

GENERIC ISSUE MANAGEMENT CONTROL SYSTEM REPORT FOR THE FIRST HALF OF FISCAL YEAR 2019

SUMMARY STATUS OF ACTIVE GENERIC ISSUES

Active Generic Issues

During this reporting period (October 2018 through March 2019), the U.S. Nuclear Regulatory Commission (NRC) staff continued its evaluation of three open generic issues (GIs) and two proposed GIs.

The staff continued its assessment of the first proposed GI, on the effects of high-energy arcing faults involving aluminum at nuclear power plants, to determine whether the issue should proceed to the regulatory office implementation stage of the GI process. In particular, in September 2018, the Office of Nuclear Regulatory Research (RES) conducted several confirmatory tests involving aluminum components in high-energy arcing faults. The test results will be used in future pilot plant studies to calculate any increase in risk.

The staff determined that second proposed GI, related to the adequacy of licensee procedures to address anticipated operational occurrences, did not meet the screening criteria to proceed in the GI program, and the issue was closed.

The Office of Nuclear Reactor Regulation (NRR) is currently resolving the three open GIs (GI-191, GI-199, and GI-204) which are in the Regulatory Office Implementation stage of the GI process. The sections below summarize the regulatory actions associated with these three open GIs. Additional information on the status of these open GIs appears on the GI dashboard on the NRC's public Web site at <http://www.nrc.gov/about-nrc/regulatory/gen-issues/dashboard.html>.

GI-191, "Assessment of Debris Accumulation on PWR Sump Performance"

GI-191 concerns the possibility that, after a loss-of-coolant accident in a pressurized-water reactor (PWR), debris accumulating on the emergency core cooling system (ECCS) sump screen may result in clogging and the restriction of water flow to the pumps. As a result of GI-191, all PWR plants increased the size of their containment sump strainers, significantly reducing the risk of debris clogging the strainers. Generic Letter (GL) 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors," dated September 13, 2004 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML042360586), also considered a related issue, the potential for debris to pass through the sump strainers and cause flow restrictions inside the reactor core.

In 2008, the NRC determined that additional industry-sponsored testing was necessary to resolve this issue. On October 18, 2012, the ACRS issued its reviewed (ADAMS Accession No. ML12290A654) of the NRC staff draft safety evaluation report (ADAMS Accession No. ML12115A308) of the industry topical report WCAP-16793-NP, "Evaluation of Long-Term Cooling Considering Particulate, Fibrous and Chemical Debris in the Recirculating Fluid," revision 2 (ADAMS Accession No. ML11292A021). The ACRS concurred with the staff's finding that WCAP-16793-NP was an acceptable model for assessing the effects on core cooling from fibrous, particulate, and chemical debris reaching the reactor vessel. This included a conservative generic limit on the amount of fiber expected to reach the core.

Subsequently, the PWR Owners Group (PWROG) developed a methodology to define an in-vessel fibrous debris limit to respond to in-vessel questions in GL 2004-02, using plant-specific analyses. On July 17, 2015, the PWROG submitted a new topical report, WCAP-17788, “Comprehensive Analysis and Test Program for GSI-191 Closure (PA-SEE-1090)—Cold Leg Break (CLB) Evaluation Method for GSI-191 Long-Term Cooling” (ADAMS Accession No. ML15210A667). The NRC staff’s review of WCAP-17788 identified several issues that were not readily resolved. The PWROG provided initial responses to the NRC requests for additional information on March 20, 2017 (ADAMS Accession No. ML17293A220), and revised responses on September 28, 2018 (ADAMS Accession No. ML18285A019). Given the ongoing technical issues in portions of the thermal-hydraulic analysis in WCAP-17788, the NRC staff is reevaluating the overall significance of the effects of debris on in-vessel blockage.

In SECY-12-0093, “Closure Options for Generic Safety Issue-191, Assessment of Debris Accumulation on Pressurized-Water Reactor Sump Performance,” dated July 9, 2012, the NRC staff proposed three options for licensees to choose among to close GSI-191. In response, on December 14, 2012, the Commission issued Staff Requirements Memorandum (SRM) -SECY-12-0093 (ADAMS Accession No. ML12349A378) approving these options. Licensees have since notified the NRC of the option that they have selected and are developing proposed technical resolutions for the staff to review.

There are 37 operating reactor sites subject to GI-191. All of the nine operating reactor sites that chose Option 1, which involves using WCAP-16793, have submitted their evaluations. The NRC staff has reviewed these evaluations and closed the GI for these plants. The remaining 28 operating reactor sites chose Option 2, which involves implementing mitigative measures and a deterministic approach (Option 2a) or a risk-informed approach (Option 2b). Of the 28 sites choosing Option 2, 21 sites chose Option 2a and 7 sites chose Option 2b. Plants that elect to use a risk-informed approach are following the pilot plant submittal by South Texas Project, which the NRC used to close out the issue in the summer of 2017 (ADAMS Package Accession No. ML17019A001). No sites are pursuing Option 3, which involves separating the regulatory treatment of the sump strainer and in-vessel effects.

During this reporting period, the NRC continued its review of a technical report from Vogtle Electric Generating Plant for the closure of GL 2004-02, which it received on April 21, 2017, as well as a license amendment request and closure letter for GL 2004-02 for Calvert Cliffs Nuclear Power Plant, which it received on August 14, 2018. The NRC also continued its review of technical reports for the closure of GL 2004-02 for St. Lucie Plant, Units 1 and 2; Turkey Point Nuclear Generating, Units 3 and 4; Point Beach Nuclear Plant, Units 1 and 2; and Seabrook Station.

Based upon current schedules, the staff expects all activities associated with GI-191 to be completed by the end of 2021. However, the NRC staff is currently exploring alternative approaches to resolving GI-191 using the information in the topical reports and submitted by licensees that, if feasible, may accelerate the resolution schedules.

GI-199, “Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants”

This GI addresses how current estimates of the seismic hazard level at some nuclear sites in the central and eastern United States might be higher than the values used in their original

designs and previous evaluations. Following collaboration with the Electric Power Research Institute, the NRC staff issued a safety/risk assessment report, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants," in August 2010 (ADAMS Accession No. ML100270639). In addition, on September 2, 2010, the NRC staff issued Information Notice 2010-18, "Generic Issue 199, 'Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants'" (ADAMS Accession No. ML101970221).

Following the March 2011 nuclear event at the Fukushima Dai-ichi nuclear reactors in Japan, the NRC incorporated GI-199 into its response activities. Consequently, as part of a March 12, 2012, request for information under Title 10 of the *Code of Federal Regulations* (10 CFR) 50.54(f), the NRC asked all nuclear power plants to reevaluate their seismic hazards using present-day guidance and methods (ADAMS Accession No. ML12053A340). All sites submitted their reevaluated seismic hazard reports to the NRC by March 2015. The staff completed its assessment of the reevaluated seismic hazard reports by December 2016.

Based on the staff's assessment of the licensees' reevaluated seismic hazards reports, the staff refined the requirements for individual plants to complete seismic probabilistic risk assessments (SPRAs) or other limited-scope seismic evaluations. The NRC staff determined which sites were required to complete individual plant evaluations and specified the level of evaluation in the NRC's final determination letter dated October 27, 2015 (ADAMS Accession No. ML15194A015). Nine sites screened out of any further seismic evaluations.

The NRC staff screened in 34 sites to submit expedited seismic evaluation process (ESEP) reports. The ESEP reports confirmed that adequate seismic margin exists to safely shut down the plants without the need for modifications while lengthier seismic evaluations were being conducted. The NRC staff has completed its reviews of all 34 ESEP reports. Licensees have notified the NRC that all required upgrades have either been completed or deferred (with justification) to the SPRA.

The NRC staff screened in 52 sites to perform one or more limited-scope evaluations (i.e., low-frequency evaluations, high-frequency evaluations, spent fuel pool low-hazard evaluations, or spent fuel pool high-hazard evaluations):

- The NRC staff completed reviews of 1 low-frequency evaluation, 34 high-frequency evaluations, 30 spent fuel pool low-hazard evaluations, and 8 spent fuel pool high-hazard evaluations.
- The NRC staff has now completed its review of all 52 sites requiring a limited-scope seismic evaluation.

The NRC required 20 sites to submit SPRAs to the NRC for review and approval. These sites had the following status as of March 2019:

- Two sites (Catawba Nuclear Station and McGuire Nuclear Station) provided supplemental information and were subsequently screened out from having to complete an SPRA.
- Eight sites have submitted their SPRAs to the NRC for staff review and approval.

- The NRC has completed its review of four of the eight sites. During this reporting period, the NRC completed its review of the SPRA from Diablo Canyon Power Plant.
- The remaining four sites are currently under NRC review. During this reporting period, the agency received SPRAs from Virgil C. Summer Nuclear Station and the Oconee Nuclear Station for review.
- Ten sites have requested and received extensions or deferrals of the due dates from the NRC; some sites are pending licensing actions:
 - Two sites have received NRC approval for deferrals past their early shutdown dates.
 - Eight sites have received NRC approval to extend the due date for their submittals; the agency expects to receive SPRAs from these eight sites before December 30, 2019.

In summary, as of March 2019, the NRC staff had completed its assessment and closed out actions on seismic hazard reevaluations for 46 reactor sites. There are 14 sites remaining pending review, submittal, or deferral. Based upon current schedules, the staff expects that it will complete activities associated with GI-199 by the end of 2020.

GI-204, “Flooding of Nuclear Power Plant Sites Following Upstream Dam Failure”

This GI relates to potential flooding effects from upstream dam failure on nuclear power plant sites, spent fuel pools, and sites undergoing decommissioning with spent fuel stored in spent fuel pools. NRR proposed this GI in July 2010, and the GI has been subsumed as part of the implementation of the recommendations from the agency’s Japan Near-Term Task Force.

In March 2012, the NRC sent letters to licensees requesting information under 10 CFR 50.54(f) about the reevaluation of all flood hazards, including dam failures, using present-day guidance and methodologies (ADAMS Accession No. ML12053A340). All sites have completed flood hazard reevaluations in response to the March 2012 request. The NRC has issued staff assessments for all of the flood hazard reevaluation reports. The following took place during this reporting period:

- The NRC staff received a revised flood hazard reevaluation report from Millstone Power Station, which is currently under review.

The NRC required those sites that had flood-causing mechanisms that exceeded the current design basis to perform an additional analysis. On June 30, 2015, the staff presented a plan to the Commission in COMSECY-15-0019, “Closure Plan for the Reevaluation of Flooding Hazards for Operating Nuclear Power Plants” (ADAMS Accession No. ML15153A104), to complete the analysis. In response, on July 28, 2015, the Commission issued an SRM to COMSECY-15-0019 approving the staff’s plan (ADAMS Accession No. ML15209A682). The plan included the option for sites to perform a focused evaluation to fully complete their response to the 10 CFR 50.54(f) request for information without needing to perform an integrated assessment, depending on the hazard and the site’s response to the updated flood hazard.

On April 21, 2016, the Nuclear Energy Institute (NEI) issued NEI 16-05, "External Flooding Assessment Guidelines" (ADAMS Accession No. ML16159A077), which describes the Flooding Impact Assessment Process (FIAP) to assess the impacts of flood mechanisms not bounded by the design-basis flood level. The NRC endorsed revision 1 of NEI 16-05 of NEI 16-05, (ADAMS Accession No. ML16165A178) as an acceptable method to complete the FIAP. The FIAP directs licensees to perform either a focused evaluation or an integrated assessment.

The staff expects 54 sites to submit either focused evaluations or integrated assessments to the NRC for review. Six sites have their reevaluated hazard mechanisms bounded by the site's current design basis and are not required to submit additional evaluations. The evaluations have the following status as of March 2019:

- Forty-three sites have submitted focused evaluations.
 - The NRC staff has issued its assessments for 40 of those sites and is currently reviewing the other 3 sites. However, the licensee has requested the staff suspend review of one of the three sites that is under staff review.
 - During this reporting period—
 - The NRC received a focused evaluation from Catawba Nuclear Station.
 - The NRC staff completed its review of focused evaluations for Brunswick Steam Electric Plant and Palisades Nuclear Plant.
- Four sites have submitted integrated assessments.
 - The NRC staff has issued its evaluation for one site and is currently reviewing the other three.
 - During this reporting period—
 - The NRC received integrated assessments for Cooper Nuclear Station and H.B. Robinson Steam Electric Plant.
 - The NRC staff completed its review of the integrated assessment for Dresden Nuclear Power Station.
- Four sites are anticipated to submit their evaluations to the NRC by mid-2019.
 - Three of the four sites are expected to submit focused evaluations.
 - One site is expected to submit an integrated assessment.
- Three sites have requested deferral for their evaluations until after their expected early permanent shutdown dates.

The NRC staff has completed its assessment and closed out all required actions concerning flooding hazard reevaluations for 47 sites, with 13 sites pending further action. Based upon

current schedules, the staff anticipates that it will complete the remaining activities associated with this GI by the end of 2020.