

April 10, 2013

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Office of Nuclear Reactor Regulation

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FROM: Richard P. Correia, Director */RA D. Coe for/*  
Division of Risk Analysis  
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SUBJECT: GENERIC ISSUE MANAGEMENT CONTROL SYSTEM REPORT  
(FY 2013, Q2)

Enclosed is the second Generic Issue Management Control System (GIMCS) report of fiscal year (FY) 2013. As part of the Generic Issues Program, this report is sent to the division directors responsible for one or more of the Generic Issues (GIs). The following table summarizes the status of GIs, and the subsequent paragraphs provide a narrative summary of the status of these GIs. Additional detail is provided in the enclosure. This memorandum and the enclosed report cover the period from December 1, 2012, through March 1, 2013.

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<i>Status Summary of Active Generic Issues during Second Quarter (Q2) of FY 2013</i>					
<i>GI No.</i>	<i>Title</i>	<i>Current Stage</i>	<i>Planned Closure</i>	<i>Months Open</i>	<i>Regulatory Impacts</i>
189	<i>Susceptibility of Ice Condenser and Mark III Containments to Early Failure from Hydrogen Combustion During a Severe Accident</i>	<i>Regulatory Office Implementation</i>	<i>05/2013</i>	<i>142</i>	<i>Title 10 of the Code of Federal Regulations (10 CFR) 50.34, "Design Objectives for Equipment to Control Releases of Radioactive Material in Effluents— Nuclear Power Reactors," and 50.44, "Combustible Gas Control for Nuclear Power Reactors. "</i>
191	<i>Assessment of Debris Accumulation on PWR Sump Performance</i>	<i>Regulatory Office Implementation</i>	<i>12/2018</i>	<i>198</i>	<i>Regulatory Guide 1.82, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant-Accident"; NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition"; Bulletin 2003-01; GL 2004-02</i>
193	<i>BWR ECCS Suction Concerns</i>	<i>Technical Assessment</i>	<i>To Be Determined</i>	<i>130</i>	<i>To Be Determined</i>

<i>Status Summary of Active Generic Issues during Second Quarter (Q2) of FY 2013</i>					
<i>GI No.</i>	<i>Title</i>	<i>Current Stage</i>	<i>Planned Closure</i>	<i>Months Open</i>	<i>Regulatory Impacts</i>
199	<i>Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States for Existing Plants</i>	<i>Regulatory Office Implementation</i>  <i>Activities Covered by 10 CFR 50.54(f) Letters on items 2.1 &amp; 2.3 of the Japan Near-Term Task Force (NTTF) Recommendations</i>	<i>To Be Determined</i>	94	<i>Information Notice (IN) 2010-018 and IN 2010-019</i>
204	<i>Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures</i>	<i>Regulatory Office Implementation</i>  <i>Activities Covered by 10 CFR 50.54(f) Letters on Items 2.1 &amp; 2.3 of the Japan NTTF Recommendations</i>	<i>To Be Determined</i>	14	<i>To Be Determined</i>

In accordance with Management Directive 6.4, "Generic Issues Program," the NRC transferred the responsibility for implementation and verification of GI-189, GI-191, GI-199, and GI-204 to the Office of Nuclear Reactor Regulation (NRR). Through the Japan Lessons Learned Project Directorate working groups, NRR is coordinating with the Office of New Reactors (NRO) on GI-199 and GI-204. The Generic Issues Program will continue to track the status of all GIs and report on them until completion.

### **Reactor Generic Issues**

**GI-189, Regulatory Office Implementation, "Susceptibility of Ice Condenser and Mark III Containments to Early Failure from Hydrogen Combustion during a Severe Accident"** (pages 1–5 of the GIMCS report). This GI involves the early containment failure probability of ice condenser containments, which is dominated by non-direct containment heat (DCH) hydrogen combustion events. The staff subsequently extended the issue to include boiling-water reactor (BWR) Mark III containments because their relative low free volume and strength are comparable to pressurized-water reactor (PWR) ice condensers. In March 2007, the NRC staff reviewed proposals from nine licensees affected by GI-189 and concluded that those proposed modifications will resolve GI-189 and provide benefit for some separate security scenarios that the NRC identified during the course of the GI-189 review. On June 15, 2007, the NRC staff issued letters to affected licensees accepting the commitments to changes that enhance plant capabilities to mitigate the potential for early containment failure from hydrogen combustion. Since that time, licensee implementation and NRC verification inspections performed pursuant to NRC Temporary Instruction (TI) 2515/174, "Hydrogen Igniter Backup Power Verification,"

have been completed at all nine affected sites. In November 2010, the staff received a commitment from the Tennessee Valley Authority to carry out measures at Watts Bar Unit 2 (a facility under construction) equivalent to those measures verified to have been carried out at Watts Bar Unit 1. The 2011 reactor events in Japan provided insights into defense-in-depth, station blackout and combustible-gas control that may relate to this GI. Assessments of the March 2011 nuclear accident in Japan continue and may touch on other issues associated with hydrogen combustion under Near-Term Task Force Recommendation 6. The NRC Japan Lessons-Learned Project Directorate will proceed independently to address other hydrogen combustion issues, if required. On January 31, 2013, the staff transmitted a technical report supporting closure of GI-189 to the Advisory Committee for Reactor Safeguards (ACRS) for review. The staff expects to proceed with closure of GI-189 in May 2013 following ACRS endorsement.

**GI-191, Regulatory Office Implementation, “Assessment of Debris Accumulation on Pressurized Water Reactor (PWR) Sump Performance”** (pages 6–11 of the GIMCS report). This GI concerns the possibility that, following a loss of coolant accident in a PWR, debris accumulating on the emergency core cooling system sump screen may result in clogging and restrict water flow to the pumps. Because of this GI and the related generic letter (GL) 2004-02, all PWR licensees increased the size of their containment sump strainers substantially, which is significantly reducing the risk of strainer clogging. Some licensees removed fibrous or particulate insulation, changed their sump pH buffers to reduce chemical effects, or installed debris interceptors to reduce the amount of debris that can reach the strainers. An associated issue that needs to be resolved to close GI-191 regards the potential for debris to bypass the sump strainers and enter the reactor core. In 2008, the NRC staff determined that additional industry-sponsored testing was necessary to support resolution of this issue. The industry performed some testing, but additional testing and NRC staff evaluation has been continuing because of staff concerns about the testing results and related assumptions. The Commission issued a staff requirements memorandum (SRM) in December 2010. The Commission determined that it was prudent to allow the nuclear industry to complete testing on in-vessel effects and zone of influence in 2011 and to develop a path forward by mid-2012. The Commission directed the staff to evaluate alternative approaches, including risk-informed approaches, for resolving GI-191 and to present them to the Commission by mid-2012. The Commission further agreed that, after development of the path forward, modifications should be completed within two operating cycles to address debris from smaller loss of coolant accidents (LOCAs); and within three operating cycles to address debris from larger LOCAs. In July 2012, the staff proposed options for resolution and requested a decision on policy issues from the Commission with options for the path forward to resolve GI-191, including risk-informed options. (SECY-12-0093, “Closure Options for Generic Safety Issue-191, Assessment of Debris Accumulation on Pressurized Water Reactor Sump Performance”). The Commission endorsed the staff’s proposed options for resolving GI-191 in a Staff Requirements Memorandum dated December 14, 2012. As part of the resolution process, licensees seeking additional time to pursue new testing or new approaches (including risk-informed approaches) will implement measures to mitigate the potential for debris blockage of the strainer or debris entry into the reactor core. The staff currently projects closure for this GI for December 2018.

**GI-193, Technical Assessment, “Boiling Water Reactor (BWR) Emergency Core Cooling System (ECCS) Suction Concerns”** (pages 12–15 of the GIMCS report). This GI involves an evaluation of suppression pool designs, in particular the location of ECCS suction strainers in relation to the downcomer pipes; the dynamics of drywell atmosphere (nitrogen) entrainment in the suppression pool following a large or medium break LOCA; the likelihood of any trapped gas

being transported down the ECCS piping; and the capability of ECCS pumps to perform their design function in the presence of gas. Based upon a staff request, the BWR owners group voluntarily provided proprietary data regarding the characteristics of LOCA phenomena at the earliest stages of the postulated accidents, along with a general assessment of the issue from the members' perspective. Experiments were conducted at the PUMA (Purdue University Multidimensional Integral Test Assembly) test facility located at Purdue University in an attempt to provide clarification on the potential for gas bubbles formed during a simulated LOCA blowdown to be transported widely in the wetwell. An updated literature review completed in January 2013 provides the acceptable and unacceptable void fraction ranges at the ECCS pump intake to support pump operation. Review of the findings continues, and the NRC is evaluating the potential for use of sophisticated analytical tools, such as computational fluid dynamics.

**GI-199, Regulatory Office Implementation, “Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States for Existing Plants”** (pages 16–19 of the GIMCS report). The NRC opened GI-199 to assess the implications of updated seismic data and methods for Central and Eastern U.S. (CEUS) operating plants. The staff's confirmatory analysis concluded that the calculated seismic hazard for some operating plants in the CEUS had increased. The NRC issued IN 2010-18 to nuclear power plants and independent spent fuel storage installations (ISFSIs). The agency issued IN 2010-19 to fuel cycle facilities. These INs stated that the NRC would follow the appropriate regulatory process to request that operating plants, fuel cycle facilities, and ISFSIs provide specific information about their facilities to enable the staff to complete the regulatory assessment and to identify and evaluate candidate backfits. NRR developed a draft GL to request needed data from power reactor licensees. The NRC originally intended the request to apply only for power reactor licensees in the CEUS, but in light of the recent Japanese earthquake, NRR expanded the scope of the request to include all U.S. power reactor licensees.

The NRC released the draft GL to the public for comment in September 2011. The preparation of the GL was halted because the agency incorporated this GI into the work it is doing in response to the Fukushima Dai-ichi accident. The NRC has requested that all nuclear power plants perform a reevaluation of seismic hazard using present-day guidance and methodologies. For plants in the CEUS, the seismic hazard reevaluations will be completed by September 2013. Plants in the Western United States will complete the seismic hazard reevaluations by March 2015. In addition, some plants will be required to complete a risk assessment response if the reevaluated hazard exceeds the plant's design basis. If required, the risk assessment must be completed within four years (three years for higher priority risk evaluations) from the date of the prioritization.

**GI-204, Regulatory Office Implementation, “Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures”** (page 20–21 of the GIMCS report). This GI pertains to the flooding of U.S. nuclear power plant sites following upstream dam failure. Possible effects on spent fuel pools at nuclear power plant sites are also within the scope of the GI. The NRC completed a screening analysis, and it approved the issue as a GI on February 29, 2012. This issue is similar to GI-199 in that the NRC was examining both issues prior to the Fukushima Dai-ichi accident in Japan. The NRC is addressing both issues as part of its response to the recommendations of the agency's NTTF review of insights from the accident. Request for information letters related to the reevaluation of flood hazards were issued in March 2012. A May 2012 letter to all power reactor licensees provides prioritized categories with the flood

hazard reevaluation due dates. All hazard reevaluations are due to the NRC by March 12, 2015.

***Nonreactor Generic Issues***

At the end of the reporting period, no nonreactor GIs remain to be resolved.

The GI Program will continue to track the staff's progress in resolving reactor GIs and is available to support any significant challenges that may arise during their resolution.

Enclosure:  
As stated

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Enclosure:  
As stated

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