

# POLICY ISSUE NOTATION VOTE

February 17, 2012

SECY-12-0025

FOR: The Commissioners

FROM: R. W. Borchardt  
Executive Director for Operations

SUBJECT: PROPOSED ORDERS AND REQUESTS FOR INFORMATION IN RESPONSE  
TO LESSONS LEARNED FROM JAPAN'S MARCH 11, 2011, GREAT TOHOKU  
EARTHQUAKE AND TSUNAMI

PURPOSE:

The purpose of this paper is to provide, for Commission consideration, the U.S. Nuclear Regulatory Commission (NRC) staff's proposed orders in response to lessons learned from Japan's March 11, 2011, Great Tōhoku Earthquake and subsequent tsunami. In addition, in accordance with the Staff Requirements Memorandum (SRM) for SECY-11-0137, "Prioritization of Recommended Actions to be Taken in Response to Fukushima Lessons Learned," this paper provides for Commission awareness the requests for information that the staff plans to send to reactor licensees, Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 construction permit holders, and combined license (COL) holders as of March 9, 2012. As requested in the October 19, 2011, SRM for SECY-11-0117, "Proposed Charter for the Longer-Term Review of Lessons Learned from the March 11, 2011, Japanese Earthquake and Tsunami," this paper also informs the Commission of the ongoing work conducted under the Charter.

SUMMARY:

The staff proposes to issue three orders. The staff also intends to issue a request for information. These regulatory actions have been informed by stakeholder input from numerous public meetings, recommendations from the Advisory Committee on Reactor Safeguards (ACRS), and the December 2011 Consolidated Appropriations Act, 2012 (Public Law (PL) 112-

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74). The staff has also completed its review of the six additional staff recommendations included in SECY-11-0137 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11272A111), which were beyond those identified in the Near-Term Task Force (NTTF) report (SECY-11-0093, "Near-Term Report and Recommendations for Agency Actions Following the Events in Japan," dated July 12, 2011, ADAMS Accession No. ML11186A950), and that the staff determined had a clear nexus to the Fukushima Dai-ichi event. The staff has developed a process to disposition all subsequent additional issues related to Fukushima Dai-ichi and has applied this process to review the recommendations from the ACRS. The staff has also provided a 6-month status report, which includes the staff's plans to initiate development of a probabilistic risk assessment (PRA) methodology that addresses seismically-induced fires and floods.

#### BACKGROUND:

In SECY-11-0137, the staff provided its proposed prioritization of the NTTF recommendations in SECY-11-0093 to the Commission. In a December 15, 2011, SRM (ADAMS Accession No. ML113490055), the Commission approved the staff's recommended prioritization, subject to direction provided in SRM-SECY-11-0124, "Staff Requirements-SECY-11-0124 Recommended Actions to be Taken without Delay from the Near-Term Task Force Report," dated October 18, 2011 (ADAMS Accession No. ML112911571).

In SRM-SECY-11-0117, dated October 19, 2011, the Commission also approved the staff's proposed "Charter for the Nuclear Regulatory Commission Steering Committee to Conduct a Longer-term Review of the Events in Japan" (ADAMS Accession No. ML112920034). Among other things, the Charter requires the staff to highlight potential policy issues for the Commission, provide the Commission every 6 months an update on the review work conducted under the Charter, and provide recommendations regarding the sunset of the Steering Committee, the Advisory Committee, and the Japan Lessons Learned Project Directorate.

The staff requirements in SRM-SECY-11-0137, addressed in this paper are the following:

1. Consult with the Commission via notation vote papers before issuing any orders that would lead to a change in the design basis of licensed plants.
2. Inform the Commission 5 business days before issuing letters under 10 CFR Section 50.54(f) associated with the regulatory activities outlined in SECY-11-0137.
3. Inform the Commission of the results of its review of six additional staff recommendations, that went beyond those prepared by the NTTF but which the staff determined had a clear nexus to the Fukushima Dai-ichi event and may warrant additional action. This includes the results of the staff's consideration of filtration of containment vents in the context of the existing Tier 1 issues on hardened reliable vents for boiling-water reactor (BWR) Mark I and Mark II containments.
4. Inform the Commission of how the staff addressed ACRS recommendations, dated November 8, 2011 (ADAMS Accession No. ML11311A264).
5. Initiate a PRA methodology to evaluate potential enhancements to the capability to prevent or mitigate seismically induced fires and floods as part of Tier 1 activities described in SECY-11-0137.

DISCUSSION:

In accordance with the staff's plan for regulatory activities identified as Tier 1 in SECY-11-0137, the staff proposes to issue three orders. The staff also intends to issue a request for information. The staff's approach to implementation of the Tier 1 issues has been enhanced by legislation, ACRS recommendations, stakeholder input, and the review of the additional issues in SECY-11-0137.

Consolidated Appropriations Act, 2012

Section 402 of the December 2011 Consolidated Appropriations Act, 2012 (PL 112-74) provides that:

The Nuclear Regulatory Commission shall require reactor licensees to re-evaluate the seismic, tsunami, flooding, and other external hazards at their sites against current applicable Commission requirements and guidance for such licensees as expeditiously as possible, and thereafter when appropriate, as determined by the Commission, and require each licensee to respond to the Commission that the design basis for each reactor meets the requirements of its license, current applicable Commission requirements and guidance for such license. Based upon the evaluations conducted pursuant to this section and other information it deems relevant, the Commission shall require licensees to update the design basis for each reactor, if necessary.

The Conference Report for PL 112-74 states:

The conferees recognize the progress that the Nuclear Regulatory Commission has made on the recommendations of the Near Term Task Force. Commission staff has proposed a prioritized list of the Task Force recommendations that reflects the order regulatory actions are to be taken. The conferees direct the Commission to implement these recommendations consistent with, or more expeditiously than, the "schedules and milestones" proposed by NRC staff on October 3, 2011. The conferees direct the Commission to maintain an implementation schedule such that the remaining recommendations (not identified as Tier 1 priorities) will be evaluated and acted upon as expeditiously as practicable. The conferees request that the Commission provide a written status report to the House and Senate Committees on Appropriations on its implementation of the Task Force recommendations on the one year anniversary of the Fukushima disaster.

In response to the legislation and input it received from stakeholders, the staff has accelerated the schedule originally proposed in SECY-11-0137, with a goal of issuing the Tier 1 orders and a request for information letter before the first anniversary of Japan's March 11, 2011, Great Tōhoku Earthquake and subsequent tsunami. The staff will provide under separate cover the written status report requested by the conferees.

The staff has also assessed the regulatory activities that will be required to address the "other external hazards" that are referred to in Section 402 of PL 112-74. As stated in the request for information (Enclosure 7), the staff has undertaken a Tier 1 activity to ask licensees to reevaluate seismic, tsunami, and flooding hazards, including the potential for local intense

precipitation and site drainage, flooding in streams and rivers, dam breaches and failures, storm surge and seiche, channel migration and diversion and combined effects. Albeit very low, the staff expects that these hazards dominate the risks to the operating fleet of plants from "other external hazards." As stated in Enclosure 3 and consistent with the prioritization methodology described in SECY-11-0137, the staff proposes to address "other external hazards," such as wind and missile loads from tornadoes and hurricanes and snow and ice loads for roof design, as a Tier 2 activity that will be initiated as soon as sufficient resources become available.

### Stakeholder Participation

To better inform the Tier 1 regulatory actions, the staff conducted over a dozen public meetings with stakeholders to better understand the industry's current plans and actions, and to obtain stakeholder feedback on the staff's proposed regulatory actions. Summaries of meetings related to the staff's near-term actions are available in ADAMS. A list of meeting summaries is provided as Enclosure 1.

The staff also established an e-mail box for members of the public to send input regarding NRC's resolutions of the Tier 1 recommendations. Comments received as of January 27, 2012, may be found in ADAMS under Accession No. ML12037A220. Comments received on and after January 28, 2012, may be found in ADAMS under Accession No. ML12037A221. The staff has reviewed these comments and considered them in developing the enclosed orders and request for information.

During public meetings in December 2011 and January 2012, and by letter dated December 16, 2011 (ADAMS Accession No. ML11353A008), the industry presented its plans to respond to Fukushima-like events. Industry has developed a concept of a diverse and flexible mitigation capability called "FLEX." The major principles of FLEX include: (1) adding additional layers of safety to mitigate beyond design bases events, (2) a focus on maintaining key safety functions, (3) multiple supplies of power and cooling water, (4) portable equipment that is reasonably protected, (5) symptom-based guidance and instructions, (6) programmatic controls, and (7) regional support centers. With regard to the details of FLEX, the staff is generally encouraged by the actions being taken by industry in this area. The staff envisions that many elements of FLEX may satisfy the requirements of the order to mitigate challenges to key safety functions resulting from beyond-design-basis natural phenomena hazards (Enclosure 4). The staff will consider additional information about FLEX as it becomes available, in the context of developing implementation guidance for the order requiring development of strategies to deal with beyond-design-basis external events (Enclosure 4). The staff's regulatory conclusions on the acceptability of FLEX will be based on licensee responses to this order.

### Results of Staff Review of Additional Issues Identified in SECY-11-0137

In SECY-11-0137, the staff identified six additional issues that may warrant regulatory action but that were not included with the NTTF recommendations. The staff previously judged these issues to warrant further consideration and potential prioritization based on relative safety significance, nexus to NTTF recommendations, and other ongoing staff activities. As directed by SRM-SECY-11-0137, the staff conducted an assessment of whether the issues should be included with the Japan lessons-learned activities and determined if any regulatory action is recommended or necessary. The staff applied the same prioritization process described in SECY-11-0137. The result of the staff's assessment is provided in Enclosure 2.

The staff has determined that some of the additional issues should be included in existing Tier 1 activities. In accordance with the direction in SRM-SECY-11-0137, the additional issue of filtration of containment vents was merged with the Tier 1 issue of hardened vents for Mark I and Mark II containments such that further analysis and interaction with stakeholders will inform whether filtered vents should be required. The staff has determined that consideration of severe accident conditions in the design and operation of the vent, the addition of filters to hardened reliable vents, and consideration of vents in areas other than primary containment, will be the topic of a policy paper to the Commission in July 2012.

The staff believes that the requirements for hardened reliable vents in the proposed order (Enclosure 5) are important to ensure core and containment cooling, and that these requirements should be imposed before the staff completes its evaluation of the technical and policy issues associated with imposing additional requirements, as described above. In public meetings, the staff has encouraged licensees to consider the potential for the later addition of filters. However, the industry has stated that the addition of filters to hardened containment vents may require modifications to the vent design. In light of this, a consideration in the staff's proposal to issue the proposed order now is that the proposed order requires submission of integrated plans for implementing the requirements of the order by February 28, 2013, eight months after the staff plans to send the July 2012 policy paper to the Commission for consideration. As a result, licensees should have time to revise draft plans in response to any new Commission direction before the integrated implementation plans are due.

The staff also assessed the issue of loss of the ultimate heat sink function to be of sufficient safety significance as to warrant inclusion with the ongoing Tier 1 regulatory actions to mitigate or prevent challenges to key safety functions resulting from seismic and flooding hazards. Additionally, a potential loss of ultimate heat sink function due to other natural external hazards will be considered as part of a new Recommendation 2.1 Tier 2 item, which will address reevaluation of other natural external hazards for each facility.

The additional issue of instrumentation for seismic monitoring has been transferred from the Japan lessons-learned process and will be further considered under the ongoing action plan for the August 2011 Central Virginia earthquake.

The remaining three additional issues (emergency planning zone size, prestaging potassium iodide beyond 10 miles, and transferring spent fuel to dry cask storage) have been prioritized as Tier 3 items. The staff has determined that the current regulatory approaches to these issues are acceptable. The staff will review new information that becomes available as a result of specific ongoing activities to confirm this conclusion and gain additional insights. The staff will further address these Tier 3 recommendations in its paper scheduled to be sent to the Commission in July 2012.

#### Results of Staff Review of ACRS Recommendations and Other Additional Issues

The staff developed a process to disposition all additional issues. A description of the staff's process and the results of its evaluation of the ACRS recommendations are provided in Enclosure 3. The staff's evaluation of other additional stakeholder recommendations is an ongoing process. The staff plans to make available the results of its evaluation of these issues on the NRC's public Web site. By letter dated February 15, 2012 (ML12046A145), the ACRS provided additional recommendations, which the staff will address through its additional issues process.

### Proposed Orders

Consistent with its recommendations in SECY-11-0137, the staff proposes to issue three orders. Two orders are proposed to be issued to all reactor licensees, including holders of active or deferred construction permits<sup>1</sup> under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," and holders of combined licenses (COLs)<sup>2</sup> under 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," regarding: (1) development of strategies to mitigate beyond design basis natural phenomena which addresses both multi-unit events and reasonable protection of equipment identified under such strategies, and (2) installation of enhanced spent fuel pool instrumentation. The third order pertaining to reliable containment vents is proposed to be issued to licensees operating BWRs with Mark I and Mark II containments. Each of the orders is focused on enhancing defense in depth at nuclear power plants through increased capabilities to minimize the potential for core damage following a beyond design basis external event. In order to effectuate timely implementation, each order has been made immediately effective. In addition, pursuant to 10 CFR 2.202, the NRC finds that the public health, safety and interest require that these Orders be made immediately effective.

The licensing approach for operating power reactors in all three orders is similar. The staff plans to prepare guidance for implementing the technical requirements of the orders by August 2012. Licensees will then be required, by February 28, 2013, to submit to the Commission for review an overall integrated plan including a description of how compliance with the requirements of the order will be achieved. After reviewing the licensee's submittals, the staff plans to issue facility-specific orders imposing license conditions that address the requirements of the orders. Licensees are required to provide an initial status report within 60 days of the issuance of the staff's guidance, and additional reports every 6 months following the submittal of the overall integrated plans. The purpose of the status reports is to ensure that staff can monitor licensees' incremental progress and take appropriate regulatory action, if needed. Each licensee will be required to achieve full compliance within two refueling outages after submittal of its overall integrated plan, or by December 31, 2016, whichever comes first.

### *Adequate Protection*

As stated in the enclosed orders, to protect public health and safety from the inadvertent release of radioactive materials, the NRC's defense-in-depth strategy includes multiple layers of protection: (1) prevention of accidents by virtue of the design, construction and operation of the plant, (2) multiple mitigation features to prevent radioactive releases should an accident occur, and (3) emergency preparedness programs that include measures such as sheltering and evacuation. The defense-in-depth strategy also provides for multiple physical barriers to contain the radioactive materials in the event of an accident. The barriers are the fuel cladding, the reactor coolant pressure boundary, and the containment. These defense-in-depth features are embodied in the existing regulatory requirements and thereby provide adequate protection of

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<sup>1</sup> Bellefonte Nuclear Plant, Units 1 and 2 (Construction Permit Numbers CPPR-122 and CPPR-123); and Watts Bar Unit 2 (CPPR-92).

<sup>2</sup> Vogtle Electric Generating Plant Units 3 and 4 (NPF-91 and NPF-92)

the public health and safety. However, the events at Fukushima highlighted the possibility that extreme natural phenomena could challenge the prevention, mitigation, and emergency preparedness defense-in-depth layers.

Accordingly, in the enclosed orders, the staff is proposing to redefine the level of protection regarded as adequate pursuant to 10 CFR 50.109(a)(4)(iii) and require actions of licensees to meet that new level of protection. A summary of the staff's justification for redefining the level of protection regarded as adequate for each of the orders is provided below.

An order requiring development of strategies to deal with beyond-design-basis external events resulting in simultaneous loss of all ac power and loss of normal access to the ultimate heat sink is provided as Enclosure 4. The events at Fukushima highlighted the possibility that extreme natural phenomena could challenge the prevention, mitigation, and emergency preparedness defense-in-depth layers. The strategies and guidance developed and implemented by licensees in response to the requirements imposed by this order will provide the necessary capabilities to supplement those of the permanently installed plant structures, systems, and components that could be unavailable following beyond-design-basis external events. These strategies and guidance will enhance the safety and preparedness capabilities established following the events of September 11, 2001, and codified as 10 CFR 50.54(hh)(2). In order to address the potential for more widespread effects of beyond-design-basis external events, this order requires licensees to have increased capabilities to implement multiple strategies concurrently at multiple units on a site. The strategies shall be developed to add multiple ways to maintain or restore core cooling, containment and SFP cooling capabilities in order to improve the defense in depth of licensed nuclear power reactors.

With regard to the order requiring reliable, hardened vents in BWR Mark I and Mark II containments (Enclosure 5), the events at Fukushima Dai-ichi highlight the possibility that beyond-design-basis external events could challenge the prevention, mitigation and emergency preparedness defense-in-depth layers. At Fukushima, limitations in time and unpredictable conditions associated with the accident significantly challenged the attempts by the responders to preclude core damage and containment failure. In particular, the operators were unable to successfully operate the containment venting system. The inability to reduce containment pressure inhibited efforts to cool the reactor core. Had additional backup or alternate sources of power been available to operate the containment venting system remotely, or had certain valves been more accessible for manual operation, the operators at Fukushima might have been able to depressurize the containment earlier. This, in turn, could have allowed operators to implement strategies using low pressure water sources. Thus, the events at Fukushima demonstrate that reliable hardened vents at BWR facilities with Mark I and Mark II containment designs are important to maintain core and containment cooling.

Finally, Enclosure 6 to this paper contains an order requiring enhanced spent fuel pool (SFP) instrumentation. During the events in Fukushima, responders were without reliable instrumentation to determine the water level in the SFP. This caused concerns that the pool may have boiled dry, resulting in fuel damage. Fukushima demonstrated the confusion and misapplication of resources that can result from beyond-design-basis external events when adequate SFP instrumentation is not available. The SFP level instrumentation at U.S. nuclear power plants is typically narrow range and, therefore, only capable of monitoring normal and slightly off-normal conditions. Although the likelihood of a catastrophic event affecting nuclear power plants and the associated SFPs in the United States remains very low, beyond-design-basis external events could challenge the ability of existing spent fuel pool instrumentation in providing emergency responders with reliable information on the condition of SFPs. Reliable

and available indication is essential to ensure plant personnel can effectively prioritize emergency actions.

The staff continues to affirm that current regulatory requirements and existing plant capabilities allow the NRC to conclude that a sequence of events like the Fukushima Dai-ichi accident is unlikely to occur in the United States. Therefore, continued operation and continued licensing activities do not pose an imminent threat to public health and safety. However, the NRC's assessment of new insights from the events at Fukushima Dai-ichi leads the staff to conclude that additional requirements should be imposed on licensees to increase the capability of nuclear power plants to mitigate beyond-design-basis external natural events. The staff considers that all nuclear power plants should be at the redefined level of adequate protection by December 31, 2016, at the latest.

Should the Commission find that the staff's evaluation does not support a finding or declaration that the proposed orders involve redefining the level of protection to the public health and safety or common defense and security that should be regarded as adequate, the Commission may administratively exempt these orders from applicable backfit requirements. The Commission took this extremely rare action in its issuance of the Aircraft Impacts final rule (74 FR 28112 (July 9, 2009)). If the Commission chooses this course, the orders would need to be revised to provide a well articulated explanation for invoking this exemption.

#### Requests for Information

As required in SRM-SECY-11-0137, the staff is informing the Commission at least 5 business days before issuing letters associated with the regulatory activities outlined in SECY-11-0137 (Enclosure 7). The enclosed letter addresses seismic and flooding reevaluations (Recommendation 2.1), seismic and flooding hazard walkdowns (Recommendation 2.3) and a request for licensees to assess their current communications system and equipment under conditions of onsite and offsite damage and prolonged station blackout (SBO) and perform a staffing study to determine the number and qualifications of staff required to fill all necessary positions in response to a multi-unit event (Recommendation 9.3). As stated above, the staff has prioritized as a new Tier 2 activity to continue stakeholder interactions on development of additional requests for information that will address licensee reevaluations of external hazards other than seismic, tsunami and flooding against current applicable Commission requirements and guidance (Enclosure 3).

The staff will request information from COL holders, active and deferred construction permit holders and holders of operating reactor licenses in accordance with provisions of Sections 161.c, 103.b, and 182.a of the Atomic Energy Act of 1954, as amended (the Act). These provisions of the Act are implemented for holders of operating reactor licenses issued under 10 CFR Part 50 in 10 CFR 50.54(f). For COL holders under 10 CFR Part 52, the issues in NTF Recommendation 2.1 and 2.3 regarding seismic and flooding reevaluations and walkdowns are resolved. Therefore, COL holders will not be requested to respond to those portions of the 10 CFR 50.54(f) letter. Similarly, information requests related to walkdowns are not applicable to holders of construction permits under 10 CFR Part 50. Operating power reactor licensees under 10 CFR Part 50 will be requested to respond to all of the information requests provided in Enclosure 7 to this paper.

Under 10 CFR 50.54(f), when information is not sought to verify compliance with a facility's current licensing basis, the staff is required to prepare a reason or reasons for each information request prior to issuance to ensure that the burden to be imposed on respondents is justified in



view of the potential safety significance of the issue to be addressed in the requested information. As noted in the body of the enclosed letter, protection of plants from natural phenomena is critical for continued safe operation of nuclear power plants. Given that new information has been developed on natural phenomena hazards since the licensing basis of the operating plants was established, the staff finds that it is necessary to confirm the adequacy of the hazards assumed for U.S. plants and their ability to protect against them. Further, the staff finds that the accident at Fukushima highlights a need to verify the adequacy of emergency planning to address a prolonged SBO and multiunit events. Finally, the reevaluation and related information analysis will serve to meet the NRC's obligation under the Consolidated Appropriations Act, for 2012 (PL 112-74), Section 402.

The Office of Information Services is currently seeking expedited approval from the Office of Management and Budget (OMB) for the industry burden to respond to the requests for information. The staff will continue to work with OMB to meet the requirements of the paperwork reduction act for information collection.

#### *Definition of Vulnerability*

In SRM-SECY-11-0124, the Commission directed the staff to define "vulnerability," in the context of the staff's requests for information regarding actions that licensees have taken, or have planned to take, to address plant-specific vulnerabilities associated with the reevaluation of seismic and flooding hazards. In the staff's request for information (Enclosure 7), the staff defined plant-specific vulnerabilities as follows:

Plant-specific vulnerabilities are those features important to safety that when subject to an increased demand due to the newly calculated hazard evaluation have not been shown to be capable of performing their intended safety functions.

The definition is broad enough to capture both prevention and mitigation aspects and also includes features of protection such as hardware, procedures, temporary measures, and potentially available off-site resources. This definition allows the NRC staff to assess plant response to a natural hazard event as an integrated system providing consideration for all available resources. Information resulting from such an evaluation will help the staff decide upon the most appropriate regulatory action focusing on the most beneficial safety enhancements.

#### *Immediate NRC and Industry Actions*

The initial response of the NRC and industry to the nuclear reactor accident at Fukushima Dai-ichi was to perform an immediate assessment of domestic nuclear power plants. The NRC issued an information notice, a bulletin, and two temporary instructions which directed NRC inspectors to accomplish the following:

- Confirm the reliability of licensees' strategies intended to maintain or restore core cooling, containment, and SFP cooling capabilities under the circumstances associated with loss of large areas of the plant due to explosions or fire.
- Inspect the readiness of nuclear power plant operators to implement severe accident management guidelines.

The NRC inspections were completed by April 15, 2011. The minor or low safety significance issues that were identified posed no imminent threat to public health and safety. Identified issues have been entered into licensee corrective action programs.

In addition and in parallel with NRC actions, the Institute of Nuclear Power Operations (INPO) informed NRC staff that it had asked nuclear power plant licensees to accomplish the following:

- Verify the capability to mitigate internal and external flooding events required by station design.
- Perform walkdowns and inspections of important equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during seismic events and develop mitigating strategies for identified vulnerabilities.
- Increase sensitivity to spent fuel storage event response and ensure that a high state of readiness is maintained to respond to events that challenge spent fuel storage integrity.
- Develop plant specific information concerning coping times and design limitations for extended loss of power events.

#### Status update on other Charter activities

The charter requires the staff to provide the Commission every six months an update on the review work conducted under the Charter, highlight potential policy issues for the Commission, and provide recommendations regarding the sunset of the Steering Committee, Advisory Committee, and the Japan Lessons Learned Project Directorate. The staff's first 6-month summary is provided as Enclosure 8. This includes, as required in SRM-SECY-11-0137, a resource estimate and schedule for development of a probabilistic risk assessment (PRA) methodology to implement NTF Recommendation 3, which is to identify potential enhancements to the capability to prevent or mitigate seismically-induced fires and floods.

#### New Reactors and other NRC-regulated facilities

##### *Design Certifications and Combined Licenses*

For design certifications and combined license applications submitted under 10 CFR Part 52 that are currently under active staff review, the staff plans to assure that the Commission-approved Fukushima actions are addressed prior to certification or licensing. To date, the staff has met with AREVA and MHI to understand their plans for incorporating changes into their respective designs to effectively address the design-related Fukushima items. The staff will also request all COL applicants to provide the information required by the orders and request for information letters described in this paper, as applicable, through the review process. New reactor and operating reactor staff are coordinating their regulatory positions to assure that the resolutions proposed by new reactor design certification and combined license applicants are not in conflict with those proposed and accepted by the staff for operating reactors.

For new reactor design certification or license applications (e.g., construction permit, operating license, combined license) not yet submitted, the staff expects those applicants to address the

Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable.

On February 10, 2012, the NRC issued COLs for the Vogtle Electric Generating Plant Units 3 & 4. Also pending before the Commission are COLs for the Virgil C. Summer Nuclear Station Units 2 & 3. These COLs reference the AP1000 Design, which was recently certified by the Commission in Appendix D to Part 52. Consistent with the "Policy Statement on Regulation of Advanced Reactors," (73 FR 60612, October 14, 2008), the AP1000 design has enhanced safety features and safety margins beyond those contained in the licensing bases for current operating reactors. These design features and safety margins translated into enhanced operational strategies for the COLs. The applicable Commission-approved Fukushima actions not already addressed as part of the licensing process will be addressed in the same manner as operating reactor licensees. Specifically, the 50.54(f) letter being sent to operating reactors (Enclosure 7) will also be sent to Vogtle to address Tier 1 Recommendation 9.3 in its entirety.

The staff is not requesting Vogtle to respond to Tier 1 Recommendation 2.1 or 2.3. Tier 1 Recommendation 2.1 requests that licensees reevaluate the seismic and flooding hazards for their sites against present-day NRC requirements and guidance. As discussed in the 50.54(f) letter, a new seismic source characterization model (NUREG-2115, "Central and Eastern United States Seismic Source Characterization for Nuclear Facilities") has recently been issued. This new model was not available to Vogtle during the development of its COL application, and the applicant used an NRC-endorsed source model that had been recently updated. As discussed as part of NRC staff testimony at the COL hearings for Vogtle, the staff believes that use of the new source model would not result in differences in the seismic hazard characterizations that would affect the plant design for this site. The NRC staff continues to maintain this position and therefore considers that Recommendation 2.1 has been addressed as part of the completed COL reviews. Once the computer software becomes available, the staff will confirm this position by developing seismic hazard curves for each of the sites using the new source model. Tier 1 Recommendation 2.3 is not applicable to a facility that has not yet been constructed.

The staff also proposes to order Vogtle to address the portions of Tier 1 Recommendations 4.2 and 7.1 not already covered by the referenced certified design or COL review. With regard to Recommendation 4.2 for mitigation strategies for beyond-design-basis external events, the AP1000 standard design includes passive design features that provide core, containment and spent fuel pool cooling capability for 72 hours, without reliance on AC power. These features do not rely on access to any external water sources since the containment vessel and the passive containment cooling system serve as the safety-related ultimate heat sink. The AP1000 design also includes equipment to maintain required safety functions in the long term (beyond 72 hours to 7 days). Connections are provided for generators and pumping equipment that can be brought to the site to back up the installed equipment. The staff concluded in its final safety evaluation report for the AP1000 design that the installed equipment (and alternatively, the use of transportable equipment) is capable of supporting extended operation of the passive safety systems to maintain required safety functions in the long term. The proposed order requires Vogtle, prior to fuel load, to address requirements for mitigation strategies to sustain core cooling, containment and SFP cooling capabilities functions indefinitely.

With regard to Recommendation 7.1 for SFP level indication, the AP1000 standard design includes two permanently fixed safety related level instruments with the capability for a third instrument connection. The instrumentation range covers the top of the pool to the top of the fuel racks. The safety related classification ensures seismic qualification consistent with the SFP design, independence of instrument channels and power supplies, and routine testing and

calibration. The proposed order requires Vogtle to provide additional design information to ensure missile and falling debris protection, equipment qualification for extended water saturation conditions, display indications, and the capability to connect portable power supplies to the instrumentation.

### *Fuel Cycle Facilities*

On September 30, 2011, the staff issued and initiated temporary instruction (TI) 2600/015, "Evaluation of Licensee Strategies for the Prevention and/or Mitigation of Emergencies at Fuel Facilities" (ADAMS Accession No. ML111030453). These inspection activities include all 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," licensees with an integrated safety analysis (ISA), all 10 CFR Part 40, "Domestic Licensing of Source Material," licensees with a license-required ISA, and all 10 CFR Part 76, "Certification of Gaseous Diffusion Plants," certificate-holders currently in operation. The inspection activities are ongoing and are to be completed within one year of issuance of the TI. The staff will evaluate any findings under this TI using its normal inspection processes. As stated in SECY-11-0137, the staff will continue to evaluate the applicability of lessons learned to licensed facilities other than power reactors (e.g., research and test reactors, independent spent fuel storage installations, and reactors that have permanently ceased operations but still maintain fuel in a spent fuel pool), and take appropriate actions.

### COMMITMENTS:

As stated in SECY-11-0137, the staff will provide in July 2012 an evaluation of the Tier 3 recommendations. In addition, in SRM-SECY-11-0137, the Commission directed the NRC staff to take certain actions and provided further guidance including directing the staff to consider filtered vents. The staff has determined that there are technical and policy issues that need to be considered before any regulatory action can be taken to require licensees to install filtered vents. This issue will require further examination of other important policy matters related to the treatment of severe accidents, including filtration. The staff will present these policy matters in its July 2012 paper. The staff will also promptly inform the Commission of any additional recommendations that are prioritized as Tier 1.

### RECOMMENDATION:

The staff recommends the Commission approve issuance of the proposed orders. In order to support issuance of the orders by the March 11, 2012, anniversary of the events in Japan, the staff requests Commission approval by March 2, 2012.

### RESOURCES:

In fiscal year (FY) 2012 and FY 2013, the staff will reallocate from existing resources to start new Tier 1 and 2 activities described in this paper. This reallocation is less than the 4 full-time equivalent (FTE) and \$500,000 that requires Commission approval.

Previously, SECY-11-0137 described the Tier 1 and 2 activities and had an estimate of 30 FTE in FY 2012 and 90 FTE in FY 2013.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has concurred. The request for information (Enclosure 7) has been reviewed by the Committee on Review of Generic Requirements, which endorsed this regulatory product with minor editorial comments.

*/RA/*

R. W. Borchardt  
Executive Director  
for Operations

Enclosures:

1. Public Meetings related to Japan Lessons-Learned
2. Disposition of Additional Recommendations from SECY-11-0137
3. Disposition of ACRS Recommendations
4. Order on Mitigating Strategies for Beyond-Design-Basis External Events
5. Order on Reliable, Hardened, and Filtered Vents (Mark I and II BWRs)
6. Order on Spent Fuel Pool Instrumentation
7. Draft 50.54(f) letter - External Hazards Reevaluation, Walkdown and Emergency staffing
8. 6-month Status Update on other Charter Activities

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R. W. Borchardt  
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201100250/EDATS: SECY-2011-0584  
201100256/EDATS: SECY-2011-0602  
201100258/EDATS: SECY-2011-0618  
201100260/EDATS: SECY-2011-0620  
201200019/EDATS: SECY-2012-0021  
201200013/EDATS: SECY-2012-0015

201100255/EDATS: SECY-2011-0601  
201100257/EDATS: SECY-2011-0617  
201100259/EDATS: SECY-2011-0619  
201100261/EDATS: SECY-2011-0621  
201200011/EDATS: SECY-2012-0013  
201200014/EDATS: SECY-2012-0016

ADAMS Package No.: **ML12039A103**

\*via email

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