

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

September 8, 1981



Mr. James P. O'Reilly, Director  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
Region II - Suite 3100  
101 Marietta Street  
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2 - USE OF EPOXY GROUT

In response to a verbal request from D. M. Quick of your office, the following information is provided regarding the use of epoxy grout at Sequoyah Nuclear Plant.

For unit 1, TVA has determined that epoxy grout was used in various support installations inside containment and main steam valve rooms. Our investigation to identify the affected areas is continuing. We expect to complete this review by September 25, 1981.

For unit 2 a total of 42 supports inside containment were identified as potential areas for the utilization of epoxy grout. Our review of these supports included the available quality assurance documentation, the type of embedments specified for the supports, and support installation dates (epoxy grout was not used for grouted anchor bolts in the reactor building at Sequoyah after the first quarter of 1977). Based on this review, we concluded that epoxy grout was not used for any grouted anchor support installations inside the Sequoyah unit 2 containment and main steam valve rooms. Two expansion shell bolt anchors inside the unit 2 containment where epoxy grout was used during installation have been identified. TVA will evaluate these anchors for temperature effects on structural capacity and report any deficient conditions identified.

Also, Mr. Quick questioned the possible use of the epoxy grout on containment penetrations. TVA has reviewed the penetration designs and hereby confirms that epoxy grout was not utilized in this application.

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As noted above, TVA is continuing its investigation regarding the use of epoxy grout for supports at Sequoyah. The types of epoxy grout used at the site were Sika Colma-Dur (gray) and Sika Hi-Mod (brown). The chemical composition of the two epoxy types is as follows.

A. Colma-Dur (gray)

Component A = Epoxide equivalent of 175 to 195, and a reactive resin of 100 percent minimum

Component B = Polyethylene amine in admixture with a mixture of mono-alkyl and alkyl aromatic diluents, finely divided fillers, and pigments

B. Hi-Mod (brown)

Component A = Modified epoxy epichlorohydrin bisphenol A (Condensation with viscosity control agents added)

Component B = Reactive product of alkylglycidyl ether and a polyfunctional aliphatic amine containing suitable viscosity control agents and accelerators

We have reviewed the available technical data on these epoxy compounds. From this review, it was noted that the epoxy polymers maintain their chemical properties when exposed to radiation levels up to  $10^6$  rads. Accordingly, the radiation resistance of the epoxy compounds has been determined to be in excess of the expected plant life dosage.

To address the issue of elevated temperature effects, mathematical modeling of the steam generator anchor bolts is being performed to profile the temperatures that could be expected around the anchor bolt head during an accident. Although it has been determined that epoxy grout was not used at this location in either unit, the dynamic temperature analysis is being continued to assist in our evaluation of other containment areas. We expect to complete the analysis by September 18, 1981.

In addition, TVA is presently initiating tests at our Singleton Laboratory on the use of epoxy grout. Two sets of tests are planned. The first set consists of preliminary tests on selected anchors to provide general information on the load deflection behavior of epoxy anchors at sustained temperatures of 200° F. These tests should be completed by September 25, 1981. The second set of tests is a comprehensive evaluation of these anchor installations over a range of

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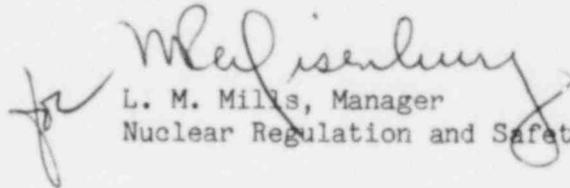
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temperatures. Also, temperature measurements will be taken to determine the effect of heat transfer through embedded bolts on the temperature in a concrete member. These tests should be completed in December 1981.

In summary, TVA believes that the above discussion provides interim technical justification for existing installations utilizing epoxy grout at Sequoyah. Supporting documentation and/or the need for corrective action will be identified by the analyses and test program described by this letter.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

  
L. M. Mills, Manager  
Nuclear Regulation and Safety

cc: Mr. Victor Stello, Director  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555