

June 15, 2000

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 - REQUEST FOR ADDITIONAL
INFORMATION REGARDING ALTERNATE STEAM GENERATOR
TUBESHEET REGION PLUGGING CRITERION (F*) (TAC NO. MA8636)

Dear Mr. Scalice:

By letter dated April 10, 2000, Tennessee Valley Authority (licensee), submitted to the U.S. Nuclear Regulatory Commission (NRC), proposed Technical Specification (TS) change WBN-TS-99-013 for the Watts Bar Nuclear Plant, Unit 1 (WBN). The proposal was to change the TSs for WBN to allow usage of the alternate tube plugging criterion F-Star (F*) repair limit of 1.06 inch as provided in Westinghouse Electric Corporation's WCAP-13084, "Tube Sheet Region Tube Alternate Plugging (F*) Criterion for the Tennessee Valley Authority Watts Bar Units 1 and 2 Nuclear Power Plant Steam Generators."

The NRC staff has reviewed the WBN submittal, and has identified additional information, as discussed in the enclosure, that is needed to complete its review. Based on discussions with your staff on June 12, 2000, we understand that your response to this request can be submitted within 60 days of receipt of this letter.

Sincerely,

/RA/

Robert E. Martin, Senior Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosure: Request for Additional Information

cc w/enclosure: See next page

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REQUEST FOR ADDITIONAL INFORMATION
F-STAR REPAIR CRITERIA FOR STEAM GENERATOR TUBES
WATTS BAR NUCLEAR PLANT, UNIT 1

1.0 INTRODUCTION

By letter dated April 10, 2000, the Tennessee Valley Authority (TVA) submitted for staff review an amendment to implement the alternate tube plugging criteria, F-star (F*), in the Watts Bar Nuclear plant (WBN) technical specifications (TS). The F* criteria would allow degraded tubes in the tubesheet to remain in service if the tube in the tubesheet has a specified defect-free length (F* distance). The technical basis for the F* criteria is presented in Westinghouse Topical Report, WCAP-13084 "Tube Sheet Region Tube Alternate Plugging (F*) Criterion for the Tennessee Valley Authority Watts Bar Units 1 and 2 Nuclear Power Plant Steam Generators." (proprietary). Following a preliminary review, the staff requests the following additional information:

1. In WCAP-13084, Westinghouse discussed potential leakage of F* tubes without providing specific leak rates. Please provide F* tube leak rate data or other evidence to demonstrate the leakage integrity of F* tubes.
2. On page 26 of WCAP-13084, it is stated that the leakage limit in the WBN TS is 0.35 gallons per minute (gpm). However, in this amendment, TVA proposed a leakage limit of 150 gallons per day per steam generator, which is equivalent to 0.104 gpm. Clarify the discrepancy between the 0.35 gpm in WCAP-13084 and the proposed TS requirements of 150 gpd.
3. Based on date of WCAP-13084 and recent experience with changes in design conditions in nuclear plants, confirm that the pressure and temperature loadings used in WCAP-13084 are consistent with the current plant operation and design basis conditions at WBN.
4. The proposed F* distance is 1.06 inches excluding nondestructive examination (NDE) uncertainties. TVA stated that the NDE uncertainties are 0.28 inch, 0.30 inch, and 0.34 inch for the 115 mil pancake coil, 80 mil pancake coil, and Plus point coil, respectively. Describe how these NDE uncertainties were obtained and the process that will be used in the future for determining NDE uncertainties.
5. On page 23 of WCAP-13084, it is stated that during the pressure test, two test tubes with shorter F* distance than the proposed F* distance were expelled from the collar. The two test tubes did not slowly release from the collar, i.e., overcoming friction and/or galling, but were suddenly expelled. The expulsion was attributed to the loss of pressure tightening of the rolled joint resulting from the presence of water between the test tube and the collar. In the field, if there is a through-wall indication below the F* distance in a F* tube, water may leak between the tube and tubesheet. Under such a scenario, joint strength may be adversely affected. Discuss how the methodology for establishing the F* distance accounted for this source of loss of joint strength.
6. Recently, Westinghouse found an error in elevated F* distance calculation. The error was attributed to an error in the tubesheet bowing loads. By letter dated April 19, 2000, the staff

ENCLOSURE

approved an amendment to change elevated F* distance in the Prairie Island TS. Discuss how it was ensured that this error does not apply to the F* distance calculation in WCAP-13084 for WBN.

7. Once an F* tube is identified, the proposed TS requires inspection of all F* tubes by rotating pancake coil or its equivalent in every outage. However, it is not clear to the staff how F* tubes are identified initially or how new F* tubes would be identified in subsequent outages. Discuss the inspection sample, sample expansion criteria, the probe that will be used in the identification process, and the requirements or commitments that are applicable to this inspection.

8. The proposed TS 5.7.2.12.d (proposed page 5.0-16) stated that F* tubes may be excluded from inspections samples. However, there is no clear TS wording to exclude F* tubes from C-1, C-2, and C-3 categories in the TS. Confirm that F* tubes will be excluded from the inspection result categories.

9. Proposed TS 5.7.2.12.f.f (Insert A) states that a minimum of 1.5 inches of the tube into the tubesheet from the top of the tubesheet shall be inspected. (1) This inspection approach is inconsistent with the F* distance measurement. According to the proposed TS, the F* distance is measured from the bottom of the roll transition or the top of the tubesheet, whichever is lower in elevation. Clarify the discrepancy. (2) The staff believes that an inspection distance of 1.5 inch may be insufficient. TVA indicated that the F* distance plus NDE uncertainty would be as much as 1.40 inches. There is only 0.1 inch difference between the F* distance and the 1.5 inch inspection length. A flaw that is outside of but close to the F* distance may grow into the F* distance zone during the cycle. Therefore, the inspection length should consider the growth potential of a flaw. Clarify if the 1.5 inch inspection length considered the growth of the flaw.

10. TS 5.7.2.12.b.d specifies that “. . . F* distance is 1.06 inches (plus an allowance for NDE uncertainty) . . .” The NDE uncertainty was discussed in the April 10, 2000 letter but not specified in the TS nor in the Westinghouse topical report, WCAP-13084. The NDE uncertainty needs to be included in the TS because F* distance plus the NDE uncertainty value is a TS safety limit.

Mr. J. A. Scalice
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WATTS BAR NUCLEAR PLANT

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