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May 11, 1989

Mr. A. Bert Davis
Regional Administrator
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Dresden Nuclear Power Station Units 2 and 3
Response to Notice of Violation and
Unresolved Item Concerning Preventative
Maintenance of 4kV Breakers and 250V
Motor Control Centers
NRC Docket Nos. 50-237 and 50-249

Reference: Letter from H.J. Miller to Cordell Reed
dated April 4, 1989 transmitting NOV and
Inspection Report 50-237/88029 and 50-249/88030

Mr. Davis:

Enclosed in Attachments A and B are the Commonwealth Edison (CECo) responses to the subject Notice of Violation (Level IV) and Unresolved Item, respectively, which resulted from the Dresden Maintenance Team Inspection conducted from January 23 to February 16, 1989.

CECo fully appreciates the significance and potential impact of preventative maintenance deficiencies on important electrical equipment such as the 4kV breakers and 250VDC motor control centers. As indicated in Attachment A, CECo is addressing the concern generically, as well as correcting the identified Dresden deficiencies.

In addition to the measures described in the attachments, actions are also being taken to address other weaknesses noted by the Maintenance Inspection Team. CECo appreciates this extensive effort by the Region staff and the many useful observations and recommendations which resulted from the inspection (e.g., the need for more effective trending of adverse equipment performance). These are being factored into both corporate and station efforts to effectively implement the CECo Conduct of Maintenance Program.

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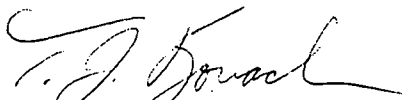
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If you have any questions regarding this matter, please contact this office.

Very truly yours,



T. J. Kovach
Nuclear Licensing Manager

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Attachments (2)

cc: B.L. Siegel - Project Manager, NRR
S.G. DuPont - Senior Resident Inspector, Dresden
W.J. Kropp - Region III

ATTACHMENT A

COMMONWEALTH EDISON COMPANY

RESPONSE TO NOTICE OF VIOLATION

SEVERITY LEVEL IV

VIOLATION

10 CFR 50, Appendix B, Criterion XVI, as implemented by Commonwealth Edison Company's Quality Assurance program, as described in Section 16 of Topical Report CE-1A, requires that measures be established to assure conditions adverse to quality are promptly identified and corrected. In the case of significant conditions adverse to quality, the measure shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.

Contrary to the above:

1. The cause of 4.16KV breaker failure was inadequately evaluated for the Unit 2 Low Pressure Coolant Injection Pump "D" in February 1988. An adequate evaluation would have identified that maintenance of 15 Unit 2 and 3 breakers was not performed at the required frequency. Two 4.16KV breakers, which supplied the motors for Unit 2 Containment Cooling Service Water pumps, were last overhauled in 1976.
2. The cause of a Unit 3 Isolation Condenser Makeup valve failure in July 1988 was inadequately evaluated. Failure to perform preventive maintenance was not identified as a contributing factor. Preventive maintenance had not been performed on Unit 3 250VDC motor control centers 3A and 3B since 1975. These motor control centers supply power to HPCI torus suction valves.
3. Auxiliary switches (SBM) for Unit 2 and 3 4.16KV breakers and breaker cubicles were not replaced even though the switches had a history of failure since 1982 and were at or near end of life. (237-88029-02, 249/88030-02)

This is a Severity Level IV violation.

DISCUSSION

1. The February 11, 1988 2D LPCI pump trip event was investigated by a Technical Staff Systems Engineer in accordance with Dresden Administrative Procedure (DAP) 2-8, Deviation Reporting. As stated in DVR 12-2-88-15, the cause of the 2D LPCI pump trip was attributed to a sticking 4KV power supply breaker trip latch roller mechanism. The 2D LPCI pump breaker was removed and replaced. The other three LPCI pumps were verified to start satisfactorily, and the Unit 2 Diesel Generator was operable to provide an alternate power source if necessary.

DISCUSSION (Cont'd)

Although the "Corrective Actions" section of DVR 12-2-88-15 did mention that "as a long term corrective action the maintenance department is reviewing the maintenance history of all 4KV circuit breakers in an effort to upgrade the Preventive Maintenance (PM) Program," the "root cause" was never fully determined to be due to the lack of PM. The "Apparent Cause of Event" section determined that the root cause was, "attributed to an intermittent malfunction of the trip latch and trip latch roller mechanism," and that this occurred due to, "a lack of lubrication and dirt buildup on the above mentioned mechanism." The NRC Maintenance Inspection Team pointed out that the root cause should have been determined to be a lack of PM on the breaker as a lack of lubrication and dirt buildup would have been corrected if the breaker had been properly maintained. Furthermore, had an adequate evaluation to determine root cause been performed, fifteen Unit 2 and 3 breakers, two of which supply motors for Unit 2 Containment Cooling Service Water Pumps, would have been identified as not having PM at the required frequency. DVR 12-2-88-15 also failed to address an adequate maintenance tracking system for individual breakers; however, it should be noted that the breaker cubicles have been tracked for maintenance performed. Finally, it is understood that appropriate priority had not been placed on the need to perform PM on Feed Breakers. It is therefore recognized that 4KV PM and root cause determination have been inadequate.

2. The July 12, 1988 Unit 3 Isolation Condenser Makeup Valve MO3-1301-10 failure was also investigated by a Technical Staff Systems Engineer in accordance with DAP 2-8. As stated in DVR 12-3-88-82 Supplement 1 dated October 6, 1988, the cause of the MO3-1301-10 valve failure was attributed to a buildup of non-conductive deposits on auxiliary contacts in the control circuitry. Although the DVR "Corrective Actions" section did reference a PM inspection surveillance to be performed once every other refueling outage, the root cause investigation was not in sufficient depth to identify the lack of PM as the true reason for the breaker failure. The "Apparent Cause of Event" section did not correctly identify the root cause. A buildup of non-conductive deposits on auxiliary contacts as the root cause does not explain how and why the buildup occurred. The actual root cause should have been attributed to the failure to incorporate the 250VDC PM procedure, DMP 8300-2, "Inspection and Maintenance of DC Operated Cutler-Hammer Reversing and Field Contactors," into the Unit 3 surveillance program. Therefore, no PM had been performed on the Unit 3A and 3B 250VDC breakers since 1975. It is therefore recognized that 250VDC PM and root cause determination have been inadequate.
3. An August 1987 Institute of Nuclear Operations (INPO) evaluation requested that the Technical Staff perform a review of 4KV breaker overcurrent relay setpoint calibration discrepancies. During the course of the above mentioned review, the Dresden Technical Staff also identified a potential repetitive failure trend concerning General Electric Type SBM control switches.

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The review identified an increase in the failure rate of the SBM switches since 1985. A 10 CFR 21 notification referenced a Westinghouse switch of similar design which was reported to have a repetitive failure trend after approximately 15 years of service. It was also noted that the Maintenance Staff had contracted a consulting firm to perform a comprehensive PM Program review of 15 plant systems, in addition to the 4KV system. This comprehensive PM Program upgrade involved performing time series analyses of failure histories in order to develop improved PM frequencies. The review also made recommendations regarding 4KV breaker and cubicle PM procedure improvements concerning testing of the SBM switches, which were implemented by the Maintenance Staff. Although these recommendations were considered significant and applied to the breaker PM Program, it was not clear to the Station that the actual root cause should have been attributed to SBM switches being at or near end of life. It is recognized that this item also should have alerted the Station to the overdue PM on some 4KV breakers and the potential for failure which this condition creates. Furthermore, in September 1988, an inspection team alerted Quad Cities Station of a concern regarding 4KV breaker PM inconsistencies and similar problems were identified in a Commonwealth Edison Operating Experience Report. Inadequate steps were taken to assure that appropriate corrective actions were implemented for similar problems at Dresden.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

Review of three concerns identified in the above referenced Notice of Violation indicates that although the DVRs in question recognized the need for improvements to the PM Program, and in fact changes had been initiated by the Maintenance Staff, root cause analysis was not fully performed to determine that failures should have been attributed to a lack of a complete and effective PM Program concerning breakers. The significance of the 4KV and 250VDC equipment concerns are understood, as is the need to provide more specific documentation concerning maintenance activity within DVR and/or Licensee Event Reports.

Initial actions taken include the following.

1. When alerted by the Maintenance Inspection Team of a concern over the lack of PM on Unit 3 250VDC MCCs, especially HPCI breakers, the Station immediately sampled the material condition of the breakers informing the inspectors that they were in acceptable condition and no problems were perceived with Unit 3 Torus suction valves, a main concern.
2. Unit 2 main feed breakers, previously unavailable due to operational conditions, were made available by using Emergency Diesel Generators to provide power to the 4KV buses prior to startup from the refuel outage. The 2 Containment Cooling Service Water Pumps identified as not having PM performed since 1976 also had PM performed.

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3. On February 17, 1989, the Technical Staff Supervisor issued a memo to all Technical Staff personnel stating the concerns raised by the Maintenance Inspection Team, giving further direction to properly performing root cause analysis. The memo also stated that the deviation report preparation checklist, part of DAP 2-8, is currently under revision to provide additional guidance.
4. The Master Electrician initiated a comprehensive review of switchgear maintenance procedures and has accelerated the PM schedule for 4KV, 480V and 250VDC breakers which have PM histories exceeding the current recommended frequencies.
5. As of March 1989, serial numbers are recorded on all breakers to assist tracking breaker maintenance and each breaker is assigned a specific cubicle. To change breakers from one cubicle to another, now requires documentation which aids in tracking breaker history.
6. Based on history of SBM switches and recent failures, the Master Electrician has determined that the next time scheduled PM is performed on a breaker and cubicle, the three associated SBM switches will be replaced.
7. A revision to DAP 2-8 has been initiated to require performance of a maintenance history review as appropriate, to assure an adequate investigation will be performed in determining the root cause.

CORRECTIVE ACTIONS TAKEN TO AVOID FURTHER NONCOMPLIANCES

1. Better communication has been provided between Station Maintenance and Operations to assure every effort is made to provide breakers to maintenance as required for PM. Consequently, every effort is being made through use of careful planning and alternate power supplies to assure PM of main feed breakers is accomplished.
2. Technical Staff System Engineers will be provided additional direction regarding performance of root cause analysis by August 1, 1989.
3. The PM schedule will continue at an accelerated rate until all overdue breaker surveillances are complete. Special attention is being paid to significantly overdue breakers.
4. A review will be conducted of maintenance history and the vendor will be consulted in determining a lifetime for SBM switches. At this point, SBM switches have been known to last approximately 15 years; however, the review will determine optimum lifetime to establish a replacement schedule.

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5. The Nuclear Engineering Maintenance Department (previously "Production Services Maintenance") initiated a review of 4KV preventive maintenance procedures/surveillances at all CECo nuclear facilities and a review of vendor manuals including current updates and discussions with vendors. This review is expected to be complete in July, 1989 at which time the corporate recommendations will be issued. Similar reviews will be performed for other voltage breakers with expected completion before year end. Once these evaluations are complete and recommendations issued, station action plans will be developed for timely implementation of any needed changes.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance was achieved when the Technical Staff memorandum was issued on February 17, 1989. This resulted in an immediate upgrade in direction for root cause analysis.

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ATTACHMENT B

DRESDEN MAINTENANCE TEAM INSPECTION

UNRESOLVED ITEMS 237/88029-01 AND 249/88030-01

ISSUE

Prior to October of 1988, Trip Latch Clearance was checked for accuracy during preventive and corrective maintenance for the 4KV switchgear addressed in the NRC unresolved item. However in 1973, the GE manual for this switchgear had been revised to exclude Trip Latch Clearance measurements and to include Trip Armature Travel. Prior to October of 1988, Trip Armature Travel was not one of the parameters measured during corrective or preventative maintenance. The question has been raised as to what effect measuring Trip Latch Clearance instead of Trip Armature Travel had on the operability of the 4KV switchgear.

BACKGROUND

The original procedures that were written for this switchgear were based on the original vendor manuals, vintage 1968. The vendor manual revisions for these breakers were released in 1973. At that time, Dresden did not have a Vendor Technical Information Program (VTIP) or equivalent program to monitor changes in vendor manuals.

The Station continued to measure Trip Latch Clearance instead of Trip Armature Travel until 1988. At that time, strict adherence to vendor manuals, as incorporated into Station procedures, was mandated by the Electrical Maintenance Department (EMD) management. As a result, the aforementioned discrepancies were brought to the attention of the EMD management. This led to an investigation of both the procedures and the vendor manual. At that time, it was determined that Trip Armature Travel was the correct measurement to be used in performing preventive maintenance on this switchgear.

JUSTIFICATION OF ACCEPTABILITY OF PREVIOUS PRACTICE

The vendor manual revisions were incorporated to provide an improved method of assuring proper 4KV breaker operation. The previous practice of using Trip Latch Clearance has been shown to be adequate for the following reasons:

1. If the Trip Armature Travel is adjusted less than the recommended value (too tight), then the breaker won't close in.
2. If the Trip Armature Travel is adjusted to a value greater than the recommended value (too loose), then the breaker will not trip or will not trip consistently.

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3. Post maintenance testing performed on 4KV breakers includes both breaker close-in and breaker trip testing. Trip Latch Clearance was adjusted until reliable breaker operation was obtained, as necessary.
4. There have been no 4KV breaker failures on breakers which have had preventive maintenance (either using Trip Latch Clearance or Trip Armature Travel) due to either of these parameters being out-of-tolerance.

ACTIONS TO PREVENT FUTURE DISCREPANCIES

1. All procedures involving this switchgear have been updated to reflect the most recent vendor manual information.
2. Ongoing vendor manual revisions are addressed via the Station's VTIP program.