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

May 24, 1984

MEMORANDUM FOR: Uldis Potapovs, Chief
Vendor Program Branch
Division of Vendor
and Technical Programs
Region IV

FROM: Robert L. Baer, Chief
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Division of Emergency Preparedness
and Engineering Response
Office of Inspection and Enforcement

SUBJECT: REVIEW COMMENTS ON ADDENDUM TO FRANKLIN RESEARCH CENTER REPORT F-C5569-306 REGARDING EVALUATION OF ROCKBESTOS CABLE MANUFACTURING TESTING

REFERENCE: Memorandum, V. Thomas to R. L. Baer, dated February 6, 1984, "Comments on FRC Report on Meeting on Rockbestos Cable Issue at IE Offices on January 5, 1984"

The enclosed addendum to Franklin Research Center (FRC) Report F-C5569-306, "Evaluation of Rockbestos Cable Manufacturing Testing," dated November 14, 1983, provides an analysis of information received since the report was issued. This submittal completes FRC's task effort regarding the Rockbestos Cable Company investigation.

The FRC report and this addendum provide their technical assessment to the NRC staff regarding whether nonconforming jacket and insulation test data identified during an inspection by Region IV (RIV) of the Rockbestos facilities have any adverse safety significance on plants in which the affected cable has been or will be installed in safety-related systems.

IE staff has reviewed the addendum and concurs with the FRC in the conclusions and related recommendations on all items of concern discussed, except one. This exception (Item 2) deals with FRC's conclusions and recommendations associated with the conductor insulation nonconformances identified with nine cable reels that were shipped to the Nine Mile Point 2 power plant, consisting of more than 19,000 feet of cable that either have been or will be installed. A similar situation existed at the Beaver Valley 2 power plant, but that issue has since been resolved. Details concerning the issue of nonconformances

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45

associated with the cable reels are discussed in the reference of memorandum and subject addendum.

Background

The referenced memorandum provides RIV with IE's technical positions and recommended followup actions needed to resolve the four major concerns addressed in FRC Report F-C5569-306. These concerns were the major topics of discussion in the January 5, 1984, meeting with Rockbestos, FRC, and NRC personnel held at the IE offices in Bethesda. The views and recommended followup actions of IE concerning items of concern 1, 3, and 4 are unchanged and are considered resolved at this time. Item 1 deals with the Rockbestos revisions to the cable retesting methodology program; Item 3 addresses the use of proper voltages for testing insulation resistance of low voltage cable; and Item 4 questioned the adequacy of cable qualification following a rejacketing process after cable repair. As mentioned above, FRC, E. Eich (cable consultant), and the NRC agree that Items of concern 1, 3, and 4 are resolved regarding the current Rockbestos investigation issue. Those items that need followup actions, as discussed in the referenced memorandum of February 6, 1984, ought to be resolved by RIV in the near future.

However, the Item 2 concern, which deals with nonconformances identified in test data taken during a retest program of the conductor insulation of two cable reels, was and is the main technical issue remaining after the meeting of January 5. Specifically, two cable reels, G34789 and G32923, which had been shipped to the Beaver Valley 2 and Nine Mile Point 2 sites, respectively, had shown values from the accelerated water absorption retest of conductor insulation that exceeded values guaranteed by Rockbestos. However, these values were well within applicable Insulated Cable Engineers Association (ICEA) standard S-66-524 requirements. Following an investigation of these abnormal values, both licensees reasoned that the cable reels were acceptable despite the minor nonrepetitive deviations (three sample retests were conducted on the cable in question) because the Rockbestos standard value is more stringent than the ICEA standard. The ICEA standard was the document applied to determine adequacy of these cable reels. At the request of RIV, both licensees submitted a written confirmation of this acceptance.

It was decided to follow-up on other cable produced from the same production run. In this regard, IE determined that a total of six cable reels consisting of more than 13,000 feet of cable were shipped to the Beaver Valley 2 plant, and nine cable reels consisting of more than 19,000 feet of cable were shipped to the Nine Mile Point 2 plant.

With respect to findings regarding the six cable reels at Beaver Valley 2, only 10 cable cuts out of 986 cable cuts are being used in safety-related electrical circuits. However, all of the 10 cable cuts are used in areas considered as mild environment. It was on this basis that FRC (see page 12 of addendum) judged the cable to be acceptable as installed at Beaver Valley 2. IE staff review of this specific issue at Beaver Valley 2 concurs with the FRC finding. Additionally, IE staff believe the cable in question to be acceptable for any application because the results of the test data meet the requirements of the governing standard, ICEA S-66-524. Therefore, IE recommends that RIV close out this part of the item 2 concern.

With respect to cable reel G32923 and the eight other reels shipped to Nine Mile Point 2, the conclusion and recommendations of the FRC, as discussed in the subject addendum, states that the cable cuts from these nine reels only would be acceptable for use in mild environments and for normal service conditions in harsh environment areas. On the basis of the information provided, FRC does not consider the cable to be acceptable for use in harsh environments during accident conditions. The reason given was that insulation covering the two suspect white insulation of conductors numbers 6 and 7 of the suspect seven-pair cable could fail in adjacent areas where moisture could accumulate during sustained accident (LOCA) conditions. These conditions, in turn could set up the potential for a short circuit between the two failed conductors, provided a difference in voltage potential existed between them. More detail of the FRC position on this issue is provided in the subject addendum.

As in the case at Beaver Valley 2, IE believes that the cable cuts taken from the suspect cable reels are acceptable for use in harsh environments under accident conditions provided all other conditions are normal. The bases for the IE conclusions are:

1. The cable in question at Nine Mile Point 2 has met all requirements of the governing standard ICEA S-66-524, during test and retest conditions. The test results that exceeded the Rockbestos guaranteed valves were non-repetitive during subsequent retest.

2. The test results that are of a concern to FRC, occurred during an accelerated water absorption test (EM60) which, according to the ICEA standard, is not recommended to be performed on conductors having insulations less than 45 mils. The cable in question at Nine Mile Point 2 (as well as the cable at Beaver Valley 2) has an insulation thickness of approximately 30 mils.

The following information obtained by IE regarding the cable further lessens any residual safety concerns:

1. All of the cable cuts comprising the more than 19,000 feet of cable at the Nine Mile Point 2 site are being used in areas with a mild environment.

2. Stone & Webster, and the cognizant engineer at Nine Mile Point 2, informed IE that only one cable cut was being used in a safety related circuit, however, it also was located in a mild environment. The remaining cable cuts from the more than 19,000 feet of cable are being used in the plant annunciator system and indicating light circuits.

On the basis of the above findings and review of the FRC addendum, IE recommends that RIV close out the concern of Item 2. IE also considers the cable as installed at Nine Mile Point 2 acceptable for the service intended at that site, as discussed above.

In summary, IE now considers all requests for technical assistance from RIV regarding the overall NRC investigation of Rockbestos to be complete and plans no further action unless requested.

P 234

Please contact V. Thomas of my staff on extension 492-4755 if you have any questions concerning the matters discussed above.

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Enclosure: Addendum

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page 4

The results of the ~~audits and Region III~~ inspections show that there have been ~~are~~ severe deficiencies in the qualification programs. ~~in effect at the~~ Rockbestos Company. Individually, some of the deficiencies could be justified, but taken collectively, the nature and number of deficiencies identified invalidate any claim that qualification has been established. However, it is the responsibility of the user utilities to ~~demonstrate what~~ take corrective action ~~will be taken~~ to ensure ~~qualification of~~ that the Rockbestos cables installed in their plants are qualified.

Some possible courses of action might be:

a) Perform a valid qualification test of installed cables.

b) Obtain documentation for valid qualification tests already performed and determine its applicability to installed cable.

c) Perform analyses of existing qualification reports applicable to installed cables ~~and justify any deviations from accepted standards~~ to ensure that the documentation relied upon to demonstrate environmental qualification supports such a conclusion.

Even though the validity of the Rockbestos qualification reports are in doubt based on the results of tests performed on Rockbestos cable by both the Franklin Research Center and Sandia National Laboratories ~~indicate that the cables tested are capable of performing their required function.~~ the NRC staff ~~therefore~~ has concluded at this time that ~~there is~~ no ~~immediate~~ safety problem ~~in the~~ exists from the use of Rockbestos cable.