

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, DC 20555-0001

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NRC INFORMATION NOTICE 2010-19: UPDATED PROBABILISTIC SEISMIC HAZARD
ESTIMATES IN CENTRAL AND EASTERN UNITED
STATES

ADDRESSEES

All licensees, applicants, and holders of a construction authorization and/or certificate issued by the U.S. Nuclear Regulatory Commission (NRC), for fuel cycle facilities including Fuel Manufacturing Facilities, Mixed Oxide facilities, and Uranium Enrichment Facilities licensed under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 70, "Domestic Licensing of Special Nuclear Material"; Gaseous Diffusion Plants Certified under 10 CFR Part 76, "Certification of Gaseous Diffusion Plants"; and Uranium Conversion/De-conversion Facilities licensed under 10 CFR Part 40, "Domestic Licensing of Source Material" (i.e., Honeywell Metropolis Works).

PURPOSE

NRC is issuing this Information Notice (IN) to inform addressees about the NRC's findings relating to higher estimated seismic hazards in the Central and Eastern United States (CEUS) according to the U.S. Geological Survey (USGS)'s 2008 seismic hazard model. The seismic hazard is usually described by the seismic hazard curve or the annual exceedance frequency as a function of ground motion level (peak ground acceleration or spectral accelerations at certain frequencies). The increase is due to the updates to ground motion models and seismic sources in the regions around Charleston, South Carolina, New Madrid, Missouri, southern Illinois and southern Indiana. The increase is mostly from the comparison between the 1989 Electric Power Research Institute-Seismicity Owner Group (EPRI-SOG) study, which was updated in 2009, and the USGS 2008 seismic hazard model.

Licensees, applicants, and holders of a construction authorization and/or certificate should review this IN and consider actions, as appropriate. However, the suggestions contained in this IN are not new NRC requirements; therefore, no specific action or written response is required.

BACKGROUND

In support of early site permits (ESP) for new reactors, the NRC staff reviewed updates to the seismic source and ground motion models provided by applicants, which identified higher estimate seismic hazards at operating facilities in the CEUS where ESPs were sought. This finding was addressed in a July 2006 memorandum (ADAMS accession number ML052360044) to the NRC's Commissioners from the NRC's Executive Director of Operations, and identified the impact of a higher seismic hazard on currently operating nuclear power plants in the CEUS as Generic Issue 199. The seismic update information from ESP applicants included new EPRI models to estimate earthquake ground motion and updated models for earthquake sources in seismic regions such as eastern Tennessee, and around both Charleston, South Carolina, and

New Madrid, Missouri. The NRC staff reviewed and evaluated this new information along with similar USGS seismic hazard estimates in 2008. From this review, the NRC staff concluded that the likelihood of exceeding the seismic hazard values used in plant design and in previous evaluations may be higher than previously understood for some currently operating CEUS sites. The NRC staff's conclusions were discussed in an NRC public meeting in 2008 that included many operating reactor licensees and EPRI representatives.

Because many fuel cycle facilities are located in the CEUS, with some located in the above mentioned seismic source regions, the updated seismic hazard information should be reviewed and actions be considered as appropriate.

Seismic hazards are considered as natural phenomena hazards (10 CFR 70.64, Appendix A to Part 70, and 10 CFR 76.87) and may initiate potential accident sequences in a fuel cycle facility. The new fuel cycle facility designs are required to provide for adequate protection against these natural phenomena hazards (10 CFR 70.64); all licensed fuel cycle facilities are required to meet the performance requirements of §70.61 through consequence evaluation as part of the Integrated Safety Analysis. The increased seismic hazards in the CEUS may have some impact on the existing and new fuel facilities for these seismic safety evaluations. This focus of this IN is to: (1) raise attention to potential concerns that not all addressees have considered the increased USGS 2008 seismic hazard results; and (2) suggest that appropriate actions being taken.

The USGS 2008 seismic hazard model is available online at <http://earthquake.usgs.gov/hazards/>. By utilizing the interactive seismic hazard maps, a user can calculate the ground motions for any site by inputting the latitude and longitude of the site. For soil response of a site, the user can input appropriate shear wave velocities for the top 30 meters.

Due to the estimated seismic hazard increase, the NRC encourages fuel cycle facilities in CEUS to consider the USGS updated seismic hazard estimates to assess the potential for exceeding the licensing basis on design of the structures, systems, and components and the event consequences initiated by seismic events, and consider actions as appropriate.

CONTACT

This IN requires no specific action or written response. Please direct any questions about this matter to the technical contacts listed below or to the appropriate project manager in the Office of Nuclear Material Safety and Safeguards, Division of Fuel Cycle Safety and Safeguards.

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Marissa Bailey, Acting Director
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Technical contacts:	Tianqing Cao	Osiris Siurano
	301-492-3568	301-492-3117
	E-mail: Tianqing.Cao@nrc.gov	Osiris.Siurano-Perez@nrc.gov

