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JOSEPH A. TIERNAN
VICE PRESIDENT
NUCLEAR ENERGY

September 20, 1988

U. S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

ATTENTION: W. T. Russell
Regional Administrator

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Notification of a Defect in Westinghouse Type DS Circuit Breakers per
10 CFR 21

Gentlemen:

We have identified a deviation in Westinghouse Type DS 206 and DS 416 circuit breakers. We evaluated the deviation, and determined such deviation can be considered a defect as defined in 10 CFR 21. This defect was reported to me on September 15, 1988, and we notified Mr. David Limroth by telephone on September 16, 1988. Attached is our written report as required by 10 CFR 21.21(b)(2). The report contains the information required by 10 CFR 21.21(b)(3).

Should you have any further questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,

JAT/WPM/dlm

Attachment

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ATTACHMENT A

The length of time that was taken to complete the action:

Breakers were taken out of service, tested, and repaired, if necessary, from October 1987 to July 1988, as operating conditions permitted. This work was done while we were inspecting pole shaft assemblies, as required by NRC Bulletin 88-01.

(viii) Any advice related to the defect that has been, is being, or will be given to purchasers or licensees:

We have informed Westinghouse of the results of our investigation, and will send them a copy of this letter.

Mr. W. T. Russell
September 20, 1988
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cc: D. A. Brune, Esquire
J. E. Silberg, Esquire
T. E. Murley, NRC (3 copies)
R. A. Capra, NRC
S. A. McNeil, NRC
W. T. Russell, NRC
D. C. Trimble, NRC
T. Magette, DNR
P. Morris, Westinghouse

ATTACHMENT A

The format of this Attachment conforms to the list of information required per 10 CFR 21.21(b)(3).

- (i) Name and address of the individual informing the Commission.

Joseph A. Tiernan
Vice President Nuclear Energy
Baltimore Gas and Electric Company
P. O. Box 1535
Lusby, MD 20657

- (ii) Identification of the basic component which contains a defect.

Westinghouse Type DS 206 and DS 416 Circuit Breakers

- (iii) Identification of the firm supplying the basic component which contains a defect.

Westinghouse Electric Corporation

- (iv) Nature of the defect and the safety hazard which could be created by such defect.

Inadequate crimps on insulated Amp closed-end splices have been found in power-operated circuit breakers. We identified the deviation while investigating the failure of a reactor cavity cooling fan 480 volt breaker to close. A crimped connector fell off during inspection. The connector was crimped at the end of the barrel and did not contain the leads. The following day, a second connector fell off a charging pump breaker during maintenance.

After conferring with Amp, the supplier of the connectors, we tension-tested all crimped connectors in Class 1E, 480 volt breakers. An extremely conservative acceptance criteria was applied to the tension test. This criteria was based on the manufacturer's recommended limits for wire installation. Pulling tension for 18 AWG wire was 20 pounds.

Test results are given in Item (vi) below. Ninety-two breakers were tested. Two breakers contained connectors that fell off before the tension test. Ten of the remaining ninety breakers contained one or more connectors that did not meet the tension test criteria. In all, out of ninety-four breakers, four breakers contained a connector that fell off and ten other breakers contained one or more connectors that did not meet the tension test criteria.

Of the fourteen breakers that had inadequate crimps, only one breaker had lost a function and that function was non-safety-related. An inadequate crimp on the reactor cavity cooling fan breaker led to a failure of that

ATTACHMENT A

breaker to close. The safety-related function of that breaker is to trip, or open. This function was not affected by the inadequate crimp. All of the other 13 breakers had operated properly up to when they were taken out-of-service for the tension test. Nonetheless, we have conservatively concluded that, had the deviation occurred on another one of the crimp connectors, it could have prevented a breaker from performing its safety-related function. We are reporting this deviation to notify others of a potential problem. Our evaluation indicated that a significant safety hazard did not exist.

- (v) The date on which the information of such defect was obtained:

September 15, 1988

- (vi) The number and location of all such defective components identified in use at Calvert Cliffs Units 1 and 2:

<u>Breaker No.</u>	<u>Equipment</u>	<u>No. of Failed Connectors</u>
52-1101	11 Cavity Cooling Fan	1 (1)
52-1413	Load Center 14B Main	3
52-1415	13 Charging Pump	1 (1)
52-1416	13 Component Cooling Water Pump	2 (2)
52-1430	12 Pressurizer Proportional Heater	2
52-2109	MCC 201AT Feeder Breaker	1
52-2113	Load Center 21B Main	1
52-2413	Load Center 24B Main	2
52-2419	MCC 201BT Feeder Breaker	3
52-2422	22 Hydrogen Recombiner	2
52-1106	11 Component Cooling Water Pump	2
52-1115	11 Charging Pump	- 1 (1)
89-1116	13 Component Cooling Water Pump Disconnect	1
89-1416	13 Component Cooling Water Pump Disconnect	1

NOTES:

- (1) Connector fell off prior to a tension test.
(2) One of the two connectors fell off prior to a tension test.

- (vii) The corrective action which has been taken:

We repaired all crimp connections that failed our test criteria.

The name of the organization responsible for the corrective action:

Baltimore Gas and Electric Company