

November 29, 2001

Mr. J. A. Scalice
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 - ISSUANCE OF AMENDMENT
REGARDING REDUCTION OF ICE CONDENSER ICE WEIGHT
(TAC NO. MB2969)

Dear Mr. Scalice:

The Commission has issued the enclosed Amendment No. 33 to Facility Operating License No. NPF-90 for Watts Bar Nuclear Plant, Unit 1. This amendment is in response to your application dated September 7, 2001.

The amendments revise Technical Specifications (TS) Section 3.6.11, "Ice Bed," Surveillance Requirement (SR) 3.6.11.2, SR 3.6.11.3, and the associated Bases to lower the minimum average ice basket weight from 1236 pounds to 1110 pounds. This would reduce the overall weight of ice required in the ice condenser from 2,403,800 pounds to 2,158,000 pounds. The Nuclear Regulatory Commission has reviewed the submittal for these changes and, based on our review, we find the proposed changes acceptable.

A copy of the safety evaluation is also enclosed. Notice of issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA by John M. Goshen for/
L. Mark Padovan, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosures: 1. Amendment No. 33 to NPF-90
2. Safety Evaluation

cc w/enclosures: See next page

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Mr. J. A. Scalice
Tennessee Valley Authority

WATTS BAR NUCLEAR PLANT

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TENNESSEE VALLEY AUTHORITY

DOCKET NO. 50-390

WATTS BAR NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 33
License No. NPF-90

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Tennessee Valley Authority (the licensee) dated September 7, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-90 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 33, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. TVA shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented no later than Mode 4 during startup from Cycle 4 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

Richard P. Correia, Chief, Section 2
Project Directorate II
Division of Project Licensing Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: November 29, 2001

ATTACHMENT TO AMENDMENT NO. 33
FACILITY OPERATING LICENSE NO. NPF-90
DOCKET NO. 50-390

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the area of change.

Remove Pages

3.6-29

B 3.6-28

B 3.6-37

B 3.6-65

B 3.6-70

Insert Pages

3.6-29

B 3.6-28

B 3.6-37

B 3.6-65

B 3.6-70

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 33 TO FACILITY OPERATING LICENSE NO. NPF-90

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-390

1.0 INTRODUCTION

By letter dated September 7, 2001, the Tennessee Valley Authority (TVA, the licensee) submitted a request for changes to the Watts Bar Nuclear Plant, Unit 1 (WBN), Technical Specifications (TS). The requested changes would lower the minimum average ice basket weight from 1236 pounds to 1110 pounds. This would reduce the overall weight of ice required in the ice condenser from 2,403,800 pounds to 2,158,000 pounds. WBN utilizes an ice condenser containment design, and the weight of available ice is essential in assuring that the maximum containment pressure attained in a design basis accident remains below design basis limits.

2.0 EVALUATION

The operability of the ice beds in the ice condenser requires that the ice inventory be distributed evenly throughout the ice condenser bays in containment and contain sufficient heat removal capability to condense the reactor coolant system volume released during a loss-of-coolant accident (LOCA). Sufficient pressure suppression capability from the ice in the ice condenser is necessary to limit the containment peak pressure transient during a LOCA. The ice inventory is contained in 1944 ice baskets throughout the ice condenser.

TS Surveillance Requirement (SR) 3.6.11.4 currently requires that each basket contains at least 1236 pounds of ice and that the average ice weight for each bay and each group-row combination not be less than 1236 pounds per basket at a 95 percent level of confidence at the start of the surveillance interval. WBN's current 1236 pounds TS limit is based on a containment analysis that assumes an even distribution of 1093 pounds per basket throughout the ice condenser at the time of LOCA. The 1236 pounds per basket TS limit contains a conservative allowance for ice loss through sublimation during the surveillance interval and a conservative allowance for ice-weighing instrument error. These values are currently 12 percent and 1 percent, respectively. The above limits ensure that, at a 95 percent level of confidence, a minimum total ice weight of 2,403,320 pounds is present in the ice condenser at the start of surveillance interval which is required by the Limiting Condition for Operation 3.6.11. The current containment analysis using the 1093 pounds ice weight per basket yields a peak containment pressure of 11.21 psi following a design basis LOCA.

ENCLOSURE

The licensee indicated that the revised containment analysis, utilizing the revised mass and energy model and an ice weight of 1044 pounds per basket, calculated a peak design basis LOCA containment pressure of 10.44 psi which remains below the containment design pressure of 13.50 psi. Allowing a 6 percent margin to bound expected sublimation over one cycle, the minimum basket weight at the time of weight measurement will be 1110 pounds. This value translates into a total ice weight of 2,158,000 pounds at the current value of 95-percent level of confidence.

Westinghouse performed a new containment integrity analysis for Watts Bar, Unit 1 and documented it in WCAP-15699, Revision 1, entitled, "TVA Watts Bar Nuclear Plant Unit 1 Containment Integrity Analyses for Ice Weight Optimization Engineering Report," to support ice weight optimization at the Watts Bar Nuclear Plant Unit 1. The new analysis includes two steps: the mass and energy calculation and containment pressure calculation. The mass and energy calculation used the methodology described in WCAP-10325-P-A, "Westinghouse LOCA Mass and Energy Release Model for Containment Design," which is different from the current licensing analyses. WCAP-10325-P-A was found acceptable by NRC in a safety evaluation to Westinghouse dated February 17, 1987. The containment pressure calculation is consistent with the current licensed methodology using the LOTIC-1 Computer Code.

The licensee indicated that the new analysis eliminated certain analytical conservatism from the current one. For example, the current analysis for Watts Bar is based on a core stored energy of 5.4 full power seconds. The new analysis in WCAP-15699 Rev.1, being based on improved core predictive models, used a core stored energy of 4.23 full power seconds. This reduction is a result of the improved predictive models. The core stored energy is still based on a full core (193 assemblies) of fresh fuel. The current analysis for Watts Bar is based on ANS 1971 decay heat standard. The new analysis uses the ANSI/ANS-5.1 1979 Decay Heat Standard, as described in WCAP-10325-P-A. The new analysis generated an increased number of data points (up to 40) for the mass and energy release rates (especially during the post-blowdown phase). This improved segment representation of the data has resulted in some reduction in the mass and energy releases when compared to the current analysis. In the new analysis, the steam generator metal mass was modeled to include only the portion of the steam generator (SG) which is in contact with the fluid on the secondary side. The current analysis considers all SG metal energy to be available for the energy release. The staff has reviewed all the proposed changes from the current licensing basis identified in WCAP-15699, Rev. 1, and finds that the licensee used the overall approved methodology in WCAP-10325-P-A, with revised input assumptions reflecting modeling refinements based on better and more detailed data. Therefore, the staff concludes these changes are acceptable.

The analysis was completed to provide the analytical basis for a reduction in the present WBN design basis ice mass of 1093 pounds per basket but retain the current time interval (approximately 150 seconds) relationship between ice bed meltout time and containment spray switchover time and provide for peak pressure margin to design pressure. The results of the analysis support the design basis ice mass of 1044 pounds per basket, a calculated containment peak pressure of 10.44 psig, and containment spray switchover icemelt relationship of 178.5 seconds. The current margin between the design operating pressure and the peak LOCA pressure will be slightly increased, and the margin of safety provided by the containment design is increased. The margin of safety is stated to be the structural (or ultimate) design pressure (15 psig) less the design operating pressure (13.5psig).

3.0 CONCLUSION

Based on the above evaluation, the NRC staff finds the licensee's proposed change of lowering the minimum TS ice weight of each ice basket from 1236 pounds to 1110 pounds to be acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Tennessee State official was notified of the proposed issuance of the amendments. 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 and changes surveillance requirements. 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 (66 FR 52804 dated October 17, 2001). 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: John M. Goshen, NRR

Dated: November 29, 2001