

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
WASHINGTON, D.C. 20555

April 30, 1985

IE INFORMATION NOTICE NO. 85-34: HEAT TRACING CONTRIBUTES TO CORROSION FAILURE  
OF STAINLESS STEEL PIPING

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 use of heat tracing, especially with tubes containing traces of chemical contamination. It is expected that recipients will review the information in this notice 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:

On December 7, 1984, Pilgrim Nuclear Power Station reported seven through-wall cracks in 50 feet of type 304 stainless steel piping that was installed in a horizontal position. The 1 inch piping is part of the postaccident sampling system (PASS) and the containment atmospheric continuous monitoring system. The cracks were discovered during final testing, before initial service.


The piping was installed in August 1984 with heat tracing set for approximately 270°F. During the installation and calibration of the heat tracing equipment, temperatures were periodically higher in various portions of the piping. Although the lines were intended to have a slope for draining purposes, interface requirements led to a horizontal line.

The piping carries gas samples and heat tracing is used to keep it dry. During installation it was filled with clean water several times for hydrostatic testing and flushing of the system. The water was removed by blowing air through the pipe and using the heat tracing for final drying. During evaporation, the chlorides present in the water concentrated where the pipe sagged. The combination of concentrating the chlorides, having regions where the pipes sagged, and applying heat to these areas resulted in chloride-induced stress corrosion cracking in those regions.

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The noteworthy aspect of this event is that the trace chemicals in the water will concentrate as the water is being evaporated by the use of heat tracing. The water may be introduced during hydrostatic testing or as moisture in the gas samples. Repeated evaporation will lead to a buildup of chemicals and may eventually cause corrosion of the piping that is kept hot by the heat tracing.

No specific action or written response is required by this information notice. If you have any questions 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

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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
84-84 Rev. 1	Deficiencies In Ferro-Resonant Transformers	4/24/85	All power reactor facilities holding an OL or CP
85-33	Undersized Nozzle-To-Shell Welded Joints In Tanks And Heat Exchangers Constructed Under The Rules Of The ASME Boiler And Pressure Vessel Code	4/22/85	All power reactor facilities holding an OL or CP
85-32	Recent Engine Failures Of Emergency Diesel Generators	4/22/85	All power reactor facilities holding an OL or CP
85-31	Buildup Of Enriched Uranium In Ventilation Ducts And Associated Effluent Treatment Systems	4/19/85	All uranium fuel fabrication licensees
85-30	Microbiologically Induced Corrosion Of Containment Service Water System	4/19/85	All power reactor facilities holding an OL or CP
85-29	Use Of Unqualified Sources In Well Logging Applications	4/12/85	All well logging source licensees
85-03 Sup. 1	Separation Of Primary Reactor Coolant Pump Shaft And Impeller	4/9/85	All power reactor facilities holding an OL or CP
85-28	Partial Loss Of AC Power And Diesel Generator Degradation	4/9/85	All power reactor facilities holding an OL or CP
85-27	Notifications To The NRC Operations Center And Reporting Events In Licensee Event Reports	4/3/85	All power reactor facilities holding an OL or CP

OL = Operating License  
 CP = Construction Permit