

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
WASHINGTON, DC 20555

April 2, 1985

IE INFORMATION NOTICE NO. 85-25: CONSIDERATION OF THERMAL CONDITIONS IN THE DESIGN AND INSTALLATION OF SUPPORTS FOR DIESEL GENERATOR EXHAUST SILENCERS

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or a construction permit (CP).

Purpose:

This information notice is provided to alert recipients of a potentially significant problem pertaining to the effects of thermal conditions on supports for diesel generator exhaust silencers. It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude a similar problem occurring at their facilities. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

Seabrook - An NRC regional inspection (50-443/84-02 and 50-443/84-04) identified cracks in the concrete supports for the diesel generator exhaust silencers that were manufactured by Riley-Beard, Incorporated. Further investigation by the licensee determined that the set of concrete pedestals supporting the exhaust silencer tank for one of the diesel generators cracked during operational testing. The cracking was caused by thermal expansion, which had not been accounted for in the pedestal base plate design of the steel support saddles of the exhaust silencers. These support saddles experienced temperatures in excess of 200°F and expanded more than the anchor bolt clearances allowed at the base plate. Significant restraining forces developed in the anchor bolts and in the concrete pedestals where the anchor bolts were set. In addition, temperatures above 200°F, which were higher than the maximum recommended sustained temperature of the concrete, were reached near the top portion of the concrete pedestal.

River Bend - The NRC Construction Appraisal Team (CAT) inspection at the River Bend Nuclear Power Station found that the exhaust silencers for the Trans-america Delaval, Inc. diesel generators were installed without any sliding connection for thermal expansion. Investigation by the architect/engineer found that the manufacturer's installation drawing was incorrect.

Shearon Harris - At the Shearon Harris Nuclear Power Station, the NRC CAT inspectors found that the diesel generator exhaust silencers, manufactured by American Air Filter Company, had grout in and around the slotted sections of the base plates. These sections were designed to be clear to allow for movement caused by thermal expansion. In addition, the concrete support pad under the sliding attachment for one of the exhaust silencers was sloped in such a fashion as to cause the attachment to wedge itself tight as expansion occurred.

Braidwood - At the Braidwood Nuclear Power Station, the applicant identified cracked concrete pedestals of the diesel generator exhaust silencers manufactured by Riley-Beard, Incorporated. The architect/engineer determined that the original design did not properly account for thermal expansion. During the Braidwood NRC CAT inspection, the CAT inspectors also noticed that the bolted connections of the sliding ends of the exhaust silencers may have been too tight to permit movement for thermal expansion. Corrective action required modifying the sliding joints of the exhaust silencers.


Discussion:

The deficiencies described above show that there was inadequate consideration of thermal conditions in the supports for exhaust silencers at four nuclear plant sites. Generally, thermal conditions of the diesel generator exhaust silencers were not adequately accounted for in either the design or installation requirements for the component concrete pedestals and sliding joints. As a result, in two cases the forces created by expansion when the exhaust silencers reached operating temperatures caused damage to the concrete pedestals.

If left as they are, the cracked foundations for the exhaust silencers may not be able to support imposed loads in a seismic event. Failure of the exhaust silencers could reduce the capacity of the diesel generators.

Similar problems may exist with other mechanical equipment that operates at elevated temperatures and that is supported by concrete pedestals with sliding connections.

No specific action or written response is required by this information notice. If you need additional information about this matter, please contact the Regional Administrator of the appropriate NRC regional office or this office.

  
Edward L. Jordan, Director  
Division of Emergency Preparedness  
and Engineering Response  
Office of Inspection and Enforcement

Technical Contact: John Nemoto, IE  
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Attachment: List of Recently Issued IE Information Notices

LIST OF RECENTLY ISSUED  
 IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
85-24	Failures Of Protective Coatings In Pipes And Heat Exchangers	3/26/85	All power reactor facilities holding an OL or CP
85-23	Inadequate Surveillance And Postmaintenance And Post-modification System Testing	3/22/85	All power reactor facilities holding an OL or CP
85-22	Failure Of Limitorque Motor-Operated Valves Resulting From Incorrect Installation Of Pinon Gear	3/21/85	All power reactor facilities holding an OL or CP
85-21	Main Steam Isolation Valve Closure Logic	3/18/85	All PWR facilities holding an OL or CP
85-20	Motor-Operated Valve Failures Due To Hammering Effect	3/12/85	All power reactor facilities holding an OL or CP
85-19	Alleged Falsification Of Certifications And Alteration Of Markings On Piping, Valves And Fittings	3/11/85	All power reactor facilities holding an OL or CP
85-10 Sup. 1	Posstensioned Containment Tendon Anchor Head Failure	3/8/85	All power reactor facilities holding an OL or CP
84-18	Failures Of Undervoltage Output Circuit Boards In The Westinghouse-Designed Solid State Protection System	3/7/85	All Westinghouse PWR facilities holding an OL or CP
83-70 Sup. 1	Vibration-Induced Valve Failures	3/4/85	All power reactor facilities holding an OL or CP
85-17	Possible Sticking Of ASCO Solenoid Valves	3/1/85	All power reactor facilities holding an OL or CP

OL = Operating License  
 CP = Construction Permit