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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 67 TO PROVISIONAL OPERATING LICENSEE NO. DPR-21

NORTHEAST NUCLEAR ENERGY COMPANY

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 1

DOCKET NO. 50-245

1.0 INTRODUCTION

By letter dated March 19, 1980, as supplemented April 16 and 29, 1980 and May 2, 1980, Northeast Nuclear Energy Company (NNECo or the licensee) requested changes to the Technical Specifications appended to Provisional Operating License No. DPR-21 for Millstone Nuclear Power Station, Unit No. 1. The changes to the Appendix A Technical Specifications would add an automatic initiation of the Isolation Condenser on reactor vessel low-low water level and would allow credit for the Isolation Condenser system in the Emergency Core Cooling System (ECCS) performance calculations.

2.0 DISCUSSION

The proposed changes respond to a recently discovered Low Pressure Coolant Injection (LPCI) loop selection logic insensitivity for small break mitigation. The licensee has administratively imposed Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) restrictions and conservatively revised ECCS initiation setpoints, such that, even with the LPCI loop selection logic insensitivity, the consequences of a small break Loss Of Coolant Accident (LOCA) are acceptable.

3.0 EVALUATION

In Reference 1, NNECO described the impact of the LPCI loop selection logic insensitivity to small break LOCAs, <0.1 ft , and explained interim corrective actions of administrative MAPLHGR reductions and a conservative setback of the Automatic Depressurization System (ADS) timer. The first of these interim corrective actions restricted reactor power density, which reduces peak cladding temperature (PCT) linearly with MAPLHGR for the small break LOCA. The setback of the ADS timer effectively moved up the reactor depressurization, so that low pressure ECCS subsystems (Core Spray) can inject into the reactor vessel earlier in the LOCA sequence which reduced PCT. In Reference 1, the licensee also presented MAPLHGR reduction factors which would allow the ADS timer to be set at its maximum Technical Specifications limit with no credit for LPCI loop selection logic. Because of the licensee's and our concerns on the increased probability of ADS actuation with the setback of the ADS timer, i.e., from 120 seconds to 45 seconds, the licensee has administratively imposed the more restrictive MAPLHGR reductions factor with a 120 second ADS timer. We concur with the licensees administrative actions.

The licensee has now proposed long term corrective actions in the form of Technical Specification changes (Reference 2). The changes would add an automatic initiation on low-low reactor vessel water level of the isolation condenser, would incorporate the isolation condenser as part of ECCS and would take credit for its function during LOCA, i.e., increase MAPLHGR limits from the current administrative reduction. The isolation condenser reduces the inventory loss during depressurization, increases the depressurization rate, and decreases the depressurization time which effectively results in earlier hot node recovery and lower PCTs for small break LOCAs.

The licensee has provided the results of a revised ECCS performance analysis which takes credit for isolation condenser operation and assumes failure of the LPCI loop selection logic. This analysis covered an appropriate range of break sizes, locations, and single failures, and utilized the standard General Electric Company (GE) ECCS performance methods with two additions to the analytical methods. The first of these additions is to determine the isolation condenser heat removal rate. GE calculated the heat removal rate at the pressure extremes for isolation condenser operation and used a linear interpolation to establish heat removal during depressurization. The second of these additions was to take credit for LPCI flow past the broken loop. GE calculated this flow rate based on conservative assumptions. Reference 3 provides a detailed description of these changes per our request. Credit for isolation condenser operation is taken by another operating reactor, e.g., Oyster Creek (Reference 4). The method used to simulate isolation condenser heat removal rate is appropriate for ECCS evaluation purposes. The modeling of LPCI flow past the break requires further review and consideration. Based on plant specific calculations by the licensee (References 5 and 6), we have concluded that without LPCI flow the model calculates lower PCTs. This is because of a lower plenum quenching phenomenon associated with LPCI flow which delays recovery of the hot node. Therefore, the use of the proposed MAPLHGR limits are acceptable without credit for LPCI flow past the break. Based on this conclusion and the fact that the analysis has been performed with GE's methodology which conforms to 10 CFR 50.46 and Appendix K, we find the analysis to be acceptable.

Based on the above, we find the resulting modifications to MAPLHGR limits and the proposed Technical Specification changes are acceptable for the remainder of Cycle 7 operations.

On the basis of documentary information provided by the licensee (Reference 3) in response to NRC questions 4 and 6, ongoing Systematic Evaluation Program Topic III-12 "Environmental Qualifications of Safety Related Equipment" and the re-evaluation and upgrading of the isolation condenser steam and condensate return line restraints currently in progress we conclude that the isolation condenser and related piping and electrical systems can meet the reliability requirements of Engineered Safety Features.

4.0 ENVIRONMENTAL CONSIDERATIONS

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR §51.5(d)(4) that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

5.0 CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment 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.

Date: May 8, 1980

REFERENCES

1. Letter from W. G. Counsil (NNECo) to D. L. Ziemann (USNRC), February 14, 1980.

2. Letter from W. G. Counsil (NNECo) to D. L. Ziemann (USNRC), March 19, 1980.

3. Letter from W. G. Counsil (NNECo) to D. L. Ziemann (USNRC), April 16, 1980.

4. "Safety Evaluation Report by the Office of Nuclear Reactor Regulation Regarding Review of the Exxon Nuclear Company Non-Jet Pump Boiling Water REactor ECCS Evaluation Model Described in Exxon Topical Reports XN-75-55 Revision 2, Dated August, 1976, XN-75-55, Revision 2, Supplement 1, Dated September, 1976, XN-75-55, Revision 2, Supplement 2, Dated December, 1976 for Conformance to Appendix K to 10 CFR 50," USNRC, February 25, 1977.

5. Letter from W. G. Counsil (NNECo) to D. M. Crutchfield April 29, 1980.

6. Letter from W. G. Counsil (NNECo) to D. M. Crutchfield May 2, 1980.