



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 179 TO FACILITY OPERATING LICENSE NO. DPR-40  
OMAHA PUBLIC POWER DISTRICT  
FORT CALHOUN STATION, UNIT NO. 1  
DOCKET NO. 50-285

1.0 INTRODUCTION

By application dated May 31, 1996, Omaha Public Power District (OPPD) requested changes to the Technical Specifications (Appendix A to Facility Operating License No. DPR-40) for the Fort Calhoun Station, (FCS) Unit No. 1. The requested changes would revise the technical specifications (TSs) for FCS to increase the amount of trisodium phosphate (TSP) dodecahydrate located in the containment sump storage baskets from a minimum of 40 cubic feet to 110 cubic feet. The requested change is the result of analyses 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).

The requested change would move the details of the required verification tests to the TS Bases section, but the performance requirements would remain in the TS surveillance requirements (SR). The changes would not alter the current acceptance criteria or test methodology.

2.0 BACKGROUND

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.

3.0 EVALUATION

TS 3.6(2)d(i) requires verification that a minimum of 40 ft<sup>3</sup> of solid granular TSP is contained within the TSP storage baskets. License Amendment No. 44 established that 40 ft<sup>3</sup> of TSP was the minimum required to maintain a containment sump pH of 7.0 during post RAS conditions. During laboratory and chemical testing to verify the basis for its TSP surveillance test procedure,

(STP) the licensee determined the TS required minimum TSP was not sufficient. Although, the initial amount TSP tested raised the pH to the required 7.0, it did not represent the worst case conditions following a LOCA. The results of the new calculations indicated that the minimum quantity of TSP necessary to maintain a pH of 7.0 is 110 ft<sup>3</sup> which is based on the highest expected boron concentration in the sump water following a LOCA.

The licensee performed an operability evaluation and determined that the existing amount of TSP, would neutralize the containment sump to a pH of equal to or greater than 7.0 for the existing boric acid concentrations. The as-found amounts of TSP did not result in a condition adverse to safety. Based on the results of its evaluation, the licensee established administrative controls to ensure that the maximum boric acid concentration would not exceed the neutralizing ability of the TSP in the containment sump.

During the recent refueling outage (Fall 1996), the licensee completed a modification to install larger baskets capable of holding 110 ft<sup>3</sup> of TSP in the containment sump.

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 FCS Updated Safety Analysis Report (USAR), Chapter 14, "Safety Analysis," Section 14.15, "Loss of Coolant Accident," does not take credit for a post-LOCA minimum containment sump pH adjustment to 7.0 for the iodine removal and retention calculation until 10 hours after initiation of the event.

Based on the above, the NRC staff has concluded that changing the minimum value of TS 3.6(2)d(i) from 40 ft<sup>3</sup> to 110 ft<sup>3</sup> of TSP is acceptable.

The proposed change to TS 3.6(2)d(ii) moves the details of the surveillance testing to the TS Bases; however, it does not change the performance requirement of the test, the current test acceptance criteria or the test methodology. The details of the surveillance test are not required to be in the TS under 10 CFR 50.36. The proposed TS change will permit adjustments to the ratio of the TSP to borated water in the containment sump following a LOCA. The boron concentration of the test water will be representative of the maximum possible concentration corresponding to the maximum sump volume following a LOCA. 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 115-125°F; however, the temperature is adjusted to 75-79°F when the pH is measured. The 115-125°F is well below the expected temperature of the containment sump water following a LOCA and the 75-79°F is a standard laboratory practice temperature to assure consistent chemistry test measurements.

Therefore, the NRC staff has concluded, based on the above, that the proposed changes to TS 3.6(2)d(ii) are acceptable and that the tests delineated in the associated TS Bases, Section 3.6, will adequately measure the pH for the expected post LOCA conditions.

The proposed change to TS 2.3 adds a new limiting condition for operation, TS 2.3(4) and associated Bases consistent with NUREG-1432, "Combustion Engineering Standard Technical Specification," Revision 1, April 1995, and are acceptable.

The other changes are editorial corrections. A TS section heading, "Surveillance Requirement, Safety Injection and Containment Cooling Systems Tests (Continued)," was previously omitted in Amendment No. 44. Additionally, Amendment No. 171 was issued with a typographical error, the TS section number of a page heading should have been 3.0 instead of 13.0. Since these changes are editorial in nature, they are acceptable.

### 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Nebraska 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 (61 FR 40025). 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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