

September 2, 2010

MEMORANDUM TO: Brian W. Sheron, Director
Office of Nuclear Regulatory Research

FROM: Patrick Hiland, Chairman **/RA/**
Safety/Risk Assessment Panel for Generic Issue 199

SUBJECT: SAFETY/RISK ASSESSMENT RESULTS FOR GENERIC ISSUE 199,
"IMPLICATIONS OF UPDATED PROBABILISTIC SEISMIC HAZARD
ESTIMATES IN CENTRAL AND EASTERN UNITED STATES ON
EXISTING PLANTS"

In accordance with Management Directive (MD) 6.4, "Generic Issues Program," a Safety/Risk Assessment panel was established to:

- Determine, on a generic basis, if the risk associated with Generic Issue (GI) 199, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States (CEUS) on Existing Plants," warrants further investigation for potential imposition as a cost-justified backfit.
- Provide a recommendation regarding the next step (i.e., should the issue continue to the Regulatory Assessment Stage for identification and evaluation of potential generic, cost-justified backfits, be dropped due to low risk, or have other actions taken outside the Generic Issues Program [GIP]).

The panel completed its independent review of the Safety/Risk Assessment (see Enclosure 1) for GI-199. The panel reached the following conclusions and observations:

- Overall seismic core damage risk estimates are consistent with the Commission's Safety Goal Policy Statement because they are within the subsidiary objective of 10^{-4} /year for core damage frequency. The GI-199 Safety/Risk Assessment, based in part on information from the U.S. Nuclear Regulatory Commission's (NRC's) Individual Plant Examination of External Events (IPEEE) program, indicates that no concern exists regarding adequate protection and that the current seismic design of operating reactors provides a safety margin to withstand potential earthquakes exceeding the original design basis.
- The changes in seismic core-damage frequency (SCDF) estimated in the Safety/Risk Assessment Stage of GI-199 for numerous plants lie in the range of 10^{-4} /yr to 10^{-5} /yr, which meet the numerical risk criteria for an issue to proceed to the Regulatory Assessment Stage of the GIP.

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- New consensus seismic-hazard estimates will become available in late 2010 or early 2011 (these are a product of a joint NRC, U.S. Department of Energy, U.S. Geological Survey (USGS) and Electric Power Research Institute (EPRI) project). These consensus seismic-hazard estimates will supersede the existing EPRI, Lawrence Livermore National Laboratory, and USGS hazard estimates used in the GI-199 Safety/Risk Assessment.
- Certain factors that affect the development of realistic SCDF estimates will remain unresolved even after the new consensus seismic hazard estimates are developed. The issue is primarily that many IPEEEs did not produce SCDF estimates and so lack some of the information needed to produce such estimates.
 - For a number of the plants that performed reduced-scope seismic margins analyses as part of the IPEEE program, limited detailed information exists regarding plant seismic capacity (the ability of a plant's structures, systems, and components [SSCs] to successfully withstand an earthquake) beyond the required design-basis level.
 - The approach used in the attached Safety/Risk Assessment to estimate SCDF considers the plant-level seismic capacity and, therefore, does not provide insight into which SSCs are important to seismic risk. Such knowledge would be required in order to postulate potential cost-beneficial backfits.
- IPEEE submittals generally provided limited, qualitative information about the seismic capability of containments. Any regulatory analysis of GI-199 should consider potential plant modifications for reducing the probability of seismically induced containment failure as discussed in Section 3.3.1 of NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission."

The panel recommends the following:

- Transfer lead responsibility for subsequent GI-199 actions to the Office of Nuclear Reactor Regulation for regulatory office implementation, including maintenance of the GI-199 Communication Plan and stakeholder briefings and interactions. (Note: the GIP will continue to track the issue and report its status in the Generic Issues Management Control System until all actions are completed).
- Take further actions to address GI-199 outside the GIP (i.e. obtain information and develop methods, as needed, to complete plant-specific value-impact analyses of potential backfits to reduce seismic risk). Any needed Office of Nuclear Regulatory Research support can be obtained using the User Need Request process.

Enclosure:
Safety/Risk Assessment for GI-199

Approved: /RA/
Brian W. Sheron, Director
Office of Nuclear Regulatory Research

Date: 9/2/2010

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Safety/Risk Assessment for GI-199

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