

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

December 6, 2006

**NRC REGULATORY ISSUE SUMMARY 2006-23
POST-TORNADO OPERABILITY OF VENTILATING AND
AIR-CONDITIONING SYSTEMS HOUSED IN EMERGENCY DIESEL
GENERATOR ROOMS**

ADDRESSEES

All holders of operating licenses for nuclear power reactors, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

INTENT

The U.S. Nuclear Regulatory Commission (NRC) is issuing this Regulatory Issue Summary (RIS) to notify licensees of its regulatory position regarding loading effects caused by natural phenomena to safety related systems and components housed inside a structure partially exposed to the outside environment, specifically ventilating and air-conditioning (VAC) systems housed in the Emergency Diesel Generator (EDG) room. NRC expects addressees to review this RIS for applicability to their facilities and consider actions as appropriate. This RIS requires no action or written response from addressees.

BACKGROUND INFORMATION

During an NRC inspection in May 2005, inspectors questioned the ability of a licensee's VAC system and other components in an EDG room to operate safely during and after a tornado event. Specifically, the NRC staff questioned whether wind pressures and differential pressures caused by a tornado passing directly over the EDG building could adversely affect safety related systems and components inside the EDG building.

In response to the NRC questions, the licensee conducted an industrywide survey revealing approximately 25 plants with a licensing basis similar to their own. In addition, the licensee performed rapid depressurization and re-pressurization analyses (venting) of the EDG room and large deformation inelastic-stress calculations of potentially vulnerable duct segments. The licensee's analyses demonstrated and provided assurance that the structural integrity of the VAC system ducts in the EDG room would be maintained during the tornado event, and that afterward the VAC system would be able to perform its intended function. The staff reviewed the analyses and concluded that the integrity of the licensee's VAC system is adequate.

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The NRC staff encountered a similar situation with a different conclusion in 1996 and discussed it in Information Notice (IN) 96-06. IN 96-06 states that South Texas Project Unit 1 (South Texas) found that an interference between a tornado damper and gusset prevented the damper from fully closing. South Texas found that rapid depressurization could result in the collapse of the VAC system, thus, preventing the cooling of safety-related systems.

Based on its review, the staff concluded that the licensee's analysis was site specific and that other nuclear plants might not have adequately considered tornado wind and pressure-drop effects on safety-related systems and components inside building structures open to the outside environment.

SUMMARY OF ISSUE

Natural hazards are discussed in 10 CFR Part 50, Appendix A, GDC 2, and include earthquakes, tornadoes, and floods. NRC expects licensees to consider natural hazards during the design of systems and components housed inside safety-related structures if these systems and components may be exposed to the outside environment and if their malfunction or loss may prevent or impact the operability of safety-related systems and components.

Vented VAC ducts, and other internal safety-related systems and components, may be subjected to the effects of rapid room depressurization and re-pressurization and other effects associated with a tornado event. In some cases the loss of structural integrity of VAC systems may pose a challenge to the safe operation of the facility. In such cases, licensees should take any necessary measures to ensure the operability of VAC duct systems located in EDG rooms.

BACKFIT DISCUSSION

This RIS requires no action or written response. Any action on the part of the addressees to inform NRC regarding the ability of their systems to withstand loadings caused by partial exposure to the environment in accordance with the guidance contained in this RIS is strictly voluntary and, therefore, is not a backfit under 10 CFR 50.109. Consequently, the staff has not performed a backfit analysis.

FEDERAL REGISTER NOTIFICATION

A notice of opportunity for public comment on this RIS was not published in the *Federal Register* because this RIS is informational and pertains to a staff position that does not represent a departure from current regulatory requirements and practice.

CONGRESSIONAL REVIEW ACT

This RIS is not a rule as designated by the Congressional Review Act (5 U.S.C. §§ 801-888) and, therefore, is not subject to the Act.

PAPERWORK REDUCTION ACT STATEMENT

This RIS does not contain information collections and, therefore, is not subject to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.).

CONTACT

Please direct any questions about this matter to the technical contact listed below.

/RA/

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