

Cutler-Hammer

Nuclear Programs
130 Commonwealth Drive, Warrendale, PA 15086



LTR99185

November 12, 1999

Document Control Desk
United States Nuclear Regulatory Commission
Washington, DC 20555

Attention: Director, Office of Inspection and Enforcement

Subject: Potential Non Operability of the Cutler-Hammer DS and DSL Circuit
Breaker Due to Zinc Chromate plating of hardened parts.

The following information is provided pursuant to the requirements of 10CFR Part 21 to report a potential safety concern. This issue concerns the potential for the malfunction of the Cutler-Hammer DS and DSL circuit breakers due to the application of Zinc Chromate Plating to hardened parts.

Eaton Power Plant Controls/Eaton Cutler-Hammer Nuclear Programs Inspection personnel have observed the results of improper plating during the performance of Class 1E Breaker Reconditioning. The improper plating must have been performed as a result of prior reconditioning activities since the application of plating was not in accordance with factory manufacturing processes. Multiple instances of parts which are known to be hardened having zinc chromate plating applied to them have been seen. In one case a Spirol Pin was observed in the Levering Shaft of a breaker, which fractured during removal as part of Cutler-Hammer's reconditioning process. The Spirol Pin inner layers separated when the pin was driven from the part. Although not confirmed by independent testing it is believed that the cause of the part failure was that Hydrogen Embrittlement Relief was not performed on the part following it being plated.

The failure of hardened parts to maintain their design integrity due to cracking and the potential for the total separation of pieces during a seismic event or normal operation and their subsequent infiltration of the breaker operating assembly could cause the failure of the breaker to perform its design function. In addition, mechanical interlocks may not perform as expected or the breaker may not be able to be charged depending on the actual failure which could occur.

This deficiency was identified and determined to be of a chronic reportable nature on approximately October 12, 1999.

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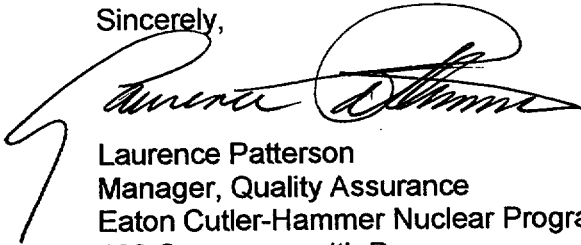
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The installed base of the DS style circuit breakers is spread throughout the nuclear industry however, it is unknown to Eaton PPC specifically which utilities may have had reconditioning performed on their breakers that included plating of parts.

Eaton Power Plant Controls recommends that a thorough inspection be conducted on all breakers which may have undergone previous reconditioning activities which included plating or replating of component parts. Specific attention should be directed toward Spirol Pins, which are constructed of hardened spring steel. A comparison of breakers which have never been reconditioned to breakers, which have undergone reconditioning may reveal other discrepancies which should be evaluated for potential impact on circuit breaker operability. Please note that plating alone on parts, which previously were not plated, may not be a technical problem as long as the proper Hydrogen Embrittlement Relief has been performed within the required timeframe required by the applicable ASTM specification. If plating is noted that may not be in accordance with factory configurations seen on other breakers, the vendor which performed the prior reconditioning activities should be consulted as to what process they used to identify hardened parts and any Hydrogen Embrittlement Relief which may have been performed.

Should you have any questions regarding this please contact Pat Patterson, Eaton Cutler-Hammer Nuclear Programs at 724/779-5931.

Sincerely,



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DS Circuit Breaker File

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