September 3, 1996

Mr. Oliver D. Kingsley, Jr.
President, TVA Nuclear and
Chief Nuclear Officer
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING SLAVE RELAY TEST FREQUENCY, WATTS BAR UNIT 1 (TAC NO. M94425)

Dear Mr. Kingsley:

On February 28, 1996 the Tennessee Valley Authority (TVA) submitted an application for amendment of the Watts Bar Unit 1 Technical Specification on the surveillance frequency for Westinghouse type AR relays. The proposed amendment would change the surveillance frequency from quarterly to a refueling outage frequency. Your letter stated that Watts Bar is the lead plant for the Westinghouse Owners Group for relaxation of the slave relay test frequency for Westinghouse type AR relays. Your letter also submitted the Westinghouse Electric Company reports WCAP-13877 (Proprietary), "Reliability Assessment for Westinghouse Type AR Relays Used as SSPS Slave Relays," and its non-proprietary version, WCAP-14129, "Reliability Assessment of Westinghouse Type AR Relays used as SSPS Slave Relays." The NRC staff has reviewed the reports and has identified a number of issues requiring additional information as stated in the enclosure.

We are transmitting this request for information to TVA even though several of the issues relate to Westinghouse-designed plants other than Watts Bar. We understand that TVA, as the lead plant for the Westinghouse Owners Group on this issue, will coordinate the submittal of answers for those issues with Westinghouse. To facilitate this, at your staff's suggestion, we are providing a copy of this letter to Mr. J.W. Irons of the Westinghouse Electric Corporation.

Sincerely,

Original signed by

Robert E. Martin, Senior Project Manager
Project Directorate II-3
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosure: Request For Additional Information

cc w/enclosure: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

REQUEST FOR ADDITIONAL INFORMATION

SLAVE RELAY TEST FREQUENCY EXTENSION

WOG TOPICAL REPORT WCAP-13877

WATTS BAR NUCLEAR PLANT

1. Applicability of topical report: Westinghouse topical report WCAP-13877 is applicable for certain types of AR relays. The submittal of February 28, 1996 did not demonstrate the applicability of the topical report for the Watts Bar Nuclear Plant (WBN). Provide this information.

2. Section 3.3, page 3-2: Since the ARLA latch attachment is obsolete and has been replaced by the new latch attachment which is not covered by this topical report, how are plants that have replaced the old latch attachment with the new attachment covered by this topical report?

3. Section 4.2.2, page 4-3: How is the reliability of AR relays as stated in WCAP-13877 affected for plants which do not have AR relays with their armature pin bonded with epoxy to the crossbar?

ENCLOSURE

4. Section 5.3, page 5-3, first full paragraph: The last sentence of this paragraph states that, "The contacts selected for the AR relays exhibited greater reliability". However, no reliability number or basis for this statement was provided. Please provide this basis.

5. Section 5.4.1, page 5-5, bracketed paragraphs: The second bracketed paragraph states that the original lubricant material would have attacked and consumed the polycarbonate carrier material and the AR relays would, therefore, not have survived. This lubricant material was replaced by other suitable material. Has the lubricant material been replaced in all Westinghouse plants? How was the new suitable material qualified?

6. Section 5.4.3, page 5-6: This section discusses a failure mode in certain applications of the AR relays and the modification that was implemented in 1984 to eliminate this failure mode. This failure mode occurred after several million relay operations. Were these relays normally energized? If not, is it possible for this failure mode to occur after a small number of cycles for those relays which are normally energized?

7. Section 5.4.2, page 5-6, second paragraph: A design change was incorporated for AR relays in January 1994 to improve their reliability. Has this change been implemented for all Westinghouse designed plants?

8. Table 5-1 lists the expected temperature rise for non-metallic materials. However, no basis is provided for this temperature rise. It appears that the temperature rise for the normally energized relays must be higher than listed in the table. Explain this apparent discrepancy.

9. Section 6.5, page 6-4: The reliability analysis in WCAP-13877 does not account for failures based on excess loading on relay contacts. Provide the contact loading analysis for WBN to justify excluding this failure mode at WBN.

10. Section 8.2, page 8-2: Thermogravimetric Analysis (TGA) is used for aging. The staff has not accepted this methodology for aging. Provide the basis for the acceptability of TGA for this purpose.

11. Sections 8.3.1 and 8.3.2, pages 8-6 and 8-7: The qualified life of normally energized AR relays based on the 8°C, 5°C and 3°C cabinet temperature rise has been calculated as 5.3 years, 6.8 years and 8.1 years, respectively. Also the qualified life for periodically energized AR relays has been limited to 20 years. However, WBN has not provided any analysis to establish the life of these relays. Provide the appropriate analysis.

12. Section 9.0, page 9-1, table 9-8: Table 9.8 and Section 9.0 identify events which are considered non-failures of AR relays. However, no justification is provided for why these events are considered non-failures. Please provide the appropriate justification.

13. Section 9.2.1, page 9-4: The last sentence on this page states that the post-maintenance testing requirements did not require multiple actuation of the relay to verify operability. Do all Westinghouse designed plants use multiple actuation tests to identify this failure mode?

14. Section 9.3, page 9-5: This section lists non-verifiable events of AR relay failures. Has Westinghouse approached the utilities for more information in order to determine the rpot cause of these events? From the discussion in section 9.3.1, it appears that most of these failures are blamed on technician's error, which may not be the true cause of these failures. Provide additional information justifying the disposition of these non-failures.

15. Section 9.3.1.7, page 9-7, lists a failure of relay K620B at Sequoyah Unit 2 on November 19, 1987, while table 9-6, page 9-16, lists the failure of the same relay at Sequoyah Unit 2 on October 19, 1987. Are these the same event?

16. Section 9.3.1.1, page 9-6, discusses failures of relays K603A and K604A at Sequoyah Unit 1 on September 15, 1981, but these failures have not been listed in tables 9-6 thru 9-8. Please resolve this discrepancy.

17. All failures or non-failures of AR relays listed in tables 9-7 and 9-8 are not discussed in sections 9.2 and 9.3. Also some of the failures discussed in sections 9.2 and 9.3 are not listed in tables 9-6 thru 9-8. Please resolve this discrepancy.

18. When two or more AR relays fail in a 12-month period, the staff requires licensees to re-evaluate the adequacy of the proposed extended surveillance interval and if it is determined that the interval is inadequate for detecting single relay failures, the surveillance interval should be decreased. The revised surveillance interval should be such that the licensee can detect an ESFAS subgroup relay failure prior to the occurrence of a second failure. Provide a commitment to implement this requirement.