NEI Peebles - Electric Products, Inc.

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179824

November 24, 1986

Mr. James Taylor, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: 10CFR21 Notification of Existence of a Reportable Defect in Class 1E Diesel Generator.

Dear Sir,

It has been determined that a defect exists in one rotor pole in the following nuclear safety related generator.

SHOP ORDER	CUSTOMER	UTILITY
17609966	Cooper Energy	Arizona Power Palo Verde Unit 3

50-530

This equipment was manufactured by Parsons Peebles-Electric Products, Inc., 1725 Clarkstone Road, Cleveland, Ohio, 44112 during 1980. It has been determined that the copper winding on a pole has moved. A full engineering report is attached with our preliminary determination of the failure. Investigation and further evaluation continue.

The NRC Regional office in Chicago was notified of this situation by phone on Thursday, November 20, 1986.

Should you require any further information, please contact us.

Yours sincerely,

NEI PEEBLES - ELECTRIC PRODUCTS, INC.

Ron B. Politi
Vice President & General Manager

RP/jmr

Attachment

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NEI

Peebles - Electric Products, Inc.

Internal Correspondence

EI 3306

To: R.B. Politi

Date: November 24, 1986

From: J.V. Pospisil

Subject: 10 CFR 21 - Notification of Existence of a Defect in Class 1E Diesel Generator System.

It was determined that a manufacturing defect exists in the rotor of one of the Class 1E Emergency Standby Diesel Generators installed at Palo Verde, Unit 3, and identified by the Serial No. 17609966-200. Potential existence of a similar defect in the rotor of the duplicate unit identified by the Serial No. 17609969-200 could not be excluded with an acceptable degree of certainty. Thus, pending further verification, both Diesel Generators of the redundant pair installed at Palo Verde, Unit 3, must be considered potentially defective at this time.

This equipment was manufactured by NEI, Parsons Peebles-Electric Products, Inc. during the second quarter of 1980 and upon completion of the specified factory routine testing shipped to Cooper Energy Services in July and August of the same year. The design of these generators duplicated that made by Portec, Inc. Electric Products Div. for Palo Verde, Unit 1 and Unit 2, identified by Serial Nos. 17609964 plus 967-200 and 17609965 plus 968-200, shipped previously.

Based on the information available to us so far, the manufacturing defect was tentatively identified as substandard bond of the polyester resin encapsulant and the field coil conductor in certain localized areas of the wirewound rotor pole. Unable to resist the horizontal shear between bonded layers of wire resulting from centrifugal components due to rotation, the resin bond breaks, permitting the wires to separate from each other and displace away from the coil. With progressive separation and displacement, a condition is reached under which the wire insulation becomes damaged and an electrical failure of the equipment follows.

Resin bond failure leading to separation of layers and physical displacement of conductors can be caused by the following conditions:

a. Mechanical damage by impact or excessive overspeed.

b. Improper formulation, mix, or cure of the resin.

c. Improper application of resin or contamination of the wire surfaces.

As there was no physical evidence of mechanical damage anywhere else but in one particular area of one particular pole, Condition a. was excluded from further consideration. On the other hand, a potential existence of either Condition b., or c., or a combination thereof became targets of detail investigations which are in progress.

NEI, PP-EP, Inc. records reveal that rotor poles for Serial No. 17609966-200 were wound between May 28 and June 13, 1980, and those for 17609969-200 between June 18 and July 9, 1980, utilizing the manufacturer-premixed two-part compound

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certified by its manufacturer, the Sterling Division of Reichhold Chemicals, Inc. as D 111 furnished under PP EP Purchase Order No. 5029 3. These records also reveal that the batch of poles wound immediately prior to this period was completed on April 24, 1980, and no other batch was started until October 10, 1980. These findings confirm that the presence of the same potential defect is limited to the generators identified in the first paragraph above.

A two part corrective action is suggested. First, the damaged rotor pole should be removed from the installed rotor Serial 17609966 200 and replaced with a spare rotor pole on hand. Second, the rotors of both generators should be overspeed-tested by driving them de-energized to the maximum safe speed (between 110 and 125% of the synchronous speed) permitted by the diesel engine manufacturer. If no apparent injury to any rotor pole takes place during a 5 minute de-energized run at a speed in excess of that required to "set overspeed trips" (typically 110%), the rotor should be accepted. If otherwise, damaged poles should be rewound and the rotors retested.

The foregoing will be supplemented as new information becomes available.

J.V. Pospisil, P.E.
Manager of Engineering

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