

## Status Summary of Japan Lessons-Learned Activities

April 2013

The NRC staff provided an update on the status of the agency's response to the lessons learned from the Fukushima Dai-ichi accident in a paper to the Commission dated February 14, 2013. The paper is available on the NRC website at <http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2013/2013-0020scv.pdf>

The paper describes the current status of the NRC's Fukushima lessons-learned activities, including recommendations from the Near-Term Task Force (NTTF) and other assessments. The paper describes the activities using the 3-tier prioritization system established by the NRC. The NRC staff has issued numerous orders, requests for information, and guidance documents to implement the lessons learned from the accident at Fukushima Dai-ichi. The Tier 1 items, which provide the most significant safety benefits, are now being implemented by the licensees of all operating nuclear power plants. Consistent with the existing orders, the NRC expects that plant modifications and procedure changes will be completed at U.S. nuclear power plants within the schedules established by the Commission.

Each of the lessons-learned activities involves several process steps:

- Gather information, perform technical analyses, and assess possible regulatory actions;
- Deliberate and make decisions on a regulatory approach;
- Take the appropriate regulatory actions; and
- Oversee licensees' implementation of the appropriate design and procedural changes at each affected facility.

The following table is provided to highlight the current status and timelines for the NRC's Fukushima lessons-learned activities by showing these process steps.

It is not possible, at this time, to provide a specific timeline for making regulatory decisions to implement the Tier 3 activities that the Commission might determine are warranted. These require further research and evaluation to determine if regulatory action is necessary, and/or are dependent upon insights gained from implementation of Tier 1 activities, which are still ongoing. Notwithstanding, the NRC staff prepared and issued program plans for each Tier 3 activity in a July 13, 2012, paper to the Commission (SECY-12-0095). These plans provided the roadmap for what actions or studies the NRC expects to complete to be able to make an informed decision to either pursue further regulatory action, or to conclude that the current regulatory approach is sufficient. The status of each of these plans was described in the February 14, 2013, update to the Commission (referenced earlier), and each item remains consistent with its program plan from the July 2012 paper. Therefore, the Tier 3 items are not included in the following table.

Enclosure

ITEM	Near-Term Task Force # <sup>1</sup>	PROCESS STEP (Completion Dates)			Licensee Actions
		NRC Actions			
		Identify, Gather Information & Assess	Deliberate & Decide	Regulatory Action	
<b>Tier 1 Orders</b>					
Provide a three-phase approach for mitigating beyond-design-basis external events.	NTTF 4.2 Tier 1	Complete	Complete	Complete	2013-2016 <sup>2</sup>
Provide a reliable hardened containment venting system for boiling-water reactors (BWR) with Mark I and II containments.	NTTF 5.1 Tier 1 <sup>3</sup>	Complete	Complete	Complete	To be defined in revised order
Revise reliable hardened containment venting systems for BWR Mark I and II containments to address severe accident conditions	Additional Staff Recommendation Tier 1 <sup>5</sup>	Complete	Complete	Complete	May 2013
Provide a reliable indication of water level in spent fuel storage pools.	NTTF 7.1 Tier 1	Complete	Complete	Complete	2013-2016 <sup>4</sup>
<b>Tier 1 Requests for Information</b>					
Perform seismic and flood protection	NTTF 2.3	Complete	Complete	Complete	Complete <sup>5</sup>

<sup>1</sup> Near-Term Task Force recommendation number

<sup>2</sup> Licensees are required to complete implementation within two refueling outages, or by December 31, 2016, whichever comes first. Full implementation will occur at many sites in 2014 and 2015. Licensees are in the process of acquiring equipment at their sites.

<sup>3</sup> In SRM-SECY-12-0157, the Commission directed the staff to revise the March 2012 Order requiring hardened venting systems at the 31 boiling-water reactors in the United States such that the vents will remain functional during severe accident conditions.

<sup>4</sup> Licensees are required to complete implementation within two refueling outages, or by December 31, 2016, whichever comes first. Full implementation will occur at many sites in 2014 and 2015.

<sup>5</sup> Licensees have completed the walkdowns and submitted the required reports. Discrepancies found during the walkdowns were entered into licensee corrective action programs. NRC inspections and followup are being performed as part of the routine reactor oversight process

ITEM	Near-Term Task Force # <sup>1</sup>	PROCESS STEP (Completion Dates)			Licensee Actions
		NRC Actions			
		Identify, Gather Information & Assess	Deliberate & Decide	Regulatory Action	
walkdowns to verify compliance with existing seismic and flooding design bases	Tier 1				

ITEM	Near-Term Task Force # <sup>1</sup>	PROCESS STEP (Completion Dates)				Licensee Actions
		NRC Actions			Regulatory Action	
		Identify, Gather Information & Assess	Deliberate & Decide			
Reevaluate seismic hazards against current requirements and guidance and update the design basis. Take appropriate regulatory action to resolve issues associated with updated site-specific hazards.	NTTF 2.1 Tier 1 <sup>6</sup>	2013-2020	Hazard reevaluations 2013-2015  Further evaluation dependent on safety significance of plant-specific updated hazard 2013-2021	2013-2021 Depending on safety significance of plant-specific updated hazard	2014-2016 Implement enhanced interim actions at central and eastern U.S. plants, including plant modifications <sup>7</sup>  2016-2018 Implement enhanced interim actions at western U.S. plants, including plant modifications <sup>8</sup>  2013-2025 Finalize actions depending on safety significance of plant-specific updated hazard	

<sup>6</sup> The reevaluations of seismic and flooding hazards required by the NRC requests for information to all plants is being completed in various steps and phases, dependent on locations and initial assessments of the external hazards. In some cases, the reevaluations may lead to additional analyses such as probabilistic risk assessments. Plant-specific schedules are being developed for the reevaluation activities. The need for regulatory actions may likewise be decided on a plant-specific basis.

<sup>7</sup> Some plant modifications requiring outages may extend beyond these dates.

<sup>8</sup> Some plant modifications requiring outages may extend beyond these dates.

ITEM	Near-Term Task Force # <sup>1</sup>	PROCESS STEP (Completion Dates)				Licensee Actions
		NRC Actions			Regulatory Action	
		Identify, Gather Information & Assess	Deliberate & Decide			
Reevaluate flooding hazards against current requirements and guidance and update the design basis. Take appropriate regulatory action to resolve issues associated with updated site-specific hazards.	NTTF 2.1 Tier 1 <sup>8</sup>	2013 - 2017	Hazard reevaluations 2013-2015 Interim licensee actions 2013-2016 Further evaluation dependent on safety significance of plant-specific updated hazard 2013-2018	2013-2018 Dependent on safety significance of plant-specific updated hazard	2013-2022 Finalize actions dependent on safety significance of plant-specific updated hazard	
Perform a staffing study for responding to multiunit events, evaluate enhancements that would be needed to power communications equipment throughout a prolonged station black out, and inform the NRC of the results.	NTTF 9.3 partial Tier 1	Complete	Complete	Complete	2013- 2016 <sup>9</sup>	

<sup>9</sup> The final licensee response is to be coordinated with completion of mitigating strategies activities. Licensees will be required to have sufficient staffing levels to implement the mitigating strategies order, in accordance with the established schedules for the order.

ITEM	Near-Term Task Force # <sup>1</sup>	PROCESS STEP (Completion Dates)				Licensee Actions
		NRC Actions			Regulatory Action	
		Identify, Gather Information & Assess	Deliberate & Decide			
<b>Tier 1 Rulemakings</b>						
Rulemaking to require the capability to maintain plant safety throughout a prolonged station blackout via mitigating strategies implemented above.	NTTF 4.1 Tier 1	Regulatory Basis 2013	Proposed Rule 2014	Final Rule 2016	Dependent on requirements in final rule <sup>10</sup>	
Rulemaking to require integration of onsite emergency response processes, procedures, training, and exercises.	NTTF 8 Tier 1	Regulatory Basis 2013	Proposed Rule 2014	Final Rule 2016	Dependent on requirements in final rule	
Rulemaking to assess filtration of radioactive material and additional severe accident performance requirements for BWR Mark I and II containments.	Additional Staff Recommendation Tier 1 <sup>11</sup>	Regulatory Basis 2014	Proposed Rule 2015	Final Rule 2017	Dependent on requirements in final rule <sup>12</sup>	

<sup>10</sup> As documented in COMSECY-13-002, this rulemaking is intended to make the requirements of the Mitigating Strategies Order generically applicable. If additional requirements beyond those of the order are incorporated into the final rule, licensees will need time to implement those requirements.

<sup>11</sup> In SRM-SECY-13-0157, the Commission directed the staff to begin a full public rulemaking process to consider additional requirements for reactors with Mark I and II containments to retain and/or filter radioactive material during an accident and enhance the capability to maintain containment integrity and cool core debris. Together these methods will shape a comprehensive approach for minimizing the chances of public exposure to radiation following a severe accident and provide added defense in depth.

<sup>12</sup> If refueling outages are needed to comply with the requirements of the final rule, implementation will likely occur within 4-5 years.

ITEM	Near-Term Task Force # <sup>1</sup>	PROCESS STEP (Completion Dates)			Licensee Actions
		NRC Actions			
		Identify, Gather Information & Assess	Deliberate & Decide	Regulatory Action	
<b>Remaining Tier 2 Activities</b>					
Reevaluate other external natural hazards against current requirements and guidance and update the design basis. Take appropriate regulatory action to resolve issues associated with updated site-specific hazards.	Congress Tier 2 <sup>13</sup>	To be initiated once sufficient progress made on seismic and flooding reevaluations and availability of resources (NTTF 2.1)	Within approximately 1 year of completing the information gathering and assessment	Within approximately 1 year of completing deliberation	Within 4-5 years of regulatory action
Require licensees to provide reliable spent fuel pool makeup capabilities.	NTTF 7.2-7.5 Tier 2	Complete	Complete	Complete	2013-2016 <sup>14</sup>

<sup>13</sup> The need to reevaluate other external hazards (beyond seismic and flood) identified in Consolidated Appropriations Act, 2012, (Public Law 112-074, dated December 23, 2011).

<sup>14</sup> Regulatory action on this Tier 2 activity was incorporated into the Mitigating Strategies Order, a Tier 1 activity. As such, licensees are required to complete implementation within two refueling outages, or by December 31, 2016, whichever comes first. Full implementation will occur at many sites in 2014 and 2015.

ITEM	Near-Term Task Force # <sup>1</sup>	PROCESS STEP (Completion Dates)			
		NRC Actions			Licensee Actions
		Identify, Gather Information & Assess	Deliberate & Decide	Regulatory Action	
Require a revision to the emergency plan to address multiunit dose assessments, periodic training and exercises for multiunit and prolonged station blackout scenarios, and drills on identification and acquisition of offsite resources, and ensuring sufficient emergency preparedness resources for multiunit and prolonged station blackout scenarios.	NTTF 9.3 partial Tier 2	Complete	Complete	Complete	2013-2016 <sup>15</sup>
<b>Items not within a Tier</b>					
Complete the Emergency Response Data System modernization initiative by June 2012 to ensure multiunit site monitoring capability.	NTTF 9.4	Complete	Complete	Complete	Complete
Develop improved regulatory framework to better address beyond-design-basis events.	NTTF 1	Underway	2014	Dependent on Commission deliberation	Dependent on Commission deliberation

<sup>15</sup> Regulatory action on portions of this Tier 2 activity related to training and exercises and sufficient EP resources were incorporated into the Mitigating Strategies Order, a Tier 1 activity. As such, licensees are required to complete implementation of those portions within two refueling outages, or by December 31, 2016, whichever comes first. Full implementation will occur at many sites in 2014 and 2015. In COMSECY-13-0010, the staff proposed to incorporate the multiunit dose assessment portion of this activity in the Tier 3 Emergency Preparedness rulemaking.