

NORTHEAST UTILITIES



The Connecticut Light And Power Company
Western Massachusetts Electric Company
Holyoke Water Power Company
Northeast Utilities Service Company
Northeast Nuclear Energy Company

General Offices · Seiden Street, Berlin Connecticut

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April 10, 1989
MP-12950

Re: Millstone Unit 2
Technical Specification 4.4.5.1.5.c

Mr. William T. Russell
Regional Administrator
Region I
U. S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA. 19406

Reference: Facility Operating License No. DPR-65
Docket No. 50-336

Gentlemen:

This letter provides information required by Millstone Unit 2 Technical Specification 4.4.5.1.5.c and constitutes the Special Report required by that specification.

During the inservice inspection of steam generator tubes conducted in February 1989, defects greater than the repair limit (40% through wall penetration) were identified in 301 tubes in No. 1 Steam Generator and 113 tubes in No. 2 Steam Generator. In addition, 3 tubes in No. 1 Steam Generator and 16 tubes in No. 2 Steam Generator could not be adequately examined. Both the defective tubes and the tubes which could not be adequately examined were removed from service by plugging.

During the inspection all unsleeved inservice tube ends (24,593 tube ends) were examined with a narrow groove, high frequency, bobbin coil eddy current probe. All tube ends in the region susceptible to cracking (12,556 tube ends) were examined with a rotating pancake coil eddy current probe. Approximately 1000 sleeved tube ends were examined with a specially designed segmented bobbin coil eddy current probe. Over 4000 tubes were examined full length with conventional bobbin coil eddy current probes.

Two defect types accounted for all of the observed defects. Circumferential cracks at the top of the tubesheet were identified in 309 tube ends. Pit type defects exceeding the repair limit were identified, in a region extending several inches above the top of the tubesheet, in 125 tube ends. Some tubes had more than one type defect.

Circumferential cracking at the top of the tubesheet was first identified in February 1987 and subsequently confirmed during the 1988 inservice inspection of the steam generator tubes. Pit type defects have been identified in the steam generators since 1981. With the exception of about 30 larger volume, larger depth pit type defects initiated during the most recent operating cycle, average through wall growth of pit type defects was less than 2 percent. Investigation is continuing to identify possible causes of the larger volume pits.

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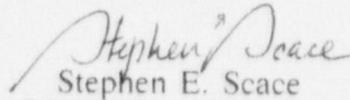
Examination of a failed tube removed in 1988, indicates the cause of the circumferential cracking was probably caustic stress corrosion cracking. Analysis of the cation/anion hideout return ratio indicates that major improvements in secondary water chemistry control near the end of Operating Cycle 7 resulted in a shift in the local chemistry in the sludge pile at the top of the tubesheet toward a caustic condition. Operation with this condition during the remainder of Operating Cycle 7, Operating Cycle 8, and the first two months of the most recent operating cycle resulted in the observed degradation. Boric acid addition to the secondary side of the steam generator was initiated during the most recent operating cycle to modify this local area chemistry and reduce cracking. It is expected that subsequent operating periods will result in significantly reduced amounts of tube cracking.

All tubes with circumferential defects were stabilized as well as being plugged. This will prevent any contact with adjacent tubes in the unlikely event that cracking continues to tube separation after plugging.

These actions meet all Millstone Unit 2 Technical Specification requirements and when combined with a continuing program of proper chemistry control provide assurance that the Millstone Unit 2 steam generators can be safely operated during the upcoming operating cycle.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



Stephen E. Scace
Station Superintendent
Millstone Nuclear Power Station

SES:RTB

cc: P. Habighorst, NRC Resident Inspector
W. Raymond