



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 94 TO FACILITY OPERATING LICENSE NPF-35
AND AMENDMENT NO. 88 TO FACILITY OPERATING LICENSE NPF-52
DUKE POWER COMPANY, ET AL.
CATAWBA NUCLEAR STATION, UNITS 1 AND 2
DOCKET NOS. 50-413 AND 50-414

1.0 INTRODUCTION

By letter dated August 6, 1991, the Duke Power Company (the licensee) submitted a request for changes to the Catawba Nuclear Station, Units 1 and 2, Technical Specifications (TS).

Catawba Units 1 and 2 are provided with a Boron Dilution Mitigation System (BDMS) which serves to detect uncontrolled boron dilution events in Modes 3-6 of plant operation. When an alarm setpoint is exceeded, each of the two trains of the BDMS will automatically shutoff both reactor makeup water pumps (RMWP), align the suction of the charging pumps to highly borated water from the refueling water storage tank, and isolate flow to the charging pumps from the volume control tank. Therefore, no operator action is necessary to terminate the boron dilution event and recover the shutdown margin.

When one or both trains of BDMS is operable in Modes 3-6, the current TS 3/4.3.3.12 and 3/4.9.2 define the limitation of the flow rate from the RMWP to values which have been calculated to allow sufficient operator action time to terminate the dilution prior to reactor criticality.

Based on a Westinghouse bulletin received by the licensee concerning potential nonconservatism in the existing boron dilution analysis, the licensee, in its letter dated August 6, 1991, proposed changes to TS on the new limitation of the flow rate from the RMWP as the results of a licensee's reanalysis of the boron dilution event.

2.0 EVALUATION

The licensee's submittal indicated that the previous analyses for Catawba did not take into account the difference in the fluid conditions of the reactor coolant system (RCS) relative to the dilution source conditions when determining the dilution flow rate. This resulted in nonconservative calculations of time from alarm to loss of shutdown margin, the applicable criterion for the boron dilution event.

In its reanalysis, the licensee has considered the temperature effects of the diluting water as it reaches the RCS. Since the diluting water is colder than the RCS inventory, the diluting water expands within the RCS. This expansion causes a given volumetric flow rate measured at the colder temperature to correspond to a larger volumetric dilution flow rate within the RCS. This temperature effect was not accounted for in the original analysis. This reduced the maximum allowable flow rate from the RMWPs from 200 gpm to 150 gpm for Mode 3 and from 80 gpm to 75 gpm for Mode 5. The original Mode 4 analysis had incorrectly used the Mode 5 and 6 minimum RCS water volume of 3588 ft³ (reduced inventory operation) instead of the correct Mode 4 value of 9029 ft³. This change of assumption overshadowed the temperature difference correction and resulted in an increase in the maximum allowable flow rate from the RMWPs from 80 gpm to 150 gpm for Mode 4. Also, to assure that the 30 minute operator action time for mitigation of a boron dilution event is available, the results of the licensee's reanalysis established a maximum allowable flow rate of 70 gpm from the RMWPs for Mode 6. The licensee has proposed changes to TS affected by the results of the reanalysis to incorporate the necessary changes in maximum allowable flow rate from the RMWPs.

The NRC staff has reviewed the licensee's submittal and concluded that the licensee's proposed changes to TS 3/4.3.3.1² and 3/4.9.2 are consistent with the results of their supporting analysis and therefore, are acceptable.

Other changes of an administrative nature have also been made as follows. Action (d) has been removed from TS 3.9.2.1 because the provision provided by it was included in the revised TS 3.0.4 in Amendment Nos. 48/41 pursuant to Generic Letter 87-09. The footnote in TS 3.3.3.12 and TS 3.9.2.1 referring to applicability after the first refueling outage of Unit 2 is extraneous since that milestone has been passed. The addition of the term "square root of 10" to TS 3.3.3.12 provides consistency with reference to the same parameters in TS 4.3.3.12 and 3.9.2.1. The removal of "3/4.3.3.12" from the title of the BDMS TS provides consistency with the titling of other TS. The spelling of the word "least" has been corrected in TS 4.9.2.1.2(c). These changes are administrative and clarifying in nature and are acceptable.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. 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 (56 FR 66919). 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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Date: March 3, 1992