

UNITED STATES NUCLEAR REGULATORY COMMISSION

SAFETY EVALUATION

BRUNSWICK STEAM ELECTRIC PLANT (BSEP)

REVISION OF SUPPRESSION CHAMBER TEMPERATURE AND REACTOR COOLANT

SYSTEM VOLUME

1.0 INTRODUCTION

By letter dated July 18, 1997, Carolina Power and Light Company (CP&L), the licensee for Brunswick Steam Electric Plant (BSEP), Units 1 and 2, proposed to revise Technical Specifications (TS) 5.2.2.b and 5.4.2 by correcting the listed design suppression chamber temperature of 200°F to 220°F and the listed total water and steam volume of the reactor coolant system from 18,670 cubic feet to 18,320 cubic feet.

2.0 DISCUSSION AND EVALUATION

Proposed Change 1 - Revision to Suppression Chamber Temperature:

The licensee indicated that their reviews of the suppression chamber design and history of the Design Features section of the TS have resulted in the determination that the currently listed suppression chamber design temperature of 200°F is incorrect. The correct value is 220°F based on the review of the following:

The original suppression chamber fabrication drawings for BSEP Units 1 and 2 (FP-1110) specify a design temperature of 220°F and also the Preliminary Safety Analysis Report Table V-2-1 lists the design temperature of pressure-suppression chamber as 220°F.

The original containment structural design analysis was based on a pressure of 62 psig and temperature of 300°F and 220°F for the drywell and suppression chamber, respectively. The steel-lined reinforced concrete drywell and suppression chamber and connecting ver* system were procured and fabricated to those design values. Subsequent to the original analysis, a more detailed analysis was performed in December 22,1970, in response to NRC questions and commitments. This analysis showed that the specified design allowables would not be exceeded at a temperature less than 220°F.

Final Safety Analysis F port (FSAR) Table 5.2-1, Amendment 12, dated May 30, 1972, listed the design temperature of the suppression chamber as 200°F. No basis for the 200°F has been determined. Amendment 16 to the FSAR dated April 1973 listed the suppression chamber design temperature of 220°F in Table 5.2-1. It appears the error introduced with the issuance of the FSAR in 1972 was corrected at this point; however, a discussion of the error and its correction was not included in the amendment.

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9805010040 980527 PDR ADOCK 05000324 PDR PDR The original BSEP Custom Technical Specifications stated that the design parameters of the primary containment shall be given in FSAR Table 5.2-1. On November 23, 1977, Amendments 12 and 39 were issued for BSEP Units 1 and 2 TS, respectively. These amendments converted custom TS to Standard TS format and included the listing of the Suppression Chamber design temperature of 200°F in the Design Features section. No basis for this temperature has been determined.

A detailed re-evaluation of the Mark I containment system was implemented in the addance with NUREG-0661, "Safety Evaluation Report- Mark I Containment-Long-Term Program-Resolution of Geneirc Technical Activity A-7," issued in July 1980. This evaluation is contained in Report "Plant Unique Analysis Mark 1 Containment Program for CP&L BSEP Units 1 and 2 (PUAR)," issued in August, 1984. The analysis cid not result in a change to the original design temperature of the suppression chamber.

The new Design Basis Accident - Loss of Coolant Accident (DBA-LOCA) time histories for temperature and pressure developed by General Electric (GE) for Power Uprate (GE-NE-T23-00735-01) remain bounded by the current suppression chamber evaluation contained in the PUAR.

Study Report 7992.104-S-S-104-046, "Study Report For Assessment of The Containment Capability For Severe Accident Loadings For Brunswick Steam Electric Plant, Units 1 and 2," indicates that the primary containment structure has an ultimate structural capacity far in excess of the effects of the design basis loads and would remain functional at a pressure of 200 psig with a temperature of 350°F.

Updated FSAR Table 6.2.1-1, Containment Parameters for Containment LOCA Response Analysis, currently specifies a suppression chamber design temperature of 220°F.

The licensee indicated that the design temperature of 220°F is for the suppression chamber structure. Other analytical parameters such as net positive suction head (NPSH) requirements provide a more restrictive limit on the suppression chamber water temperature and are included in engineering analyses as appropriate.

Based on the above review, the staff finds the suppression chamber original design temperature of 220°F has not changed. Therefore, the proposed amendment to TS 5.2.2.b for correcting the listed design suppression chamber temperature of 200°F to 220°F, which reflect the actual design temperature, is acceptable.

Proposed Change 2 - Reactor Coolant System Volume:

The licensee stated that the currently indicated TS 5.4.2 vessel volume of 18,670 cubic feet matches the FSAR vessel values used for input to the original containment analyses, which used the CONTEMPT-PS model. For the power uprate analysis, GE utilized the SHEX long-term containment model, which requires more discrimination in water and stearn volume input parameters. The vessel volume value utilized by GE for power uprate was derived from the "Primary System Weight and Volumes" design drawings for BSEP Units 1 and 2 on the master parts list at GE offices and was approximately 18,320 cubic feet for vessel volume plus an

additional feedwater contribution of approximately 3,500 cubic feet. Amendments 183 and 214 to the Technical Specifications for BSEP Units 1 and 2 were issued on November 1, 1996, and authorized power uprate for each of the Brunswick Units. These proposed amendments to the reactor coolant system volume reflect a more accurate volume used in the current analyses. Based on the above, the staff finds that the proposed amendment to revise the total water and steam volume of the reactor coolant system from 18,670 cubic feet to 18,320 cubic feet in the Design Features section of the Technical Specifications, constitutes a correction to reflect a more accurate volume used in current analyses.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change 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 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 concideration, and there has been no public comment on such finding (62 FR 45454). 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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