February 1, 2008

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

FROM: Patrick Hiland, Chairman */RA/*
Panel for Review of Generic Issue 199 Screening Evaluation
Division of Engineering
Office of Nuclear Reactor Regulation

SUBJECT: RESULTS OF INITIAL SCREENING OF 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," and SECY-07-0022, "Status Report on Proposed Improvements to the Generic Issues Program," dated January 30, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML063460239), the panel completed its independent review of the initial screening evaluation (see Enclosure 1) for Generic Issue (GI) 199, "Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants." The panel concluded that this issue should proceed to the safety and risk assessment phase under the Generic Issues Program (GIP).

The panel's recommendation is based on the screening analysis which showed that the current knowledge of this issue and its potential impact on Central and Eastern United States (CEUS) plants passes the seven GI screening criteria. Therefore, this issue warrants further analysis under the GIP, and the panel recommends that this GI proceed to the safety and risk assessment phase of the GIP in accordance with MD 6.4 and SECY-07-0022.

This screening analysis shows that the estimated increase in spectral acceleration for some existing CEUS plant sites might exceed the design basis and values used for the NRC's review of Individual Plant Examination of External Events (IPEEE) submittals. This translates to an equivalent increase in seismic demand on plant structures, systems, and components. As a result, this issue has the potential to result in increased seismic core damage frequency estimates for some plants. However, this screening analysis provides a limited evaluation that does not assess the safety response of the plants. The next phase of the analysis under the GIP will assess the risk impact at plants where the estimated increase in seismic hazard exceeds previous levels to an extent that might challenge available seismic margins.

The results from this limited scope screening analysis is that seismic designs of operating plants in the CEUS still provide adequate safety margins while the staff continues to evaluate new seismic hazard data and models and their potential impact on plant risk estimates. Specific reasons for this conclusion include:

- The estimated annual probability of exceedence of seismic hazard is small in an absolute sense.
- Earthquakes cause ground motion over a range of frequencies. Lower frequency motions are more damaging to buildings and equipment than higher frequency motions. Based on the NRC staff's reviews associated with Early Site Permits (ESP), the staff is confident that the recent seismic data and models will show that increased estimates of the seismic hazards will occur primarily in the higher frequency motions. Accordingly, these increased estimates of seismic hazards would primarily have little impact on previous estimates of the potential damage to buildings and equipment.
- The plants are designed to withstand anticipated earthquakes with substantial design margins. Plants may have seismic margins beyond those reflected in their IPEEE submittals and these could compensate for the increase in estimated seismic load. Such additional seismic margins at plants may be inherent in the design and construction, realized from improved data and analysis methods, or result from plant modifications or enhancements completed since the IPEEE submittals.

The GIP staff will maintain the screening results of this GI for future records in the Generic Issue Management Control System and will publish the results in the next supplement to NUREG-0933, "A Prioritization of Generic Safety Issues." I request your approval of the panel's recommendation so that the Office of Nuclear Regulatory Research can proceed as required by MD 6.4.

Enclosure:
Screening Analysis for GI-199

Approved: *Brian W. Sheron* Date: *02/01/2008*
Brian W. Sheron, Director
Office of Nuclear Regulatory Research

- The estimated annual probability of exceedence of seismic hazard is small in an absolute sense.
- Earthquakes cause ground motion over a range of frequencies. Lower frequency motions are more damaging to buildings and equipment than higher frequency motions. Based on the NRC staff's reviews associated with Early Site Permits (ESP), the staff is confident that the recent seismic data and models will show that increased estimates of the seismic hazards will occur primarily in the higher frequency motions. Accordingly, these increased estimates of seismic hazards would primarily have little impact on previous estimates of the potential damage to buildings and equipment.
- The plants are designed to withstand anticipated earthquakes with substantial design margins. Plants may have seismic margins beyond those reflected in their IPEEE submittals and these could compensate for the increase in estimated seismic load. Such additional seismic margins at plants may be inherent in the design and construction, realized from improved data and analysis methods, or result from plant modifications or enhancements completed since the IPEEE submittals.

The GIP staff will maintain the screening results of this GI for future records in the Generic Issue Management Control System and will publish the results in the next supplement to NUREG-0933, "A Prioritization of Generic Safety Issues." I request your approval of the panel's recommendation so that the Office of Nuclear Regulatory Research can proceed as required by MD 6.4.

Enclosure:
Screening Analysis for GI-199

Approved: */RA/ Brian W. Sheron* Date: *02/01/08*
Brian W. Sheron, Director
Office of Nuclear Regulatory Research

DISTRIBUTION:

NChokshi, NRO	MMurphy, NRR	GParry, NRR	RHogan, RES
GBagchi, NRO	JGolla, NRR	AKammerer, RES	JKauffman, RES
CJackson, NRO	FEltawila, RES	JAke, RES	TMitts, RES
MMayfield, NRO	JMonninger, RES	JFoster, RES	OEGIB RF
RSAB RF	DSA RF		

ADAMS Accession No.: ML073400477

OFFICE	OEGIB	OEGIB	OEGIB	SUNSI Review	NRR	NRO
NAME	TMitts	JKauffman	JFoster	JFoster	GParry	CMunson
DATE	12/10/07	12/10/07	12/10/07	12/10/07	12/13/07	01/14/08
OFFICE	NRO	RES	NRR			
NAME	YLi	AMurphy	PHiland			
DATE	01/14/08	01/23/08	01/15/08			

OFFICIAL RECORD COPY