

May 5, 1993

Docket No. 50-390

Tennessee Valley Authority
ATTN: Dr. Mark O. Medford, Vice President
Nuclear Assurance, Licensing and Fuels
3B Lookout Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Dr. Medford:

SUBJECT: WATTS BAR UNIT 1 - THERMO-LAG RELATED AMPACITY DERATING
ISSUES (TAC M63648)

By letter dated February 10, 1993, TVA submitted additional information pertaining to the Watts Bar Nuclear Plant Thermo-Lag conduit fire test program, including Test Plan R1, "Development of Ampacity Derating Factors for Fire Wrapped Raceways" dated January 26, 1993, and the Test Plan entitled "Circuit Functionality Testing for Cables Protected with TSI Thermo-Lag 330 Fire Barrier System." The staff has reviewed the TVA submittal and developed the enclosed comments and questions to TVA's test plans on circuit (cable) functionality and ampacity derating testing. The staff requests TVA to address these comments and questions.

If you need clarification on this request for additional information, please feel free to call. We will discuss with your staff, in the next licensing status meeting, an acceptable target date for your response. This requirement affects 9 or fewer respondents and, therefore, is not subject to Office of Management and Budget review under P.L. 96-511.

Sincerely,

Original signed by
Peter S. Tam, Senior Project Manager
Project Directorate II-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosure:
Request for Additional Information
cc w/enclosure:

See next page

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Tennessee Valley Authority
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Watts Bar Nuclear Plant

cc:

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Knoxville, Tennessee 37902

REQUEST FOR ADDITIONAL INFORMATION

WATTS BAR NUCLEAR PLANT

AMPACITY DERATING AND CABLE FUNCTIONALITY ISSUES

QUESTIONS AND COMMENTS ON AMPACITY DERATING TEST PLAN, R1

1. The proposed IEEE Standard P848 Draft 12 has been issued by the IEEE Task Group 12-45, correcting the previous Draft (11) version. Given TVA's participation on the subject Task Group, please identify what changes, if any, will be made to meet the current draft of the IEEE Standard in the final test report. Please identify what empirical evidence (test data) has been developed to validate the assumptions inherent in the IEEE procedure.
2. TVA states that tests conducted by other organizations, such as Texas Utilities, that are evaluated as appropriate for TVA installations may be utilized in the WBN test program. Please provide the quality assurance and engineering evaluations which establish the suitability of application for the construction, quality control and test program of the test article(s) to WBN plant installation, and quality assurance program requirements. Describe and disposition any differences between the test articles and WBN installed configurations.
3. The subject test plan specifies that 1-inch conduit and 4-inch conduit test articles are the *only* conduit sizes to be tested to determine the ampacity derating associated with the Thermo-Lag protective material. In Section 2.0, OBJECTIVE of the subject Test Plan, TVA states that "the results of the test will allow determination of a single derating factor for each configuration of fire barrier material, regardless of conduit size." However, IEEE P848, Draft 11 states in Section 5.3.2.2 that "the application of the fire protection system may result in differing derating for different conduit sizes." Please describe how the conduit sizes chosen provide ampacity derating results which bound the WBN plant configuration, given other conduit sizes (e.g., 3/4-inch and 5-inch conduit sizes) listed on Attachment 1 of TVA's submittal.
4. The subject Test Plan does not specify that laboratory activities will be controlled under an Appendix B quality assurance program and that the test articles will be procured to Appendix B purchase requirements. Please identify quality assurance requirements applicable for ampacity derating tests.

5. TVA's submittal states, in response to NRC Question No. 2, that ampacity tests will be conducted for all intended Thermo-Lag applications regardless of temperatures recorded during fire endurance tests. Please provide ampacity derating test results or engineering justification for the presence of coiled cables in Pull/Junction Boxes, air drops and other electrical enclosures.

QUESTIONS AND COMMENTS ON CIRCUIT/CABLE FUNCTIONALITY TEST PLAN

6. In Attachment 3 (Test Plan - Circuit Functionality Testing) of the TVA submittal, Section 8.0, PROCEDURE of the test, does not provide for a parametric assessment of insulation resistance changes during the elevated temperature exposure to establish functionality of instrumentation cables. It is not clear how "the measurement of leakage current for margin assessment only" will be used to provide information to TVA in the context of demonstrating functionality.
7. How is the issue of the minimum insulation levels required for nuclear instrumentation cables, as applicable to WBN, assessed given the insulation resistance values shown in Section 8.4 of the subject Test Plan? Please also state whether the Test Plan criteria is acceptable for demonstrating the functionality of these cables.
8. Although TVA has described in previous meetings (e.g., October 7, 1992 Meeting at NRC Headquarters) likely failure modes (i.e., creep and crack phenomena) during the cable functionality test, the subject Test Plan procedure does not include a visual inspection or examination to assess the condition of the cable samples following the elevated temperature exposure portion of the test. The evidence of visible cable degradation would provide a subjective assessment verifying the information obtained through the megger and leakage current measurements. Please provide an assessment of the visible cable degradation in future circuit/cable functionality tests.