NRC is coordinating its actions with other Federal agencies as part of the U.S. government response.

6. What other U.S. agencies are involved, and what are they doing?

The entire federal family is responding to this event. The NRC is closely coordinating its efforts with the White House, DOE, DOD, USAID, and others. The U.S. government is providing whatever support requested by the Japanese government.

7. What else can go wrong?

The NRC is continuously monitoring the developments at the nuclear power plants in Japan. Circumstances are constantly evolving and it would be inappropriate to speculate on how this situation might develop over the coming days.

8. What is the worst-case scenario?

In a nuclear emergency, the most important action is to ensure the core is covered with water to provide cooling to remove any heat from the fuel rods. Without adequate cooling, the fuel rods will melt. Should the final containment structure fail, radiation from these melting fuel rods would be released to the atmosphere and additional protective measures may be necessary depending on factors such as prevailing wind patterns.

9. The United States has troops in Japan and has sent ships to help the relief effort – are they in danger from the radiation?

The NRC is not the appropriate federal agency to answer this question. DOD is better suited to provide information regarding its personnel.

10. Is there a danger of radiation making it to the United States?

In response to nuclear emergencies, the NRC works with other U.S. agencies to monitor radioactive releases and predict their path. The NRC continues to monitor information regarding wind patterns near the Japanese nuclear power plants. Nevertheless, given the thousands of miles between the two countries, Hawaii, Alaska, the U.S. Territories and the U.S. West Coast are not expected to experience any harmful levels of radioactivity.

11. Is the U.S. government tracking the radiation released from the Japanese plants?

Yes, a number of U.S. agencies are involved in monitoring and assessing radiation including EPA, DOE, and NRC. The best source of additional information is the Environmental Protection Agency.

12. Has the government set up radiation monitoring stations to track the release?

The NRC understands that EPA is utilizing its existing nationwide radiation monitoring system, RadNet, to monitor continuously the nation's air and regularly monitors drinking water, milk and precipitation for environmental radiation. EPA has publicly stated its agreement with the NRC's assessment that we do not expect to see radiation at harmful levels reaching the U.S. from damaged Japanese nuclear power plants. Nevertheless, EPA has stated that it plans to work with its federal partners to deploy additional monitoring capabilities to parts of the western U.S. and U.S. territories.

13. The radiation "plume" seems to be going out to sea – what is the danger of it reaching Alaska? Hawaii? The west coast?

See response to Question 10.

14. I live in the Western United States – should I be taking potassium iodide (KI)?

At this time, the NRC does not believe that protective measures are necessary in the United States. We do not expect any U.S. states or territories to experience harmful levels of radioactivity. In the unlikely event that circumstances change, U.S. residents should listen to the protective action decisions of their states and counties. These protective action decisions could include actions such as sheltering, evacuation, or taking potassium iodide. The NRC will provide technical assistance to the states should they request it.

15. Are there other protective measures I should be taking?

At this time, the NRC does not believe that protective measures are necessary in the United States. We do not expect any U.S. states or territories to experience harmful levels of radioactivity. In the unlikely event that circumstances change, U.S. residents should listen to the protective action decisions of their states and counties. These protective action decisions could include actions such as sheltering, evacuation, or taking potassium iodide. The NRC will provide technical assistance to the states should they request it. United States citizens in Japan are encouraged to follow the protective measures recommended by the Japanese government. These measures appear to be consistent with steps the United States would take.

16. What are the risks to my children?

See response to Question 15.

17. My family has planned a vacation to Hawaii/Alaska/Seattle next week – is it safe to go, or should we cancel our plans?

The NRC does not expect that residents of the United States or its territories are at any risk of exposure to harmful levels of radiation resulting from the events in Japan. Any changes to travel are a personal decision. The NRC is unaware of any travel restrictions within the United States or its territories.

18. What are the short-term and long-term effects of exposure to radiation?

The NRC does not expect that residents of the United States or its territories are at any risk of exposure to harmful levels of radiation resulting from the events in Japan.

On a daily basis, people are exposed to naturally occurring sources of radiation, such as from the sun or medical X-rays. The resulting effects are dependent on the strength and type of radiation as well as the duration of exposure.

19. I am traveling to Asia (not Japan). Should I adjust my travel plans to avoid flying through plume or being contaminated once on the ground?

The NRC is not the responsible federal agency to advise U.S. citizens on foreign travel restrictions. That responsibility belongs to the Department of State.

20. What is the official agency to report radiation numbers and what is the public contact?

NRC regulations require nuclear power plants to report any radiation doses detected at the plant that could be harmful to the public. This would include doses that are generated by the plant or by an external source. During an event in the U.S., it is the state's responsibility to provide protective action decisions for public health and safety. For this incident, the Japanese are responsible for reporting the public dose; nevertheless, should radiation doses be detected within the U.S., it would still be the state's responsibility to provide protective action decisions for public health and safety.

21. How many plants are located in seismic areas?

Although we often think of the US as having "active" and "non-active" earthquake zones, earthquakes can actually happen almost anywhere. Seismologists typically separate the US into low, moderate, and high seismicity zones. The NRC requires that every plant be designed for site-specific ground motions that are appropriate for their location. In

addition, the NRC has specified a minimum ground shaking level to which the plants must be designed.

22. Where would I get IOSAT Potassium Iodide if my city should experience fallout from the Japanese nuclear disaster? Is this the right precaution or is there anything else that can be done to protect myself?

We do not expect any U.S. states or territories to experience harmful levels of radioactivity. As such, we do not believe that there is any need for residents of the United States to take potassium iodide. U.S. residents should listen to the protective action decisions by their states and counties. If necessary, protective action decisions could include actions such as sheltering, evacuating, or taking potassium iodide.

Additional information regarding the use of potassium iodide can be found on NRC's webpage at the following link:

<http://www.nrc.gov/about-nrc/emerg-preparedness/about-emerg-preparedness/potassium-iodide-use.html>

Since Potassium Iodide is classified as a drug. Additional information is on the Food and Drug Administration's web site. www.fda.gov

23. My loved one is overseas, how do I find out if they are ok?

We are directing public inquiries with regard to concern for loved ones overseas to the State Department, Consular Services at 202-647-7004.

See, Kenneth

From: Chokshi, Nilesch
Sent: Saturday, March 19, 2011 9:01 AM
To: Nicholson, Thomas; JEngland@usbr.gov
Cc: Randall, John; Ott, William; Kanney, Joseph; Raione, Richard; See, Kenneth
Subject: RE: Draft Narrative for PMP Studies for Nilesch Chokshi

Tom and Joe,

Thanks for putting this together in a very short time. All of this is very useful much beyond the immediate needs of the Commission briefing.

Nilesch

From: Nicholson, Thomas
Sent: Thursday, March 17, 2011 5:39 PM
To: JEngland@usbr.gov
Cc: Randall, John; Ott, William; Kanney, Joseph; Chokshi, Nilesch; Raione, Richard; See, Kenneth
Subject: Draft Narrative for PMP Studies for Nilesch Chokshi

John:

Joe Kanney and I tried calling you this afternoon for immediate input to a NRO management request.

The request is to provide a very short update on the PMP estimates for the Carolinas. Joe Kanney and I propose the following paragraph. Please review and correct/modify to assure its veracity.

Does research, funded by NRC's office of Nuclear Regulatory Research, to date indicate whether the PMP estimates in HydroMeteorological Report (HMR) 51 for the Carolinas are sufficiently conservative? Have the PMP estimates in any part of the U.S. been exceeded since the publication of the HMR's?

The ongoing NRC-funded research by the U.S. Bureau of Reclamation is a pilot project to review the information and methods in HMR 51 focusing on South and North Carolina. To date, this research that is reviewing precipitation records from extreme storm events (e.g., tropical storms, hurricanes) since the publication of HMR 51 does not indicate any exceedance or potential for exceedance of those PMP estimates in the pilot region. We have not seen any information or data that would indicate that HMR PMP estimates for the U.S. have been exceeded.

In addition to this research effort, NRC staff is participating in a Work Group on Extreme Storm Events under the Federal Subcommittee on Hydrology which provides access to studies by other Federal Agencies (e.g., NOAA/National Weather Service, U.S. Army Corps of Engineers, Federal Energy Regulatory Commission, U.S. Geological Survey, Federal Emergency Management Agency) on extreme storm events.

For the NRO management, I have attached HMR 51 as background.

Thanks Tom and Joe

Thomas J. Nicholson, Senior Technical Advisor
U.S. Nuclear Regulatory Commission
Office of Nuclear Regulatory Research

c/26

Dep. Dir., Div. of Site & Environmental Reviews
Office of New Reactors
USNRC
MS T-07F3
Washington, DC 20555
(301)-415-1634

-AKR
From: [Brown, Frederick](#)
To: [Westreich, Barry](#); [Cheok, Michael](#); [Holian, Brian](#); [Hiland, Patrick](#); [Lubinski, John](#)
Subject: FW: Draft Scheduling Note for Japan event 3-16-2011
Date: Wednesday, March 16, 2011 1:23:34 PM
Attachments: [Scheduling NoteMar2011 JapaneseEvent agh 3-16-2011.docx](#)

FYI

-AKR
From: Howe, Allen
Sent: Wednesday, March 16, 2011 1:18 PM
To: Merzke, Daniel; Andersen, James
Cc: Leeds, Eric; Ruland, William; Giitter, Joseph; Boger, Bruce; Grobe, Jack; Virgilio, Martin; Weber, Michael; Borchardt, Bill; Brenner, Eliot; Schmidt, Rebecca; Doane, Margaret; Holian, Brian; Brown, Frederick
Subject: Draft Scheduling Note for Japan event 3-16-2011

Dan/Jim – attached is a rough draft scheduling note for the Commission meeting. Eric Leeds has reviewed it and approved. We are coordinating support for the meeting, which could occur as early as Monday. Please keep me updated on any developments.

Thanks - Allen

c/a

Draft: 3/16/11

SCHEDULING NOTE

Title: BRIEFING ON JAPANESE EVENT and US RESPONSE (Public?)

Purpose: To provide the Commission a status on the recent event in Japan, and to provide an overview of staff actions to date, early planned actions

Scheduled: March XX, 2011
9:00 am

Duration: Approx. 2 hours

Location: Commissioners' Conference Room OWFN

Participants: **Presentation**

NRC Staff Panel **50 mins.***

Bill Borchardt, Executive Director for Operations 15 mins.*
Topic: Overview of Japanese Event and U.S. response

Mike Weber, Deputy Executive Director Materials, Waste,
Research, State, Tribal and Compliance Programs 10 mins.*
Topic: Potential consequences; what will be seen in U.S.

Marty Virgilio, Deputy Executive Director for Reactor
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Elliot Brenner, OPA 5 mins.*
Topic: Communication Challenges

Eric Leeds, Director, NRR 10 mins.*
Topic: Path forward; Near term and longer term

Commission Q & A **30 mins.**

Discussion – Wrap-up **5 mins.**

Break **10 mins.**

Closed session

Strategy and agenda planning

Documents:

Staff background material due to SECY: March __, 2011.

Slides due to SECY: March __, 2011.

- NKK

From: [Beckford, Kaydian](#)
To: [Thomas, Brian](#); [Lubinski, John](#); [Taylor, Robert](#); [Lupold, Timothy](#); [Wolfgang, Robert](#); [Mitchell, Matthew](#); [Cusumano, Victor](#)
Subject: Agency Activities Related to Japan

When: Wednesday, March 16, 2011 2:30 PM-3:00 PM (GMT-05:00) Eastern Time (US & Canada).
Where: HQ-OWFN-09B06-12p

Note: The GMT offset above does not reflect daylight saving time adjustments.

~~*~*~*~*~*~*~*~*

C/28

From: [Thomas, Brian](#) - NRR
To: [Cusumano, Victor](#)
Cc: [Lubinski, John](#)
Subject: RE: Japan Updates
Date: Wednesday, March 16, 2011 11:08:02 AM

Vic,
Excellent! thanks for helping to keep the division staff well informed.

From: Cusumano, Victor - NRR
Sent: Wednesday, March 16, 2011 9:25 AM
To: NRR_DCI Distribution
Subject: Japan Updates

- From the Tepco (the utility) as of today (VERY detailed press release):
<http://www.tepco.co.jp/en/press/corp-com/release/11031608-e.html>
- From Japan Atomic Industrial Forum (JAIF) detailed spreadsheet with unit/system status at-a-glance: [complete summary PDF](#)
- JAIF main site (english): <http://www.jaif.or.jp/english/index.php>

Vic

VICTOR CUSUMANO
TECHNICAL ASSISTANT

NRR/DCI
Phone: 301.415.4011
Location: 0-09010

cl29

From: [Howe, Allen](#) -NRK
To: [Cheok, Michael](#); [Holian, Brian](#); [Ruland, William](#); [Wilson, George](#); [Lubinski, John](#); [Thomas, Brian](#); [Quay, Theodore](#); [Nelson, Robert](#); [Glitter, Joseph](#); [Brown, Frederick](#)
Subject: Outline from today's emergency LT attached
Date: Wednesday, March 16, 2011 11:23:21 AM
Attachments: [Commission Meeting Outline.pdf](#)

open & closed

Commission Meeting Outline

NRC Response to Core Damage Accident in Japan

Current Status of Fukushima Daiichi

- Reactors
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- External Events
- Severe Accidents

Path Forward and Priorities

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 In Support of Response
- Longer Term Actions
 Lessons Learned From this Event
 Resolution of GSI 19⁹

What's not getting done

Howe, Allen

From: Howe, Allen, *NAR*
Sent: Wednesday, March 16, 2011 2:10 PM
To: Harrington, Holly, *OPA*
Cc: Ruland, William; Leeds, Eric
Subject: FW: Draft Scheduling Note for Japan event 3-16-2011
Attachments: Scheduling NoteMar2011_JapaneseEvent agh 3-16-2011.docx

Importance: High

Holly – I appreciate the challenges you are facing right now with the blizzard of requests coming to your office. I am coordinating a Commission briefing on the Japan event to be conducted as early as Monday. The draft scheduling note is attached. We are reaching out to impacted offices to prepare for the brief. I have Eliot Brenner as a speaker to discuss communication challenges. What is needed is a POC who can engage in preparations to develop slides and talking points for Eliot. The POC is needed ASAP.

Thanks for your help - Allen

From: Howe, Allen *NAR*
Sent: Wednesday, March 16, 2011 1:18 PM
To: Merzke, Daniel; Andersen, James
Cc: Leeds, Eric; Ruland, William; Giitter, Joseph; Boger, Bruce; Grobe, Jack; Virgilio, Martin; Weber, Michael; Borchardt, Bill; Brenner, Eliot; Schmidt, Rebecca; Doane, Margaret; Holian, Brian; Brown, Frederick
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Thanks - Allen

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Topic: Potential consequences; what will be seen in U.S.

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Documents:

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Cohen, Shari

From: Leeds, Eric *NRR*
Sent: Wednesday, March 16, 2011 2:29 PM
To: Haney, Catherine *NMSS*
Cc: Ruland, William; Ordaz, Vonna; Howe, Allen
Subject: RE: Planning for upcoming, short notice Commission meeting

Thanks, Cathy. With the issues on Spent fuel pools, we should address the issue with the Commission – as well as the potential for dry cask storage. I know we did a bunch of work on airplanes hitting casks for the Goshute Indian facility – and the potential impact. Can we get that info?

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

From: Haney, Catherine *NMSS*
Sent: Wednesday, March 16, 2011 2:06 PM
To: Ruland, William; Williams, Donna; Uhle, Jennifer; Sheron, Brian; Moore, Scott; Miller, Charles; Brenner, Eliot; Dorman, Dan; Wiggins, Jim; Evans, Michele; Doane, Margaret; Mamish, Nader
Cc: Johnson, Michael; Holahan, Gary; Leeds, Eric; Grobe, Jack; Howe, Allen; Bajwa, Chris
Subject: RE: Planning for upcoming, short notice Commission meeting

NMSS POC is Chris Bajwa, SFST

From: Ruland, William *NRR*
Sent: Wednesday, March 16, 2011 1:19 PM
To: Williams, Donna; Uhle, Jennifer; Sheron, Brian; Moore, Scott; Miller, Charles; Brenner, Eliot; Haney, Catherine; Dorman, Dan; Wiggins, Jim; Evans, Michele; Doane, Margaret; Mamish, Nader
Cc: Johnson, Michael; Holahan, Gary; Leeds, Eric; Grobe, Jack; Howe, Allen
Subject: Planning for upcoming, short notice Commission meeting

Folks,

Attached find a early draft of a scheduling note for a Commission meeting that may be held as early as this coming Monday, March 21st. NRR has been assigned as the lead to pull the meeting together. As you could imagine, this will take some effort. To help with coordination, please provide me a contact so that we can draw on your expertise and help to make this happen. Alan Howe, currently deputy director of DORL, has the lead to pull this together.

I know you have many questions. I'd ask for your patience as we try to get this done. I'll keep you updated through the contact that you provide to us.

Thank you very much.

Bill Ruland

Heida, Bruce

NRC
NRC

From: Rodriguez, Veronica
Sent: Wednesday, March 16, 2011 8:53 AM
To: Chung, Donald; Circle, Jeff; Ferrante, Fernando; Mitman, Jeffrey; Stambaugh, Margaret; Vail, James; Wong, See-Meng; Zoulis, Antonios
Subject: Update - Japan
Follow Up Flag: Follow up
Flag Status: Flagged

Folks,

Yesterday afternoon the BCs attended a First Line Supervisors meeting with the EDO. As you can imagine Japan's events were one of the topics of discussion. The message conveyed basically re-emphasized the items I discussed during our Branch Meeting. Below I'm including a list of highlights. I'll provide more information as it becomes available.

- 9 additional NRC staff members were deployed to Japan. They are acting as part of the U.S. Agency for International Development assistance team. The NRC currently has 11 employees working from the Embassy. Chuck Casto is the lead of the team. More information can be found in the following [press release](#).
- All requests for information should be sent / coordinated through the HOO (301-816-5100). If you receive information and you're not certain the incident response already has it, this should also be forwarded to them.
 - Remember, NRC employees should not be responding to these request personally.
 - If you receive information and you're not certain the incident response already has it, this should also be forwarded to them.
- This is an ongoing crisis for the Japanese and they have primary responsibility for handling it and communicating about it. The NRC will not publicly comment on hour-to-hour developments at the Japanese reactors.
- Key Message: Stay focus on our Mission! Continue to monitor the safety of the U.S NPPs.
- The best sources of information are: NRC [press releases](#) and the NRC [blog](#).

--Veronica

Heida, Bruce

From: Ferrante, Fernando, *NA*
Sent: Wednesday, March 16, 2011 8:59 AM
To: Ferrante, Fernando

Follow Up Flag: Follow up
Flag Status: Flagged

Press Release (Mar 16,2011)
Transfer of Fukushima Dai-ichi Power Station Workers

At approximately 6:00 today, an abnormal noise began emanating from nearby the pressure suppression chamber of Fukushima Dai-ichi Power Station. Given that the pressure within this chamber had decreased, it was believed that this was an indication that an abnormality had arisen. From this point on, while water injection operations are still underway, the temporary transfer to a safe place of TEPCO employees and workers from other companies not directly involved with this work has begun. Currently, at Fukushima Dai-ichi Power Station, the remaining workers are doing their best to secure the safety and security of the site.

The parameters for Unit 2's nuclear containment vessel and the containment vessel show no significant change.

We are aware of and sincerely apologize for the great distress and inconvenience this incident has caused to not just those inhabitants residing in the immediate vicinity but also society at large.

Thank you,

Fernando Ferrante, Ph.D.
Office of Nuclear Reactor Regulation (NRR)
Division of Risk Assessment (DRA)
PRA Operational Support Branch (APOB)
Mail Stop: 0-10C15
Phone: 301-415-8385
Fax: 301-415-3577

✓
Feintuch, Karl

From: Feintuch, Karl *NR*
Sent: Wednesday, March 16, 2011 9:17 AM
To: Pascarelli, Robert *NR*
Subject: Morning status call items

Kewaunee in Mode 5; Reactor head bolts tensioned; expect Mode 4 this weekend or shortly thereafter. **Duane Arnold** expects a visit from a state representative this Friday. It was planned before the events in Japan.
(Riemer reminded all to coordinate with Public Affairs on any contact with media.)

Events in Japan (caution regarding maturity and reliability of following information)
(Definition U = Unit)

- U1,2,3 have fuel damage
- U2 containment now appears to be intact.(contrary to earlier announcements)
- U1,2,3 have lost secondary containment integrity
- 60 mrem/hr dose at site boundary
- Z-H (Zirconium-Hydrogen) fire in U4 spent fuel pool
- U5, U6 fuel pool temp reported at 80 degC
- Multiple Z-H fires reported in spent fuel pools

- US to supply Japan with KI doses
- Japan reports 5 persons have received lethal radiation doses

- INPO appears to be lead in coordinating for US nuc industry
- INPO asking sites for following types of info:
 - -B5B capability/response (c/r)
 - -SAMG c/r
 - -Station Blackout c/r
 - -Internal/external c/r

- 11 NRC people now in Japan

Emphasized this morning to work with Public Affairs if any media contact

Caponiti, Kathleen

From: Cusumano, Victor *NRR*
Sent: Wednesday, March 16, 2011 9:25 AM
To: NRR_DCI Distribution
Subject: Japan Updates

- From the Tepco (the utility) as of today (VERY detailed press release):
<http://www.tepco.co.jp/en/press/corp-com/release/11031608-e.html>
- From Japan Atomic Industrial Forum (JAIF) detailed spreadsheet with unit/system status at-a-glance: complete summary PDF
- JAIF main site (english): <http://www.jaif.or.jp/english/index.php>

Vic

VICTOR CUSUMANO
TECHNICAL ASSISTANT

NRR/DCI
Phone: 301.415.4011
Location: 0-09C10

Chernoff, Harold

From: Guzman, Richard, *nrc*
Sent: Wednesday, March 16, 2011 9:41 AM
To: Hughey, John
Cc: Chernoff, Harold
Subject: RE: Google Alert - nrc peach bottom - Japan & SOARCA

Thanks, John. The SOARCA folks in RES were not aware of the article... interesting.

Rich

From: Hughey, John *nrc*
Sent: Wednesday, March 16, 2011 7:58 AM
To: Guzman, Richard; Chernoff, Harold
Subject: FW: Google Alert - nrc peach bottom - Japan & SOARCA

FYI

John Hughey
Peach Bottom Project Manager
NRR / Division of Operating Reactor Licensing
Phone: 301-415-3204
e-mail: John.Hughey@nrc.gov

From: Bower, Fred, *RT*
Sent: Wednesday, March 16, 2011 7:51 AM
To: Krohn, Paul; Sheehan, Neil
Cc: Ziedonis, Adam; Rosebrook, Andrew; Hughey, John
Subject: FW: Google Alert - nrc peach bottom - Japan & SOARCA

Interesting article that ties Japan and Peach Bottom SOARCA effort.....

Fred Bower
Senior Resident Inspector
Peach Bottom Atomic Power Station

From: Google Alerts [<mailto:googlealerts-noreply@google.com>]
Sent: Tuesday, March 15, 2011 9:16 PM
To: Bower, Fred
Subject: Google Alert - nrc peach bottom

News

1 new result for nrc peach bottom

[NRC tapping tech for better analysis of nuclear accidents](#)

Computerworld

What's different with SOARCA, says the NRC, is that it uses modern ... of the NRCs SOARCA project is the **Peach Bottom** Atomic Power Station in Pennsylvania. ...

Tip: Use a plus sign (+) to match a term in your query exactly as is. [Learn more.](#)

4/3/11

[Remove](#) this alert.
[Create](#) another alert.
[Manage](#) your alerts.

Heida, Bruce

NRP
From: Mitman, Jeffrey
Sent: Wednesday, March 16, 2011 9:51 PM
To: Ferrante, Fernando, *NRP*
Subject: RE: Japan status

Fernando, the presentation went well. It was attended by 15 or 20 people which is about average for the conference. There were two series of questions. The most interesting was about whether there was some way to take into account additional dam parameters into consideration when calculating the failure frequencies. I'm not sure I succeeded in convincing the questioner that I believed that was not possible. But we may have been talking past each other as she may have been trying to say that a better dam specific frequency could be derived using engineering analysis/judgement.

No one from Duke appears to be here and there were no connections drawn to Jocassee. There does appear to be some stirring interest in external flood analysis among PRA contractors driven by utility interest. They now we are looking and thinking about external floods. The big topic of interest here has been seismic due to the Japanese earthquake. Everyone refers to the Fukushima plant problems as being driven by a quake when it is clear to me that it was flood that caused the damage to the electrical and service water systems.

Of course there is also a lot of interest (and complaining) about fire.

Jeff

NRP
From: Ferrante, Fernando
Sent: Wednesday, March 16, 2011 8:48 AM
To: Mitman, Jeffrey
Subject: RE: Japan status

Jeff, give me a call when you can, I am interested to know how the presentation went.

From: Mitman, Jeffrey
Sent: Tuesday, March 15, 2011 10:23 PM
To: Circle, Jeff; Ferrante, Fernando; Chung, Donald; Pohida, Marie; Vail, James
Subject: FW: Japan status

Excellent link.

RES
From: Lai, Sandra
Sent: Tuesday, March 15, 2011 2:56 PM
To: Mary Drouin; Sancaktar, Selim; Mitman, Jeffrey; Zoulis, Antonios; Lachance, Jeffrey Lynn; 'Willard Thomas'; Gordon, Matthew; Dennis, Matthew L; Mills, Daniel
Subject: Japan status

http://www.iaif.or.jp/english/news_images/pdf/ENGNEWS01_1300189582P.pdf

Sandy Lai
Reliability and Risk Engineer
U.S. Nuclear Regulatory Commission
RES/DRA/PRB
301-251-7607

Giitter, Joseph

From: Giitter, Joseph *in RR*
Sent: Wednesday, March 16, 2011 10:28 AM
To: Hasselberg, Rick *NSIR*
Subject: FW: quick visual summary of conditions - about 24 hours old

Rick- Old information but may be a reliable source. Have you seen this info?

-----Original Message-----

From: Boyle, Patrick
Sent: Wednesday, March 16, 2011 9:32 AM
To: Howe, Allen; Giitter, Joseph; Nelson, Robert
Subject: quick visual summary of conditions - about 24 hours old

http://www.jaif.or.jp/english/news_images/pdf/ENGNEWS01_1300168169P.pdf

c/39

Boyle, Patrick

From: Boyle, Patrick *MRK*
Sent: Wednesday, March 16, 2011 10:31 AM
To: Giitter, Joseph
Subject: RE: quick visual summary of conditions - about 24 hours old
Attachments: E-News from Nuclear Plant Journal

I got the link from an email sent to me from the Nuclear Plant Journal. The site looks like it is available to the general public.

-----Original Message-----

From: Giitter, Joseph *MRK*
Sent: Wednesday, March 16, 2011 10:27 AM
To: Boyle, Patrick
Subject: RE: quick visual summary of conditions - about 24 hours old

Patrick--What is your source for this information?

-----Original Message-----

From: Boyle, Patrick
Sent: Wednesday, March 16, 2011 9:32 AM
To: Howe, Allen; Giitter, Joseph; Nelson, Robert
Subject: quick visual summary of conditions - about 24 hours old

http://www.jaif.or.jp/english/news_images/pdf/ENGNEWS01_1300168169P.pdf

Boyle, Patrick

From: Nuclear Plant Journal [anu@goinfo.com]
Sent: Tuesday, March 15, 2011 5:47 PM
To: Boyle, Patrick
Subject: E-News from Nuclear Plant Journal

Having trouble viewing this email? [Click here](#)

Nuclear Plant Journal

An International Publication
Published in the United States

Nuclear Plant Journal E-News

Japan Update
March 15, 2011

Dear PATRICK,

Nuclear Plant Journal brings you a special E-edition of the Journal with the latest information from events related to the Miyagiken-Oki Earthquake and ensuing tsunami on March 11, 2011, in northern Japan.

All Fukushima Daiichi Nuclear Power Plants have an INES Radiation Alert Level 4. Please see this [IAEA link](#) for an explanation of the levels.

The following two links provides updates as of March 15, 2011:

- On the JAIF website, there is a [complete summary PDF](#) that includes status updates of all units at the Fukushima plant.
- The Prime Minister's office [update](#).

Organizations which are currently providing the current status of the Japanese affected nuclear power stations are listed below.

TEPCO News Releases

Tokyo Electric Power Company provides the [latest updates](#) from the utility that owns the Fukushima Daiichi Nuclear Power Station.



TOKYO ELECTRIC POWER COMPANY

Japan Atomic Industrial Forum

Please see [this link](#) for the most current from the Japan Atomic Industrial Forum.

Nuclear and Industrial Safety Agency (NISA)

Please see [this link](#) for the most current from NISA.

NISA Nuclear and Industrial Safety Agency

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Contact Information

phone: 630-313-6739

email: NPJ@goinfo.com

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This email was sent to patrick.boyle@nrc.gov by anu@goinfo.com |
[Update Profile/Email Address](#) | Instant removal with [SafeUnsubscribe™](#) | [Privacy Policy](#).
Nuclear Plant Journal | 1400 Opus Place, Suite 904 | Downers Grove | IL | 60515

Cartwright, William

From: Holian, Brian *MRK*
Sent: Wednesday, March 16, 2011 10:52 AM
To: Howe, Allen *MRK*
Cc: Ruland, William; Brown, Frederick; Giitter, Joseph; Galloway, Melanie; Nelson, Robert; Cheok, Michael
Subject: Strawman scheduling note for Upcoming Commission meeting
Attachments: Scheduling NoteMar2011_JapaneseEvent.docx

Allen

I did not have the single sheet of paper that Bill passed out...
But I modified a previous scheduling note and just inserted some thoughts based on the discussion.

Probably be hard to get an Industry panel together on such short notice....put some thoughts down as an option...

SCHEDULING NOTE

Title: BRIEFING ON JAPANESE EVENT and US RESPONSE (Public?)

Purpose: To provide the Commission a status on the recent event in Japan, and to provide an overview of staff actions to date, early planned actions

Scheduled: March 22, 2011
9:00 am

Duration: Approx. 2 hours

Location: Commissioners' Conference Room OWFN

Participants:	Presentation
<u>Industry Panel (for consideration)</u>	40 mins.*
INPO Rep, <u>Topic:</u> View of the event and pertinent issues from INPO	10 mins.*
NEI Rep <u>Topic:</u> Assessment of Industry preparations and early lessons	10 mins.*
BWR Owners Group Rep <u>Topic:</u> Perspective on areas of focus for aging management (PWR and BWR).	10 mins.*
State Representative ?? Perspective on Communications so far	10 mins
Commission Q & A	30 mins.
Break	5 mins
<u>NRC Staff Panel</u>	50 mins.*
Bill Borchardt, Executive Director for Operations	
Brian Sheron, Office Director, RES <u>Topic:</u> Overview of Japanese Event	15 mins.*
Charlie Miller, Director, FSME <u>Topic:</u> Overview of dose to public; what will be seen in U.S.	10 mins.*

Eric Leeds, Director, NRR	15 mins.*
<u>Topic:</u> Summary of US Designs; Similarities and Differences; Generic Communication to Industry	
Elliot Brenner, OPA	10 mins
<u>Topic:</u> Communication Challenges	
Commission Q & A	30 mins.
Discussion – Wrap-up	5 mins.

Documents:

Staff background material due to SECY: March __, 2011.

Slides due to SECY: March __, 2011.

Hughey, John

From: Miller, Ed *NRC*
Sent: Wednesday, March 16, 2011 7:50 AM
To: Chernoff, Harold *NEA*
Cc: Hughey, John; Bamford, Peter; Ennis, Rick

Here is a comment from the NRC Blog. Just to reinforce the call for better engagement with the public by the NRC.

I watched the Bill Nye interview last night and he said that they use Cs-137 as a neutron poison, that TMI was up and running shortly after the accident, and he stumbles when they came to the use of boric acid in a reactor. This incorrect and misleading information is what the public will take as true when we fail to engage.

1. **Noah Hensley** March 15, 2011 at 12:55 pm

To whom it may concern (the whole of NRC),

While sending experts to Tokyo is great for international partnerships, but who is the media getting their information from? I'm a supporter of nuclear energy as a step towards energy independence and a temporary source until better renewable energy becomes available. I'm certainly not an expert, but I do have a BS in physics and have always been interested in nuclear energy and understand the basic principles. Most people however, hate physics and don't understand nuclear power, yet they still feel free to argue against it. I would urge whoever reads this at the NRC (if you are reading these comments) to step up into the limelight, your country needs you, and not just at press conferences. NRC employees and experts should be the ones on Larry King Live and sharing information with FOXNEWS, ABC, NBC, and CNN. The media is having a hayday with your livelihood, get out there and defend it. At least 90% (completely made-up, but in my experience this is a conservative estimate) of Americans are generally uninformed when it comes to radiation and nuclear power. In fact, I doubt most americans even know that the NRC exists. If someone doesn't step into the media limelight, nuclear power will be cut much sooner than it should be. I believe it should be your job to educate the American people, as well as the US and state congresses; otherwise who will do it (pundits, politicians, and others who know nothing about nuclear power)? Please, give Larry King a call...

Chernoff, Harold

From: Ennis, Rick, *NR*
Sent: *NR* Wednesday, March 16, 2011 8:44 AM
To: Chernoff, Harold; Bamford, Peter; Hughey, John; Miller, Ed; Whited, Jeffrey
Subject: FAQ from NEI
Attachments: Japanese Nuclear Situation_FAQs.pdf

I found the attached FAQs on NEIs website. They are pretty good but need to be updated to reflect changes in plant status since they were issued on Monday.



NUCLEAR ENERGY INSTITUTE

Frequently Asked Questions: Japanese Nuclear Energy Situation

1. What will be the impact of the Fukushima Daiichi accident on the U.S. nuclear program?

It is premature to draw conclusions from the tragedy in Japan about the U.S. nuclear energy program. Japan is facing what literally can be considered a “worst case” disaster and, so far, even the most seriously damaged of its 54 reactors has not released radiation at levels that would harm the public. That is a testament to their rugged design and construction, and the effectiveness of their employees and the industry’s emergency preparedness planning.

Until we understand clearly what has occurred at the Fukushima Daiichi nuclear power plants, and any consequences, it is difficult to speculate about the long-term impact on the U.S. nuclear energy program. The U.S. nuclear industry, the U.S. Nuclear Regulatory Commission, the Institute of Nuclear Power Operations, the World Association of Nuclear Operators and other expert organizations in the United States and around the world will conduct detailed reviews of the accident, identify lessons learned (both in terms of plant operation and design), and we will incorporate those lessons learned into the design and operation of U.S. nuclear power plants. When we fully understand the facts surrounding the event in Japan, we will use those insights to make nuclear energy even safer.

In the long-term, we believe that the U.S. nuclear energy enterprise is built on a strong foundation:

- reactor designs and operating practices that incorporate a defense-in-depth approach and multiple levels of redundant systems
- a strong, independent regulatory infrastructure
- a transparent regulatory process that provides for public participation in licensing decisions, and
- a continuing and systematic process to identify lessons learned from operating experience and to incorporate those lessons.

2. What will be the impact of the Fukushima Daiichi accident on new nuclear plant construction in the United States?

Nuclear energy has been and will continue to be a key element in meeting America’s energy needs. The nuclear industry sets the highest standards for safety and, through our focus on continuous learning, we will incorporate lessons learned from the events in Japan into the ongoing process of designing, licensing and building new nuclear power plants.

New nuclear power plant construction in the United States is in the early stages and proceeding in a deliberate fashion. Two companies have started site preparation and other construction activities for new nuclear power plants in Georgia and South Carolina, with the expectation that they will receive their combined construction-operating licenses from the Nuclear Regulatory Commission in late 2011 or early 2012. We expect those new reactor projects to proceed. Both

projects use a light water reactor design with advanced safety features – i.e., the reactors rely on natural forces like gravity (rather than engineered safety features like pumps) to deliver cooling water to the reactor core.

In addition, a number of companies are moving forward with design, licensing and – at the appropriate time – construction of small modular reactors (SMRs), which also incorporate design features that provide additional safety margin.

Although America's 104 nuclear power plants are safe and meet all requirements necessary to protect public health and safety, these new designs are even safer.

3. *Could an accident like the one at Japan's Fukushima Daiichi nuclear plant happen in the United States?*

It is difficult to answer this question until we have a better understanding of the precise problems and conditions that faced the operators at Fukushima Daiichi. We do know, however, that Fukushima Daiichi Units 1-3 lost all offsite power and emergency diesel generators. This situation is called "station blackout." U.S. nuclear power plants are designed to cope with a station blackout event that involves a loss of offsite power *and* onsite emergency power. The Nuclear Regulatory Commission's detailed regulations address this scenario. U.S. nuclear plants are required to conduct a "coping" assessment and develop a strategy to demonstrate to the NRC that they could maintain the plant in a safe condition during a station blackout scenario. These assessments, proposed modifications and operating procedures were reviewed and approved by the NRC. Several plants added additional AC power sources to comply with this regulation.

In addition, U.S. nuclear plant designs and operating practices since the terrorist events of September 11, 2001, are designed to mitigate severe accident scenarios such as aircraft impact, which include the complete loss of offsite power and all on-site emergency power sources.

U.S. nuclear plant designs include consideration of seismic events and tsunamis'. It is important not to extrapolate earthquake and tsunami data from one location of the world to another when evaluating these natural hazards. These catastrophic natural events are very region- and location-specific, based on tectonic and geological fault line locations.

4. *What would U.S. nuclear plant operators do if they faced a loss of power from the grid and loss of emergency diesel generators like that faced by the operators at Fukushima Daiichi?*

Nuclear power plant operators are trained to ensure that the plant will achieve and maintain safe shutdown during a station blackout scenario (loss of offsite power and loss of onsite emergency AC power). They have operating procedures that guide them on actions to be taken in responding to this scenario. The training includes regular classroom work as well as plant-specific simulator exercises.

5. *Do NRC regulations require nuclear plant operators to have back-up power long enough to maintain safe conditions when power from the grid is not available for several days?*

Yes, nuclear plants are required to have emergency AC power sources (diesel generators) to provide electrical power to plant safety equipment when there is a loss of power from the electrical grid. These backup generators are tested on a monthly basis to ensure that they successfully start and accept electric loads. Additionally, there are also battery powered DC support systems for some emergency DC power to critical valves, etc.

A nuclear plant can maintain a shutdown condition isolated from the bulk power transmission system for an indefinite period of time.

6. *How many U.S. reactors use the Mark I containment design used at Fukushima Daiichi Unit 1?*

Six U.S. nuclear reactors (Monticello in Minnesota, Pilgrim in Massachusetts, Dresden 2 and 3 and Quad Cities 1 and 2 in Illinois) are the same base design as the Fukushima Daiichi Unit 1 design (BWR-3 design with Mark I containment). Twenty-three U.S. nuclear plants are boiling water reactors (either BWR-2, BWR-3 or BWR-4) and use the Mark I containment: Browns Ferry 1, 2 and 3; Brunswick 1 and 2; Cooper; Dresden 2 and 3; Duane Arnold; Hatch 1 and 2; Fermi; Hope Creek; Fitzpatrick; Monticello; Nine Mile Point 1; Oyster Creek; Peach Bottom 2 and 3; Pilgrim; Quad Cities 1 and 2; Vermont Yankee. Although these are the same basic reactor design, specific elements of the safety systems will vary based on the requirements of the U.S. NRC.

7. *What caused the explosion at Fukushima Daiichi Unit 1 on Saturday, March 12?*

The explosion appears to have been caused by a build-up of hydrogen in the reactor building. The uranium fuel pellets are enclosed in steel tubes made of zirconium alloy. When exposed to very high temperatures, the zirconium reacts with water to form zirconium oxide and hydrogen. This appears to have happened at Fukushima Daiichi Unit 1 when a portion of the uranium fuel was uncovered. It is assumed that the hydrogen found its way into the reactor building, accumulated there, and ignited. Although significant, the explosion did not appear to compromise the integrity of the primary containment or the reactor vessel.

8. *Given that Fukushima Daiichi Unit 1 is a 1970s-vintage plant, do you anticipate increased regulatory requirements and scrutiny on U.S. plants of similar vintage? Do you think the accident will have an impact on license renewal of the older U.S. nuclear power plants?*

The U.S. nuclear energy industry and the Nuclear Regulatory Commission will analyze the events at Fukushima Daiichi, identify lessons learned and incorporate those lessons, as appropriate, into the design and operation of U.S. nuclear power plants.

The U.S. industry routinely incorporates lessons learned from operating experience into its reactor designs and operations. For example, as a result of the 1979 accident at Three Mile Island, the industry learned valuable lessons about hydrogen accumulation inside containment. After Three Mile Island, many boiling water reactors implemented a modification referred to as a hardened vent or direct vent. This allows the plant to vent primary containment via high pressure piping. This precludes over-pressurization of containment.

9. *There have been questions raised in the past about the BWR Mark I containment like that at Fukushima Daiichi Unit 1? Some critics have pointed to a comment by an NRC official in the early 1980s: "Mark I containment, especially being smaller with lower design pressure, in spite of the suppression pool, if you look at the WASH 1400 safety study, you'll find something like a 90% probability of that containment failing."*

The Mark I containment meets all Nuclear Regulatory Commission design and safety requirements necessary to protect public health and safety. The WASH-1400 safety study referenced was performed in 1975. The Nuclear Regulatory Commission has analyzed the Mark I containment design in great detail. The NRC analysis found that the BWR Mark I risk was

dominated by two scenarios: station blackout and anticipated transient without scram. The NRC subsequently promulgated regulations for both of these sequences as well as other actions to reduce the probability.

10. *What happens when you have a complete loss of electrical power to operate pumps in a BWR-3 reactor with Mark I containment like the one at Fukushima Daiichi Unit 1?*

If plant operators cannot move water through the reactor core, the water in the reactor vessel begins to boil and turn to steam, increasing pressure inside the reactor vessel. In order to keep the reactor vessel pressure below design limits, this steam is then piped into what is called a “suppression pool” of water or “torus” – a large doughnut-shaped ring that sits beneath the reactor vessel.

Eventually, the water in the suppression pool reaches “saturation” – i.e., it cannot absorb any additional heat and it, too begins to boil, increasing pressure in containment. In order to stay within design limits for the primary containment, operators will reduce pressure by venting steam through filters (to scrub out any radioactive particles) to the atmosphere through the vent stack.

If operators cannot pump additional water into the reactor vessel, the water level will begin to drop, uncovering the fuel rods. If the fuel remains uncovered for an extended period of time, fuel damage, possibly including melting of fuel, may occur. If there is fuel damage, and steam is being vented to the suppression pool, then to primary containment, then to secondary containment (in order to relieve pressure build-up on plant systems), small quantities of radioactive materials will escape to the environment.

11. *How serious are the releases of radiation from Fukushima Daiichi? Do they represent a threat to human health? Will we see an increase in cancer rates in future years?*

The most effective options for protecting the public have already been instituted. In the early stages of this event, authorities ordered evacuation of the people who live around the Fukushima Daiichi site to prevent or mitigate radiation exposure from any releases. Authorities are also distributing potassium iodide tablets to specifically protect against exposure from radioactive iodine that may be present in the releases. Any speculation about possible health effects would be premature until more accurate and complete data becomes available.

12. *Did the reactor cores melt at any of the Fukushima Daiichi reactors? Was there any fuel damage?*

It appears that Fukushima Daiichi Units 1 and 3 have experienced some fuel damage, since we understand that the upper portion of the fuel rods were uncovered (not covered with water) for some period of time. There is no evidence of a complete core meltdown at either unit, however. The information we have suggests that the basic core configuration so far remains intact, so some water or steam cooling through the core is occurring.

13. *Is this accident likely to result in changes to regulatory requirements for U.S. nuclear plants in seismically active areas? Will those regulatory requirements be revisited and made more robust?*

The nuclear energy industry believes that existing seismic design criteria are adequate. Every U.S. nuclear power plant has an in-depth seismic analysis and is designed and constructed to withstand the maximum projected earthquake that could occur in its area without any breach of safety systems. Each reactor is built to withstand the maximum site-specific earthquake by utilizing reinforced concrete and other specialized materials. Each reactor would retain the ability

to safely shut down the plant without a release of radiation. Given the seismic history in California, for example, plants in that state are built to withstand an even higher level of seismic activity than plants in many other parts of the country.

Engineers and scientists calculate the potential for earthquake-induced ground motion for a site using a wide range of data and review the impacts of historical earthquakes up to 200 miles away. Those earthquakes within 25 miles are studied in great detail. They use this research to determine the maximum potential earthquake that could affect the site. Each reactor is built to withstand the respective strongest earthquake. Experts identify the potential ground motion for a given site by studying various soil characteristics directly under the plant. For example, a site that features clay over bedrock will respond differently during an earthquake than a hard-rock site. Taking all of these factors into account, experts determine the maximum ground motion the plant must be designed to withstand. As a result, the design requirements for resisting ground motion are greater than indicated by historical records for that site.

It is also important not to extrapolate earthquake and tsunami data from one location of the world to another when evaluating these natural hazards. These catastrophic natural events are very region- and location-specific, based on tectonic and geological fault line locations.

14. Are U.S. emergency planning requirements and practices adequate to deal with a situation like that faced at Fukushima Daiichi?

Yes. Federal law requires that energy companies develop and perform graded exercises of sophisticated emergency response plans to protect the public in the event of an accident at a nuclear power plant. The U.S. Nuclear Regulatory Commission reviews and approves these plans. In addition, the NRC coordinates approval of these plans with the Federal Emergency Management Agency (FEMA), which has the lead federal role in emergency planning beyond the nuclear plant site. An approved emergency plan is required for the plant to maintain its federal operating license. A nuclear plant's emergency response plan must provide protective measures, such as sheltering and evacuation of communities within a 10-mile radius of the facility. In 2001, the NRC issued new requirements and guidance that focus in part on emergency preparedness at plant sites in response to security threats. The industry has implemented these measures, which address such issues as on-site sheltering and evacuation, public communications, and emergency staffing in the specific context of a security breach. Several communities have used the structure of nuclear plant emergency plans to respond to other types of emergencies. For example, during the 2007 wildfires in California, county emergency officials drew on relationships and communications links they had established during their years of planning for nuclear-related events.

In addition, as part of the emergency plan, nuclear plant operators would also staff Emergency Centers within one hour to provide support to the plant staff during the event. This support would be in the form of:

- Technical expertise (engineering, operations, maintenance and radiological controls)
- Offsite communications and interfaces, (state, local and NRC)
- Security and logistics

15. *Should U.S. nuclear facilities be required to withstand earthquakes and tsunamis of the kind just experienced in Japan? If not, why not?*

U.S. nuclear reactors are designed to withstand an earthquake equal to the most significant historical event or the maximum projected seismic event and associated tsunami without any breach of safety systems.

The lessons learned from this experience must be reviewed carefully to see whether they apply to U.S. nuclear power plants. It is important not to extrapolate earthquake and tsunami data from one location of the world to another when evaluating these natural hazards, however. These catastrophic natural events are very region- and location-specific, based on tectonic and geological fault line locations.

The U.S. Geological Survey (USGS) conducts continuous research of earthquake history and geology, and publishes updated seismic hazard curves for various regions in the continental US. These curves are updated approximately every six years. NRC identified a generic issue (GI-199) that is currently undergoing an evaluation to assess implications of this new information to nuclear plant sites located in the central and eastern United States. The industry is working with the NRC to develop a methodology for addressing this issue.

16. *Is this accident as serious as the Three Mile Island accident in 1979? As serious as the Chernobyl accident?*

According to the International Atomic Energy Agency's seven-level International Nuclear and Radiological Event Scale (INES), the accident at Fukushima Daiichi is a Level 4 accident.

INES defines Level 4 as an "Accident With Local Consequences," which is lower than the Level 5 rating given to the 1979 Three Mile Island accident in Pennsylvania. The major accident at Chernobyl in 1986 was classified at the highest INES rating of 7.

17. *Do you expect an impact on public opinion about nuclear power or public support for nuclear power in the United States as a result of the Fukushima Daiichi accident?*

Given the safety record in this country, the robust regulatory infrastructure, the defense in depth that governs operations and designs, and the seismological differences between the U.S. and Japan, we believe that public support for nuclear power should not decline dramatically.

The events at Fukushima Daiichi show that nuclear power's defense-in-depth approach to safety is appropriate and strong. Despite one of the largest earthquakes in world history, with accompanying tsunamis, fires and aftershocks—multiple disasters compounded one on top of the other—the primary containments at reactors near the epicenter have not been breached and the radioactive release has been minimal and controlled. This event will show that even under very severe circumstances, nuclear power plants are designed to withstand natural disasters. Still, the industry takes the incident with utmost seriousness and will strive to continually incorporate any lessons to enhance the safety of nuclear power plants. Opinion surveys show that public confidence in nuclear energy in the United States is strong and we believe it will continue to grow.

18. Do the events indicate that iodine tablets should be made widely available during an emergency?

The thyroid gland preferentially absorbs iodine. In doing so it does not differentiate between radioactive and nonradioactive forms of iodine. The ingestion of nonradioactive potassium iodide (KI), if taken within several hours of likely exposure to radioactive iodine, can protect the thyroid gland by blocking further uptake of radioactive forms of iodine. KI does not protect any other part of the body, nor does it protect against any other radioactive element.

The NRC has supplied KI tablets to states that have requested it for the population within the 10-mile emergency planning zone (EPZ) of a nuclear reactor. If necessary, KI is to be used to supplement other measures, such as evacuation, sheltering in place, and control of the food supply, not to take the place of these actions. The Environmental Protection Agency and the Food and Drug Administration have published guidance for state emergency responders on the dosage and effectiveness of KI on different segments of the population. According to the EPA guidance, "KI provides optimal protection when administered immediately prior to or in conjunction with passage of a radioactive cloud."

Populations within the 10-mile emergency planning zone of a nuclear plant are at greatest risk of exposure to radiation and radioactive materials including radioactive iodine. Beyond 10 miles, the major risk of radioiodine exposure is from ingestion of contaminated foodstuffs, particularly milk products. Both the EPA and the FDA have published guidance to protect consumers from contaminated foods within a 50 mile radius.

19. Do the events indicate that evacuation zones around plants should be extended?

The 10-mile emergency planning zone around nuclear power plants as determined in 1978 by a multi-agency federal task force is appropriate and should not change due to the accident at Fukushima Daiichi. In the United States, a nuclear plant's emergency response plan must provide protective measures, such as sheltering and evacuation of communities within a 10-mile radius of the facility. Japan used a similar plan. During the accident there, the Japanese government has issued evacuation orders for a 20-kilometre (12.5-mile) radius around Fukushima Daiichi, and a 3-kilometre radius around Fukushima Daini.

Updated 3/13/11 3:30pm

Cohen, Shari

From: Leeds, Eric, *NR*
Sent: Wednesday, March 16, 2011 10:39 AM
To: Nelson, Robert, *NR*
Cc: Boger, Bruce; Gitter, Joseph; Howell, Art
Subject: RE: DORL Initiative

Thanks, Nelson. Great initiative. Please keep me in the loop with regard to the consensus position you develop with regard to what "enhanced handling" means and how we plan to implement it.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

From: Nelson, Robert *NR*
Sent: Wednesday, March 16, 2011 9:33 AM
To: Boger, Bruce; Leeds, Eric; Ruland, William
Cc: Gitter, Joseph; Howe, Allen; Chernoff, Harold
Subject: RE: DORL Initiative

We're developing an approach for enhanced handling of selected near-term licensing activities along with a proposed list of subject areas where enhanced handling measures would be applied. The intent of this process is to ensure appropriate treatment of licensing activities that may be affected by the evolving situation in Japan subsequent to the March 11, 2011 earthquake/tsunami.

Definitions

Licensing Activities – This term includes all licensing actions, as well as, controlled correspondence (e.g., 2.206 issues and Congressional correspondence).

Selected Licensing Activities – Any Licensing Activity that directly involves one of the subjects in the Selected Licensing Activities Subject Reference List.

Near-term – Any Licensing Activity with a planned completion and/or issuance on or before April 8, 2012 (note that this initial period of applicability may be modified by the Director DORL).

Selected Licensing Activities Subject Reference List

1. Containment design issues (e.g., containment peak pressure, primary/secondary ventilation and filtration, cooling, and leak rate testing).
2. Containment combustible gas control.
3. AC/DC power (e.g., emergency diesel generators, Station Blackout (SBO) and batteries)
4. Seismic issues
5. Flooding (tsunami, seiche, and river system)
6. Emergency core cooling systems
7. Ultimate heat sink
8. Fuel design (e.g., structural capacity and seismic design)
9. Spent fuel pool design (cooling, criticality, rack strength, and structural capacity)

Harold Chernoff made this suggestion and is working with the DORL BCs to finalize the process.

We'll keep you informed.

C/44

NELSON

From: Boger, Bruce, *NRR*
Sent: Wednesday, March 16, 2011 9:09 AM
To: Giitter, Joseph; Howe, Allen; Nelson, Robert
Subject: Fw: DORL Initiative

Please advise us of any licensing actions that require delay or adjustment as a result of this appropriate focus. Thanks.

From: Leeds, Eric, *NRR*
To: Boger, Bruce; Ruland, William; Grobe, Jack
Cc: Giitter, Joseph
Sent: Tue Mar 15 17:27:51 2011
Subject: RE: DORL Initiative

Thank you! I need to know if any are influenced by the Japanese events.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

From: Boger, Bruce, *NRR*
Sent: Tuesday, March 15, 2011 3:53 PM
To: Leeds, Eric; Ruland, William; Grobe, Jack
Cc: Giitter, Joseph
Subject: DORL Initiative

FYI—DORL has started to take a look at licensing actions that are ready for issuance with a sensitivity to potential considerations from the Japanese situation.

Freeman, Eric

From: Freeman, Eric
Sent: Wednesday, March 16, 2011 10:37 AM
To: Aguilar, Santiago
Subject: Need more of this

We really need to see more of this sort of commentary online...

As a result of the events in Japan, some have already begun with grand gestures to call on our lawmakers to rule out new nuclear power development. We need to reflect on the simple truth that we do not have a nonfossil alternative that can make up the substantial power needs of the world other than nuclear power.

Sure, we can use solar, wind, hydroelectric, biomass and the like, but collectively, on a future very good day, using every practical alternative resource to expand these alternative energy sources, they will only amount to a grand sum of 20% of our energy needs. To keep global warming in check, and faced with the concept of rolling blackouts or steady, clean electricity, the gap can and must be made up with modern nuclear power, which is passively safe with the newest design.

The pundits go on to ask, "What about the waste?" I answer this by asking, did you ever wonder why our French colleagues have 40 years of mostly nuclear power and no waste problems?

Like most nations, they recycle their used fuel, since 95% of the fuel can be recycled back into the reactor and used again, making nuclear power the most "green" energy source out there. Burying the waste, as we do in the United States, is completely wasteful, and other nations, including Japan, recycle all of their used fuel.

We do need to take pause, as the events in Japan are certainly immense, and we need to collectively ponder ways to improve at all levels. However, I believe we need to be smart and carry on the mission of nuclear power for a sustainable future, learning from our mistakes. Likewise, I don't stop driving my gasoline powered automobile when I hear about an oil refinery accident. Let us be smart, but let us also be sensible and realistic.

The opinions expressed in this commentary are solely those of Glenn Sjoden.

From: [Johnson, Michael](#)
To: [Andersen, James](#); [Muessle, Mary](#); [Holahan, Gary](#); [Dudes, Laura](#); [Mayfield, Michael](#)
Cc: [Virgilio, Martin](#)
Bcc: [Johnson, Michael](#)
Subject: ITAAC and SMR Commission Meetings
Date: Saturday, March 19, 2011 11:58:00 PM

Jim,

For your discussions regarding upcoming Commission meetings and finding time slots for the Commission to meet on the event in Japan, I suggest we can forego meetings on ITAAC and SMR.

We have a paper in front of the Commission that provides the plan to risk-inform the licensing review of SMRs. It can stand alone without a meeting. No issues up in front of the Commission regarding ITAAC.

Mike

C/46

From: [Schwarz, Sherry](#) on behalf of [Leeds, Eric](#)
To: [NRR Distribution](#)
Subject: Appreciation and Continued Mission Focus
Date: Wednesday, March 16, 2011 5:05:55 PM

NRR

During this period of heightened activity in response to the events in Japan, I want to take the time to let you know how much I value the work that all of you do in NRR. Some of you are providing key support in emergency response, while others are performing the equally vital day-to-day regulatory duties. Throughout these distracting times abroad, it is so important to keep our focus on the safe operation of nuclear power plants here in the United States. Whether you are involved with licensing actions, technical analysis, budget preparations, or administrative functions to help us execute our essential regulatory work, your continued dedication and commitment are vital for us to maintain our mission of protecting the American public's health and safety.

I know that there can be anxiety and stress as events unfold; take time to take good care of yourself. To keep informed, there will be periodic updates from the EDO, and I encourage you to stay abreast of the agency's public announcements and blog at www.nrc.gov. As regulators, we excel at our steadiness in protecting people and the environment. Again, thanks for all you do.

Eric

C/47

From: [HRMSBulletin Resource](#)
To: [HRMSBulletin Resource](#)
Cc: [HRMSBulletin Resource](#)
Subject: New Agency Wide TAC Number
Date: Wednesday, March 16, 2011 9:52:44 AM

All Employees,

Due to the most current event in Japan, the Agency has decided to establish a new Agency wide Activity Code. It is: ZG0061 - Japan Earthquake and Tsunami. The PA will be: 111180 – Response Program-Event/Response - Operating RX. Please be reminded that if you charged hours to D92374 in PP6, you will need to submit a corrected time card and use the new TAC number ZG0061 under PA 111180. Also please contact your T & L Coordinator to have that TAC established in your profile.

Thank you for your cooperation.

Time, Labor and Payroll Services

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From: [Operations Center Bulletin](#)
To: [Operations Center Bulletin](#)
Subject: UPDATE: NRC IS RESPONDING TO JAPANESE EVENTS
Date: Wednesday, March 16, 2011 10:40:15 AM

THIS IS NOT A DRILL

The Office of Public Affairs is expecting a large volume of calls from media and the general public regarding the latest statements from the State Department and the NRC regarding the situation in Japan. ALL CALLS from media or the general public on this topic must be referred to the 301-415-8200 number.

The NRC is coordinating its actions with other Federal agencies as part of the U.S. government response to the events in Japan. The NRC is examining all available information as part of the effort to analyze the event and understand its implications both for Japan and the United States. The NRC's Headquarters Operations Center in Rockville, MD has been stood up since the beginning of the emergency in Japan and is operating on a 24-hour basis.

NRC Incident Responders at Headquarters have spoken with the agency's counterpart in Japan and offered the assistance of U.S. technical experts. NRC representatives with expertise on boiling water nuclear reactors have deployed to Japan as part of a U.S. International Agency for International Development (USAID) team. USAID is the Federal government agency primarily responsible for providing assistance to countries recovering from disasters.

U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety significant structures, systems, and components be designed to take in account the most severe natural phenomena historically estimated for the site and surrounding area.

The NRC will **not** provide information on the status of Japan's nuclear power plants. For the latest information on NRC actions see the NRC's web site at www.nrc.gov or blog at <http://public-blog.nrc-gateway.gov>.

Two important reminders:

It is possible that some of us will be requested by colleagues in another country to provide technical advice and assistance during this emergency. It is essential that all such communications be handled through the NRC Operations Center. Any assistance to a foreign government or entity must be coordinated through the NRC Operations Center and the U.S. Department of State (DOS). If you receive such a request, contact the NRC Operations Officer (301-816-5100 or via the NRC Operator) immediately.

If you receive information regarding this or any emergency (foreign or domestic) and you are not certain that the NRC's Incident Response Operations Officer is already aware of that information,

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you should contact the NRC Operations Officer (301-816-5100 or via the NRC Operator) and provide that information.

Other Sources of Information:

USAID – www.usaid.gov

U.S. Department of State – www.state.gov

FEMA – www.fema.gov

White House – www.whitehouse.gov

Nuclear Energy Institute – www.nei.org

International Atomic Energy Agency – www.iaea.org/press

No response to this message is required.

THIS IS NOT A DRILL

NRE
From: Stuchell, Sheldon *NRE*
To: Hon, Andrew; Beaulieu, David; Golla, Joe
Subject: RE: Fukushima Status Report from Japan Atomic Industrial Forum...
Date: Wednesday, March 16, 2011 8:08:24 AM

I think we now have a team of 12 people over in Japan, headed up by Chuck Casto.

From: Hon, Andrew *NRE*
Sent: Wednesday, March 16, 2011 8:07 AM
To: Stuchell, Sheldon; Beaulieu, David; Golla, Joe
Subject: RE: Fukushima Status Report from Japan Atomic Industrial Forum...

Thanks Sheldon,

Neat info and presentation format!

Andy

NRE
From: Stuchell, Sheldon *NRE*
Sent: Wednesday, March 16, 2011 6:44 AM
To: Beaulieu, David; Golla, Joe; Hon, Andrew
Subject: FW: Fukushima Status Report from Japan Atomic Industrial Forum...

Courtesy of <http://ansnuclearcafe.org/> (providing twice daily news updates).

Link to attached file:

http://www.jaif.or.jp/english/news_images/pdf/ENGNEWS01_1300189582P.pdf

Thought this might be of interest as it seems to provide a good one page snapshot from what is presumably a reasonably well-informed source.

NRR
From: [Hon. Andrew](#)
To: [Stuchell, Sheldon](#); [Beaulieu, David](#); [Golla, Joe](#)
Subject: RE: Fukushima Status Report from Japan Atomic Industrial Forum...
Date: Wednesday, March 16, 2011 8:06:50 AM

Thanks Sheldon,

Neat info and presentation format!

Andy

NRR
From: Stuchell, Sheldon, *NRR*
Sent: Wednesday, March 16, 2011 6:44 AM
To: Beaulieu, David; Golla, Joe; Hon, Andrew
Subject: FW: Fukushima Status Report from Japan Atomic Industrial Forum...

Courtesy of <http://ansnuclearcafe.org/> (providing twice daily news updates).

Link to attached file:

http://www.jaif.or.jp/english/news_images/pdf/ENGNEWS01_1300189582P.pdf

Thought this might be of interest as it seems to provide a good one page snapshot from what is presumably a reasonably well-informed source.

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From: [NRC Announcement](#)
To: [NRC Announcement](#)
Subject: General Interest: U.S. House of Representatives Energy and Commerce Committee hearing today, March 16 @ 9:30 AM
Date: Wednesday, March 16, 2011 9:55:09 AM

NRC Daily Announcements



Highlighted Information and Messages



Wednesday March 16, 2011 -- Headquarters Edition

[General Interest: U.S. House of Representatives Energy and Commerce Committee hearing today, March 16 @ 9:30 AM](#)

General Interest: U.S. House of Representatives Energy and Commerce Committee hearing today, March 16 @ 9:30 AM

Chairman Jaczko and Energy Secretary Chu will be testifying this morning at a joint hearing of two subcommittees of the House Energy and Commerce Committee, scheduled to begin @ 9:30 a.m. This event can be viewed on C-Span 3, which is channel 39 (NRC Broadband) and is expected to be available on the C-Span website. The hearing was originally scheduled to examine the FY2012 budget, but has been expanded to provide an opportunity for Congress to formally receive a status update on the Japanese nuclear facilities damaged by the earthquake and tsunami. There also will be a Senate Environment and Public Works Committee briefing this afternoon at 3:30 p.m. that is expected to be carried on C-Span.



(2011-03-16 00:00:00.0)

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From: *MR* [Stuchell, Sheldon](#)
To: *MR* [Beaulieu, David](#); [Golla, Joe](#); [Hon. Andrew](#)
Subject: FW: Fukushima Status Report from Japan Atomic Industrial Forum...
Date: Wednesday, March 16, 2011 6:43:43 AM
Attachments: [ENGNEWS01_1300189582P.pdf](#)

Courtesy of <http://ansnuclearcafe.org/> (providing twice daily news updates).

Link to attached file:

http://www.jaif.or.jp/english/news_images/pdf/ENGNEWS01_1300189582P.pdf

Thought this might be of interest as it seems to provide a good one page snapshot from what is presumably a reasonably well-informed source.

c/53

Status of nuclear power plants in Fukushima as of 19:00 March 15 (Estimated by JAIF)

Power Station	Fukushima #1 Nuclear Power Station					
Unit	1	2	3	4	5	6
Electric / Thermal Power output (MWe)	460 / 1380		784 / 2381		1100 / 3293	
Type of Reactor	BWR-3	BWR-4	BWR-4	BWR-4	BWR-4	BWR-5
Operation Status at the earthquake occurred	Service	Service	Service	Outage	Outage	Outage
Fuel Integrity	Damaged	Unknown	Damaged	Not Damaged	Not Damaged	Not Damaged
Containment Integrity	Not Damaged	Damage Suspected	Not Damaged	Not Damaged	Not Damaged	Not Damaged
Core cooling requiring AC power	Not Functional	Not Functional	Not Functional	Not necessary	Not necessary	Not necessary
Core cooling not requiring AC power	Not Functional	Not Functional	Not Functional	Not necessary	Not necessary	Not necessary
Building Integrity	Severely Damaged	Slightly Damaged	Severely Damaged	Partially Damaged	Not Damaged	Not Damaged
water level of the pressure vessel	Around half of the Fuel	Recovering after Dried-up	Around half of the Fuel	Safe	Safe	Safe
pressure of the pressure vessel	Stable	Fluctuating	Stable	Safe	Safe	Safe
Containment pressure	Stable	D/W: Unknown, S/P: Atmosphere	Stable	Safe	Safe	Safe
Sea water injection to core	Continuing	Continuing	Continuing	Not necessary	Not necessary	Not necessary
Sea water injection to Containment Vessel	Continuing	to be decided	to be decided	Not necessary	Not necessary	Not necessary
Containment venting	Continuing	Preparing	Continuing	Not necessary	Not necessary	Not necessary
Spent Fuel Integrity	(No info)	(No info)	(No info)	SFP level low, Injecting Water	SFP Temp. Increasing	SFP Temp. Increasing
Environmental effect	NPS border: 489.8 μ Sv/h at 16:30, Mar. 15					
Evacuation Area	20km from NPS * People who live between 20km to 30km from the Fukushima #1NPS are to stay indoors.					
INES	Level 4 (estimated by NISA)					
Remarks	A fire broke on the 4th floor of the Unit-4 Reactor Building around 6AM, Mar. 15, and the radiation monitor readings increased outside of the building: 30mSv between Unit-2 and Unit-3, 400mSv beside Unit-3, 100mSv beside Unit-4 at 10:22, Mar. 15. It is estimated that spent fuels stored in the spent fuel pit heated and hydrogen was generated from these fuels, resulting in explosion. TEPCO later announced the fire had been extinguished. Other staff and workers than fifty TEPCO employees who are engaged in water injection operation have been evacuated.					

Power Station	Fukushima #2 Nuclear Power Station			
Unit	1	2	3	4
Electric / Thermal Power output (MWe)	1100 / 3293			
Type of Reactor	BWR-5	BWR-5	BWR-5	BWR-5
Operation Status at the earthquake occurred	Service	Service	Service	Service
Fuel Integrity	Not Damaged	Not Damaged	Not Damaged	Not Damaged
Containment Integrity	Not Damaged	Not Damaged	Not Damaged	Not Damaged
Core cooling requiring AC power	Functioning	Functioning	Functioning	Functioning
Core cooling not requiring AC power	Not necessary	Not necessary	Not necessary	Not necessary
Building Integrity	Not Damaged	Not Damaged	Not Damaged	Not Damaged
water level of the pressure vessel	(No info)	(No info)	(No info)	(No info)
pressure of the pressure vessel	(No info)	(No info)	(No info)	(No info)
Containment pressure	(No info)	(No info)	(No info)	(No info)
Sea water injection to core	Not necessary	Not necessary	Not necessary	Not necessary
Sea water injection to Containment Vessel	Not necessary	Not necessary	Not necessary	Not necessary
Containment venting	Not necessary	Not necessary	Not necessary	Not necessary
Environmental effect	NPS border: 13.7 μ Sv/h at 12:00, Mar. 15			
Evacuation Area	10km from NPS			
INES	(No Info)			
Spent Fuel Integrity	(No Info)			
Remarks	All the units are in cold shutdown.			

[Source]

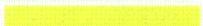
Governmental Emergency Headquarters: News Release (3/15 14:00), Press conference (3/14 11:45, 16:15, 3/15 8:00, 11:00, 16:25)
 NISA: News Release (3/14 7:30)
 Tokyo Electric Power Co.: Press Release (3/14 16:00, 17:35, 3/15 6:00, 12:00, 16:30), Press Conference (3/14 12:10, 20:00, 3/15 8:00, 8:30)

[Abbreviations]

INES: International Nuclear Event Scale
 NISA: Nuclear and Industrial Safety Agency
 SFP: spent fuel pool

[Significance]

 : low

 : high

 : severe

From: [Brown, Nathan](#) *NCR*
To: [NRR DPR PLPB Distribution](#)
Subject: FW: New Agency Wide TAC Number
Date: Wednesday, March 16, 2011 9:53:28 AM

From: HRMSBulletin Resource
Sent: Wednesday, March 16, 2011 9:52 AM
To: HRMSBulletin Resource
Cc: HRMSBulletin Resource
Subject: New Agency Wide TAC Number

All Employees,

Due to the most current event in Japan, the Agency has decided to establish a new Agency wide Activity Code. It is: ZG0061 - Japan Earthquake and Tsunami. The PA will be: 111180 – Response Program-Event/Response - Operating RX. Please be reminded that if you charged hours to D92374 in PP6, you will need to submit a corrected time card and use the new TAC number ZG0061 under PA 111180. Also please contact your T & L Coordinator to have that TAC established in your profile.

Thank you for your cooperation.

Time, Labor and Payroll Services

C/54

From: [HRMSBulletin Resource](#)
To: [HRMSBulletin Resource](#)
Cc: [HRMSBulletin Resource](#)
Subject: New Agency Wide TAC Number
Date: Wednesday, March 16, 2011 9:53:59 AM

All Employees,

Due to the most current event in Japan, the Agency has decided to establish a new Agency wide Activity Code. It is: ZG0061 - Japan Earthquake and Tsunami. The PA will be: 111180 – Response Program-Event/Response - Operating RX. Please be reminded that if you charged hours to D92374 in PP6, you will need to submit a corrected time card and use the new TAC number ZG0061 under PA 111180. Also please contact your T & L Coordinator to have that TAC established in your profile.

Thank you for your cooperation.

Time, Labor and Payroll Services

4/55

From: [McGinty, Tim](#) *NRR*
To: [NRR DPR Distribution](#)
Subject: RE: Appreciation and Continued Mission Focus
Date: Wednesday, March 16, 2011 6:32:47 PM

DPR Staff –

Regarding Eric's message to all of NRR, I wanted to touch base with you.

Last Friday morning I was asked to check in with the Ops Center for the Liaison Team. As you probably know, my Incident Response roots in the NRC are pretty strong ... my first job with the Agency was as a Headquarters Operations Officer (HOO), and my first management position was also in NSIR Incident Response, right after 9/11.

The Liaison Team has a variety of roles (kind of like DPR, actually) in our Agency response, including interactions with the States, other Federal Agencies, Congressional Affairs and International. Both Tom and I are Liaison Team "Directors", and we have both been on watch and in response mode and on shift since there was a tsunami warning for our West Coast. We have been busy. We all know what has transpired since, regarding the scale of the tragedy that the Japanese citizens are still enduring, and of course, the ongoing issues at some of their nuclear power plants.

So, thank you Ted for running the Division while Tom and I have been on shift. I have seen a number of DPR staff also standing watch in the Operations Center, and just as importantly, all of DPR continues to remain appropriately focused on the safety and security of the commercial operating and test reactor fleet, rulemaking, decommissioning funding, international activities ... all those things that you do so well, every day.

I came off of Operations shiftwork, temporarily, today. Moving forward, we have recruited additional SES/SLS to serve in the LT Director capacity, and Tom and I are going to try and both not be on shift in the Ops Center at the same time. We now have 11 NRC staff embedded in Japan to help, and we are already making plans to send in a group to relieve them in a few weeks. The NRC is making plans to have its Operations Center staffed appropriately to support our staff in Japan, and thus, we are planning all the way through mid-April at the moment.

Again, I just wanted to touch base to let you know I am back on dayshift and working in DPR until next weekend. Tom should also be able to come back to DPR on Monday. Tim

From: Schwarz, Sherry **On Behalf Of** Leeds, Eric *NRR*
Sent: Wednesday, March 16, 2011 5:05 PM
To: NRR Distribution
Subject: Appreciation and Continued Mission Focus

During this period of heightened activity in response to the events in Japan, I want to take the time to let you know how much I value the work that all of you do in NRR. Some of you are providing key support in emergency response, while others are performing the equally vital day-to-day regulatory duties. Throughout these distracting times abroad, it is so important to keep our focus on the safe operation of nuclear power plants here in the United States. Whether you are involved

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with licensing actions, technical analysis, budget preparations, or administrative functions to help us execute our essential regulatory work, your continued dedication and commitment are vital for us to maintain our mission of protecting the American public's health and safety.

I know that there can be anxiety and stress as events unfold; take time to take good care of yourself. To keep informed, there will be periodic updates from the EDO, and I encourage you to stay abreast of the agency's public announcements and blog at www.nrc.gov. As regulators, we excel at our steadiness in protecting people and the environment. Again, thanks for all you do.

Eric

From: NEIGA@nei.org
To: [Hiland, Patrick](#)
Subject: **Update 1:15pm March 16** Information on the Japanese Earthquake and Reactors in that Region
Date: Wednesday, March 16, 2011 2:01:23 PM



UPDATE AS OF 1:15 P.M. EDT, WEDNESDAY, MARCH 16:

NEI has posted an updated version of the fact sheet [Used Nuclear Fuel Storage at the Fukushima Daiichi Nuclear Power Plant](#). Also available is a new fact sheet called [Industry Taking Action to Ensure Continued Safety at U.S. Nuclear Energy Plants](#).

As always, please go to <http://resources.nei.org/japan> for the latest updates.

Click [here](#) to unsubscribe



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INRR

From: [Hiland, Patrick](#)
To: [Thomas, George](#); [Farzam, Farhad](#); [Hoang, Dan](#); [Sherbini, Sami](#)
Cc: [Brown, Eva](#)
Bcc: [Skeen, David](#)
Subject: Early Morning Request From Reactor Safety Team
Date: Wednesday, March 16, 2011 2:58:00 PM
Importance: High

Thank you all for your willingness to discuss potential possibilities in support of the NRC Team in Japan. Your communication with myself and/or Ms. Eva Brown at 5:30 a.m. today was very important. For your information, we were communicating directly with GE and Naval Reactors at the same time. Bottom line was that in 30 minutes we did what we could to respond to the request. Most of the suggestions made were similar to NUREG 1353, but your few minutes helped us speak with some confidence. Thanks.

e/s8

From: [Mayfield, Michael](#)
To: [Johnson, Michael](#); [Holahan, Gary](#); [Tappert, John](#); [Dudes, Laura](#); [Shuaibi, Mohammed](#); [Williams, Donna](#)
Cc: [Coffin, Stephanie](#); [Magruder, Stewart](#); [Reckley, William](#); [Araguas, Christian](#)
Subject: FW: ITAAC and SMR Commission Meetings
Date: Monday, March 21, 2011 12:39:12 PM

FYI. SMR is still on but ITAAC is postponed.

From: Andersen, James
Sent: Monday, March 21, 2011 12:38 PM
To: Mayfield, Michael
Cc: Muessle, Mary; Sanfilippo, Nathan
Subject: RE: ITAAC and SMR Commission Meetings

Mike, at the agenda planning meeting this morning, the Commission decided to keep the SMR meeting, but postpone the ITAAC meeting to a later time.

Jim A.

From: Mayfield, Michael
Sent: Monday, March 21, 2011 12:31 PM
To: Andersen, James; Muessle, Mary
Subject: FW: ITAAC and SMR Commission Meetings

Jim/Mary – Mike Johnson asked me to follow up regarding these two Commission meetings. Any decisions yet? For the SMR meeting, two of the presenters are coming from out of town (Jack Bailey from TVA and Paul Lorenzini from Nuscale), so it would be good to be able to let them know soon if that meeting is going to be moved or cancelled. Also, Lorenzini may pull out anyhow owing to financial problems for his company. However, they wanted to hold off until this week to make that decision.

Mike

From: Johnson, Michael
Sent: Saturday, March 19, 2011 11:59 PM
To: Andersen, James; Muessle, Mary; Holahan, Gary; Dudes, Laura; Mayfield, Michael
Cc: Virgilio, Martin
Subject: ITAAC and SMR Commission Meetings

Jim,

For your discussions regarding upcoming Commission meetings and finding time slots for the Commission to meet on the event in Japan, I suggest we can forego meetings on ITAAC and SMR.

We have a paper in front of the Commission that provides the plan to risk-inform the licensing review of SMRs. It can stand alone without a meeting. No issues up in front of the Commission regarding ITAAC.

Mike

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Martin, Karnisha

From: See, Kenneth
Sent: Friday, March 18, 2011 12:05 PM
To: Cook, Christopher
Subject: Please review
Attachments: QA and Messages Regarding Flooding KSeeRWescottCook.pdf

Chris,

See attached pdf.

Thanks for the help!

Ken

Kenneth R. See, P.E.
Senior Hydrologist
U.S. Nuclear Regulatory Commission
Division of Site and Environmental Reviews
Hydrologic Engineering Branch
(301)415-1508
kenneth.see@nrc.gov

C/60

Flooding Issues:

1. General Design Criterion 2 (GDC 2), 10CFR50, requires, in part, that structures, systems, and components important to safety be designed to withstand the effects of natural phenomena such as floods, tsunamis, and seiches without loss of capability to perform their safety functions. Design bases for these SSCs are also required to reflect:
 - a. Appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding region, with sufficient margin for the limited accuracy and quantity of the historical data and the period of time in which the data have been accumulated.
 - b. Appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena.
 - c. The importance of the safety functions to be performed.
2. Almost all design basis floods for presently operating plants were based on the use of deterministic methods such as the probable maximum flood, precipitation, hurricane, and seiche as well as postulated undersea earthquakes and landslides. Those standards have been monitored, and were found to be sufficient and appropriate. As new information becomes available that could affect the design basis, licensees are required to evaluate the new information. Based on this review, if needed, licensees are required to take appropriate mitigation measures, update their final safety analysis report and submit it to the NRC for review and approval.
3. In order to impose new requirements on existing plants, the NRC must be able to justify the new requirements in accordance with the "Backfit Rule" (10 CFR 50.109).

Questions and Answers for Flooding Issues

Does the NRC consider severe floods in the design of nuclear power plants?

Yes. NRC regulations require that nuclear power plants are capable of shutting down and maintaining a safe shutdown condition under severe flooding situations. Safety-related Structures, Systems and Components (SSCs) of Nuclear reactors in the U.S. are required to withstand the design basis flood (DBF). The design basis flood may be caused by the following natural Phenomena:

- 1) Intense rainfall occurring at the site (known as local intense precipitation).
- 2) Intense rainfall (known as the Probable Maximum Precipitation) occurring on other areas of the watershed leading to riverine or coastal flooding (known as Probable Maximum Flood" or "PMF".
- 3) Floods from upstream dam failure or a combination of upstream dam failures.
- 4) Failure of On-site Water Control or Storage Structures (i.e. tanks).
- 5) Storm Surge, Seiche and Tsunami including wave effects. **(See Tsunami Q&A Sheet)**
- 6) Flooding caused by ice effects (i.e. ice dams both upstream and downstream).
- 7) Floods caused by diversions of stream channels toward the site.
- 8) Other site specific cause(s) identified by the applicant and/or the NRC.

What about droughts and conditions which lead to low water? Are these considered?

Yes. Impacts to the plant from low water conditions brought about by ice effects, downstream dam breach, and channel diversions away from the site are reviewed as well to ensure the plant remains safe under these scenerios.

Periods of long rainfall can cause the groundwater elevation to rise which can cause structures such as deeply embedded tanks to fail due to buoyancy. Are nuclear power plants designed to withstand this effect?

Yes. Worst-case groundwater levels are estimated for each site and the impacts of these levels are considered in the design of the plant to ensure the plant remains safe under these conditions. During the safety review, impacts due to groundwater levels and other hydrodynamic effects on the design bases of plant foundations and other safety-related structures systems and components (SSCs) are evaluated. Impacts to a safety-related structure such as a deeply embedded tank or a structure containing a deeply embedded tank would be considered in the safety review.

Some of the Reports from the National Weather Service used to estimate the design precipitation are 30-40 years old. Are these estimates still valid?

The NRC has funded research by the U.S. Bureau of Reclamation to review the information and methods developed by the National Weather Service and the U.S. Army Corps of Engineers (HMR 51), focusing on South and North Carolina. To date, reviews of precipitation records from extreme storm events (e.g., tropical storms, hurricanes) since the publication of HMR 51 does not indicate any exceedance or potential for exceedance of those precipitation (PMP) estimates in this region. We have not seen any information or data that would indicate that HMR precipitation (PMP) estimates for the U.S. have been exceeded.

NR

From: [Giitter, Joseph](#)
To: [Leeds, Eric](#); [Howe, Allen](#); [Ruland, William](#); [Boger, Bruce](#); [Grobe, Jack](#)
Cc: [Brown, Frederick](#); [McGinty, Tim](#); [Hiland, Patrick](#)
Subject: RE: Brain-storming upcoming Commish meeting
Date: Wednesday, March 16, 2011 7:47:42 PM
Attachments: [Eric Leeds Remarks.docx](#)

Eric - I took a stab and putting some thoughts together. It needs a lot of work, but it is a start.

NR

From: Leeds, Eric
Sent: Wednesday, March 16, 2011 1:34 PM
To: Howe, Allen; Ruland, William; Boger, Bruce; Grobe, Jack
Cc: Brown, Frederick; McGinty, Tim; Giitter, Joseph; Hiland, Patrick
Subject: Brain-storming upcoming Commish meeting

Allen/all -

I will undoubtedly need your help in crafting the staff's messages for the upcoming Commission meeting on the Japanese event. If there is a public part of this meeting, and there probably will be, it will be a good opportunity for us to get out the message that we have requirements in place for severe accident management, 50.63 SBO, flooding, 50.54hh(2), Mark I containment improvements, etc. Please brainstorm how we can make that part of our message to the Commission. A lot of what I think we need to do with our licensees, at least in the near term, is to verify what they are already required to do. It might make a good message for the public.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

c/61

Draft Remarks for Eric in Preparation for the upcoming Commission Meeting on the event at the Fukushima Daiichi Plant in Japan

There will undoubtedly be many lessons learned in the months to come as we learn more about the tragic events at the Fukushima Daiichi plant in Japan. However, one of the early lessons is that events can occur that you didn't anticipate—either in the deterministic design basis of the plant or through probabilistic risk assessment models. That is why the fundamental approach to defense in depth is crucial to ensuring that safety is achieved, even under extreme circumstances, such as those experienced at the Fukushima Daiichi plant.

Of course, defense in depth starts with the design of the reactor. In the 1980s the NRC undertook a program to determine if any actions needed to be taken, on a generic basis, to reduce the vulnerability of designs to severe accident challenges. As part of this effort, the NRC looked specifically at the BWR Mark I containment design and identified a number of plant modifications that substantially enhance the ability of the design to prevent and mitigate the consequences of severe accidents. These recommendations included installation of a hardened vent that allows operators, in accordance with their emergency procedures, to relieve pressure from the containment to avoid exceeding the containment pressure limit. At this time the NRC also concluded that continued reliance on pre-existing capability—which was a non-pressure-bearing vent path—could jeopardize access to vital plant areas or other equipment and create an impediment to implementing a successful accident management strategy. Furthermore, the NRC determined that implementation of reliable venting capability and procedures can reduce the likelihood of core melt from accident sequences involving loss of long-term decay heat removal, such as a station blackout event. Finally, it was concluded that the hardened vent provides assurance of a pressure relief path with significant scrubbing of fission products which would result in lower releases, even for containment failure modes not associated with pressurization, such as liner meltthrough. All U.S. BWRs with the Mark I containment design have installed hardened vents (need to verify).

The NRC also identified certain containment performance improvements that licensees should “seriously consider” individual plant examinations in addition to the implementation of a hardened vent. These improvements included an alternate source of water injection into the reactor vessel to reduce the likelihood of core melt due to a station blackout or a loss of long-term decay heat removal, and an enhanced reactor pressure vessel depressurization system that could be operated in an extended station blackout after station batteries have been depleted. (Need to say something about the extent to which licensees have implemented this).

- 2 -

Also, in the 1980s--specifically in 1988-- the NRC concluded that additional regulatory requirements were justified in order to provide further assurance that a loss of both offsite and onsite emergency ac power systems—a station blackout condition--would not adversely affect public health and safety. Studies conducted by the NRC have shown that the hardware and procedures that have been implemented to meet the station blackout requirements have resulted in significant risk reduction and have further enhanced defense in depth. However, we plan to carefully evaluate the lessons learned from the events in Japan to determine if enhancements to the station blackout rule are warranted.

One of the most significant lessons learned from the Three Mile Island Accident in 1979 was that operating procedures need to be symptom based and less prescriptive. Procedures that previously directed operators to take a series of actions based on a pre-established accident were replaced with procedures that directed operators to maintain the critical safety functions-- such as keeping the core

covered and cooled. Emergency procedure guidelines that address conditions well beyond design basis accidents and can be used for severe accident management were also developed. Operators routinely practice these procedures on a plant specific simulator to ensure that they can be implemented for a wide range of accident scenarios, including a station blackout scenario.

More recently, since the 9/11 terrorist attack, NRC has required licensees to implement procedures and pre-stage equipment that would allow operators to ensure critical safety functions are met even under extreme conditions involving fires and explosions. NRC routinely evaluates the ability of licensees to implement these strategies. (Need more detail here.)

Mention steps that INPO has taken in their level 1 directive and our corresponding regulatory footprint—whatever it might be.

See, Kenneth

From: Chokshi, Nilesh
Sent: Sunday, March 20, 2011 8:17 PM
To: Dreisbach, Jason; See, Kenneth
Cc: McKirgan, John; Flanders, Scott; Kammerer, Annie; Bagchi, Goutam; Ader, Charles; Lombard, Mark; Khanna, Meena; Vettori, Robert; Dinh, Thinh; Lee, Samuel
Subject: RE: Qs on Seismic-induced flooding and fire

Thanks, Jason. This helps.

-----Original Message-----

From: Dreisbach, Jason
Sent: Sunday, March 20, 2011 7:05 PM
To: Chokshi, Nilesh; See, Kenneth
Cc: McKirgan, John; Flanders, Scott; Kammerer, Annie; Bagchi, Goutam; Ader, Charles; Lombard, Mark; Khanna, Meena; Vettori, Robert; Dinh, Thinh; Lee, Samuel
Subject: RE: Qs on Seismic-induced flooding and fire

Nilesh,

Regarding references to NRC guidance and recommendations, I am always referring to what is in RG 1.189. These obviously aren't requirements, and come from our guidance, not from 50.48 or Appendix R, so i don't call them requirements.

"Severe earthquake" is SSE.

For the reference to earthquakes that are expected to occur every 10 years, there is a discussion in RG 1.189, saying licensees should make sure FP systems are functional following "less severe earthquakes with high frequencies (approximately once in 10 years)", obviously different from the SSE.

All questions are applicable to operating reactors.

Fire suppressions systems are not seismically Cat I qualified and aren't required to work after an earthquake, however they could be "seismic Cat II", for the so called "II over I" situations. FP systems won't necessarily be functional, but it is required that their failure during an earthquake won't fail safe shutdown equipment.

-Jason.

From: Chokshi, Nilesh
Sent: Saturday, March 19, 2011 2:42 PM
To: Dreisbach, Jason; See, Kenneth
Cc: McKirgan, John; Flanders, Scott; Kammerer, Annie; Bagchi, Goutam; Ader, Charles; Lombard, Mark; Khanna, Meena; Vettori, Robert; Dinh, Thinh; Lee, Samuel
Subject: RE: Qs on Seismic-induced flooding and fire

Jason,

Thanks for the information, it is very useful. I need some clarifications: in the second answer you refer to NRC guidance and it's recommendation – what does this mean? Is this an applicant's choice or a real requirement. By severe earthquakes, do you mean SSE or something else? How do we define earthquakes that are expected to occur every 10 years? Final question – is answer to question 2 applicable to the operating reactors?

Your answer to first Q covers most of the waterfront, but there will be an interest in knowing whether fire suppression systems will work after an earthquake.

Thanks,

Nilesh

From: Dreisbach, Jason
Sent: Friday, March 18, 2011 3:51 PM
To: Chokshi, Nilesh; See, Kenneth
Cc: McKirgan, John; Flanders, Scott; Kammerer, Annie; Bagchi, Goutam; Ader, Charles; Lombard, Mark; Khanna, Meena; Vettori, Robert; Dinh, Tinh; Lee, Samuel
Subject: RE: Qs on Seismic-induced flooding and fire

Here are the seismic/fire Q&As...

From: Lee, Samuel
Sent: Friday, March 18, 2011 3:48 PM
To: Chokshi, Nilesh; See, Kenneth
Cc: McKirgan, John; Flanders, Scott; Kammerer, Annie; Bagchi, Goutam; Ader, Charles; Lombard, Mark; Khanna, Meena; Dreisbach, Jason
Subject: RE: Qs on Seismic-induced flooding and fire

Nilesh/Ken,
Attached provides SBP's suggested Q&As on seismically-induced internal flooding for the upcoming Commission meeting. Jason Dreisbach will send you our suggested Q&As on seismically-induced fire, separately.
sam

Samuel S. Lee, Chief
Balance of Plant Branch 2
Division of Safety Systems & Risk Assessment Office of New Reactors U.S. Nuclear Regulatory Commission
301-415-0155
samuel.lee@nrc.gov

From: Chokshi, Nilesh
Sent: Friday, March 18, 2011 10:10 AM
To: Lee, Samuel; McKirgan, John
Cc: See, Kenneth; Flanders, Scott; Kammerer, Annie; Bagchi, Goutam; Ader, Charles; Khanna, Meena
Subject: RE: Qs on Seismic-induced flooding and fire

Sam,

Questions were verbal and general. I tried to characterize them in my e-mail. If it helps, let's have a phone call - you, me, and Ken, we can formulate questions together..

Thanks,

Nilesh

From: Lee, Samuel
Sent: Friday, March 18, 2011 10:02 AM
To: Chokshi, Nilesh; McKirgan, John
Cc: See, Kenneth; Flanders, Scott; Kammerer, Annie; Bagchi, Goutam; Ader, Charles; Khanna, Meena
Subject: RE: Qs on Seismic-induced flooding and fire

Nilesh,

Please forward me the questions that GXA asked during your briefing with him.

sam

Samuel S. Lee, Chief

Balance of Plant Branch 2

Division of Safety Systems & Risk Assessment Office of New Reactors U.S. Nuclear Regulatory Commission

301-415-0155

samuel.lee@nrc.gov

From: Chokshi, Nilesh

Sent: Friday, March 18, 2011 9:51 AM

To: McKirgan, John

Cc: See, Kenneth; Flanders, Scott; Kammerer, Annie; Bagchi, Goutam; Ader, Charles; Khanna, Meena; Lee, Samuel

Subject: Qs on Seismic-induced flooding and fire

John,

As we discussed, during my briefing with Comm. Apostolakis , he asked questions regarding how we look at seismic-induced internal floods. Internal floods are handled in the review of SRP Sections 3.4.1 and 3.4.2. I am not sure about seismic-induced fire during the design review. I know how we do both of these things in the beyond design basis space. So we need your help in developing answers to these questions. Ken See of my staff is working on these questions and I will ask him to contact Sam. These answers will also go in a Qs and As document being put together by Annie. We need these answers today. There is a Commission briefing on Monday morning.

Thanks,

Nilesh

Dep. Dir., Div. of Site & Environmental Reviews Office of New Reactors USNRC MS T-07F3 Washington, DC
20555

(301)-415-1634

Maier, Bill

From: Barbara Byron [Bbyron@energy.state.ca.us]
Sent: Wednesday, March 16, 2011 4:32 PM
To: Maier, Bill
Subject: Re: NRC TALKING POINTS CLEARED FOR YOUR USE

Bill please add me to your e-mail distribution list. Thanks.

Barbara

>>> "Maier, Bill" <Bill.Maier@nrc.gov> 3/16/2011 12:27 PM >>>
Dear State Liaison Officers and Radiation Control Program Directors:

Attached are the NRC's questions and answers that have been released for your information and use regarding the Japanese reactor accident and its perceived impact for the United States. The document is in pdf format.

Also, you should have been provided NRC news release # 11-050, which conveys NRC's protective action recommendations for Americans located near the stricken reactor plants in Japan. This development will certainly cause the answers to Questions 5 and 15 of the attached document to be altered to include this protective action recommendation.

Please note the statement at the bottom of News Release #11-050 that states:

All the available information continues to indicate Hawaii, Alaska, the U.S. Territories and the U.S. West Coast are not expected to experience any harmful levels of radioactivity.

If you have not received the above referenced news release, you can view it, and any follow-on news releases at the following web location:

<http://www.nrc.gov/reading-rm/doc-collections/news/2011/>

Bill Maier
Regional State Liaison Officer
USNRC Region 4
612 E. Lamar Blvd.
Suite 400
Arlington, TX 76011-4125
Tel: 817-860-8267
e-mail: bill.maier@nrc.gov

Raione, Richard

From: Lauron, Carolyn
Sent: Wednesday, March 16, 2011 9:16 AM
To: NRO DSER Branch Chiefs
Cc: Chokshi, Nilesh; Flanders, Scott
Subject: URGENT ACTION by 10am today: List of pending letters or press releases

Importance: High

Hi –

Please provide your responses to me by 10am today.

Thanks,
Carolyn
2736

From: Rosales-Cooper, Cindy
Sent: Wednesday, March 16, 2011 9:15 AM
To: Snyder, Amy; Erwin, Kenneth; Lauron, Carolyn; Araguas, Christian
Cc: Akstulewicz, Frank; Chokshi, Nilesh; Mayfield, Michael
Subject: Urgent: List of pending letters or press releases

All,
We need, urgently, a list of any pending letters to applicants or press releases on major licensing actions and milestones that your divisions currently have in purview. We don't need the actual letter or press release but the title or topic.

Please respond by 10:30am this morning.

Thanks for your help,
Cindy

CL/64

Candelario, Luisette

From: Chokshi, Nilesh
Sent: Wednesday, March 16, 2011 10:02 AM
To: Karas, Rebecca; Raione, Richard; Ahn, Hosung; Caverly, Jill; See, Kenneth; Giacinto, Joseph; Jones, Henry; McBride, Mark; Tiruneh, Nebiyu; Bauer, Laurel; Bieganousky, Wayne; Candelario, Luisette; Cook, Christopher; Devlin, Stephanie; Graizer, Vladimir; Kahler, Carolyn; Li, Yong; Munson, Clifford; Plaza-Toledo, Meralis; Rodriguez, Ricardo; Seber, Dogan; Stieve, Alice; Stirewalt, Gerry; Tabatabai, Sarah; Thompson, Jenise; Vega, Frankie; Wang, Weijun; Xi, Zuhan
Cc: Lauron, Carolyn
Subject: RE: does anyone besides Yong and Laurel have a paper/presentation coming up soon (to external audiences)?

Follow Up Flag: Follow up
Flag Status: Flagged

Becky,

I remember approving two Gerry's papers.

Nilesh

From: Karas, Rebecca
Sent: Wednesday, March 16, 2011 9:54 AM
To: Raione, Richard; Ahn, Hosung; Caverly, Jill; See, Kenneth; Giacinto, Joseph; Jones, Henry; McBride, Mark; Tiruneh, Nebiyu; Bauer, Laurel; Bieganousky, Wayne; Candelario, Luisette; Cook, Christopher; Devlin, Stephanie; Graizer, Vladimir; Kahler, Carolyn; Li, Yong; Munson, Clifford; Plaza-Toledo, Meralis; Rodriguez, Ricardo; Seber, Dogan; Stieve, Alice; Stirewalt, Gerry; Tabatabai, Sarah; Thompson, Jenise; Vega, Frankie; Wang, Weijun; Xi, Zuhan
Cc: Lauron, Carolyn; Chokshi, Nilesh
Subject: does anyone besides Yong and Laurel have a paper/presentation coming up soon (to external audiences)?
Importance: High

Need to know before 10am today, as given the situation in Japan, we are looking at these again. Please forward to Carolyn with Nilesh and I on cc.

Rebecca Karas, Chief
Geosciences and Geotechnical Engineering Branch 1
Division of Site and Environmental Reviews
Office of New Reactors
U.S. Nuclear Regulatory Commission
Phone: 301-415-7533
Fax: 301-415-5397

Candelario, Luisette

From: Karas, Rebecca
Sent: Wednesday, March 16, 2011 10:05 AM
To: Karas, Rebecca; Raione, Richard; Ahn, Hosung; Caverly, Jill; See, Kenneth; Giacinto, Joseph; Jones, Henry; McBride, Mark; Tiruneh, Nebiyu; Bauer, Laurel; Bieganousky, Wayne; Candelario, Luisette; Cook, Christopher; Devlin, Stephanie; Graizer, Vladimir; Kahler, Carolyn; Li, Yong; Munson, Clifford; Plaza-Toledo, Meralis; Rodriguez, Ricardo; Seber, Dogan; Stieve, Alice; Stirewalt, Gerry; Tabatabai, Sarah; Thompson, Jenise; Vega, Frankie; Wang, Weijun; Xi, Zuhan
Cc: Lauron, Carolyn; Chokshi, Nilesh
Subject: RE: does anyone besides Yong and Laurel have a paper/presentation coming up soon (to external audiences)?

Follow Up Flag: Follow up
Flag Status: Flagged

Please respond with the topic of the paper when you respond, and the conference it is to be presented at.

Rebecca Karas, Chief
Geosciences and Geotechnical Engineering Branch 1
Division of Site and Environmental Reviews
Office of New Reactors
U.S. Nuclear Regulatory Commission
Phone: 301-415-7533
Fax: 301-415-5397

From: Karas, Rebecca
Sent: Wednesday, March 16, 2011 9:54 AM
To: Raione, Richard; Ahn, Hosung; Caverly, Jill; See, Kenneth; Giacinto, Joseph; Jones, Henry; McBride, Mark; Tiruneh, Nebiyu; Bauer, Laurel; Bieganousky, Wayne; Candelario, Luisette; Cook, Christopher; Devlin, Stephanie; Graizer, Vladimir; Kahler, Carolyn; Li, Yong; Munson, Clifford; Plaza-Toledo, Meralis; Rodriguez, Ricardo; Seber, Dogan; Stieve, Alice; Stirewalt, Gerry; Tabatabai, Sarah; Thompson, Jenise; Vega, Frankie; Wang, Weijun; Xi, Zuhan
Cc: Lauron, Carolyn; Chokshi, Nilesh
Subject: does anyone besides Yong and Laurel have a paper/presentation coming up soon (to external audiences)?
Importance: High

Need to know before 10am today, as given the situation in Japan, we are looking at these again. Please forward to Carolyn with Nilesh and I on cc.

Rebecca Karas, Chief
Geosciences and Geotechnical Engineering Branch 1
Division of Site and Environmental Reviews
Office of New Reactors
U.S. Nuclear Regulatory Commission
Phone: 301-415-7533
Fax: 301-415-5397

Candelario, Luisette

From: Applestein, Lisa
Sent: Wednesday, March 16, 2011 10:33 AM
To: NRO_Distribution
Subject: FYI: New Agency Wide TAC Number

Follow Up Flag: Follow up
Flag Status: Flagged

Please be advised there is a new agency wide TAC number that is associated with the Japan Earthquake and Tsunami Drill. See guidance below. E-mail me and I will add you to this designated TAC number.

Thank you,

Lisa D. Applestein
T&L Coordinator
NRO/PMDA/ITMB
T-6F35
Phone #: 301-415-6175

From: HRMSBulletin Resource
Sent: Wednesday, March 16, 2011 9:52 AM
To: HRMSBulletin Resource
Cc: HRMSBulletin Resource
Subject: New Agency Wide TAC Number

All Employees,

Due to the most current event in Japan, the Agency has decided to establish a new Agency wide Activity Code. It is: ZG0061 - Japan Earthquake and Tsunami. The PA will be: 111180 – Response Program-Event/Response - Operating RX. Please be reminded that if you charged hours to D92374 in PP6, you will need to submit a corrected time card and use the new TAC number ZG0061 under PA 111180. Also please contact your T & L Coordinator to have that TAC established in your profile.

Thank you for your cooperation.

Time, Labor and Payroll Services

Raione, Richard

From: Karas, Rebecca
Sent: Wednesday, March 16, 2011 12:20 PM
To: Ahn, Hosung
Cc: Chokshi, Nilesh; Munson, Clifford; Raione, Richard
Subject: RE: Calls for answering questions on earthquakes, etc, in support of Japanese event activities

Yes, this is a specific example that has happened. They need to go through our ops center. Do not give them answers directly on this.

Rebecca Karas, Chief
Geosciences and Geotechnical Engineering Branch 1
Division of Site and Environmental Reviews
Office of New Reactors
U.S. Nuclear Regulatory Commission
Phone: 301-415-7533
Fax: 301-415-5397

From: Ahn, Hosung
Sent: Wednesday, March 16, 2011 12:13 PM
To: Karas, Rebecca
Cc: Chokshi, Nilesh; Munson, Clifford; Raione, Richard
Subject: RE: Calls for answering questions on earthquakes, etc, in support of Japanese event activities

Becky,
Does this rule also apply to our contractors who work earthquake and tsunami issues for us? The contracts could be contacted by media.

Hosung

From: Karas, Rebecca
Sent: Wednesday, March 16, 2011 12:05 PM
To: NRO_DSER Distribution
Cc: Chokshi, Nilesh; Kammerer, Annie; Munson, Clifford
Subject: Calls for answering questions on earthquakes, etc, in support of Japanese event activities

All,

Chokshi

Based on what just happened to Gerry and Henry, individuals within NRC appear to be either randomly calling geologists/geophysicists/hydrologists or people they happen to know to answer questions.

For callers who are NRC staff who ask you a question, please direct them to call the Ops Center and ask to be connected to the RST seismologist (Cliff on day shift, Annie on evening shift). That person will coordinate all question responses (if Cliff or Annie call you, provide any support they need to help answer these questions).

For callers who are NOT NRC staff (including people from other agencies), please continue to follow the direction of the EDO here:

THIS IS NOT A DRILL

The Office of Public Affairs is expecting a large volume of calls from media and the general public regarding the latest statements from the State Department and the NRC regarding the situation in Japan. ALL CALLS from media or the general public on this topic must be referred to the 301-415-8200 number.

The NRC is coordinating its actions with other Federal agencies as part of the U.S. government response to the events in Japan. The NRC is examining all available information as part of the effort to analyze the event and understand its implications both for Japan and the United States. The NRC's Headquarters Operations Center in Rockville, MD has been stood up since the beginning of the emergency in Japan and is operating on a 24-hour basis.

NRC Incident Responders at Headquarters have spoken with the agency's counterpart in Japan and offered the assistance of U.S. technical experts. NRC representatives with expertise on boiling water nuclear reactors have deployed to Japan as part of a U.S. International Agency for International Development (USAID) team. USAID is the Federal government agency primarily responsible for providing assistance to countries recovering from disasters.

U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety significant structures, systems, and components be designed to take in account the most severe natural phenomena historically estimated for the site and surrounding area.

The NRC will **not** provide information on the status of Japan's nuclear power plants. For the latest information on NRC actions see the NRC's web site at www.nrc.gov or blog at <http://public-blog.nrc-gateway.gov>.

Two important reminders:

It is possible that some of us will be requested by colleagues in another country to provide technical advice and assistance during this emergency. It is essential that all such communications be handled through the NRC Operations Center. Any assistance to a foreign government or entity must be coordinated through the NRC Operations Center and the U.S. Department of State (DOS). If you receive such a request, contact the NRC Operations Officer (301-816-5100 or via the NRC Operator) immediately.

If you receive information regarding this or any emergency (foreign or domestic) and you are not certain that the NRC's Incident Response Operations Officer is already aware of that information, you should contact the NRC Operations Officer (301-816-5100 or via the NRC Operator) and provide that information.

Other Sources of Information:

USAID – www.usaid.gov

U.S. Department of State – www.state.gov

FEMA – www.fema.gov

White House – www.whitehouse.gov

Nuclear Energy Institute – www.nei.org

International Atomic Energy Agency – www.iaea.org/press

No response to this message is required.

THIS IS NOT A DRILL

Rebecca Karas, Chief

Geosciences and Geotechnical Engineering Branch 1

Division of Site and Environmental Reviews

Office of New Reactors

U.S. Nuclear Regulatory Commission

Phone: 301-415-7533

Fax: 301-415-5397

Raione, Richard

From: Munson, Clifford
Sent: Wednesday, March 16, 2011 12:37 PM
To: Karas, Rebecca; Jones, Henry
Cc: Chokshi, Nilesh; Raione, Richard
Subject: RE: tsunami fact sheet

Cliff

Need more details/specifics on SONGS and Diablo in last section.

From: Karas, Rebecca
Sent: Wednesday, March 16, 2011 11:49 AM
To: Jones, Henry
Cc: Chokshi, Nilesh; Munson, Clifford
Subject: FW: tsunami fact sheet
Importance: High

Henry, can you do the final edit on what Goutam has produced and then email it to Cliff, Nilesh and I so we can do some final work on it.

Rebecca Karas, Chief
Geosciences and Geotechnical Engineering Branch 1
Division of Site and Environmental Reviews
Office of New Reactors
U.S. Nuclear Regulatory Commission
Phone: 301-415-7533
Fax: 301-415-5397

From: Bagchi, Goutam
Sent: Wednesday, March 16, 2011 11:43 AM
To: Karas, Rebecca; Munson, Clifford
Subject: RE: tsunami fact sheet

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*Thank you,
Goutam*

From: Karas, Rebecca
Sent: Wednesday, March 16, 2011 11:29 AM
To: Munson, Clifford
Cc: Bagchi, Goutam
Subject: RE: tsunami fact sheet

Goutam, didn't you want Cliff to look at this now? Or did I misunderstand you?

Rebecca Karas, Chief
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Division of Site and Environmental Reviews
Office of New Reactors
U.S. Nuclear Regulatory Commission
Phone: 301-415-7533
Fax: 301-415-5397

From: Munson, Clifford
Sent: Wednesday, March 16, 2011 11:28 AM
To: Karas, Rebecca
Subject: RE: tsunami fact sheet

He sent it to Richard and Henry for them to comment and incorporate their parts.

From: Karas, Rebecca
Sent: Wednesday, March 16, 2011 11:28 AM
To: Munson, Clifford
Subject: RE: tsunami fact sheet

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U.S. Nuclear Regulatory Commission
Phone: 301-415-7533
Fax: 301-415-5397

From: Munson, Clifford
Sent: Wednesday, March 16, 2011 11:25 AM

To: Karas, Rebecca

Subject: tsunami fact sheet

Can we get something from RHEB – we've been waiting patiently.

Cliff

Raione, Richard

2/70

From: Jones, Henry
Sent: Wednesday, March 16, 2011 12:43 PM
To: Raione, Richard
Subject: FW: tsunami fact sheet

Forwarded.

From: Karas, Rebecca
Sent: Wednesday, March 16, 2011 11:45 AM
To: Bagchi, Goutam; Munson, Clifford; Jones, Henry
Subject: RE: tsunami fact sheet

Who is doing the Q&As that Annie put together the questions for on tsunami?

Rebecca Karas, Chief
Geosciences and Geotechnical Engineering Branch 1
Division of Site and Environmental Reviews
Office of New Reactors
U.S. Nuclear Regulatory Commission
Phone: 301-415-7533
Fax: 301-415-5397

From: Bagchi, Goutam
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Fax: 301-415-5397

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Sent: Wednesday, March 16, 2011 11:25 AM
To: Karas, Rebecca
Subject: tsunami fact sheet

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Cliff

Raione, Richard

1170

From: Jones, Henry
Sent: Wednesday, March 16, 2011 12:44 PM
To: Raione, Richard
Subject: FW: tsunami fact sheet
Attachments: Tsunami Data Sheet; TsunamiFactSheetGB.docx

Importance: High

She left you out again.

From: Karas, Rebecca
Sent: Wednesday, March 16, 2011 11:49 AM
To: Jones, Henry
Cc: Chokshi, Nilesh; Munson, Clifford
Subject: FW: tsunami fact sheet
Importance: High

Henry, can you do the final edit on what Goutam has produced and then email it to Cliff, Nilesh and I so we can do some final work on it.

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Sent: Wednesday, March 16, 2011 11:25 AM

To: Karas, Rebecca

Subject: tsunami fact sheet

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Cliff

Raione, Richard

From: Bagchi, Goutam
Sent: Wednesday, March 16, 2011 9:17 AM
To: Raione, Richard; Jones, Henry
Cc: Chokshi, Nilesh; Munson, Clifford
Subject: Tsunami Data Sheet
Attachments: TsunamiFactSheetGB.docx

Richard and Henry,

The attached file is my draft frame work for the task we must finalize today. Please revise it and forward the revised version to Nilesh. I know that you will be able to add web links and other important information.

*Thank you,
Goutam*

Cliff,

We need your input. Thanks

elk

Fact Sheet on Protection of Nuclear Power Plants against tsunami flooding

Nuclear power plants are designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions. The word tsunami literally means harbor wave. Tsunamis can be generated by large off shore earthquakes (usually greater than magnitude 6.5), submarine or on shore land slides or volcanoes. Some large on shore earthquakes close to the shoreline can generate tsunami. The Nuclear Regulatory Commission (NRC) requires all nuclear power plants to be protected against earthquakes, tsunamis and other natural hazards.

Background

Protection against tsunami effects was required for all operating plants and is required for all new reactors. Following the Indian Ocean tsunami on December 26, 2004, the President moved to protect lives and property by launching an initiative to improve domestic tsunami warning capabilities. This plan was placed under the auspices of the National Science and Technology Council through the President's initiative in July 2005 in the context of a broad national effort of tsunami risk reduction, and United States participated in international efforts to reduce tsunami risk worldwide. In response to the president's initiative, the NRC reviewed its licensing criteria and conducted independent studies and participated in international forums under the auspices of the International Atomic Energy Agency with many participating countries including India and Japan. The final report of the study was published in April 2009 as NUREG/CR 6966, "Tsunami Hazard Assessment at Nuclear Power Plant Sites in the United States of America," ADAMS Accession # ML0915901933. NRC revised its Standard Review Plan for conducting safety reviews of nuclear power plants in 2007. The Office of Nuclear Regulatory Research is conducting tsunami studies in collaboration with the United States Geological Survey and has published a report on tsunami hazard in the Atlantic, Gulf and Pacific coastal areas. Selected nuclear power plants now get tsunami warning notification. The agency requires plant designs to withstand the effects of natural phenomena including effects of tsunamis. The agency's requirements, including General Design Criteria for licensing a plant, are described in Title 10 of the *Code of Federal Regulations* (10 CFR). These license requirements consist of incorporating margins in the initiating hazard and additional margins are due to traditional engineering practices such as "safety factors." Practices such as these add an extra element of safety into design, construction, and operations.

The NRC has always required licensees to design, operate, and maintain safety-significant structures, systems, and components to withstand the effects of natural hazards and to maintain the capability to perform their intended safety functions. The

agency ensures these requirements are satisfied through the licensing, reactor oversight, and enforcement processes.

Tsunami Hazard Evaluation

Tsunami hazard evaluation is one component of the complete hydrological review requirements provided in the Standard Review Plan. The safety determination of reactor sites require consideration of major flood causing elements, including consideration of combined flood causing conditions. These are for example, Probable Maximum Flood (PMF) on Streams and Rivers, Potential Dam Failures, Probable Maximum Surge and Seiche Flooding, Probable Maximum Tsunami Hazards, Ice Effects, Cooling Water Canals and Reservoirs, Channel Diversions, Flooding Protection Requirements.

The Probable Maximum Tsunami (PMT) is defined as that tsunami for which the impact at the site is derived from the use of best available scientific information to arrive at a set of scenarios reasonably expected to affect the nuclear power plant site taking into account (a) appropriate consideration of the most severe of the natural phenomena that have been historically reported or determine from geological and physical data for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated, (b) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena, and (c) the importance of the safety functions to be performed.

Site-specific tsunami data are collected from historical tsunami records, paleotsunami evidence, regional tsunami assessments, site-specific tsunami mechanisms, site-specific data, such as submarine survey of sea bed and approach channel geometry etc. Effects of tsunami on a nuclear power plant can be flooding due to water run up, hydro-dynamic pressure on exterior walls of structures, impact of floating debris, and foundation scouring. In addition, tsunami can draw down water from the intake source of plant cooling water.

The tsunami database is available for interactive search and downloads on the internet at <http://www.ngdc.noaa.gov/hazard/tsu.shtml>.

Tsunami Safety Assessment

The licensing bases for existing nuclear power plants are based on historical data at each site. This data is used to determine probable maximum tsunami and the tsunami effects are evaluated for each site with potential for tsunami flooding. The potential for tsunami hazard is determined on a hierarchical analysis process that can identify tsunami potential based primarily on distance from tsunami source and site elevation. The NRC also required existing plants to assess their potential vulnerability to external

events, as part of the Individual Plant Examination of External Events Program. This process ensured that existing plants are not vulnerable to tsunami hazard, and they continue to provide adequate public health and safety.

Today, the NRC utilizes a risk-informed regulatory approach, including insights from probabilistic assessments and traditional deterministic engineering methods to make regulatory decisions about existing plants (e.g., licensing amendment decisions). Any new nuclear plant the NRC licenses will use a probabilistic, performance-based approach to establish the plant's seismic hazard and the seismic loads for the plant's design basis.

Tsunami Lessons Learned

The NRC is fully engaged in national international tsunami hazard mitigation programs, and is conducting active research to refine the tsunami sources in the Atlantic, Gulf Coast and Pacific Coast areas. Diablo Canyon and San Onofre are two nuclear plant sites that have potential for tsunami Hazard. Both the Diablo Canyon (main plant) and SONGS are located above the flood level associated with tsunami. However, the intake structures and Auxiliary Sea Water System at Diablo canyon are designed for combination of tsunami-storm wave activity. SONGS has reinforced concrete cantilevered retaining seawall and screen well perimeter wall designed to withstand the design basis earthquake, followed by the maximum predicted tsunami with coincident storm wave action. These reactors are adequately protected against tsunami effects.

Additional Information

To read more about risk-related NRC policy, see the fact sheets on Probabilistic Risk Assessment (<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/probabilistic-risk-asses.html>) and Nuclear Reactor Risk (<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/reactor-risk.html>). Each provides more information on the use of probability in evaluating hazards (including earthquakes) and their potential impact on plant safety margins.

March 2011

Tsunami Catalogue for the Sanriku District near the Sendai Area, mostly based upon Miyagi Showa Shinsho-Shi (Record of the Showa Earthquake and Tsunami in Miyagi Prefecture) and partially on Shuto's memory.

Year	Source	Description
869	document	Giant earthquake in the Tohoku District. Tsunami flooded up to the Tagajo castle near Sendai. Over 1,000 drowned.
1585	legend	Tsunami hit Tokura, Motoyoshi, Miyagi Pref.
1611	document	After an earthquake, a big tsunami hit the Date clan (nearly equal to Miyagi Pref.). 1,783 people drowned. This is the first document to record this phenomenon as tsunami.
1616	document	A strong earthquake, then big tsunami.
1651	legend	Watari, Miyagi Pref. was hit by a tsunami.
1676	document	A tsunami hit Mito, Kanto District and Iwaki, Fukushima Pref. Several drowned.
1677	legend	Nanbu clan (Iwate Pref.) felt several earthquakes. No damage due to earthquake. At Miyako, Kuwagasaki and Oozuchi in Iwate Pref., houses were washed away.
1687	document	Coastal area in the Miyagi Pref., including Shiogama, was hit by tsunami. Tsunami height was about 50 cm above ground, flood and ebb 12 or 13 times.
1689	legend	A tsunami in Rikuchu District (Iwate Pref.)
1693	document	High waves hit the Kitakami River. 300 boats were lost. Many persons were drowned. (Storm Surge ? : Shuto)
1793	document	Earthquake and tsunami along the Sanriku Coast. At Ogatu in the Miyagi Pref., tsunami height was 60 cm above the first floor.
1836	document	A big earthquake in the Sendai Area. A large flood of sea water washed away several hundred houses. Many drowned.
1856	document	An earthquake in the Sanriku District at noon. Then big tsunami hit. At Ogatu, Miyagi Pref.

		tsunami height was about 1 m above the first floor. Flood and ebb 14 or 15 times until 10 p.m.
1867	document	A tsunami in the Motoyosi, Miyagi Pref.
1894	document	A small tsunami along the Iwate Pref.
1896	document	The Meiji Great Sanriku Tsunami was generated by a tsunami-earthquake. 22,000 loss of lives. The highest run-up of 38 m at Ryori Shirahama, in Iwate Pref.
1915	document	A small tsunami in Shizugawa Bay (Minami Sanriku Town).
1933	document	The Showa Great Sanriku Tsunami. Nearly 3,000 loss of lives. The highest run-up of 28 m at Ryori Shirahama.
1960	document	The 1960 Chilean Tsunami. Tsunami height was about 3 m, at the highest 6 m or so. All the Pacific Coast of Japan from Hokkaido to Okinawa was damaged.

(SHUTO Nobuo is responsible for the catalogue)

Raione, Richard

From: Raione, Richard
Sent: Wednesday, March 16, 2011 12:50 PM
To: Jones, Henry
Subject: FW: tsunami fact sheet

We can use Nilesh's presentation for more details
I'm looking at it now.

From: Munson, Clifford
Sent: Wednesday, March 16, 2011 12:37 PM
To: Karas, Rebecca; Jones, Henry
Cc: Chokshi, Nilesh; Raione, Richard
Subject: RE: tsunami fact sheet

Need more details/specifics on SONGS and Diablo in last section.

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Cc: Chokshi, Nilesh; Munson, Clifford
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Importance: High

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From: Bagchi, Goutam
Sent: Wednesday, March 16, 2011 11:43 AM
To: Karas, Rebecca; Munson, Clifford
Subject: RE: tsunami fact sheet

273

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From: Munson, Clifford
Sent: Wednesday, March 16, 2011 11:25 AM
To: Karas, Rebecca
Subject: tsunami fact sheet

Can we get something from RHEB – we've been waiting patiently.
Cliff

Raione, Richard

From: Hickey, Eva E [eva.hickey@pnl.gov]
Sent: Wednesday, March 16, 2011 3:55 PM
To: Clayton, Brent; Hatchett, Gregory; Fetter, Allen; Whited, Ryan; Raione, Richard; Chokshi, Nilesh; Flanders, Scott
Cc: Bryce, Robert W
Subject: Contacts by media to PNNL staff regarding the issues in Japan

All:

I know we are all concerned about what is going on in Japan and expecting that there will be contacts by media to some of the PNNL technical experts. Rajiv Prasad forwarded a message to me stating that if PNNL staff are contacted we are to direct the individual to the NRC public relations staff. Our management has provided direction to us based on PNNL policy (see message below)

You no doubt have been following the tragic events in Japan including the situation at the Fukushima Nuclear Power Plant near Okuma. In their effort to provide details and relevancy in their news stories, both U.S. and international media have been seeking out staff at national laboratories and other U.S. organizations for interviews and comments. If you receive any calls from news media, please forward them without comment to Geoff Harvey (372-6083) or Greg Koller (372-4864), per laboratory policy. We'll work with staff and management to respond as appropriate.

I am going to post a notice on EARRTH as a reminder to PNNL staff to follow this policy. If you have any questions or concerns, please let me know. If necessary I am sure that our PR staff would be more than happy to interact with the NRC PR staff.

I am going to be out of the office March 17-25 and Bob Bryce will be acting for me – therefore I have added him as CC to this message.

Thanks

Eva Eckert Hickey

Staff Scientist
Radiological Science and Engineering Group
Energy and Environment Division

Pacific Northwest National Laboratory
902 Battelle Boulevard
P.O. Box 999, MSIN K3-66
Richland, WA 99352 USA
Tel: 509-375-2065
Fax: 509-375-3886

4174

eva.hickey@pnl.gov
www.pnl.gov

Clayton, Brent

From: NEIGA@nei.org
Sent: Wednesday, March 16, 2011 2:01 PM
To: Clayton, Brent
Subject: **Update 1:15pm March 16** Information on the Japanese Earthquake and Reactors in that Region



UPDATE AS OF 1:15 P.M. EDT, WEDNESDAY, MARCH 16:

NEI has posted an updated version of the fact sheet [Used Nuclear Fuel Storage at the Fukushima Daiichi Nuclear Power Plant](#). Also available is a new fact sheet called [Industry Taking Action to Ensure Continued Safety at U.S. Nuclear Energy Plants](#).

As always, please go to <http://resources.nei.org/japan> for the latest updates.

Click [here](#) to unsubscribe

C/75

Terao, David

From: Terao, David
Sent: Monday, March 21, 2011 8:56 AM
To: Bergman, Thomas
Cc: Dixon-Herrity, Jennifer; Norato, Michael; Chokshi, Nilesh
Subject: Seismic Design of Piping in U.S. NPPs
Attachments: Are US plants safe from eartquakes.docx

Tom,

In preparation for questions from the Commissioners on piping seismic design, I put some of my thoughts on paper. Attached, for your information, is what I prepared to address the question, "**Are U.S. nuclear power plants safe from an earthquake and in particular piping systems?**" Although the briefing has been cancelled, I thought you might want this information in case you are asked a similar question.

David Terao, Chief
Component Integrity, Performance and Testing Branch 1 (PWRs)
Division of Engineering, NRO
Phone: (301) 415-3317

Are U.S. nuclear power plants safe from earthquakes and in particular piping systems?

The current fleet of operating NPPs in the U.S. is safe from earthquakes, but a focused assessment of seismic vulnerabilities using new information from the recent earthquake in Japan can enhance the safety of U.S. NPPs.

The recent 9.0 Tohoku-Taiheiyou-Oki earthquake in Japan taught us a lot:

- How destructive an earthquake and resulting tsunami can be
- How difficult it is to design NPPs for unexpected and highly improbable events
- How important it is to maintain structural margins in NPPs

The Fukushima Dai-ichi NPPs (and all the Japanese NPPs in Northern Japan affected by the earthquake) survived the largest earthquake recorded in Japan.

Even though the magnitude of the seismic event was likely beyond the plant's design basis, all safety systems operated as designed – until the tsunami hit the plant site.

It is apparent that the design of the Japanese NPPs to withstand tsunamis was the weak link causing the major problems at the Fukushima Dai-ichi site.

The capability of NPPs world-wide to resist an earthquake is evident in the amount of attention seismic design has received in the last 30 years and continues today.

Not much attention is given to the mechanics of a tsunami and how to adequately design a NPP to withstand one.

Given that most U.S. NPPs are not built on an ocean front that could be hit by a tsunami, the concern should be focused only on those few U.S. NPPs that might be subject to a tsunami (regardless of the low probability of one occurring).

For earthquakes, U.S. NPPs are generally designed to the same strict seismic design standards as Japanese NPPs although the Japanese seismic input loadings used to assess the structural capacity are much higher than those used in the U.S.

The recent Japanese earthquake gave us some new insights that we should use to assess U.S. NPPs.

For example, the duration of the Tohoku earthquake was much longer than assumed in design – 5 minutes versus 20 seconds used in design.

This longer earthquake would produce many more earthquake cycles in NPP components and may necessitate a reassessment of the adequacy of the fatigue evaluation performed for piping and other components.

It would be imprudent to suggest that there is no need to reassess the designs of U.S. NPPs using this new seismic information.

It would be equally imprudent to look only broadly at the risks of earthquakes as the primary focus of concern since the effects of earthquakes have already been studied comprehensively.

What about piping systems in particular? Are they adequately design for earthquakes?

The first thought is usually to add more conservatism to the seismic design of piping systems.

Adding conservatism is not always the proper course of action as we have learned.

For example:

- Increasing the piping wall thickness might result in a more robust piping, but it will lead to a stiffer piping system that can cause thermal expansion problems under high temperatures during normal operation.
- Adding more seismic restraints might reduce the seismic stresses in piping systems, but will make snubber lockup more probable under normal operation, thus, causing thermal expansion problems (e.g., Trojan steam-generator snubber lockup event).
- Adding more pipe-whip restraints might protect the plant from more postulated pipe breaks, but adversely impacts the ability to inspect pipe welds for signs of cracking.

The U.S. nuclear industry has already performed a comprehensive assessment of the seismic design of piping systems in the 1980's.

In the 1980's the "conservative" piping seismic criteria led to an excessive number of seismic restraints (i.e., snubbers) on piping systems.

In 1985, the NRC and EPRI established a Piping and Fitting Dynamic Reliability Program (PFDRP) to develop improved, realistic, and defensible seismic design rules for piping systems using results from extensive dynamic testing.

The PFDRP identified the failure mode of piping systems under seismic loadings as fatigue or fatigue-ratcheting rather than the assumed structural (plastic) collapse of the piping.

The ASME revised its seismic design rules in the 1994 Addenda to the ASME Boiler and Pressure Vessel Code, Section III to incorporate these new rules.

The NRC staff did not accept these relaxed Code stress limits and prohibited their use in U.S. NPPs.

NRC/ASME have been working together to resolve these differences in piping seismic rules, and the ASME subsequently revised their Code rules to reflect NRC's concerns.

NRC will be adopting the newly revised ASME Code seismic design rules that appear in the 2006 Addenda.

In light of the longer duration earthquake in Japan and the fact that the PFDRP identified fatigue and fatigue-ratcheting as the failure mode of piping under seismic loadings, it would be prudent to reassess the methodology used for fatigue evaluation in piping systems using the latest seismic information.

3/11/2011 Fukushima Event (as of Thurs, 3/17/11 8:00am)

- Earthquake of magnitude 9.0 Richter scale hit Japan on 3/11/2011 at 2:46pm JST.
 - also referred to as the Tohoku-Taiheiyou-Oki earthquake
 - earthquake duration was about 5 minutes long (most earthquakes are about 15-30 sec)
- Tsunami followed ~40 minutes later hitting the Fukushima Dai-ichi (I) and Dai-ni (II) plant sites.
- Fukushima I site has 6 BWRs (Units 1-5 have Mark I containment; Unit 6 has Mark II)
 - Units 1, 2 and 3 were operating at time of earthquake (other units were shutdown for maintenance)
 - Fukushima I site has 13 emergency diesel generators (EDGs)
 - All three units automatically tripped (control rods inserted) when earthquake hit
 - EDGs immediately started up
 - All EDGs were unavailable shortly after tsunami hit the plant site (lost diesel fuel?)
 - Without EDGs, plant cooling system (reactor recirculation and residual heat removal) was lost
 - Switchgear was found to be damaged by tsunami; unable to use portable generators
 - Batteries were used and flown in to operate the cooling pumps
 - Fire trucks were used to inject water into plant
 - Hydrogen accumulation in reactor building exploded ejecting Unit 1 blowout panels
 - Cesium detected outside plant indicating some core damage
 - Sea water and boron pumped into Unit 1 to cool reactor
 - Unit 1 core undergoes partial meltdown
 - Sea water and boron pumped into Unit 3 to cool reactor
 - Unit 3 core undergoes partial meltdown
 - Hydrogen explosion at Unit 3; hydrogen created from exposed spent fuel in pool
 - Sea water and boron pumped into Unit 2 to cool reactor
 - Hydrogen explosion at Unit 4; hole in roof; hydrogen created from exposed spent fuel
 - Fire broke out at Unit 4 in spent fuel pool area; subsequently put out
 - Spent fuel pool temperature increases in Unit 4 (100 °C exposing top of spent fuel)
 - Explosion heard near Unit 2 suppression pool; primary containment breached
 - Unit 2 fuel rods exposed 2.7 meters (about half of length)
 - High radiation in plant including control room
 - Of 800 plant personnel, all but 50 who are involved with injecting water into plant were moved to a safer location
 - Second fire broke out in Unit 4 spent fuel pool; likely the zircaloy cladding
 - High airborne radiation from spent fuel fire in Unit 4
 - High airborne radiation also emanating from exposed spent fuel in Unit 3 SFP
 - Units 5 and 6 spent fuel pool temperature increasing; but water circulation is available

At TMI-2 with the core uncovered, the high-temperature chemical reaction between water and Zircaloy cladding on fuel pellets created a hydrogen bubble in the reactor. Escaping gas in the TMI-2 containment ignited causing a spike in containment pressure. Eventually, the valve on the pressurizer was used to control the hydrogen accumulation at TMI-2.

Raione, Richard

From: Jones, Henry
Sent: Wednesday, March 16, 2011 6:51 PM
To: Raione, Richard
Subject: FW: Action Requested by noon, Thursday, 3/17: DSER Support Related to Japanese Event
Importance: High

Richard,

Do to my doctor's appointment, you may want to fill-in my information in the morning. It should be the same as yours if the questions Carolyn is referring to are the same as the Q&A and Fact Sheet sheet for Annie. Thanks

Henry

From: Lauron, Carolyn
Sent: Wednesday, March 16, 2011 6:10 PM
To: Lauron, Carolyn
Subject: Action Requested by noon, Thursday, 3/17: DSER Support Related to Japanese Event

Hi –

We have been asked to provide a list of staff members who are supporting the Japanese event.

Please use the attached file and confirm/update the following:

- Ops Center Shift Work worksheet
 - o Find/Add your name and indicate the hours you worked or are scheduled to work on each day at the Ops Center (see Michelle Hart's input)
 - o Each column is a day starting on March 11.
- Responding to Requests
 - o Find/Add your name to indicate that you have provided responses to questions from the Ops Center.

Please send the file back to me (for now – I'll try to get a SharePoint site put together on this).

Call me if you have questions/comments.

WR

Thanks,
Carolyn
2376