GENERAL ELECTRIC

CONTRACTOR EQUIPMENT BUSINESS OPERATIONS
GENERAL ELECTRIC COMPANY • 41 WOODFORD AVENUE • PLAINVILLE, CONNECTICUT 06062 • (203) 747-7111

February 24, 1984

Mr. Richard C. DeYoung
Director of Office of Inspections
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Washington, D.C. 20555

Dear Mr. DeYoung:

The Distribution Equipment Engineering and Manufacturing Operation of the General Electric Company has determined on this date that reportable defects exist on certain AKR-30 and AKR-50 Low-Voltage Power Circuit Breakers delivered for use at the Hope Creek Nuclear Generating Station. These defects include:

- Loose holding pawl nuts
- Loose buffer assembly
- Defective solder joints
- Defective ratchet assembly pin
- Improperly installed control switch activating plate
- Loose control switches

We believe that these defects were introduced into these circuit breakers during the incorporation of modifications to correct previously reported defects and that these breakers were not properly re-inspected and re-tested. Unlike the other AKR Circuit Breakers which were modified at the nuclear generating stations where they were to be used, the modification of the Hope Creek units was carried out at our warehouse while these breakers were being held for subsequent delivery. These defects may result in the failure of the circuit breakers to properly charge or latch.

As far as can be determined, the Hope Creek facility is the only installation effected by these problems. Approximately 360 Class 1E and non-1E AKR-30 and AKR-50 Circuit Breakers were delivered to the Hope Creek facility.

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The General Electric Company is in the process of correcting these problems through a program to recycle all the AKR-30 and AKR-50 circuit breakers at Hope Creek through our Plainville facility for repair, re-inspection, re-testing, and re-certification. We are confident that this corrective action program established for these circuit breakers will fully correct the defects reported.

Attached to this notification is a copy of the information relating to these problems which has been given to the Hope Creek facility.

If you require any further information, please contact me.

Very Truly Yours,

David J. Dixon

David J. Dixon, Manager
Quality Assurance

(203) 747-7466

clt/Attach. (2617P)

cc: V. D. Thomas - US NRC - Wash. D.C.
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February 23, 1984

Mr. Claude Turnbow
Manager of Construction
Bechtel Power Corporation
P.O. Box "B"
Hancocks Bridge, NJ 08038

RE: PUBLIC SERVICE ELECTRIC AND GAS COMPANY
HOPE CREEK GENERATING STATION
BECHTEL JOB 10855 - UNIT 1
GENERAL ELECTRIC AKR-30 CIRCUIT BREAKERS

Dear Mr. Turnbow,

The various circuit breaker deficiencies which were reported to us by Bechtel during our meeting of February 6, 1984 have been analyzed, as per your request.

We believe that most of these problems occurred as a result of the rework programs which were performed on these circuit breakers while they were located in our Plainville warehouse. These rework programs were associated with the implementation of Service Advices 175-9.6, 175-9.7, and 175-9.11.

The circuit breakers which were to be shipped to Hope Creek had been stored in our warehouse facilities for some time, at the request of Bechtel, when it became necessary to implement the subject Service Advices at three (3) different times. This rework program was done for all but one other nuclear generating station through the utilization of General Electric's field service engineering organization. The AKR breakers for Hope Creek were modified by our factory organization in Plainville who had not previously been involved in such rework programs. It now appears that this modification program did not include adequate retesting and reinspection of the circuit breakers.

We have formalized the return, repair, reinspection, and retesting of the Hope Creek AKR circuit breakers for recertification and are confident that the program for these circuit breakers, which has been proposed to Bechtel Power Corporation, will eliminate any concerns which either Bechtel or PSE&G may have with respect to the reliability and quality of this equipment.

The detailed analysis of the reported problems is as follows:

- Loose Nut on Holding Pawl Assembly

  Evaluation and Cause - The manufacturing assembly process requires that each holding pawl nut be torqued to 250 in-lbs and that loctite #271 be applied to further ensure the integrity of that assembly. We believe that the holding nut was removed during the implementation of Service Advice 175-9.6 in Plainville and that the assembly was not adequately retorqued. It is probable that many of the circuit breakers located at Hope Creek will exhibit this condition.

  Corrective Action - All of the circuit breakers at Hope Creek will be inspected for this torque requirement during the inspection program in Plainville.

- Loose Buffer Assembly

  Evaluation and Cause - This assembly loosened due to a poor mating fit between the bolt and its' associated self-locking nut. This problem has occurred on only one (1) circuit breaker at Hope Creek (S/N N2919300058). In addition, we have not received any field reports from other installations, commercial or nuclear, reporting the loosening of this assembly.

  Corrective Action - This assembly will be inspected on all circuit breakers from Hope Creek as part of the inspection program.

- Short Motor Spacer

  Evaluation and Cause - The only reported incident this Operation has received concerning a short motor mount spacer occurred on one (1) circuit breaker at Hope Creek. It should be noted, however, that the short spacer did not adversely affect the reliable operation of the circuit breaker. It is our belief that this complaint is isolated to only one (1) circuit breaker.

  Corrective Action - The motor mount spacers on all these circuit breakers will be inspected in Plainville.

- Anti-Pump Relay Connections

  Evaluation and Cause - This anti-pump relay solder connections came loose on two (2) circuit breakers at Hope Creek as a result of a "cold" solder joint. The possibility exists that other circuit breakers at Hope Creek may exhibit a similar condition.

Corrective Action - The integrity of the anti-pump relay solder connections will be verified during the inspection program.

- Defective Spring Charging Motor

Evaluation and Cause - We believe that this is a secondary failure caused by the loose holding pawl assembly in this breaker. The motor is not rated for continuous duty and probably failed thermally when it was required to run for an extended length of time, as occurs when the holding pawl assembly is loose. Further, our overall field experience on AKR breakers indicates that motor failures by themselves have not occurred.

Corrective Action - None required. This failure mode will be eliminated as a result of the verification of the holding pawl assembly torques.

- Ratchet Assembly Pin

Evaluation and Cause - This pin was, apparently, damaged while the ratchet assembly was being installed during the implementation of Service Advice 175-9.6 in Plainville. As stated earlier, it now appears that the reinspection and retest programs were not implemented properly. This defect has not been observed in either audit testing or Engineering endurance testing and it is unlikely that any other circuit breakers at Hope Creek will exhibit this condition.

Corrective Action - The ratchet assemblies will be inspected on all of the Hope Creek circuit breakers. Further, all breakers will be tested electrically to ensure proper operation.

- Improperly Installed Cut-off Switchplate

Evaluation and Cause - This plate was improperly installed during the rework program which was undertaken in Plainville to replace closing spring props and switchettes (Service Advice 175-9.11). If this circuit breaker had been adequately retested, this misassembly would have been readily detected. Other circuit breakers at Hope Creek may have improperly installed cut-off plates.

Corrective Action - The electrical testing to be performed during the recalibration of circuit breakers will ensure that the cut-off switch plate is installed correctly.

- Loose Cut-off Switches

  Evaluation and Cause - A special tool is required to properly tighten the jam nuts on F & G cut-off switches in AKR circuit breakers. It is likely that the cut-off switches were adjusted and retightened without using the proper tool, allowing them to become loose during operation. Other circuit breakers at Hope Creek may have loose F & G switches.

  Corrective Action - A recent design change has been implemented which requires the application of glyptol to serve as indication that the jam nut torque has been checked and to aid in locking the nuts in place. The jam nuts will be checked for proper torque during the recertification process and the glyptol applied.

- Loose Parts

  Evaluation and Cause - Extra parts were inadvertently shipped with the circuit breakers as a result of the Plainville rework programs.

  Corrective Action - The comprehensive inspection program prepared by the General Electric Company will ensure that circuit breakers are not shipped to Hope Creek with either loose or missing hardware.

If you have any questions regarding this response, please contact me.

Very truly yours,

Philip M. Piqueira

Philip M. Piqueira
Manager, Product Service

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