UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 46 TO FACILITY OPERATING LICENSE NO. NPF-86

NORTH ATLANTIC ENERGY SERVICE CORPORATION

SEABROOK STATION, UNIT NO. 1

DOCKET NO. 50-443

1.0 INTRODUCTION

By application dated June 7, 1995, North Atlantic Energy Service Corporation (North Atlantic/the licensee) proposed an amendment to the Appendix A Technical Specifications (TS) for the Seabrook Station, Unit 1 (Seabrook). The proposed amendment would increase the temperature limits above which (1) reactor coolant sampling and analysis for dissolved oxygen is required and (2) when limits for dissolved oxygen apply. Specifically, the temperature limit stated in the footnotes to TS Surveillance Requirement (SR) 4.4.7 and to Table 3.4-2 would be increased to 250°F from 180°F.

2.0 DISCUSSION AND EVALUATION

Currently, SR 4.4.7 requires sampling and analysis of reactor coolant for dissolved oxygen and Table 3.4-2 specifies a dissolved oxygen limit whenever T_{avg} is greater than 180°F. North Atlantic has proposed to revise SR 4.4.7 and Table 3.4-2 by raising this temperature to 250°F. North Atlantic asserts that this change is consistent with current industry guidelines and practices for control of reactor coolant dissolved oxygen and that the change will enhance operational flexibility when returning the plant to service from cold shutdown conditions.

As discussed in Section 5.2.3.2d of the Seabrook Updated Final Safety Analysis Report (UFSAR), the purpose of the temperature limit for Reactor Coolant System (RCS) oxygen control is to minimize the corrosive effect at high temperatures on RCS components. At elevated temperatures, dissolved oxygen can lead to stress corrosion cracking and general corrosion of RCS components. North Atlantic notes that industry guidance and practice indicate that these mechanisms do not prevail at temperatures below 250°F; thus, these effects are reduced to a point of little concern at temperatures less than 250°F and operating controls need not be implemented until the coolant exceeds this temperature. North Atlantic notes further that the proposed changes are consistent with Standard Westinghouse Technical Specifications and with those of other plants of similar size and vintage.

The practice at Seabrook during plant heatup is to introduce hydrazine into the RCS to scavenge oxygen from the coolant when the RCS temperature is below 180°F to comply with the requirements of TS 3/4 4.7. However, because of the slow

reaction rate of hydrazine with oxygen at or below 180°F and because hydrazine simultaneously is decomposing rapidly, the effective removal rate of oxygen is slow. Thus, it is necessary to suspend heatup above 180°F until the dissolved oxygen is lowered to within the limit specified in Table 3.4-2.

The reaction rate of hydrazine with dissolved oxygen increases rapidly with increasing temperature. Thus, as temperature increases, the rate of oxygen scavenging relative to the hydrazine decomposition rate becomes greater and the removal of dissolved oxygen by hydrazine becomes more effective. The concentration of dissolved oxygen in the coolant could be brought into compliance with the specified limit faster if heatup could proceed above 180°F. North Atlantic's proposal to increase the temperature limit for applicability to 250°F would decrease the time needed to achieve compliance with the dissolved oxygen limit and decrease the overall time to restart the unit from cold shutdown.

The staff agrees that other similar Westinghouse units have adopted the Westinghouse Standard Technical Specification (NUREG-0450, Revision 4) with regard to the temperature limit of 250°F for applicability of the requirements for sampling, analysis, and dissolved oxygen limit. Further, the staff agrees that below 250°F, the influence of dissolved oxygen in the reactor coolant is not significant with regard to stress corrosion cracking and general corrosion of RCS components. Therefore, the staff finds acceptable, North Atlantic's proposals to change the footnote to SR 4.4.7 to indicate that sampling and analysis for dissolved oxygen when T_{avg} is equal to or less than 250°F is not required and to change the footnote to Table 3.4-2 to indicate that the limit for dissolved oxygen does not apply when T_{avg} is equal to or less than 250°F.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Hampshire and Massachusetts State officials were notified of the proposed issuance of the amendment. The State officials had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes a surveillance requirement. 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 (60 FR 37098). 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.

5.0 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.

Principal Contributor: Albert De Agazio

Date: November 29, 1995