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 December 1, 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 piping at the Vermont Yankee Nuclear Power Station. The leak was detected in a 1.5 inch diameter, 2.5 inch long spool piece in Class 3 piping which is used to maintain a static pressure in the fire water system when the fire water system is in standby.

The service water system is a moderate energy piping system with a design temperature of 85°F and a design pressure of 125 psig. The piping is Schedule 80 carbon steel piping with a nominal wall thickness of 0.2 inch. Attempts to isolate and repair the leak were unsuccessful due to a small amount of leakage past the isolation boundary valves, therefore it is impractical to isolate this leak and perform a Code repair.

2.0 DISCUSSION

The leak is located in a 2.5 inch long spool piece. The leakage rate is approximately one drop every 10 minutes. Ultrasonic examinations (UT) of the spool piece were performed. The UT exams showed wall thinning in a small localized area around the leak which appeared to be indicative of microbiologically induced corrosion (MIC). The measured wall thickness in this area ranged from 0.045 to 0.075 inch. One other localized flaw was identified with wall thickness ranging from 0.069 to 0.072 inch. The additional flaw was sufficiently far from the leak location that the licensee was not required to connect them for analytical purposes. The measured wall thickness of the remaining portions of the 2.5 inch long spool piece ranged from 0.10 to 0.19 inch. The Code-required minimum wall thickness for this piping is 0.008 inch.

The licensee performed a through-wall flaw evaluation following the guidance in GL 90-05. The evaluation concluded that a single flaw of less than a 0.375-inch diameter would be acceptable using the GL 90-05 guidance. This flaw size bounds the existing flaw as described by the UT examination. In addition, the licensee performed a structural analysis of the remaining portion of the pipe, conservatively assuming a wall thickness of 0.1 inch. The piping stresses were found to be acceptable.

The licensee evaluated the effects of the leak on service water system and alternate cooling system performance and concluded that the effects were acceptable given the small size of the leak.

Since the structural analysis conducted by the licensee has shown compliance with the guidance of GL 90-05, the licensee plans to leave the leak as is. Code repair will occur at the next available opportunity, but not later than startup from the next refueling outage, which is planned for 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 December 21, 1995, the licensee stated that it will perform a qualitative assessment of the leakage at least once each week to determine any degradation of structural integrity.

3.0 CONCLUSION

The licensee has demonstrated the structural integrity of the pipe using the through-wall approach of GL 90-05 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, giving 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.

Principal Contributor: D. Dorman

Date: January 17, 1996