NORTHEAST UTILITIES

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October 1, 1991

Docket No. 50-423
B13930
ASME Section XI

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

References:
1. E. J. Mroczka letter to the U.S. Nuclear Regulatory Commission, "Overpressurization of Isolated Reactor Coolant System 'B' Loop," dated April 3, 1991.
2. D. H. Jaffe letter to E. J. Mroczka, "Millstone 3--Evaluation of the March 23, 1991, Overpressure Incident (TAC No. 80059)," dated April 5, 1991.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
Evaluation of the March 23, 1991, Overpressure Incident (TAC No. 80059)

On March 23, 1991, Millstone Unit No. 3 inadvertently pressurized the isolated portion of the 'B' reactor coolant system loop (outboard of the loop stop valves). The isolated loop was exposed to pressures potentially as high as 2500 psi and temperatures as low as 70°F. The secondary side of the steam generator (SG) was full of water, but was not pressurized. The water temperature of the secondary side also was 70°F or higher. At that time, the other three loops were filled and both Loop 'B' stop valves were closed. The affected components were the loop stop valves, the reactor coolant pump, piping, and the SG.

The overpressurization event caused an excursion outside the normal operating pressure and temperature limits specified in the Millstone Unit No. 3 Technical Specification Sections 3.4.9.1, "Pressure/Temperature Limits," and 3.7.2, "Steam Generator Pressure/Temperature Limitation." As required by the above Technical Specifications, an engineering evaluation was performed to determine the effects on the structural integrity of the affected components. The engineering evaluation was performed using the guidance of ASME Code Section XI, Appendix E. In a letter dated April 3, 1991 (Reference 1), Northeast Nuclear Energy Company (NNECO) submitted to the NRC the results of the engineering evaluation.

In a letter dated April 5, 1991 (Reference 2), the NRC concluded that while NNECO's evaluation supports start-up and operation during Cycle 4, NNECO has not clearly demonstrated that NNECO's inspection technique will detect flaws of the size involved. However, to ensure that there are no flaws exceeding the critical size within the primary SG manway forging, the NRC requested that

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within 6 months of Reference 2, NNECO must demonstrate that their inspection technique is capable of detecting this size flaw. The purpose of this submittal is to present that information to satisfy the Staff's request included in Reference 2. Originally, NNECO had planned to duplicate the nozzle inner radius examination technique on a flawed specimen. However, the design, manufacture, and procurement activities associated with it would have required us to seek an extension to our present commitment date for an additional several months. Instead, using the existing plant condition (shutdown) and access to the SG possible, NNECO determined that it was prudent to take the conservative approach and use the high-angle longitudinal wave technique (HALT) inspection for demonstration purposes. NNECO presently has in its possession four clad test specimens with imbedded cracks (0.13" to 0.41" D) and other reflectors. On September 18, 1991, the clad test plate was scanned using the HALT, and test results were evaluated by EPRI and found to accurately detect and locate actual flaws smaller than our previous 0.25" x 1.5" L. This blind test was used to validate our procedure and qualify the inspectors who performed the examination.

The HALT inspection uses tip diffraction signals for both the detection and sizing of flaws. It is a highly reliable technique for underclad cracking. Flaws are easily identified by their large signal travel and relatively obvious higher-than-material noise flaw tip signal. Higher resolution of flaw signals compared to shear waves is another advantage. Unfortunately, this technique requires the transducer and examiner to be on the interior clad surface for the exam making it impracticable for all circumstances. Our particular examination of the SG manway inner radius required only the examiner's hand and not the whole body be exposed to higher radiation fields. The above technique was utilized on the SG manways on September 26, 1991. The results of the examination identified no flaws in the area examined (Figure 1).

The results of the examination concluded that the April 3, 1991, conclusions are still valid in that the integrity of the affected components was not compromised by the overpressurization event.

NNECO believes that this letter fulfills the Staff's request regarding the inspection technique for detecting the critical flaw. If you have any questions, please contact our licensing representative directly.

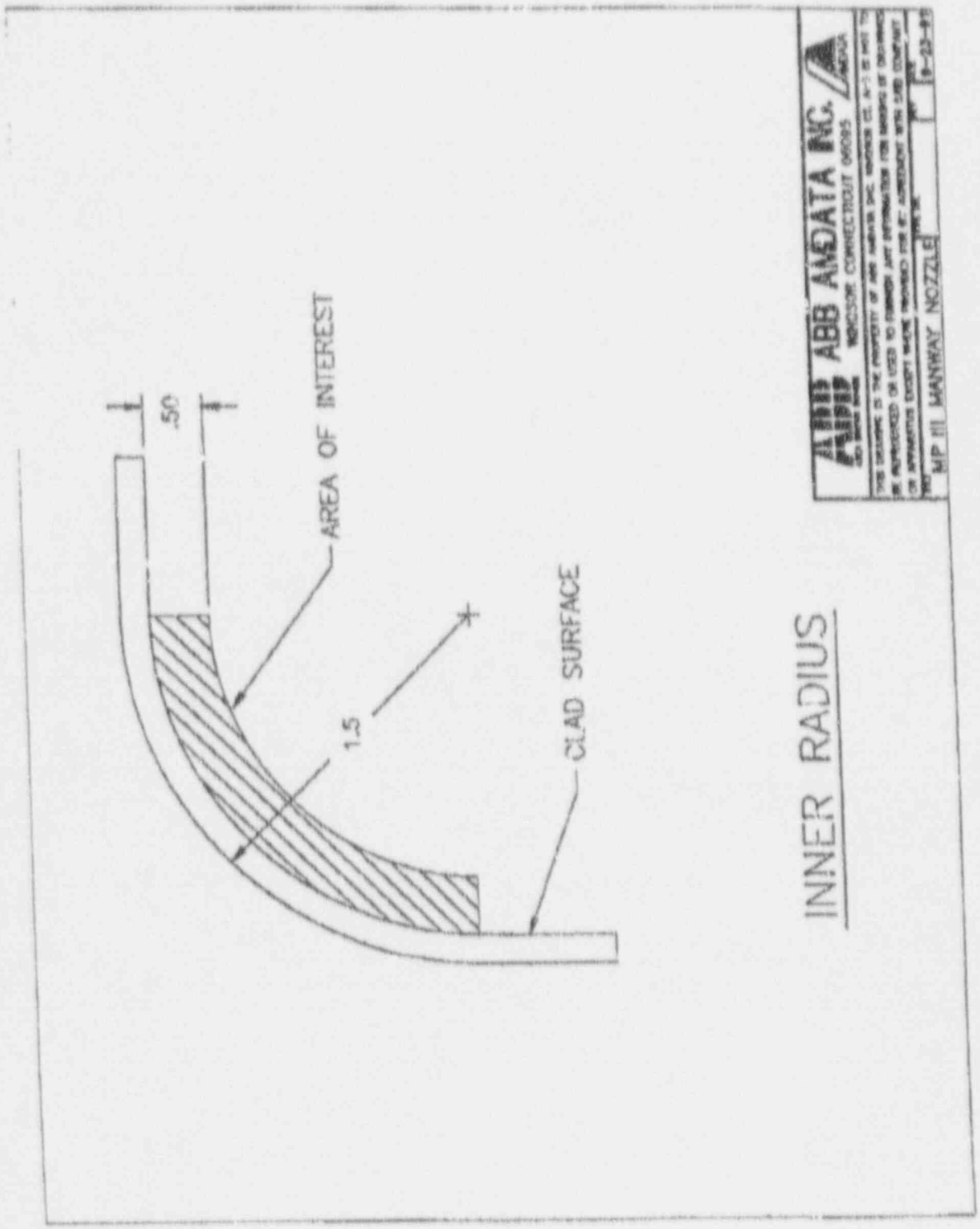
Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

E. J. Mroczka
Senior Vice President

cc: T. T. Martin, Region I Administrator
D. H. Jaffe, NRC Project Manager, Millstone Unit Nos. 1 and 3
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3

FIGURE 1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AREA OF INTEREST
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