

DUKE POWER COMPANY

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NUCLEAR PRODUCTION

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April 18, 1984

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Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Re: Oconee Nuclear Station
Docket No. 50-269, -270, -287

Dear Mr. O'Reilly:

On October 18, 1983 in Duke Power Reportable Occurrence Report RO-269/83-17, your office was notified of the potential deficiency of certain seals at conduit connections to safety-related equipment located in harsh environments. A full environmental qualification test program inclusive of thermal and radiation aging was performed per the report's Corrective Actions for the chosen moisture intrusion preventative sealant, Dow Corning RTV 3145, to envelope a 40-year qualified life for all Duke Power applications (i.e., Oconee, McGuire, and Catawba Nuclear Stations). Also, the acceptability of the Reactor Building sump monitoring Delaval transmitters as sealed for use in harsh environments at Oconee was reviewed. This correspondence discusses the results of both analyses concerning environmental qualification of connections and updates the corrective actions stated in the original submittal.

After review of the Delaval Qualification Test Report and Delaval installation requirements, it has been determined that additional modification of the transmitter sealing methods, as recommended in RO-269/83-17, is not necessary. (The Delaval transmitters were added for Reactor Building sump monitoring in response to TMI concerns.) The transmitters are filled with Dow 710 silicone fluid to a level above the cable entrance port. The port is sealed per installation requirements, as was done in the test, to prevent leakage of the silicone fluid and to provide a seal from the outside environment. A watertight electrical connection is accomplished by the installation of qualified Raychem heat shrink splices in the terminal box above the transmitters. Due to similarity of installed and tested configurations and the seals provided by the splices, port sealing, and the oil, the transmitters as installed are adequately sealed. Therefore, the existing cable entrance sealing method used for the Delaval transmitters used in harsh environments at Oconee is acceptable without additional modifications.

Based on Dow Corning radiation testing for Dow Corning RTV 3145 (RTV), Duke Power is confident that the RTV can provide an environmentally qualified short-term seal. Dow Corning data show that RTV 3145 maintains its strength and elongation properties with substantial margins at radiation exposures of approximately 20 megarads, substantially below the test level of 200 megarads.

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This correlates to a qualified life of five years' normal operation with approximately four days post LOCA for Duke Power inside Reactor Building applications. In that Reactor Building spray is terminated at the end of one day post LOCA, and since there is only a short term pressure spike (note: the spray and concurrent pressure are the primary forcing functions that contribute to moisture intrusion), it is Duke Power's judgement that ample margin exists in the ability of the RTV to maintain an adequate moisture barrier throughout the primary period of concern for the postulated Reactor Building profile. By the time (i.e., approximately four days post LOCA) that the cumulative radiation dose approaches the threshold value to cause RTV degradation, the Reactor Building environment has returned to conditions that should not subject components to significant moisture intrusion.

With respect to long-term seal qualification of Dow Corning RTV 3145, the Duke Power Company environmental qualification test profiles were very conservative compared to specific application requirements on a station and device basis. Some moisture intrusion was detected during this all-encompassing testing which resulted in the test being inconclusive in regard to the ability of the RTV to provide an acceptable long-term seal for specific applications. The moisture intrusion is attributed to the effects of high radiation (i.e., normal aging plus one year post LOCA dose).

In review of the Dow Corning temperature qualifications for RTV 3145 (i.e., qualified to 482°F long-term exposure), Duke Power has determined that the RTV is fully qualified for outside Reactor Building use. This analysis consisted of reviewing the postulated conditions in relation to the physical characteristics and limitations of the silicon elastomer inclusive of the results from Duke Power preliminary testing.

Scotchcast 9 epoxy resin, a sealing method fully qualified for long-term use in harsh environments, is planned to be utilized to seal the conduit connections to all affected Unit 3 components. Per the corrective action plan outlined in the October 18, 1983 submittal, Duke Power has applied Dow Corning RTV 3145 to the conduit fittings of all equipment of concern in Oconee Unit 2. Based on the analysis provided above and in the previous submittal, Duke Power finds Dow Corning RTV 3145 to be an acceptable short-term method of sealing components located inside the Reactor Building and fully qualified for long-term use outside the Reactor Building. Duke Power plans to upgrade the conduit/cable seals inside the Unit 2 Reactor Building using Scotchcast 9 epoxy resin or an alternative fully qualified long-term sealing method. Also for Unit 1, Scotchcast 9 epoxy resin or an alternative fully qualified long-term sealing method will be utilized.

The installation schedule for the modifications discussed above is as follows:

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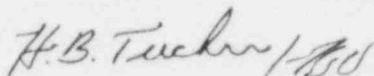
Unit 1 - During the End of Cycle 8 Refueling Outage (estimated to begin November 1984).

Unit 2 - During the End of Cycle 7 Refueling Outage (estimated to begin March 1985).

Unit 3 - During the current End of Cycle 7 Refueling Outage.

This schedule provides sufficient time to prepare and distribute necessary revisions to the installation specification, assemble materials and equipment, and assemble and train installation personnel.

Very truly yours,



Hal B. Tucker

JCP/php

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