



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 207 TO FACILITY OPERATING LICENSE NO. DPR-53
AND AMENDMENT NO. 185 TO FACILITY OPERATING LICENSE NO. DPR-69
BALTIMORE GAS AND ELECTRIC COMPANY
CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-317 AND 50-318

1.0 INTRODUCTION

By letter dated January 31, 1995, the Baltimore Gas and Electric Company (BGE or the licensee) submitted a request for changes to the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, Technical Specifications (TSs). The requested changes would revise the TSs for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2, to increase the amount of Trisodium Phosphate (TSP) Dodecahydrate located in the sump baskets of each unit from 100⁵ feet to 298.3⁵ feet. The requested change is the result of an reanalysis performed by the licensee that indicated an increase in the amount of TSP was necessary to assure that the appropriate pH (acidity/alkalinity) would be maintained in the sump water subsequent to a loss-of-coolant accident (LOCA).

Specifically, the request would change the TS value in TS 4.5.2.e.3 from the current value of 100⁵ feet of TSP to 289⁵ feet of TSP. TS 4.5.2.e.4 would also be changed by moving the details of the required tests to the TS Bases Section B 3/4.5, but the requirement to perform the tests would remain. The requested changes will not alter the current acceptance criteria or test methods, with the exception of using an initial test temperature of 120 °F and allowing adjustments to the ratio of TSP to water to reflect changing plant conditions.

The containment spray activates, following a LOCA, to limit the containment pressure and temperature which in turn will reduce the possibility of airborne radioactivity leakage to the outside environment. The containment spray pumps discharge borated water from the refueling water storage tank (RWST) to the spray headers and nozzles which are located near the top of the containment. The spray water is collected in the containment sump where it is mixed with the reactor coolant system (RCS) water which has been released as the result of a LOCA. When the inventory in the RWST is nearly depleted, a Recirculation Actuation Signal (RAS) is initiated which switches the suction of the containment spray pumps from the RWST to the containment sump.

The Updated Final Safety Analysis Report (UFSAR), Chapter 14.24, "Maximum Hypothetical Accident," assumes the containment spray has a minimum pH of 5.0 for pre-RAS conditions for calculating the initial iodine removal by the containment spray and a containment sump pH of 7.0 to assure iodine retention during post-RAS conditions when the suction of the spray pumps has been switched to the containment sump.

2.0 EVALUATION

The current TS 4.5.2.e.3 requires verification that a minimum of 100³ feet of solid granular TSP is contained within the TSP storage baskets. Amendment Nos. 48 and 31 for Units 1 and 2, respectively, established the 100³ feet of TSP to maintain a containment sump pH of 7.0 during post RAS conditions. However, the licensee was verifying the basis for its TSP Surveillance Test Procedure (STP) and recalculated the amount of TSP required to maintain the pH of the sump water at 7.0. The results of the new calculations indicated that the minimum quantity of TSP necessary to maintain a pH of 7.0 is 289.3³ feet which is based on the highest expected boron concentration in the sump water following a LOCA. The as found amounts measured was 131³ feet in Unit 1 and 129³ feet in Unit 2.

The licensee performed an evaluation using the smallest as found amount of TSP, 129³ feet, which indicated that it would yield a pH of equal to or greater than 6.5. The licensee concluded, and the staff agrees, that there is no significant difference in the iodine retention or protection from stress crack corrosion between a pH of 6.5 and a pH of 7; thus, the as found amounts of TSP did not result in a condition adverse to safety. Based on the results of its evaluation, the licensee performed a 10 CFR 50.59 evaluation and installed larger baskets capable of holding 289.3³ feet of TSP in the sumps of each unit during their respective refueling outages. The units are currently operating with 289.3³ feet of TSP which is acceptable in that the TSs establish a minimum amount of TSP and allows an increase if needed to maintain the required pH to account for changing plant conditions.

NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports For Nuclear Power Plants," dated June 1978, indicates that a minimum pH of 7.0 should be maintained in the sump water. This level of pH not only controls the airborne activity by trapping radioactive iodine in solution, but also reduces the chloride stress corrosion cracking of metal components located in the containment and reduces hydrogen generation from the corrosion of galvanized materials in containment. In addition, the CCNPP1/2 UFSAR, Chapter 14.24, "Maximum Hypothetical Accident," assumes a pre-RAS containment spray pH of 5.0 for the iodine removal calculation and a post-RAS containment sump pH of 7.0 for iodine retention.

Therefore, the NRC staff has concluded that changing the minimum value of TS 4.5.2.e.3 from 100³ feet to 289.3³ feet of TSP is acceptable.

The proposed change to TS 4.5.2.e.4 relocates the details of the testing to the TS Base, does not change the requirement to perform the test, the current

test acceptance criteria or the test methods. However, the change will permit adjustments to the ratio of the TSP to borated water. The boron concentration of the test water will be representative of the maximum possible concentration corresponding to the maximum sump volume following a LOCA. The ratio changes can be performed under the controls of 10 CFR 50.59 as long as the ratio is reflective of a minimum value of 289.3³ feet of TSP. Thus, if changes to the primary system (such as an increase in fuel enrichment) results in a required increase in boron, the test ratio can be adjusted to reflect the change. The initial test temperature is changed to 120 °F, however, the temperature is adjusted to 77 °F when the pH is measured. The 120 °F is well below the expected temperature of the containment sump water following a LOCA and the 77 °F is a standard temperature to assure consistent chemistry test measurements.

Therefore, the NRC staff has concluded, based on the above, that the proposed changes to TS 4.5.2.e.4 are acceptable and that the tests will adequately measure the pH for the expected post LOCA conditions. TS 4.5.2.e.4 will retain the requirement to perform the tests and the test details will be moved to TS Bases, Section 3/4.5.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change 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 amendments involve 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 amendments involve no significant hazards consideration, and there has been no public comment on such finding (60 FR 14016). Accordingly, the amendments meet 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 amendments.

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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

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