



NRC NEWS

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**Fukushima, Two Years On: The NRC's Continued Implementation of Lessons Learned
Prepared Remarks of Chairman Allison M. Macfarlane,
At the Howard Baker Forum U.S.-Japan Roundtable
Wednesday, March 20, 2013 – Washington, DC**

Good afternoon. I appreciate the opportunity to speak to you today to provide an update on the NRC's efforts to implement lessons learned from the Fukushima-Daiichi accident. ([Accompanying slides.](#))

I'd first like to acknowledge that we've just passed the second anniversary of the Great Tōhoku Earthquake and tsunami. Two years later, this massive natural disaster continues to impact the daily lives of the Japanese people. I admire their courage and tenacity in their efforts to move on from this tragedy.

At the last U.S.-Japan Roundtable meeting on December 5, 2012, my colleague, Commissioner William Ostendorff, provided an in-depth overview of the actions recommended by the NRC staff and how they were prioritized. I'd like to briefly recall these actions, and then focus on the progress we have made since early December of last year.

You'll recall that shortly after the Fukushima accident, the NRC established a "Near-Term Task Force." In July 2011, the Task Force concluded there was no imminent safety risk posed by continued operation of U.S. nuclear power plants. They also made a series of recommendations that were later prioritized into three "tiers." Tier 1 actions were those that could be undertaken without undue delay. In March 2012, the NRC issued three orders to its licensees on Tier 1 actions, requiring: (1) mitigating strategies for beyond-design-basis events; (2) reliable hardened venting for plants with BWR Mark 1 and 2 containments; and (3) reliable spent fuel pool instrumentation. The NRC also issued requests for information in the areas of seismic and flooding hazard evaluation and emergency response communication capabilities.

Tier 2 comprises those actions which needed further technical assessment or critical skill sets. Tier 3 are longer-term actions that depend on the completion of a shorter-term action or require further study.

The Fukushima accident emphasized a number of issues that nuclear regulators and industry alike must reexamine. Reports coming in from Japan revealed that a magnitude 9.0 earthquake had occurred on that subduction zone; a 14-15 meter tsunami struck the

Fukushima-Daiichi site; multiple reactor units were impacted simultaneously; backup equipment on-site failed, causing a prolonged station blackout; and the damage from the natural disasters made it impossible for supplemental equipment to be brought in.

In mid-December, I led a U.S. delegation to an international nuclear safety conference in Fukushima Prefecture, Japan. During this trip, I had the opportunity to visit the Fukushima Daiichi site. On the drive to the plant, we passed empty villages, roads and railway lines overgrown with weeds. It was clear that these were once thriving communities that were hastily abandoned.

One of the most significant aspects of my visit was the opportunity to go to the top of the Unit 4 reactor, which was badly damaged by a hydrogen explosion. The Japanese have removed the damaged roof and we were able to walk down into the building and view the spent fuel pool and other areas. The workers on-site are contending not only with damage from the reactors, including significant quantities of contaminated water, but also with debris from the earthquake and tsunami.

Throughout the visit, we were carefully outfitted in Tyvek suits and respirators. Though we did get a small dose, we calculated that we received a greater dose on the flight over. The experience gave us all a great appreciation for the more than 2,000 workers who are on-site on a daily basis working to mitigate the damage and prepare the reactors for decommissioning. It is also a sobering reminder of the need to take all necessary precautions to prevent another accident.

While in Japan, I also had the opportunity to meet with the new Japanese regulatory body, the Japan Nuclear Regulation Authority (JNRA). Following the accident, the Japanese changed their regulatory structure and appointed new leadership. The JNRA has a five-member Commission structure much like the NRC's.

Our continued close collaboration enables the NRC to learn from Japan as they continue to address the long-term consequences of the Fukushima accident. NRC and JNRA have established a joint Steering Committee to address specific technical issues of mutual interest. This committee forms the basis of our continued post-Fukushima information exchanges. We have already had additional meaningful exchanges with JNRA since December, most recently last week at NRC's Regulatory Information Conference.

I must commend the JNRA for how it is addressing an extremely difficult situation. They face significant challenges, and my impression from meeting with them last week is that they are working tirelessly to meet their objectives.

To be effective, a regulatory body must be independent from economic, policy and political interests. Its decisions must not be subject to undue influence that can compromise safety. It must have sustainable funding and adequate, competent staffing. The IAEA's International Nuclear Safety Group, known as INSAG, produced an important report on regulatory independence which is depicted on this slide.

Recognizing that government structures vary from country to country, there are a variety of ways to achieve this sort of independence, but it must be a global hallmark of nuclear safety regulation. At the same time, effective regulation cannot be done in a vacuum. Regulators must conduct their activities openly and transparently to ensure that the impacts of proposed regulations are well understood. Industry has a particularly important cooperative role to play in this process.

As I mentioned earlier, about a year ago, the NRC issued orders requiring licensees to develop mitigating strategies for dealing with beyond design basis external hazards and extended losses of electrical power. The agency has worked with industry and others to develop guidance on how to implement these orders. The licensees recently submitted their integrated plans related to the mitigating strategies and providing enhancements to spent fuel pool level measurements. The NRC staff is currently reviewing these plans to support licensee implementation of related plant modifications and procuring equipment.

The NRC also required licensees to complete inspections to ensure that the plants were being maintained consistent with their existing design basis requirements for seismic and flooding hazards. NRC inspectors monitored these “walkdowns” and the staff is currently reviewing reports submitted by each licensee. Any deficiencies found during these inspections were entered into licensee corrective action programs and are being followed as part of the NRC’s normal oversight process.

You may recall from Commissioner Ostendorff’s remarks that the Commission was considering several important issues related to severe accident management and mitigation. One was whether to require filtered venting for boiling water reactors with Mark I and Mark II containments. Another was the issue of economic consequences of land contamination caused by a nuclear accident.

The Commission has just made public the results of its deliberations on the filtered venting issue, and we expect to finalize and release our decision on economic consequences in the near future. Regarding venting, the Commission has taken two important steps. First, we have approved modifications to last year’s venting order. As I mentioned, the initial order required licensees with BWR Mark I and II containments to install reliable hardened vents, consistent with their design basis. The new order will require these licensees to ensure that these hardened vents can properly address the elevated pressure, temperature, and radiation levels of a beyond design-basis accident. This is an important step to further enhance the safety of U.S. nuclear plants.

The second step we’ve taken is to direct the staff to broaden its study of various strategies for filtration during severe accidents. One option is obviously an engineered filtered vent, but there are other types of equipment and other strategies that the agency and the nuclear industry plan to consider. The staff will use our rulemaking process to do this analysis, which by definition will require significant public input and involvement.

Throughout our work to address Fukushima lessons learned, we’ve made openness and transparency a priority. We have focused both on internal and external communication to ensure that our activities are well understood and that we are taking a wide variety of views into account. We have held more than 80 public meetings to date to inform interested parties about

our progress. We are working closely with industry, state and local governments, interest groups, and others. The NRC's website has a section dedicated to our Japan lessons-learned efforts.

We recognize that there is great public interest in our work, and in particular, in how our Fukushima-related work is balanced with other safety priorities. The day-to-day safe operation of nuclear power plants remains our top priority. To that end, we are examining what we call the "cumulative effects of regulation," working to ensure that NRC-imposed requirements, including our post-Fukushima activities, do not distract from other safety-related work and seeking to avoid unintended consequences.

International cooperation is a priority for the NRC. We are working closely with our international counterparts to exchange information and lessons learned, both bilaterally and multilaterally. We have shared information about our own nuclear safety assessments and sought to familiarize ourselves with different approaches, such as the European Union "stress tests." We have participated in international conferences like the one in Japan, and provided technical and policy expertise for broader U.S. Government efforts. We have participated in IAEA technical expert missions to various nuclear power plants in Japan, including Fukushima-Daiichi, Fukushima-Daini, and Onagawa. NRC technical experts are assisting the IAEA in its efforts to review its nuclear safety standards and determine if changes are necessary to incorporate Fukushima lessons learned. Finally, the NRC is actively participating in U.S. Government activities regarding strengthening the effectiveness of the Convention on Nuclear Safety.

Throughout these activities, we have noticed that although approaches differ from country to country, we have all arrived at similar technical conclusions. We have, and will continue to learn important lessons from one another.

In addition to the short-term actions imposed by orders and information requests, we are pursuing rulemaking activities in areas such as station blackout and emergency response, including improving the integration of onsite and offsite emergency response procedures. The NRC staff continues to sponsor public meetings and has recently solicited public comments on some of these proposals.

The NRC staff is also continuing to assess various issues, develop or improve the computer models used to analyze severe accidents, and engage all interested parties regarding possible regulatory actions. A Commission paper was recently posted on the NRC website and provides the current status of the NRC's Fukushima-related activities.

Our Fukushima-related work and our ongoing relationship with the Japanese will continue to be priority areas for us. As we continue our efforts, we are focused on integrating lessons learned into our existing regulatory process to ensure that the improvements we make will allow for regulatory predictability and stability in the long term.

I appreciate the opportunity to speak with you today, and would be happy to answer your questions.