



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 127 TO

FACILITY OPERATING LICENSE NO. NPF-38

ENERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

1.0 INTRODUCTION

By application dated March 27, 1997, Entergy Operations, Inc. (the licensee), submitted a request for changes to the Waterford Steam Electric Station, Unit 3, (Waterford 3), Technical Specifications (TSs). The requested changes would modify surveillance requirements 4.5.2.d.3 and 4.5.2.d.4 by increasing the required amount of trisodium phosphate dodecahydrate (TSP) stored in the containment sump from 97.5 cubic feet to 380 cubic feet. Also, the corresponding amount TSP in the solubility test will be increased from 4 ± 0.01 grams to 13.07 ± 0.03 grams in 4 ± 0.1 liters of solution. The licensee is planning in the future to use longer fuel cycles and higher energy fuel which would require higher concentrations of boric acid in the reactor coolant. In order to neutralize this additional boric acid in the water collected in the containment sump after an accident, more TSP will be needed. The licensee calculated the amount of TSP required to ensure that for any future operations with higher enrichment fuel, the post-accident pH of the sump water will be maintained at the value greater than or equal to 7.

2.0 EVALUATION

In an operability evaluation, the licensee has determined that, for the existing boric acid concentrations in different systems in the plant, the amount of 97.5 cubic feet of TSP, currently stored in the sump baskets, is sufficient to maintain pH equal to or greater than 7 in the containment sump water after an accident. Also, this pH will not exceed the value where corrosion of aluminum surfaces or zinc on galvanized surfaces or in organic coatings could result in significant hydrogen generation. However, in the future, this amount will not be sufficient because the licensee is planning to increase concentration of boric acid in the Reactor Coolant System (RCS), Safety Injection Tanks (SITs) and Refueling Water Storage Pool (RWSP) to account for the longer fuel cycles and higher energy fuel designs at Waterford 3. This increase will result in a higher concentration of boric acid in the water collected in the containment sump after an accident. The licensee calculated that the highest expected concentration of boric acid in the sump will correspond to 3011 ppm of boron.

To neutralize this amount of boric acid and ensure that at all times the sump water pH will stay above 7, 380 cubic feet of TSP will be required. This larger amount of TSP will not cause operational problems with the existing boric acid concentrations because buffering action of the boric acid-TSP system will ensure that even for the solutions with lower concentration of boric acid, sump water will not reach alkalinity levels which would cause significant corrosion of aluminum and zinc. The licensee calculated that the highest expected pH of the sump water will be 8.1. This pH is below the value at which high corrosion of aluminum and zinc is expected. The staff performed independent verification of the licensee's analyses, presented in the submittal, and found them to provide a conservative evaluation of the problem.

As discussed above, the staff has evaluated the proposed TS amendment for post-accident control of pH in the containment sump water. It concludes that the licensee's proposed increase in the amount of TSP stored in the containment sump baskets will allow increased concentrations of boric acid in the RCS, SITs and RWSP without causing any operational problems. The proposed modification of TS surveillance requirements 4.5.2.d.3 and 4.5.2.d.4 and its Bases, is therefore, acceptable.

3.0 STATE CONSULTATION

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 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 (62 FR 17234). 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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Date: May 15, 1997