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

SAFETY EVALUATION BY THE OFFICE OF SPECIAL PROJECTS

SILICONE RUBBER INSULATED CABLE TEST PROGRAM

TENNESSEE VALLEY AUTHORITY

SEQUOYAH NUCLEAR PLANT, UNITS 1 & 2

DOCKET NOS. 50-327 AND 50-328

1.0 INTRODUCTION

By letter dated, November 24, 1987, the Tennessee Valley Authority (TVA) submitted a report of results for Sequoyah, Units 1 and 2, on tests conducted by the Wyle Laboratories on silicone rubber insulated cables installed inside containment. By letter dated December 28, 1987, TVA documented its basis for concluding that these cables at Sequoyah, Units 1 and 2, are adequately environmentally qualified to perform their intended function for a 10 year period following the original installation. The staff reviewed the TVA data and concluded that the Wyle Laboratory qualification tests of the Anaconda and Rockbestos cables, and the replacement of AIW cables inside Unit 2 containment provided adequate assurance that the functional integrity of the cables at Sequoyah, Unit 2, was adequate to allow restart of Unit 2.

By letter dated May 25, 1988, the staff requested that TVA submit details of a silicone rubber insulated cable test program to extend the qualified life of the Rockbestos and Anaconda cables for 40 years. The staff has accepted TVA's schedule for completing this qualification testing before the return to power of Unit 2 from the Cycle 3 refueling outage. In that letter, the staff outlined the basic requirements for an acceptable cable test program and, by letter dated July 6, 1988, TVA submitted details of its cable test program.

2.0 EVALUATION

The staff requested that TVA submit a cable test program for testing silicone rubber insulated cables installed in containment at Sequoyah and supplied by all three manufacturers (Anaconda, AIW and Rockbestos) unless TVA decided to remove AIW cables from the Unit 1 containment. TVA has elected to remove all the AIW silicone rubber insulated cables from the Unit 1 containment and has proposed a test program for cables supplied by the remaining two manufacturers. TVA's proposed test program will involve obtaining silicone rubber insulated cable samples, five from each manufacturer, selected from the worst-case conduit configurations located in containment at Watts Bar Nuclear Plant. TVA has also identified the criteria used to determine the worst case conduit configuration. These criteria are similar to criteria which were identified in TVA's letter of July 31, 1987 and include the length of cable pull, sidewall pressure, and 90° condulets. The qualification test program includes thermal aging, radiation aging, loss-of-coolant (LOCA) test (steam/chemical environment) as well as a post-LOCA-high-pot test. The only exception is that the post-LOCA-high-pot test will be performed at twice the cables' rated

voltage [illegible]s 1,000 volts instead of 240 Vdc/mil. Aging and LOCA tests are sufficien[illegible]to demonstrate the functional operability of the cables. The post LOCA test is used to demonstrate the margin available to account for test uncertainties. Hence, the staff finds this proposed change to the test program acceptable.

The staff has reviewed TVA's proposed test program and has determined that the test program meets the requirements outlined in the staff's letter of May 25, 1988 with the following clarifications:

1. TVA has defined the scope of the test program to include only the cables which are covered by 10 CFR 50.49, Category A and B. The staff requires that all 10 CFR 50.49 cables be included in the program. TVA has informed the staff that all 10 CFR 50.49 cables are covered by Category A and B. However, to clarify the matter TVA will delete the reference to Category A and B.

2. Enclosure 2; "Sample Selection, Size and Removal Process;" TVA should add a step between (4) and (5) to state that the cable sample will be selected from a conduit with no less than 3 cables, unless justified. TVA has informed the staff that their selection criteria already include this item and will add the criteria to the test program.

3. Enclosure 3; "Resolution of Test anomalies and Test failures;" 3rd paragraph: TVA should add a requirement that, as soon as the determination is made that a test anomaly is in fact an actual test failure, NRC will be promptly notified of such determination. TVA has agreed to add this requirement to the test program.

3.0 CONCLUSION

Based on our evaluation, we conclude that the proposed cable test program is acceptable provided TVA revises the program as discussed in Items (1) thru (3) above. TVA's removal of AIW cables from Sequoyah, Unit 1 containment and the previous qualification tests of Anaconda and Rockbestos cables at the Wyle Laboratories provides adequate assurance of the integrity of cables installed at Sequoyah Unit 1 for a period of 10 years. This is adequate for the restart of Unit 1. Successful completion of the proposed test program will extend the environmentally qualified life of these cables to 40 years.

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Dated: September 2, 1988