



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 29 TO FACILITY OPERATING LICENSE NO. NPF-63
CAROLINA POWER & LIGHT COMPANY
SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1
DOCKET NO. 50-400

1.0 INTRODUCTION

By letter dated February 27, 1992, the Carolina Power & Light Company (CP&L or the licensee) submitted a request for changes to the Shearon Harris Nuclear Power Plant, Unit 1, Technical Specifications (TS). The requested changes would revise TS 4.7.1.2 and its Bases Section B 3/4.7.1.2 to add full flow surveillance test capability for both the motor-and turbine-driven AFW pumps, provide more consistent acceptance criteria, acknowledge a revised AFW design flow, and provide consistent application to the non-applicability of TS 4.0.4 for the turbine-driven AFW pump.

The present motor-driven AFW pump TS surveillance requirement provides for a minimum recirculation flow test at 50 gallons per minute (gpm) and 1558 pounds per square inch differential (psid). The present turbine-driven pump TS surveillance requirement provides for a minimum discharge pressure of 1510 pounds per square inch gauge (psig) with a minimum recirculation flow of 90 gpm at a steam supply pressure greater than 210 psig. Currently, the recirculation, or mini-flow, test is used because the AFW system design does not provide the capability of conducting a full flow test during power operation without delivering full flow to the steam generators, i.e., there is no full flow recirculation flow or redirection capability. In addition, full flow testing may add a thermal cycle to the steam generator AFW nozzles. Although the mini-flow test avoids the potential thermal cycling and proves to be a satisfactory method of verifying AFW pump operability, small flow and pressure fluctuations in combination with the high pump discharge pressure cause a certain amount of oscillation in the pressure instrument readings. These oscillations make it difficult to establish a precise average value for discharge pressure. At times, an average pressure reading has been recorded that was lower than the actual discharge pressure as determined by subsequent testing. This lower pressure may fall below the acceptance criterion and could result in a pump being declared inoperable, though the pump may actually be developing adequate discharge pressure. If the mini-flow test fails to verify pump operability, subsequent use of a full flow test may prevent an

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unnecessary declaration of pump inoperability. Therefore, the licensee has proposed acceptance criteria for a full flow surveillance test of the motor- and turbine-driven AFW pumps as a testing option to determine pump operability when needed.

In addition to the proposed full flow test alternative, the licensee also proposed to revise the discharge pressure acceptance criterion for the turbine-driven AFW pump using the temperature compensated differential pressure measurement. This change is consistent with the acceptance criteria of the motor-driven AFW pumps. In addition, the licensee increased the minimum required steam inlet pressure to the turbine-driven pump from 210 psig to 280 psig to provide greater horsepower needed for the increased flow rate during the full flow test.

In addition to the above changes, the licensee also proposes to revise the AFW TS to identify that the provisions of TS 4.0.4 are not applicable for the full flow test of the turbine-driven AFW pump. This change is consistent with the current TS for the mini-flow test of the turbine-driven AFW pump.

The Bases section of the AFW TS will also be revised to reflect the full flow test acceptance criterion of 430 gpm for all three AFW pumps. The Bases section will now be consistent with the Chapter 15 analyses in the FSAR which are based on a minimum AFW flow of 430 gpm.

2.0 EVALUATION

The proposed change to the AFW surveillance to add a full flow test which demonstrates that an AFW pump can deliver 430 gpm to the steam generators is an acceptable alternative to the present mini-flow test because the proposed surveillance would demonstrate that the AFW pumps are capable of removing the decay heat associated with the FSAR Chapter 15 accident analyses. As long as an AFW pump can be demonstrated to deliver the minimum required flow for the worst case accident conditions, the pump should be considered operable.

The proposed change to use temperature compensated differential pressure, in lieu of discharge pressure for the turbine-driven AFW pump, in both the mini-flow and full flow tests makes the surveillance consistent with the tests for the motor-driven pump. It also provides a better measure of pump performance by eliminating the dependence on varying AFW pump supply pressure. This measurement, coupled with the temperature compensation provides for a more consistent interpretation of test results. Therefore, these changes are an improvement over the present TS surveillance requirements. The minimum differential pressure for the motor-driven pump mini-flow test will also be reduced to be consistent with the minimum required flow rather than the design pump flow. Use of a minimum design pump flow curve, in lieu of the original design pump curve, is acceptable because of the Chapter 15 reanalyses which is based on a minimum AFW flow of 430 gpm.

Testing of the turbine-driven pump prior to entry into Mode 3, Hot Standby, is impossible because there is inadequate steam pressure to perform either of the surveillance tests. Therefore, an exception from the provisions of Specification 4.0.4 for entry into Mode 3 is required for both the mini-flow and full flow tests of the turbine-driven pump.

The proposed changes to the AFW Bases section of the TS, Section B 3/4.7.1.2, revises the AFW Bases to reflect the proposed revised TS changes. The original Bases were based on an earlier Westinghouse analysis of the Chapter 15 scenarios that resulted in a minimum required AFW flow of 475 gpm. Subsequent analyses have determined that the minimum required AFW flow for all Chapter 15 events is 430 gpm. The revised AFW TS and the AFW Bases section of the TS now reflect the latest Chapter 15 analyses identified in the FSAR. The proposed changes to TS B 3/4.7.1.2 are, therefore, acceptable.

3.0 SUMMARY

Based on the staff's review of the proposed changes, as described above, the staff concludes that the revised AFW TS are acceptable because they provide a surveillance test that adequately demonstrates minimum AFW flow requirements are met in order to determine a pump operable. The staff has also concluded that the revised AFW Bases section is acceptable because it reflects the present AFW design and the present Chapter 15 analyses in the FSAR. The proposed revisions to TS Sections 4.7.1.2.1 and B 3/4.7.1.2, are, therefore, acceptable.

4.0 STATE CONSULTATION

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

5.0 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. 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 (57 FR 11105). 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.

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 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: September 2, 1992

AMENDMENT NO. 29 TO FACILITY OPERATING LICENSE NO. NPF-63 - HARRIS, UNIT 1

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