Overview of Fukushima-Related Recommendations and Related Activities

The Near Term Task Force (NTTF) Report, "Recommendations for Enhancing Reactor Safety in the 21st Century" (Agencywide Document Access and Management System Accession No. ML112510271), provided an integrated assessment of possible improvements to the U.S. Nuclear Regulatory Commission's (NRC's) requirements to address lessons learned from the accident at the Fukushima Dai-ichi nuclear power plant in March 2011. The report describes measures to improve safety using the NRC's defense-in-depth philosophy by ensuring protection from external events, improving plants' capabilities to mitigate accidents, and enhancing emergency preparedness.

The NRC staff and Commission assessed the various recommendations in the NTTF report, prioritized and developed plans for the recommendations, and assigned tasks to different organizations within the agency. However, interactions with various internal and external stakeholders, including international organizations, occasionally involve questions on the overall NRC response and how the various activities work together as part of the NRC's defense-in-depth approach to nuclear reactor safety.

This enclosure provides information not only on the status of NRC activities, but also the outcome sought from each activity. Table 1 provides information on the status of activities in terms of the various steps in the regulatory process (e.g., assessment, decisionmaking, regulatory action, implementation, inspection). The table organizes the activities by outcome instead of only by the numbering system used by the NTTF for its recommendations.

Table 1 - Status Summary of Japan Lessons Learned Activities

ITEM	NTTF, Tier, and Notes	PROCESS STEP (Completion Dates)			
		Identify, Gather Information, and Assess	Deliberate and Decide	Regulatory Action	Licensee Actions
Require Confirmation of Compliance with Current Requirements (Seismic and Flooding)					
Perform seismic- and flood-protection walkdowns to verify compliance with existing seismic and flooding design bases.	NTTF 2.3 Tier 1 (Note 1)	Complete	Complete	Complete	Complete
Require Plant Changes to Improve Accident Mitigation					
Provide a three-phase approach for mitigating beyond-design-basis external events.	NTTF 4.2 Tier 1	Complete	Complete	Complete	2016 (Ongoing)
Provide a reliable indication of water level in spent fuel storage pools.	NTTF 7.1 Tier 1	Complete	Complete	Complete	2016 (Ongoing)
Provide a reliable hardened containment vent system for boiling-water reactor (BWR) Mark I and II containments.	NTTF 5.1 Tier 1 (Note 2)	Complete	Complete	Complete	2018 (Phase 1) 2019 (Phase 2)
Revise containment venting systems for BWR Mark I and II containments to address severe accident conditions.	3/19/13 staff requirements memorandum (SRM) Tier 1 (Note 2)	Complete	Complete	Complete	

Require licensees to provide reliable spent fuel pool makeup capabilities.	NTTF 7.2 through 7.5 Tier 2 (Note 3)	Complete	Complete	Complete	Incorporated in mitigating strategies
Rulemaking to codify requirements for capability to maintain plant safety throughout a prolonged station blackout (SBO) through mitigating strategies implemented above.	NTTF 4.1 Tier 1 (Note 4)	Complete	Complete	2016 (Ongoing)	N/A; codifies mitigating-strategies order

ITEM	NTTF, Tier, and Notes	PROCESS STEP (Completion Dates)			
		Identify, Gather Information, and Assess	Deliberate and Decide	Regulatory Action	Licensee Actions
Require Plant Procedure Changes to Improve Accident Management					
Require integration of onsite emergency response processes, procedures, training, and exercises.	NTTF 8 Tier 1 (Note 5)	Complete	Complete	2016 (Ongoing)	To Be Determined (TBD)
Require Offsite Emergency-Preparedness Improvements					
Perform a staffing study for responding to multiunit events, evaluate enhancements that would be needed to power communications equipment throughout a prolonged SBO, and inform the NRC of the results.	NTTF 9.3 (partial) Tier 1 (Note 6)	Complete	Complete	Complete	Incorporated in mitigating strategies
Complete the Emergency Response Data System (ERDS) modernization initiative by June 2012 to ensure multiunit site monitoring capability.	NTTF 9.4 Tier 1 (Note 17)	Complete	Complete	Complete	Complete
Require a revision to the emergency plan to address multiunit dose assessments, periodic training and exercises for multiunit and prolonged SBO scenarios, and drills on identification and acquisition of offsite resources, as well as to ensure sufficient emergency preparedness (EP) resources for multiunit and prolonged SBO scenarios.	NTTF 9.3 (partial) Tier 2 (Note 7)	Complete	Complete	Complete	These items were either accomplished separately (e.g., multi-unit dose assessment) or incorporated in mitigating strategies

ITEM	NTTF, Tier, and Notes	PROCESS STEP (Completion Dates)			
		Identify, Gather Information, and Assess	Deliberate and Decide	Regulatory Action	Licensee Actions
Certain Tier 1, 2, and 3 EP activities (9.1, 9.2, 9.3 (with the exception of maintenance of ERDS capability throughout an accident), 9.4, 10.2, and 11.1) are being addressed through a consolidated rulemaking	SRM-COMSECY-14-0046	Complete	Complete	2016 (Ongoing)	TBD as part of rule implementation

Studies and Assessments					
ITEM	**NTTF, Tier, and Notes**	**PROCESS STEP (Completion Dates)**			
		Identify, Gather Information, and Assess	**Deliberate and Decide**	**Regulatory Action**	**Licensee Actions**
Studies and Assessments: External Hazards					
Reevaluate seismic and 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 (Note 8)	2014–2015 (Central and Eastern U.S. Sites have submitted the hazard reevaluation)	TBD	TBD	TBD
Reevaluate other natural external hazards against current requirements and guidance and update the design basis. Take appropriate regulatory action to resolve issues associated with updated site-specific hazards.	Tier 2 (Note 9)	To be coordinated with seismic and flooding reevaluations (NTTF 2.1)	TBD	TBD	TBD
Periodic confirmation of seismic and flooding hazards.	NTTF 2.2 Tier 3 (Note 10)	To be coordinated with seismic and flooding reevaluations (NTTF 2.1)	TBD	TBD	TBD
Potential enhancements to the capability to prevent or mitigate seismically-induced fires and floods.	NTTF 3 (partial) Tier 3 (Note 11)	Awaiting development of analysis tool	TBD	TBD	TBD

ITEM	NTTF, Tier, and Notes	PROCESS STEP (Completion Dates)			
		Identify, Gather Information, and Assess	Deliberate and Decide	Regulatory Action	Licensee Actions
Studies and Assessments: Severe-Accident Containment Performance					
Assess filtration and additional severe-accident performance requirements for BWR Mark I and Mark II containments.	3/19/13 SRM Tier 3 (Note 12)	2014	2017	TBD	TBD
Reliable hardened vents for other containment designs.	NTTF 5.3 Tier 3	To be coordinated with BWR Mark I/II activities (above)	TBD	TBD	TBD
Hydrogen control and mitigation inside containment or in other buildings.	NTTF 6 Tier 3	To be coordinated with BWR Mark I/II activities (above)	TBD	TBD	TBD
Reactor and containment instrumentation capable of withstanding beyond-design-basis conditions.	Advisory Committee on Reactor Safeguards item Tier 3	TBD	TBD	TBD	TBD
Studies and Assessments: Offsite Emergency Preparedness					
EP enhancements for prolonged SBO and multiunit events.	NTTF 9–11 Tier 3 (Note 13,18)	TBD	TBD	TBD	TBD
ERDS capability.	NTTF 9–11 Tier 3 (Note 13, 18)	TBD	TBD	TBD	TBD
Additional EP topics for prolonged SBO and multiunit events.	NTTF 9–11 Tier 3 (Note 13,18)	TBD	TBD	TBD	TBD

ITEM	NTTF, Tier, and Notes	PROCESS STEP (Completion Dates)			
		Identify, Gather Information, and Assess	Deliberate and Decide	Regulatory Action	Licensee Actions
EP topics for decisionmaking, radiation monitoring, and public education.	NTTF 9–11 (Note 13,18)	TBD	TBD	TBD	TBD
Basis of emergency planning zone size.	Staff item Tier 3 (Note 14)	Awaiting Level 3 Probabilistic Risk Assessment (PRA)	TBD	TBD	TBD
Pre-staging of potassium iodide beyond 10 miles.	Staff item Tier 3 Note 14	Awaiting international studies	TBD	TBD	TBD
Studies and Assessments: Spent Fuel Management					
Expedited transfer of spent fuel to dry cask storage.	Staff item Tier 3 (Note 15)	Complete COMSECY-13-0030	Complete SRM 5/2014	Not Applicable	
NRC Improvements					
Reactor Oversight Process modifications to reflect the recommended defense-in-depth framework.	NTTF 12.1 Tier 3	Note 16	TBD	TBD	TBD
Staff training on severe accidents and resident inspector training on severe-accident management guidelines.	NTTF 12.2 Tier 3	Complete	TBD (Note 19)	TBD	TBD
Other					
Related to NTTF 2.1, 2.3, 4.1, and 4.2. Include ultimate heat sink (UHS) systems in hazard reevaluations and walkdowns, include loss of UHS as a design assumption in conjunction with strategies for dealing with prolonged SBO, and	Note	Complete	Complete	Complete	Complete

ITEM	NTTF, Tier, and Notes	PROCESS STEP (Completion Dates)			
		Identify, Gather Information, and Assess	Deliberate and Decide	Regulatory Action	Licensee Actions
address loss of access to normal UHS in conjunction with measures taken to deal with beyond-design-basis external hazards.					
Develop improved regulatory framework to better address beyond-design-basis events.	NTTF 1 Tier 3 (Note 16)	Complete SECY-13-0132	Complete SRM 5/2014 (refer to Risk Management Regulatory Framework (RMRF))	Not Applicable	

NOTES FOR TABLE 1

Note 1 Licensees have completed the walkdowns and submitted the required reports. Discrepancies found during the walkdowns were entered in licensee corrective action programs to be addressed commensurate with the safety significance of the finding. The NRC staff is performing inspections and follow-up activities as part of the normal reactor oversight process.

Note 2 The NRC staff issued Order EA-13-109, "Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions," to supersede the original order (EA-12-050, "Issuance of Order to Modify Licenses with Regard to Reliable Hardened Containment Vents"), as directed by the Commission following SECY-12-0157 (i.e., to make the venting systems capable of operation during severe accident conditions).

Note 3 As discussed in COMSECY-13-0002 and the related SRM, these items are addressed by and are being incorporated into the mitigating-strategies activities (NTTF 4.2).

Note 4 As discussed in COMSECY-13-0002 and the related SRM, the primary vehicle to impose regulatory requirements and achieve the desired changes to plants is the mitigating-strategies order (EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events"). This rulemaking will incorporate the requirements in NRC regulations and will benefit from lessons learned during the implementation of the order. Some licensees may need to review and possibly modify structures, systems, and components or strategies as part

of implementing the rule if reevaluations of external hazards under Recommendation 2.1 result in changes to the functional requirements from those used to develop and implement plans for Order EA-12-049.

Note 5 The NRC staff has consolidated the Station Blackout Mitigation Strategies rulemaking with the Onsite Emergency-Response Capabilities rulemaking, as well as the portions of NTTF Recommendations 9, 10, and 11 that are already being addressed as part of the Mitigating Strategies Order (NRC Order EA-12-049) implementation (NTTF Recommendation 4.2), NTTF Recommendation 8, and items already being implemented by industry, in accordance with SRM-COMSECY-14-0046. The combined rulemaking will now be referred to as the Mitigation of Beyond-Design-Basis Events rulemaking.

Note 6 The communications assessments and Phase I staffing assessments are complete. Phase II staffing assessments are still currently underway. The final licensee response is to be coordinated with completion of mitigating strategies activities (in 2016).

Note 7 Multi-unit/source dose assessment capability plans were previously submitted to the NRC staff for review. All licensees intend to have this capability by the end of 2014. This capability, including associated training and procedures, will be confirmed through inspection. This item is also included in the combined rulemaking approved by SRM-COMSECY-14-0046.

Note 8 The reevaluations of seismic and flooding hazards required by the NRC requests for information to all U.S. plants are being completed in various steps and phases that depend on the locations and initial assessments of the external hazards. In some cases, the reevaluations might lead to additional analyses such as PRA. Plant-specific schedules are being developed for the reevaluation activities. The need for regulatory actions might likewise be decided on a plant-specific basis.

Note 9 The need to reevaluate other external hazards (beyond seismic and flood) was also identified in the Consolidated Appropriations Act, 2012 (Public Law 112-074, dated December 23, 2011).

Note 10 The need to consider periodic assessments of external hazards is also identified in the Consolidated Appropriations Act, 2012. This activity is awaiting insights from the reevaluations of the seismic and flooding hazards (NTTF 2.1).

Note 11 Although further study of seismically-induced fires and floods has been deferred because of resource limitations, the NRC staff is developing the necessary tools to help in these assessments. The development of the analytical tools was identified as a Tier 1 item.

Note 12 In accordance with the SRM for SECY-12-0157, the NRC staff is preparing a Commission paper to provide a technical analysis of possible approaches to reducing releases from Mark I and Mark II containments following core-damage events and might subsequently provide a proposed rule and a final rule within 4 years of the memorandum (by 2017).

Note 13 This item and the following items in the table relate to possible enhancements to the regulatory requirements for offsite EP. An advance notice of proposed rulemaking is planned for 2016. The items to be addressed by the advance notice of proposed rulemaking are discussed in enclosure 3, “Activities Related to Emergency Preparedness”.

Note 14 The evaluation of possible changes to the emergency planning zones around nuclear power plants is awaiting additional information expected from a level 3 PRA currently being developed for the Vogtle Nuclear Power Plant. This evaluation, as well as the following one on potassium iodide, will also benefit from the continuing collection of information and insights from the Fukushima accident as well as information from international organizations. See Enclosure 3 for details.

Note 15 In SRM-COMSECY-13-0030, the Commission approved the staff’s recommendation that this issue be closed.

Note 16 In SRM-SECY-13-0132, the Commission provided the following guidance regarding NTTF Recommendation 1: “The objectives of Improvement Activities 1 and 2 should be reevaluated, as appropriate, in the context of the Commission direction on a long-term RMRF, more specifically, the proposed policy statement. Work on the RMRF and other interrelated activities should be treated outside the scope of the NRC’s post-Fukushima actions. With these decisions, the Near-Term Task Force Report Recommendation 1 is closed.”

Note 17 While industry action is already complete, NTTF 9.4 is to be included as part of the consolidated rulemaking activity (SRM-COMSECY-14-0046).

Note 18 Several of the Tier 3 EP activities (9.1, 9.2, 9.3 (with the exception of maintenance of ERDS capability throughout an accident), 9.4, 10.2, and 11.1) are being addressed through a consolidated rulemaking approved in SRM-SECY-14-0046.

Note 19 Some severe accident training is underway, but the majority of the work on this recommendation is to be determined. See Enclosure 3.