



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF FROM ASME CODE REPAIR REQUIREMENTS

FOR ASME CODE CLASS 3 PIPING

VERMONT YANKEE NUCLEAR POWER CORPORATION

VERMONT YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-271

1.0 BACKGROUND

Temporary Non-Code Repairs

The Code of Federal Regulations at 10 CFR 50.55a(g) requires nuclear power facility piping and components to meet the applicable requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (hereafter called the Code). Section XI of the Code specifies Code-acceptable repair methods for flaws that exceed Code acceptance limits in piping that is in service. A Code repair is required to restore the structural integrity of flawed Code piping, independent of the operational mode of the plant when the flaw is detected. Those repairs not in compliance with Section XI of the Code are non-Code repairs. However, the required Code repair may be impractical for a flaw detected during plant operation unless the facility is shut down. Pursuant to 10 CFR 50.55a(g)(6)(i), the NRC will evaluate determinations of impracticality, and may grant relief and may impose alternative requirements. Generic Letter (GL) 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping," dated June 15, 1990, provides guidance for the staff in evaluating relief requests submitted by licensees for temporary non-Code repairs of Code Class 3 piping. The staff may grant relief based on a staff evaluation considering the guidance in GL 90-05.

Licensee's Relief Request

By letter dated September 15, 1995, Vermont Yankee Nuclear Power Corporation (the licensee) requested relief from Code repair requirements for a pin hole leak in a moderate energy Class 3 pipe at the Vermont Yankee Nuclear Power Station. The leak was detected in an 8-inch nominal pipe size (NPS), STD schedule (0.322" wall), service water (SW) supply line to the "B" emergency diesel generator (EDG). The leak is located in a horizontal straight run of piping upstream of the control rod drive (CRD) pump room cooler (reactor recirculation unit (RRU) 9) and downstream of the emergency core cooling system (ECCS) corner room coolers (RRUs 6 and 8).

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Enclosure

The SW system is a moderate energy piping system with a design temperature of 85°F and a design pressure of 125 psig. The pipe is carbon steel ASTM A-106 grade B. Repair of the leak would require isolation of the service water supply to the "B" residual heat removal service water (RHRSW) heat exchanger, the "B" EDG, RRUs 6, 8, and 9, reactor building closed cooling water heat exchanger E-8-1B, the standby fuel pool cooling heat exchangers E-19-2A and -2B, and RHRSW pumps P8-1B and P8-1D. It is considered impractical to isolate these systems and perform a Code repair while the plant is in operation.

2.0 DISCUSSION

The leak is located in a horizontal straight run of piping in the 7 o'clock position. The leakage rate is approximately 0.75 gallons per hour. Ultrasonic examinations (UT) of the pipe were performed. The UT exams showed several small localized areas which appeared to be indicative of microbiologically induced corrosion (MIC) distributed around the circumference of the pipe. All measured wall thicknesses at these localized corroded areas were greater than or equal to 0.10 inches, except for the leak location and four other areas which measured 0.08 inches. The wall thickness of the majority of the pipe was greater than 0.20 inches. The Code required minimum wall thickness for this pipe is 0.036 inches. Augmented inspections of five additional pipe locations showed less wall thinning with a minimum wall thickness of 0.16 inches and average thicknesses of 0.24 to 0.27 inches. No inspected area was below the Code acceptable minimum.

A structural assessment was performed by use of GL 90-05 methods and the design Code unreinforced branch connection method with a safety factor of 2.0. The analysis showed that the structural margin is adequate to ensure the integrity of the piping system.

The licensee evaluated the effects of the leak on alternate cooling system inventory, SW cooling to essential plant equipment, Appendix R fire concerns, water spray on electrical equipment and the potential for flooding. Although the effects of the leak were found to be acceptable, the licensee installed a temporary clamp on the pipe to control the leakage. The clamp will be removed and reinstalled as needed to facilitate periodic UT inspections and will be removed once final repairs have been made.

Since the structural analysis conducted by the licensee has shown compliance with the guidance of the GL and the Code unreinforced branch connection method with a safety factor of 2.0, the licensee plans to leave the leak as is with the temporary clamp installed. Code repair will occur at the next available opportunity but not later than startup from the next refueling outage scheduled to begin September 1996. If the Code repair were imposed, the licensee would have to shut down the plant.

The licensee has committed to perform UT inspections of the pipe once every 3 months until a wall loss rate can be established to justify less frequent inspections of the leak area. Additionally, in a telecon on September 27, 1995, the licensee stated that it is monitoring the leakage once each week by removing the temporary clamp and measuring the leakage rate.

3.0 CONCLUSION

The licensee has demonstrated structural integrity of the pipe using the techniques of GL 90-05 and the Code unreinforced branch connection method and has satisfied the inspection and monitoring guidance of the GL.

The staff concludes that the Code requirements are impractical and that granting the relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest, given due consideration to the burden upon the licensee that could result if the Code requirements were imposed on the facility. Pursuant to 10 CFR 50.55a(g)(6)(i) and consistent with the guidance in GL 90-05, relief is granted until the next scheduled outage exceeding 30 days, but no later than the next refueling outage. A Code repair must then be completed.

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