



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

September 21, 1988

Docket No. 50-368

MEMORANDUM FOR: Victor Stello, Jr.
Executive Director for Operations

FROM: Thomas E. Murley, Director
Office of Nuclear Reactor Regulation

SUBJECT: USE OF E-BRITE 26-1 MATERIAL IN THE SHUTDOWN
COOLING HEAT EXCHANGERS AT ARKANSAS UNIT 2

This memorandum is in response to the September 6, 1988, memorandum to you from Sharon R. Connelly, Director, Office of Inspector and Auditor, concerning NRC's followup of an allegation about the use of E-Brite 26-1 material in nuclear facilities. The substance of the allegation was that E-Brite 26-1 material cannot be welded and its ductile-to-brittle transition temperature cannot be controlled, thus making its use in nuclear reactors extremely hazardous.

Referencing an NRC inspection conducted in August 1986 by the Vendor Inspection Branch (Inspection Report No. 99901063/86-01), the memorandum questioned whether a determination on the substance of the allegation had ever been made. This question arose because the inspection report primarily addressed the use of E-Brite material in nuclear facilities and not its suitability. The inspection determined that E-Brite material had not been supplied to nuclear facilities by the BOC Group (Airco Vacuum Metals); therefore, no further followup action seemed warranted at the time.

However, the NRC staff learned in late 1987 that tubes made of E-Brite 26-1 material had been used to fabricate replacement tube bundles for the shutdown cooling heat exchangers at Arkansas Unit 2 in 1981. The tubing manufacturer was Allegheny Ludlum Corporation and the tube bundle fabricator was Engineers and Fabricators Co. (EFCO).

In response, the Vendor Inspection Branch conducted an inspection (Inspection Report No. 99902007/88-01) on January 4-7, 1988, at the Claremore, Oklahoma, Tubular Products Division of the Allegheny Ludlum Corporation. This plant was the fabrication site for the E-Brite 26-1 tubing used at Arkansas Unit 2. No violations of NRC requirements were identified. The report also indicated that no other applications in nuclear facilities of E-Brite tubing or material had been made by Allegheny Ludlum, the sole supplier of E-Brite material at the time. This inspection report is included as Enclosure 1.

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Additionally, on March 2 and 3, 1988, an NRC inspection (Inspection Report No. 50-368/88-04) was performed at the Arkansas Unit 2 site. Two inspectors, one from NRR and one from Region IV, participated. The inspection reviewed the procurement and operational history associated with retubing of the heat exchangers with E-Brite 26-1 material. The inspection report indicated that the procurement and manufacture of the tube bundles met NRC requirements. The inspection also indicated that E-Brite 26-1 material had adequate weldability for the fabrication of heat exchanger tube bundles. Also, the absence of leaks in the heat exchangers since January 1983 provides additional assurance of the adequacy of this material. A copy of the March 1988 NRC inspection report is included as Enclosure 2; the E-Brite inspection is discussed on pages 9 through 12 of the report.

EFCO successfully performed tube-to-tube sheet welds during the heat exchanger tube bundle fabrication. Therefore, the alleged assertions that E-Brite 26-1 cannot be welded and that its ductile-to-brittle transition temperature cannot be controlled were not substantiated in the Arkansas Unit 2 application.

Furthermore, a June 7, 1988, memorandum to Brian K. Grimes from Edward T. Baker indicated that E-Brite 26-1 material was properly accepted into the ASME Code (Table I of Section II). This memorandum is included as Enclosure 3.

Besides the case of Arkansas Unit 2, there are no other known safety-related applications of this material in nuclear facilities. Even so, the staff has determined that E-Brite material is acceptable for use in nuclear facilities. Thus, further investigation to identify other applications is not deemed necessary.

Original signed by

Thomas E. Murley

Thomas E. Murley, Director
Office of Nuclear Reactor Regulation

Enclosures:
As stated

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EDO Principal Correspondence Control

ACTION

FROM:

DUE: 9/26/88

EDO CONTROL: 0003933
DOC DT: 09/06/88
FINAL REPLY:

Sharon R. Connelly
DIA

~~SECRET~~

TO:

Victor Stello

FOR SIGNATURE OF:

** GRN **

CRC NO:

DESC:

IDENTIFICATION OF A POSSIBLE SAFETY ISSUE AT
ARKAN...

ROUTING:

Stello
Taylor
Hoyle
RMartin

DATE: 09/07/88

ASSIGNED TO:

CONTACT:

NRR

Murley

SPECIAL INSTRUCTIONS OR REMARKS:
For Appropriate Action

NRR RECEIVED: SEPT. 7, 1988
ACTION: DRSP:HOLAHAN

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