

NORTHEAST UTILITIES



THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

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May 9, 1986

Docket No. 50-423
B12082

Dr. Thomas E. Murley
Regional Administrator
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Gentlemen:

Northeast Nuclear Energy Company,
Millstone Nuclear Power Station, Unit No. 3
Report of Substantial Safety Hazard

In conformance with applicable requirements of 10 CFR 21, Northeast Nuclear Energy Company hereby provides notification of a Substantial Safety Hazard (SSH) for the Millstone Nuclear Power Station, Unit No. 3.

On May 1, 1986, Mr. Larry Briggs of the NRC Region I office was verbally notified of a generic defect in the Type K600S circuit breakers supplied by ITE/Brown Boveri. 140 of these breakers are utilized in Millstone Unit No. 3. Forty-one (41) are Category 1E breakers supplying thirty-nine (39) safety-related load centers. Two (2) breakers are maintained as spares.

Upon racking in of 480V Load Center Breaker 32K3 (Turbine Building Crane 3MHT-CRN 1A & 1B), the 35 amp control power fuses blew. A short to ground was measured on the wire leading to the breaker trip coil inside the breaker mechanism. Investigation showed that the wire harness, containing eight (8) wires from the "52L-" Auxiliary Switch, was in direct contact with the racking shaft gear. Although this harness was wrapped in a plastic shield, the gear teeth had worn through the shield and severed the wire to the electrical trip coil. The wire grounded on the shaft gear, which blew the fuses.

The existence of this defect results in the following safety implications. Depending upon which wire(s) is cut, any of the following four (4) malfunctions could occur.

- 1) Failure of the charging motor to charge the breaker closing springs. (The operator should realize the springs did not charge during breaker rack in, and initiate corrective action at that time).
- 2) Failure of the closing latch release coil to act, resulting in the loss of the breaker's electrical (remote) closing capability.

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- 3) Loss of Electrical Shunt Trip Capability (Local and Remote Opening Function), and, at the same time, loss of local and remote "Breaker Closed" red light indication.
- 4) Loss of local and remote "Breaker Open" green light indication.

If malfunction 1, 2, or 3 remains undetected, which is very possible if the control power fuses do not blow, the system would not perform its intended safety function. However, none of these malfunctions will prevent the K600S breakers from tripping due to an overcurrent or fault condition, as designed.

Ten (10) additional K600S breakers were inspected. Eight (8) breakers exhibited wear on the harness shield. The 22 safety-related breakers that are required to open or close during or following an accident were tested for circuit integrity and were found to be satisfactory. Those 22 breakers were yellow-tagged, which required retesting of any that are racked out and then racked in any time prior to completion of corrective modifications.

Corrective action will be to repair any damaged harnesses and wires and, in all the breakers, route the wiring harness away from the racking shaft gear by relocating a cable clamp. NNECO is presently working with the supplier in confirming and implementing this modification. Visual inspection and modification of some of these breakers can be accomplished only during a plant shutdown.

During the development and review of the five-day notification letter required by 10 CFR 21.21(b)(2), an additional potential failure scenario was identified. Any or all of the wires within the wire harness could be cut or stripped by the racking shaft gear. Certain of these bare or cut wires could be positioned so that vibration (such as that caused by breaker operation) or temperature changes could cause a wire to short to ground, causing unanticipated operation or other malfunctions of the breaker. Additionally, a fifth malfunction mode was identified in which wire-to-wire shorts within the eight-wire harness could result in spurious tripping of a breaker that is required to remain closed. This failure mode resulted in the need to further investigate those breakers which feed motor control centers. There is little chance the electrical integrity test would detect such a potential short. Therefore, it was decided that a visual inspection of the wiring harness and/or removal of breaker control circuit power would be the most prudent action.

On May 3, 1986, NNECO initiated the following action on the forty-one (41) breakers supplying safety-related loads.

- (1) Twenty-one (21) breakers supply single loads. Twelve (12) of these have been visually inspected, repaired as required, and modified. The remaining nine (9) breakers, which are not required to be operable during or following an accident, will be inspected, repaired as required, and modified during a subsequent plant shutdown.
- (2) Fourteen (14) breakers supply motor control centers. One of these breakers was inspected, repaired, and modified, inasmuch as it is required to change state during accident conditions. The other thirteen (13) breakers must not change state during an accident. Therefore, the control circuits for each breaker were deenergized by pulling their power fuses.

These thirteen breakers will be inspected, repaired as required, and modified during a subsequent plant shutdown.

- (3) Four (4) of the breakers are containment penetration protection breakers and have been repaired and modified.
- (4) Two (2) of the breakers are spare breakers and will be inspected, repaired if required, and modified.

On May 5, 1986, Mr. Ebe McCabe of the NRC Region I Office was verbally notified of the inspection, repair, and modification activities initiated on May 3, 1986. This call constituted a change in our corrective action noted in our May 1, 1986 call to Larry Briggs. We informed Mr. McCabe that, in light of this change, NNECO delayed the transmittal of the five-day letter until the results of the actions of May 2, 1986 could be evaluated. This letter serves as NNECO's written notification as required in 10 CFR 21.21(b)(2).

The following information applicable to this Substantial Safety Hazard is provided as required by 10 CFR 21.21(b)(3), i through viii.

- (i) Name and Address of Individual Informing the Commission
John F. Opeka, Senior Vice President, Nuclear Engineering and Operations, Northeast Utilities Service Company, P.O. Box 270, Hartford, Connecticut 06141-0270
- (ii) Identification of the Basic Component
600 volt, 600 ampere, electrically operated, drawout circuit breaker with solid-state trip box, Type K600S.
- (iii) Identification of the Firm Supplying the Basic Component
ITE/Brown Boveri
- (iv) Nature of the Failure to Comply
(See discussion above)
- (v) Date on Which Information of Such Failure to Comply Was Obtained
April 29, 1986
- (vi) The Number and Location of all Such Circuit Breakers
140 of these circuit breakers are installed in Millstone Unit No. 3; 41 are designated as Category IE for use in safety-related circuits. None are in use in Millstone Unit Nos. 1 or 2.
- (vii) Corrective Action, Organization Responsible, and Time to Complete
(See discussion above).

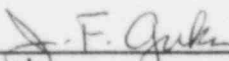
(viii) Advice Related to Failure to Comply Being Given to the Licensee

(Not applicable - Refers to Supplier).

ITE/Brown Boveri Type 1600S breakers utilized in Millstone Unit No. 3 were inspected for this defect. The large size of these breakers and their internal configuration preclude the harness interference defect.

I trust this information fulfills our reporting obligations in this matter under the requirements of 10 CFR 21.

Very truly yours,



J. F. Opeka
Senior Vice President

cc: Director, Office of Inspection and Enforcement (three copies)