



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 84 TO FACILITY OPERATING LICENSE NO. DPR-28

VERMONT YANKEE NUCLEAR POWER CORPORATION

VERMONT YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-271

1.0 Introduction

The Vermont Yankee Nuclear Power Corporation (VYNPC/the licensee), by letter dated January 23, 1984 proposed changes to the Technical Specifications to reduce the main steam line isolation valve (MSIV) low pressure setpoint to 800 psig from 850 psig, when the reactor is in run mode. The principal reason for the change is to reduce challenges to the containment isolation system and safety relief valves. Reduction of challenges to the safety relief valves is consistent with the objectives of the NUREG-0737, Item II.K.3.16, "Reduction in the Challenges and Failures of Relief Valves."

The purpose of the main steam line low pressure isolation is to prevent excessive vessel depressurization and cool down in the event of a pressure regulator malfunction. This low pressure isolation is not required for the primary containment and reactor vessel isolation during a steam line break accident. For steam line breaks, isolation signals are generated from high differential pressure across the main steam line flow restrictors.

2.0 Evaluation

The licensee, in order to determine the safety implications of reducing the MSIV low pressure isolation setpoint, submitted an analysis (NEDO-2243-1, "Safety Evaluation of MSIV Low Pressure Turbine Inlet Pressure Setpoint Change for Vermont Yankee Nuclear Power Station," Rev. 1, dated May 1983).

The analysis simulates plant response to a pressure regulator failure (open) assuming a 750 psig setpoint. The assumed 750 psig setpoint bounds the proposed 800 psig setpoint. The calculated maximum change in the vessel steam dome saturation temperature was used to calculate a vessel component peak thermal stress and fatigue usage factor. The calculations indicate that lowering the low pressure isolation setpoint from 850 psig to 800 psig will have a negligible effect on the reactor vessel's lifetime fatigue usage.

In the licensee's limiting transient analysis the vessel steam dome saturation temperature is reduced from 549°F to 510.6°F. At these temperatures, the vessel materials will behave in a ductile rather than brittle fashion. Since the reactor vessel materials will behave in a ductile fashion during the limiting transient, the staff considers that

reducing the proposed setpoint to 800 psig, will not increase the risk of brittle fracture of the reactor vessel.

The licensee has also evaluated the radiological releases resulting from the lowering of the MSIV low pressure isolation setpoint. It was determined that for the design basis main steam line break outside containment, the calculated radiological releases will not change since the MSIV isolation is assumed to occur on high steam line flow rate, not on low main steam line pressure. Breaks that are too small to be detected by the high flow sensors are assumed to be detected either by temperature sensors in the steam tunnel or area radiation monitors in the turbine building. We agree with the licensee's conclusion that no change in doses would be calculated for a main steam line break accident as a result of this change.

The maximum critical power ratio (MCPR) limit will also not be affected by the reduced low pressure isolation setpoint because a reactor water level scram will reduce power level before the pressure of 850 psig is reached. Therefore, any subsequent differences between 850 psig and 750 psig will not affect the calculated MCPR limit.

3.0 Summary

Based on the analysis results provided by the licensee, in support of the MSIV low pressure isolation setpoint from 850 psig to 800 psig we have concluded that there will be no adverse effects on 1) the vessel's lifetime fatigue usage, 2) the vessel material's brittle fracture resistance, 3) the radiological releases and 4) the MCPR operating limits. Therefore, we find the proposed Technical Specification change acceptable.

4.0 Environmental Considerations

This amendment involves a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

5.0 Conclusion

We have concluded, based on the considerations discussed above, that:
(1) there is reasonable assurance that the health and safety of the public

will not be endangered by operation in the proposed manner, and (2) 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.

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Dated: December 4, 1984