

SAFETY EVALUATION BY THE MATERIALS ENGINEERING BRANCH - MATERIALS INTEGRITY SECTION SUPPORTING AMENDMENT NO. 1 TO LICENSE NO. DFR-73, METROPOLITAN EDISON COMPANY THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 2, DOCKET NUMBER 50-320

Introduction

Figure 3.4-4 of the Technical Specifications of Facility Operating License No. DFR-73 for the Three Mile Island Nuclear Station, Unit No. 2 requires compliance with a curve of reactor coolant system inservice leak and hydrostatic test heatup and cooldown limitations applicable for the first 5.0 effective full power years. This curve requires that an inservice pressure test of 2285 psi be performed at a temperature of 260°F.

Discussion

In our review and evaluation of the Final Safety Analysis Report for Three Mile Island Nuclear Station, Unit No. 2, we approved Figure 3.4-4 of the Technical Specification for the performance of inservice leak and hydrostatic test heatup and cooldown limits during the first 5.0 efpy. This curve is consistent with the analysis presented in BAW-10046A, "Methods of Compliance with Fracture Toughness and Operational Requirements of 10 CFR 50 Appendix G." The curve shows system pressure vs system temperature. The licensee has proposed performing an inservice hydrostatic test, at 2285 psia and 180°F, prior to service because of repairs that have been made to the pressure boundary. In the interest of avoiding delays that could result from performing the testing of the new

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pressure boundaries that have not yet been hydrostatically tested at the higher temperature, the applicant has requested this license amendment. Additionally, the applicant states that a more thorough inspection can be accomplished at the lower hydrostatic test temperature.

Evaluation

The proposed test temperature of 180°F is not the fluid or system temperature, but the actual metal temperature on the outside of the vessel closure head at its juncture with the flange, which is the area of highest stress on pressurization. Also, the temperature will be essentially static (i.e., a very low heating rate), which will essentially eliminate thermal stresses and therefore permit testing at the lower temperature. The analysis has been performed by B & W in accordance with the methods shown in BAW-10046A. It is also noted that the field hydro, at 3125 psi and 177°F, has been performed using a flaw size of 1/8T at the closure head-flange juncture for the analysis of the preservice hydrostatic test. The use of the 1/8T flaw size for inservice leak test prior to operation is justified in light of the vessel being fabricated and inspected in accordance with Section III requirements and the lack of significant fatigue cycling since the nondestructive examination of the vessel. Following initial criticality all subsequent inservice leak testing is required to be performed to the requirements of the Technical Specification. These requirements are from BAW-10046A which uses a 1/6T flaw size for the analysis for inservice leak testing.

Conclusion

We have concluded, based on the considerations discussed above, that the license condition read "The requirements of the Technical Specifications Curve Figure 3.4-4 which prohibits hydrostatic testing as low as 180°F at pressures up to 2285 psia are hereby waived until initial criticality is achieved." This change (1) would not result in a significant increase in the probability or consequences of accidents previously considered or a significant decrease in any safety margin, it does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public. Also, we reaffirm our conclusions as otherwise stated in our Safety Evaluation Report.

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