

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

October 14, 1992

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 77 TO

FACILITY OPERATING LICENSE NO. NPF-38

ENTERGY OPERATIONS. INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

1.0 INTRODUCTION

By application dated January 30, 1992, Entergy Operations, Inc. (the licensee) submitted a request for changes to the Waterford Steam Electric Station, Unit 3 (Waterford 3), Technical Specifications (TS). The requested changes would modify TS Section 3/4.8.2, "D.C. Sources-Operating," and Table 4.8-2, "Battery Surveillance Requirements," to raise the average electrolyte temperature of a sample of battery cells from 60°F to 70°F and adjust the limits for specific gravity accordingly.

2.0 EVALUATION

The Waterford 3 direct current (dc) power system consists of three (60-cell) 125 volts dc batteries, each with its own battery charger, load center, and distribution panel. These three banks of batteries, designated 3A-S, 3B-S, and 3AB-S, and their associated load centers and distribution panels, are arranged to feed the safety-related redundant dc loads and non-safety-related loads associated with Division A, B, and AB. Batteries 3A-S and 3B-S are rated at 1200 ampere-hours for an 8-hour rate of discharge or 600 ampere-hours for a 1-hour rate of discharge to 1.75 volts per cell at 25°C (77°F). The 3AB-S battery is rated at 2400 ampere-hours for an 8-hour rate of discharge to 1.75 volts per cell at 25°C.

During the electrical distribution system functional inspection (EDSFI) conducted by the NRC at Waterford 3, the inspection team reviewed some battery-sizing worksheets. The team noticed that the worksheets identified a temperature correction factor of 1.0, which implied a minimum battery electrolyte temperature of 77°F. The team was concerned with the use of 77°F as a minimum electrolyte temperature because it did not correspond to the minimum electrolyte temperature of 60°F identified in the Waterford 3 TS Section 4.8.2.1.b.3. This discrepancy would require either a new calculation supporting the 60°F value or a change in the TS. Unable to support the 60°F temperature, the licensee established a new minimum TS limit for the battery electrolyte temperature. The licensee completed the analysis using the following worse-case operating conditions for the battery electrolyte temperature:

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- (2) The plant operating at 100% power.
- (3) Heating coils in the battery room are not available.
- (4) The air conditioning system delivering 55°F air to the battery room.

The analysis also assumed that the battery room temperature had not been monitored for a period of 24 hours. The battery room temperature is normally monitored every 12 hours and is equivalent to the battery electrolyte temperature. The results of the analysis showed that the electrolyte temperature for the station batteries should be 73.3"F in a 24-hour period based on the above assumptions and not 60°F as specified in Surveillance Requirement 4.8.2.1.b.3. For conservatism, the licensee used 70°F instead of 73.3°F for the battery capacity calculation, and the results showed that the battery had sufficient capacity to carry the rated loads. Using the lower temperature in the battery capacity calculation provides a larger margin of safety because at a lower temperature the battery has less capacity available to carry the rated loads. As a result of the above calculation, the licensee is requesting a change of the minimum average electrolyte temperature from 60°F to 70°F in Surveillance Requirement 4.8.2.1.b.3. Changing the minimum electrolyte temperature from 60°F to 70°F in the Waterford 3 TS and resizing the Waterford 3 batteries based upon the new /0°F value, provides the necessary consistency between the battery-sizing assumptions and the TS surveillance tests performed to verify operation within these assumptions. Therefore, the staff finds this TS change to be acceptable.

The inspection team also identified a discrepancy involving the TS surveillance requirements for the battery electrolyte specific gravity. The team found the specific gravity surveillance requirements specified in Table 4.8.2 of the TS to be inconsistent with manufacturer's recommendations documented in the vendor technical manual. In Table 4.8-2, the maximum difference permitted from the manufacturer's recommended full-charge specific gravity is specified. Generally, the table specifies that the average specific gravity of all the connected cells be no more than .010 below the manufacturer's recommended full charge-specific gravity to ensure the operability and capability of the battery. This is the criteria in the Combustion Engineering (CE) Standard TS, which assume a manufacturer's recommended full capacity-charge-specific gravi./ of 1.215. Consistent with the CE Standard TS, the batteries at Waterford 3 have a nominal fully charged specific gravity of 1.215 (at 77°F); however, the limits in Waterford 3 TS Table 4.8-2 are incorrect and are low by .005. The licensee could not justify any supporting basis for the discrepancy. The licensee has proposed to correct these limits to be consistent with the CE Standard TS and with the actual nominal fully charged specific gravity of the batteries at Waterford 3. The staff finds the proposed TS change to be more conservative and in line with the Waterford 3 design and therefore acceptable.

3.0 STATE CONSULTATION

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In accordance with the Commission's regulations, the Louisiana State official was notified of the proposed issuance of the amendment. The State official 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 in 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 (57 FR 7811). 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.

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