IN 86-106 S

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

November 10, 1988

NRC INFORMATION NOTICE NO. 86-106, SUPPLEMENT 3: FEEDWATER LINE BREAK

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This supplement to Information Notice (IN) 86-106 is intended to provide addressees with additional information about a potential problem that resulted in thinning of secondary system piping at both units of an operating nuclear power station and the catastrophic failure of a main feedwater suction pipe. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Discussion:

IN 86-106, Supplement 1, was issued on February 13, 1987, to provide additional information regarding the catastrophic feedwater line break at Surry Power Station, Unit 2. Results of the licensee's failure analysis and the NRC technical panel conclusions concerning the pipe break failure mechanism were discussed in Supplement 1. Supplement 2 addressed system interactions.

During the September 1988 outage, the Surry licensee discovered that pipe wall thinning had occurred more rapidly than expected. On the suction side of one of the main feedwater pumps, an elbow that was installed during the 1987 refueling outage lost 20 percent of its 0.500 inch wall in 1.2 years. In addition, wall thinning is continuing in safety-related main feedwater piping and in other non-safety-related condensate piping.

On the basis of partial inspection results, the licensee indicated that the broad area thinning rate for the replacement piping, installed during the last refueling outage, is roughly 60 mils/year. The maximum localized thinning rate is 90 mils/year. These rates were higher than the 20 to 30 mils/year rate estimated previously. The estimated rate of 20 to 30 mils/year was based on a single measurement and an assumption that wall thinning had been

8811040324

progressing linearly since initial full-power operation was achieved. This new rate of wall thinning, which is based on a second data point, indicates that significant wall thinning may have coincided with a reduction in feedwater dissolved-oxygen concentration subsequent to steam generator replacement. The lower rate of wall thinning associated with a higher feedwater dissolved-oxygen concentration is consistent with the low rates of erosion/corrosion reported in IN 88-17, "Summary of Responses to NRCB 87-01, 'Thinning of Pipe Walls in Nuclear Power Plants'," for boiling water reactors (BWRs), which typically operate at a feedwater dissolved-oxygen concentration of approximately 30 ppb. The licensee is continuing its failure analysis to determine the cause(s) of the increase in the estimated pipe wall thinning rate. Because the measured rate of pipe wall thinning is in excess of the previously estimated rate, the scheduled frequency of future inspections may need to be reexamined to ensure that code-allowable wall thickness is maintained.

Additional information pertaining to erosion/corrosion in feedwater-condensate system piping can be found in IE Information Notice Nos. 86-106; 86-106, Supplement 1; 87-36, "Significant Unexpected Erosion of Feedwater Lines"; 88-17; and NRC Bulletin 87-01, "Thinning of Pipe Walls in Nuclear Power Plants."

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact listed below or the Regional Administrator of the appropriate regional office.

Charles E Rossi

Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Technical Contact: Paul Wu, NRR
(301)492-0826

Attachment: List of Recently Issued NRC Information Notices