



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 146 TO FACILITY OPERATING LICENSE NO. DPR-62

CAROLINA POWER & LIGHT COMPANY, et al.

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

DOCKET NO. 50-324

1.0 INTRODUCTION

By letter dated September 29, 1987, as supplemented on November 24, 1987, the Carolina Power & Light Company submitted a request for changes to the Brunswick Steam Electric Plant, Unit 2, Technical Specifications (TS).

The amendment revises Section 3/4.3.2 by changing the reactor water level setpoint for the isolation of the Group 1 primary containment isolation valves from Low Level 2 to Low Level 3. The revisions also correct the existing master trip unit numbers to make them agree with current plant convention.

By their letters, the licensee states that the following benefits will be realized as a result of the main steam isolation valve (MSIV) setpoint change:

1. Reduction in the probability of MSIV closure (reactor isolation).
2. Reduction in Safety/Relief Valve (S/RV) challenges.
3. Prevention of unnecessary use of the suppression pool as a heat sink.
4. Possible increase in the life expectancy of the feedwater sparger.

2.0 EVALUATION

NUREG-0737, Item II.K.3.16, "Reduction of Challenges and Failures of Relief Valves--Feasibility Study and System Modification," required the licensee to investigate the feasibility and contraindications of reducing challenges to the relief valves by the use of the given suggested changes/methods or the use of other methods developed by the licensee. The changes should not compromise the performance of the valves or other systems. The licensee was required to document the proposed system changes for staff approval before implementation.

By letter dated September 29, 1987, as supplemented on November 24, 1987, the licensee provided the required documentation. The documents were Technical Specification changes that lower the MSIV setpoint from Low Level 2 (LL2) (+ 112 inches) to Low Level 3 (LL3) (+ 2.5 inches). This was an NRC

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Staff recommendation to meet NUREG-0737, Item II.K.3.16 requirements relating to safety/relief valve (S/RV) challenges. This change has also been recommended by the General Electric BWR Owners' Group and has been implemented at the other BWRs to which it applies. In addition, the licensee provided their contractor's safety evaluation of the setpoint changes.

The setpoint change was evaluated with respect to several operating parameters, including the minimum critical power ratio (MCPR), peak vessel pressure, radiation release, and shutdown capability during abnormal operating transients. Fuel cladding integrity during a loss-of-coolant accident (LOCA) and the reactor response during an ATWS event were also evaluated. Results of this evaluation are provided in the GE Topical Report NEDC-30601-P, "Safety Review of Water Level Setpoint Change for Brunswick Steam Electric Plant, Units 1 and 2" (proprietary). As stated in Section 4.2.3 and 4.2.4 of that report, the change will not cause a reduction in MCPR, an increase in the peak pressure, an increase in radiation release, cause equipment damage, a reduction in plant shutdown capability, or a decrease in core cooling capability. The MSIV level setpoint change has no impact on LOCA events previously evaluated, nor does it cause consequences of accidents previously evaluated to be increased.

Fuel cladding integrity during a LOCA and reactor response during an ATWS event were also evaluated, and the results provided in the report. None of these evaluations indicated that any new or different type of accident would be created by the change. In addition, the present function and structure of the Group 1 isolation valves remains unchanged, thereby eliminating possible operator confusion and training problems that could lead to a new or different type of accident.

The effects of the setpoint change for LOCA events has been reviewed, and it has been determined that the change has no impact. As stated in NEDC-30601-P, large and intermediate LOCA events will not be affected because the rapid depressurization and rapid inventory loss will cause the MSIV to close almost immediately after the accident, before any fuel failure could occur. Thus, the lower MSIV trip will not increase inventory loss from the reactor core or radiation release to the environment. For a small break LOCA, the highest peak cladding temperature for the worst case single failure (i.e., failure of the HPCI system) is considerably less than the 2200 F peak clad temperature limit. Therefore, the setpoint change will have no effect on the limiting maximum average planar linear heat generation rate (MAPLHGR).

For a loss of feedwater flow event the reactor would not be isolated while HPCI and RDIC are operating. Reactor core isolation cooling system flow would compensate for steam flow through the turbine control valves to the main condenser, thereby maintaining water level above Low Level 3, keeping the MSIVs open, and preventing the safety/relief valves from opening. Thus, the MSIV setpoint change will not compromise core cooling capability for the loss of feedwater flow event. Furthermore, it reduces suppression pool heatup for this event because the main condenser is available for a longer time.

The Low Level 3 reactor water level setpoint for the Group 1 primary containment isolation system valves still "ensures the effectiveness of the instrumentation used to mitigate the consequences of accidents" as demonstrated by the evaluation

in Sections 4 and 5 of NEDC-30601-P. Thus, for the reasons described above, the margin of safety is not reduced and may actually be increased.

The licensee also revised certain master trip unit numbers. This was an administrative change to make the TS agree with plant numbers.

3.0 SUMMARY

The contractor's conclusion from their analysis is that implementation of the MSIV setpoint change from low level 2 to low level 3 will not result in any unacceptable safety results for any transients during accident events.

The benefit of the lower MSIV water level trip is that it enhances the plant availability and safety. It will reduce the possibility of spurious MSIV closure due to water level variation during normal operation and it will maintain the availability of the main condenser which limits heat up of the suppression pool and reduces S/RV challenges.

The staff has reviewed the contractor's analyses and conclusions contained in report NEDE-30601-P and agrees with the above conclusions.

4.0 ENVIRONMENTAL CONSIDERATIONS

This 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 staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the type of any effluents that may be released off site; and there should be no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration, and there has been no public comment on such finding. Accordingly, this 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 made a proposed determination that this amendment involves no significant hazards consideration which was published in the FEDERAL REGISTER (52 FR 47778) on December 16, 1987, and consulted with the State of North Carolina. No public comments or requests for hearing were received, and the State of North Carolina did not have any comments.

The staff 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, and (2) such activities will be conducted in compliance with the Commission's regulations, and 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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Dated: April 1, 1988