



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 159

TO FACILITY OPERATING LICENSE NO. DPR-65

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

DOCKET NO. 50-336

1.0 INTRODUCTION

By letter dated August 6, 1991, Northeast Nuclear Energy Company (the licensee), requested amendment to their Operating License No. DPR-65 for the Millstone Nuclear Power Station, Unit 2. The proposed amendment presented changes to the Technical Specifications due to revisions to the surveillance requirement acceptance criteria for the High Pressure Safety Injection (HPSI) pumps and the Low Pressure Safety Injection (LPSI) pumps. The proposed new acceptance criteria (Technical Specification 4.5.2.a.1.b) for HPSI is based upon the minimum differential pressure required when a pump is run on recirculation to meet the delivery curve assumed in the accident analysis. It is then adjusted upwards for instrumentation uncertainty and drift. A new LPSI pump curve (head vs capacity) was developed based on in-plant test data, then degraded by 10% of reference differential pressure to establish test acceptance criteria (Technical Specification 4.5.a.2.b). This acceptance criteria was then adjusted to take into account instrument uncertainties.

2.0 BACKGROUND

The licensee's review of the existing Technical Specification sections acceptance criteria for the HPSI and LPSI pump surveillance tests revealed an inconsistency between the acceptance criteria, the Technical Specification Requirements and the assumption in the plant's safety analysis. The proposed changes resolve those inconsistencies.

3.0 EVALUATION

The present accident analysis for Millstone Unit 2 assumes that the flow from the HPSI pumps will just begin to enter the Reactor Coolant System (RCS) at an RCS pressure of 1225 psia (1210 psig). However, the present Technical Specification (4.5.2.a.1.b) monthly acceptance criteria test requires that HPSI pumps develop a minimum discharge pressure of only 1125 psig when run on recirculation flow. The licensee has determined that to be consistent with the assumptions in the accident analysis, the HPSI pump discharge should be 1235 psig which translates to a pump differential pressure of 1209 psid, assuming the refueling water storage tank (RWST) is at its minimum level for

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switchover to pump recirculation. Using an upward adjustment to account for instrument uncertainties, the licensee proposes to increase the Technical Specification (TS) value to 1231 psid. We find this to be acceptable as it meets the existing accident analyses assumptions and includes allowances for instrument uncertainty.

The present accident analysis for Millstone Unit 2 assumes that flow from the LPSI pumps will just begin to enter the RCS at an RCS pressure of 209 psia (194 psig). This translates to a LPSI discharge pressure of 218 psig or a differential pressure of 192 psid assuming the RWST is nearly empty. However, Technical Specifications 4.5.2.a.2.b and 4.5.3.f.2 currently require the LPSI pumps to develop a minimum discharge pressure of only 162 psig when run on recirculation flow and a minimum flow rate for the sum of three lowest injection lines at runout of 2370 gpm. Although the LPSI pumps have been found to meet the current TS surveillance, there was a question regarding fulfillment of the original assumptions for the accident analysis. To resolve this question, the licensee performed LPSI pump tests to obtain best estimate LPSI pump curves (head vs capacity). From the pump curves, best estimate LPSI delivery curves (RCS flow vs pressure) were produced for pumps "A" and "B" and transmitted to the fuel vendor. The fuel vendor (ANF) found that the lower pressure at which the LPSI could begin delivery had no significant impact on the accident analysis. The licensee then degraded the differential pressure on the pump test curve by 10% to develop a conservative criterion. The minimum required differential pressure on recirculation flow (157 psi) and the minimum flow rate for the sum of the three lowest injection lines at runout (2850 gpm) were determined from the new delivery curve. A further adjustment was made to account for instrument inaccuracy. The resulting pump delivery curve more accurately represents the actual pump performance for each pump.

Although the LPSI delivery for the new curve begins at lower RCS pressure and is initially less than the delivery in the old curve, it has been found that the new LPSI delivery is greater near runout at low RCS pressure and provides more water for core cooling during a large break LOCA. The accident analysis has been reevaluated by the licensee using the new conservative LPSI delivery inputs and it was found that the calculated peak clad temperature is not increased as a result of the revision to the LPSI flow curves. Also, for Modes 4, 5 and 6, it was found that the current boron dilution analysis is still bounding with the revised LPSI flow curves and is therefore acceptable.

4.0 TECHNICAL SPECIFICATIONS

The following Technical Specification changes were reviewed:

4.5.2.a.1.b. Page 3/4.5-4 - Verification that each high-pressure safety injection pump: "Develops a differential pressure of ≥ 1231 psi on recirculation flow."

This was changed from "Develops a discharge pressure of ≥ 1125 psig on recirculation flow."

This is acceptable as explained in Section 3.0.

4.5.2.a.2.b. Page 3/4.5-4 - Verification that each low-pressure safety injection pump: "Develops a differential pressure of ≥ 157 psi on recirculation flow."

This was changed from "Develops a discharge pressure of ≥ 162 psig on recirculation flow."

This is acceptable as explained in Section 3.0.

4.5.3.f.2 Page 3/4.5-6 - LPSI Header flow balance:
The sum of the three lowest injection flows must be \geq "2370 gpm" was changed to "2850 gpm."

This increase is based on the results of testing the LPSI pumps and reevaluation of the accident analysis. The change is acceptable as discussed in Section 3.0.

Bases 3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEM, Page B 3/4.5-1

The BASES for the TS were modified to reflect the changes made to the TS for the HPSI and LPSI pumps.

Based on the staff evaluation in Section 3.0 above, the staff concludes that the licensee's proposed changes to Technical Specifications Surveillance Requirements 4.5.2.a.1.b, 4.5.2.a.2.b, 4.5.3.f.2, and their associated bases are acceptable to support the revisions to the HPSI and LPSI pump pressure.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Connecticut State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes surveillance requirements. The NRC 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 the amendment involves no significant hazards consideration, and there has been no public comment on such finding (56 FR 43811). Accordingly, the 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 the amendment.

6.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: June 16, 1992