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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 117 TO FACILITY OPERATING LICENSE NPF-35

AND AMENDMENT NO. 111 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 September 28, 1993, as supplemented February 17, 1994, Duke Power Company, et al. (the licensee), submitted a request for changes to the Catawba Nuclear Station, Units 1 and 2, Technical Specifications (TS). The amendments delete the portion of the 18-month surveillance requirement contained in TS 4.5.2.d associated with verifying that the decay heat removal system suction isolation valves automatically close on a reactor coolant system pressure signal less than or equal to 560 psig. Issuance of the amendments, in effect, authorizes removal of the residual heat removal (ND) autoclosure interlock (ACI) circuitry. Also, an obsolete footnote to TS 4.5.2.e is being deleted. This footnote is no longer necessary since the first Unit 1 refueling outage is complete. The February 17, 1994, letter provided clarifying information that did not change the scope of the September 28, 1993, application and initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The ND System for each Catawba unit includes two isolation valves arranged in series of the inlet line between the high pressure NC System and the lower pressure ND System. The two motor-operated gate valves are normally closed but are opened for decay heat removal purposes once NC System pressure and temperature have been reduced to about 425 psig and 350 degrees F. Each isolation valve is interlocked with one of two independent NC System pressure signals. One interlock prevents the valves from being opened when NC System pressure exceeds an actual plant setpoint of about 385.5 psig. This interlock and its associated TS are not affected by the proposed amendments. When the valves are in the open position, the other interlock, known as the ACI, causes the valves to automatically close if NC System pressure increases to an actual setpoint of about 600 psig.

The Commission and industry have previously recognized the safety benefits of removing the ACI circuitry from the ND System. The Commission's case study on long-term decay heat removal, Case Study Report AEOD/C503, "Decay Heat Removal Problems at U.S. Pressurized Water Reactors," December 1985, recommended that consideration be given to removal of the ACI circuitry to minimize loss of

decay heat removal events. The case study recognized, however, that in view of the differences among plants, the effects of ACI removal upon plant safety would need to be evaluated on a plant-specific basis. Also, a study performed for the Commission by Brookhaven National Laboratory, NUREG/CR-5015, "Improved Reliability of Residual Heat Removal Capability in PWRs as Related to Resolution of Generic Issue 99," May 1988, listed several improvements to reduce the risk of loss of decay heat removal. One improvement was the removal of the ACI circuitry from ND Systems. Also, in Generic Letter (GL) 88-17, "Loss of Decay Heat Removal," the Commission requested that TS that restrict or limit the safety benefit of actions identified in GL 88-17 should be identified and that appropriate changes should be submitted. One of the items in GL 88-17 that could limit such safety benefits was the ACI.

In parallel with the Commission's activities, the Westinghouse Owners Group evaluated the removal of the ACI circuitry on Westinghouse designed plants and issued WCAP-11736, "Residual Heat Removal System Autoclosure Interlock Deletion Report for the Westinghouse Owners Group," Volumes 1 and 2, Revision 0.0, February 1988. WCAP-11736 documents the probabilistic analysis performed on the removal of the ACI circuitry in terms of (1) the likelihood of an interfacing loss-of-coolant accident (LOCA), (2) ND System availability, and (3) low temperature overpressurization concerns. The results show that (1) the frequency of an interfacing system LOCA decreases with the removal of the ACI circuitry from the ND System accompanied by the addition of a control room alarm and procedural enhancements, (2) removal of the ACI increases ND System availability, and (3) removal of the ACI from the ND System has no effect on heat input transients, but will result in a small, but not significant, increase in the frequency of occurrence for some types of mass input transients with a decrease in others. The net effect of ACI deletion from the ND System is a net improvement in safety.

3.0 EVALUATION

In support of the application for amendments, the licensee referenced WCAP-11736. This report was approved by the Commission's staff for reference purposes on August 8, 1989, subject to applications on a plant-specific basis demonstrating applicability of results and conclusions of the WCAP to that facility. Accordingly, the licensee's proposal justifies that the results and conclusions of WCAP-11736 are valid for Catawba Units 1 and 2 and describes how the improvements identified by the WCAP will be implemented at Catawba.

The hardware changes proposed for the Catawba Station will be the removal of the ACI function from the ND suction valves. The existing open permissive interlock, which has an actual setpoint of 385.5 psig, will remain intact. An alarm (i.e., an annunciator in the control room) will be added to each isolation valve which will actuate if the valve is not fully closed (i.e., if the valve is in the "open" or "intermediate" position) and if NC pressure is above the actual setpoint. The licensee has selected a setpoint of 440 psig because this value is well below the ND System design pressure of 600 psig and provides adequate notification of increasing NC pressure while avoiding

potential conflicting interaction with the open permissive setpoint of 385.5 psig. Valve position indication will be provided to the annunciator by the motor operator limit switch. The licensee prefers use of the limit switch because it provides a direct position indication that is independent of the motor control circuit.

The NRC has required two diverse means to monitor the position of the residual heat removal (ND) suction valves once the valves are closed and power is removed. In Reference 1 (from the licensee's September 9, 1993, application), the licensee indicated that an annunciator alarm was proposed to be added as a means of satisfying this requirement. In Reference 2, the licensee noted the other means would be satisfied by using the valve position indication on the Operator Aid Computer (OAC). Wiring changes will be made to ensure the affected computer points will remain functional following power lockout of the valves. Also, procedure changes will be made to reflect the monitoring of valve position.

The staff concludes that the proposed hardware changes for Catawba are acceptable. Accordingly, the staff concludes that removal of the ACI from the Catawba ND System isolation valves, along with removal of power from the valves, and implementation of a reliable alarm system with associated training and procedures, are in accordance with WCAP-11736 as approved by the Commission and GL 88-17. Moreover, these modifications and actions represent a net improvement in safety. Therefore, the proposed TS changes reflecting these modifications and actions are acceptable.

4.0 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.

5.0 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 and change 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 (59 FR 10004 dated March 2, 1994). 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.

6.0 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: April 4, 1994