

Events Beyond Design Safety Basis Analysis

No. 2011-01

PURPOSE

This Safety Alert provides information on a safety concern related to the identification and mitigation of events that may fall outside those analyzed in the documented safety analysis.

BACKGROUND

On March 11, 2011, the Fukushima Daiichi nuclear power station in Japan was damaged by a magnitude 9.0 earthquake and the subsequent tsunami. While there is still a lot to be learned from the accident about the adequacy of design specifications and the equipment failure modes, reports from the Nuclear Regulatory Commission (NRC) have identified some key aspects of the operational emergency at the Fukushima Daiichi nuclear power station.

Specifically, following automatic shutdown of the operating reactors due to the earthquake, a complete loss of both the offsite and on-site power systems disabled key cooling systems which eventually led to fuel damage, hydrogen generation, and high radiation levels within the facility.

AREAS FOR ATTENTION

The NRC has reported that the events at the Japanese nuclear power station appear to have been caused by factors directly impacting nuclear safety that were outside the design basis for the facility. Therefore, consistent with the approach being taken to review commercial nuclear power reactors, it is prudent to evaluate facility vulnerabilities to beyond design basis events at Department of Energy (DOE) nuclear facilities and to ensure appropriate provisions are in place to address them.

ACTION REQUIRED

For all Hazard Category 1 and 2 nuclear facilities (except for those only classified due to criticality criteria):

- Review how beyond design basis events have been considered or analyzed in accordance with DOE's Nuclear Safety Regulation and any controls that have been put in place that could prevent or mitigate them.

- Discuss the ability to safely manage a total loss of power event including a loss of backup capabilities.
- Confirm safety systems are being maintained in an operable condition in accordance with technical safety requirements.
- Confirm emergency plans, procedures, and equipment are current, functional, and have been appropriately tested, including plans and procedures for response to natural phenomena events that could have site-wide impacts or impacts on regional support infrastructure.

Priority should be given to Hazard Category 1 facilities which should be completed by April 14, followed by Hazard Category 2 facilities by May 13, 2011. Provide results from these actions to the Program Secretarial Officer and the Chief Health, Safety and Security Officer.

We will continue to monitor the situation, disseminate any lessons-learned derived from these actions, and provide additional guidance and recommendations as appropriate.

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