Update on Activities Not Within a Tier

Near-Term Task Force (NTTF) Recommendation 1 – Regulatory Framework

This lessons-learned activity originated from NTTF Recommendation 1, to establish "a logical, systematic, and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations." In Staff Requirements Memorandum (SRM)-SECY–11–0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," dated August 19, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML112310021), the Commission directed that NTTF Recommendation 1 be pursued independently of activities associated with the review of the other NTTF recommendations.

On December 6, 2013, the U.S. Nuclear Regulatory Commission (NRC) staff sent to the Commission SECY-13-0132, "U.S. Nuclear Regulatory Commission Staff Recommendation for the Disposition of Recommendation 1 of the Near-Term Task Force Report" (ADAMS Accession No. ML13277A413). The SECY paper requested the Commission's approval of the staff's recommendation to move forward on three potential regulatory improvement activities to disposition NTTF Recommendation 1. These potential improvement activities were developed after evaluation of the considerations underlying the NTTF's recommendation and consideration of the Risk Management Task Force's recommendations for power reactors, and included:

(1) Establishing a new design-basis extension category of events and requirements and associated internal NRC guidance, policies, and procedures;

(2) Establishing Commission expectations for defense in depth through the development of a policy statement;

(3) Clarifying the role of voluntary industry initiatives in the NRC regulatory process.

The NRC staff's effort was informed by extensive interaction with external stakeholders, including the Advisory Committee on Reactor Safeguards. Additionally, the staff briefed the Commission in a public meeting on January 10, 2014.

Other NRC-Regulated Facilities

This lessons-learned activity originated from the SRM to the Chairman's tasking memorandum COMGBJ–11–0002, "NRC Actions Following the Events in Japan," dated March 23, 2011 (ADAMS Accession No. ML110820875). The Commission directed the NRC staff to consider the applicability of lessons-learned from the event to "non-operating reactor and non-reactor facilities."

The NRC staff has developed a process to evaluate the potential applicability of lessons-learned activities to nonpower reactor facilities. The NRC offices responsible for classes of licensees other than power reactors have created working groups to perform the evaluations. The offices include the Office of Nuclear Reactor Regulation (NRR), the Office of Nuclear Material Safety and Safeguards (NMSS), and the Office of Federal and State Materials and Environmental Management Programs (FSME), while the associated licensees include:

NRR: Research reactors, test reactors, medical isotope production facilities;

NMSS: Fuel cycle facilities, spent fuel storage, transportation;

FSME: Materials decommissioning facilities, decommissioning reactors, uranium recovery and uranium milling facilities, low-level waste, waste treatment, irradiators, medical facilities, academic and industrial use licensees.

As described in the last update, the NRC staff has completed inspections at fuel cycle facilities in accordance with Temporary Instruction 2600/015, "Evaluation of Licensee Strategies for the Prevention and/or Mitigation of Emergencies at Fuel Facilities" (ADAMS Accession No. ML111030453). The process developed to evaluate all types of nonpower reactor licensees against the full scope of Fukushima lessons-learned will still be performed for fuel cycle facilities.

The evaluations of each type of facility or licensee are currently underway. The NRC staff will document the results of each evaluation and expects to present the results to the Commission, along with a proposed path forward to address any identified issues, in a paper scheduled for the fourth quarter of fiscal year (FY) 2014.

National Academy of Sciences Study on Fukushima

The National Academy of Sciences (NAS) is continuing their work on the NRC-funded study entitled, "Lessons Learned from the Fukushima Nuclear Accident for Improving Safety and Security of U.S. Nuclear Plants." Since the last 6-month update, a NAS study committee (Committee) has held several information-gathering meetings and visited two nuclear power plants (Oyster Creek and Hatch). The NRC staff recently provided briefing materials to the Committee regarding the NRC's oversight of spent fuel safety and security. Because of unforeseen delays, the Committee has separated the spent fuel safety and security portion of the report. The Committee has completed gathering the needed information on Fukushima lessons-learned and is in the process of drafting the report. The staff understands that NAS is currently scheduled to issue the report in the third quarter of FY 2014.

Comparison Study of U.S. and Japanese Regulations

In SRM-SECY-12-0110, "Consideration of Economic Consequences within the U.S. Nuclear Regulatory Framework," dated March 20, 2013 (ADAMS Accession No. ML13079A055), the Commission directed the NRC staff to: (1) document its comparison of U.S. and Japanese regulatory requirements that were in effect at the time of the accident, focused on those areas most relevant to the sequence of events and accident mitigation capabilities at Fukushima; and (2) describe how those differences were factored into post-Fukushima actions taken by the NRC. The staff had assessed specific areas, such as the regulatory approaches to defining

requirements for plant responses to losses of electrical power, as part of its activities before the Commission's SRM. However, in response to the SRM and similar interest expressed by various external stakeholders, the staff (with contractor support) performed a broader comparison of regulatory requirements that were in effect in the U.S. and Japan at the time of the Fukushima accident. The comparison study was completed in November 2013 and has been made available to the public (ADAMS Accession No. ML13326A991).

Support of International Activities

The NRC staff continues to be actively engaged in various international activities related to the evaluation and response to lessons-learned from the Fukushima accident. The staff is participating in several working groups within the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency (NEA) on efforts to better understand the accident and develop appropriate changes in nuclear power plants to improve their ability to cope with severe natural events. One of those working groups is preparing the "IAEA Fukushima Report," which is expected to be finalized by the end of 2014. Activities related to addressing lessons learned from the Fukushima accident were a significant focus area in the Convention on Nuclear Safety scheduled for March–April 2014.

In February 2014, the IAEA conducted its follow-up Integrated Regulatory Review Service (IRRS) mission at the NRC. That follow-up mission found that "…the NRC has acted promptly and effectively after the Tokyo Electric Power Company Fukushima Dai-ichi accident in the interests of the public health and safety in both the U.S. and Japan." The results of the Near-Term Task Force represent a sound and ample basis for taking into account the lessons-learned from the accident. The IRRS Team considered that the actions related to inspection taken by the regulatory body were exemplary and that the necessary further actions have been initiated. The full preliminary report of the IRRS follow-up mission can be found at http://www.nrc.gov/reactors/operating/ops-experience/preliminary-report.pdf.

The NRC staff is also participating in the Organization for Economic Co-operation and Development (OECD) NEA Benchmark Study of the Accident at the Fukushima Daiichi (BSAF) nuclear power station project. The BSAF project used plant data ("as built"), operational data (from operational record), measured data, and boundary conditions (best guess) to analyze what happened at Fukushima, Units 1 through 3, for approximately the first 6 days after the earthquake on March 11, 2011. This benchmarking exercise provided a better understanding of the severe accident phenomena that took place at Fukushima, and provided guidance to an international effort on post-accident recovery that aims to validate boiling water reactor accident analysis.

Additionally, the NRC staff is participating on the OECD Working Group on Analysis and Management of Accidents (WGAMA). In the past year, WGAMA has initiated three coordinated action projects with the objective of developing status reports on filtered containment venting systems (FCVS), hydrogen risk management, and spent fuel pool cooling in OECD member countries. Each of these efforts will help inform the NRC's related lessons-learned activities.

The status report on FCVS compiles information on containment venting strategies already implemented or currently planned in OECD countries, including a discussion of regulatory requirements in various countries as well as design, operation, and performance of different

FCVS. The report also discusses benefits and possible drawbacks of FCVS and identifies, from an accident management perspective, areas of hardware and operational improvements. The draft report is currently being reviewed by WGAMA.

The status report on hydrogen reviews the approaches for hydrogen management under severe accident conditions within the OECD member countries, including safety requirements, mitigation systems and their implementation status, analysis codes and their validation status, and severe accident management strategies. This will allow identifying advantages and drawbacks of the various approaches. The draft report is currently being reviewed by WGAMA.

The status report on spent fuel pools (SFPs) is intended to summarize the current understanding of the behavior of SFPs under loss of cooling accident conditions. All aspects of a loss of cooling accident are addressed (i.e., accident progression, criticality, hydrogen combustion and fission product release), and the report identifies areas where model improvements in tools are needed including a discussion on the uncertainties during a severe accident. The draft report is currently being reviewed by WGAMA.

WGAMA has also initiated a new coordinated action project to compile information on the use of analytical tools to provide a basis for informing severe accident management actions. This activity will describe existing practices, aiming to assure the correctness, usability, and efficiency of severe accident management through the use of desk-top exercises, drills, simulators, field training, and analytical simulations. The product will be a status report on the best and recommended practices on the use of analytical tools to inform severe accident management actions.

Finally, WGAMA, in cooperation with other NEA activities, is performing a benchmark of fast-running software tools used to estimate fission product releases during accidents in nuclear power plants. The benchmarking is intended to identify strengths and weaknesses of the tools used for source term prediction and identify the knowledge gaps, as well as to propose improvements in modelling capabilities. The product will be a report summarizing and comparing the software examined, scenarios used for benchmarking, results of benchmark exercises, and identifying areas of improvement in modelling and software capabilities.

Communications Activities

The NRC staff held over 25 public meetings from September 2013 to February 2014 related to Japan lessons-learned activities. Most of these meetings enabled wider public participation through webinars, webcasting and teleconferencing. Many of these meetings centered on guidance development or implementation issues related to Tier 1 actions. Additionally, the NRC Steering Committee has continued to meet publicly with the industry's steering committee approximately once a month to discuss and resolve issues related to lessons-learned activities. The staff expects these meetings and interactions to continue during and after transition of oversight to the line organizations.

In the last 6 months, the Japan Lessons-Learned Project Directorate's (JLD's) strategic communications team has evaluated and implemented tools for enhancing stakeholder understanding of Japan lessons-learned activities. The team's most significant effort was posting on the public website a plain language document explaining the current water situation

at Fukushima Dai-ichi. Additionally, the JLD has used the NRC's public blog to highlight Japan lessons-learned activities. The communications team will continue examining communication needs and developing relevant tools, with a focus on upcoming events and milestones.