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Dec

July 20, 1989

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

Subject: LaSalle County Station Units 1 and 2  
 Response to Inspection Report Nos.  
 50-373/89012 and 50-374/89012  
 Routine Safety Inspection  
NRC Docket Nos. 50-373 and 50-374

Reference (a): W.D. Shafer letter to Cordell Reed dated  
 June 20, 1989.

Dear Mr. Davis:

This letter is in response to the inspection conducted by Messrs. R. Lanksbury, R. Kopriva, A.M. Bongiovanni and D. Jones, on April 25 through June 9, 1989, of certain activities at LaSalle County Station. Reference (a) indicated that certain activities appeared to be in noncompliance with NRC requirements. The Commonwealth Edison Company's response to the Level IV Notice of Violation and additional concerns are provided in the Attachment.

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

Very truly yours,

*Wayne E. Morgan*

W. E. Morgan  
 Nuclear Licensing Administrator

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Attachment

cc: NRC Resident Inspector - LSCS

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ATTACHMENT

VIOLATION: IR 373/89012-02

AIR 373-100-89-01202

10 CFR 50, Appendix B, Criterion XVI, requires that licensee's take prompt corrective actions to assure that conditions adverse to quality are promptly identified and corrected and that corrective actions are taken to preclude repetition.

Contrary to the above, on April 5, 1989, and again on April 19, 1989, the licensee failed to promptly identify the cause of the failure, and take corrective action to prevent recurrence, of the 1VR05YA reactor building ventilation isolation damper. Corrective action to prevent recurrence was not taken until April 24, 1989. In addition, the failure mechanism of the solenoid valves has been known since at least February 1985, but the licensee has not implemented corrective actions to prevent recurrence as of the date of the end of this inspection.

CORRECTIVE ACTION TAKEN AND RESULTS ACHIEVED

The two ASCO HT series solenoid valves were replaced with rebuilt solenoid valves of the same series. The two Parker air cylinders were replaced with new air cylinders of the same type. Damper 1VR05YA now closes within the time interval specified by the Technical Specifications.

CORRECTIVE ACTION TAKEN TO AVOID FURTHER VIOLATION

Component replacement packages for the installation of the ASCO NP series valves have been approved. The NP series valves at the station have been sent to ASCO for rebuilding prior to their installation. This is in compliance with ASCO's service bulletin which was dated January 30, 1989. After the solenoid valves are rebuilt and returned to the station, the valves will be installed at the dampers of each unit during the first outage of sufficient duration. ASCO has indicated it will expedite the order and it is expected that the NP series valves will be installed during Unit 1 third refueling outage (September, 1989) and Unit 2 third refueling outage (March, 1990).

Until the component replacement is installed, the HT series solenoid valves will be rebuilt or replaced every refuel outage. The Parker air cylinders will also be replaced at an interval corresponding to every refuel outage, pending determination of the optimum interval of replacement. These two preventive maintenance items are now on the station's General Surveillance schedule.

In order to assist in the timely diagnosis of damper problems, LOS-CS-Q1, "Secondary Containment Operability Test," is being revised to have a representative from both the Electrical Maintenance department and the Technical Staff present at the surveillance.

DATE OF FULL COMPLIANCE

Full compliance has been achieved with the repair of damper 1VR05YA and the establishment of preventive maintenance schedules for the solenoid valves and air cylinders.

Although the solenoid valves did not cause the damper failures during this sequence, the solenoids will be upgraded to the WP version during L1R03 and L2R03.

The concerns mentioned in paragraph 12 of the inspection report are addressed below:

CONCERN 1: The licensee's declaring the 1VR05YA damper operable on April 5, 1989, after four consecutive failures followed by five consecutive satisfactory closures with no work performed on the system to determine the root cause.

RESPONSE: On April 5, 1989, after the initial failure of damper 1VR05YA, the station's technical staff was contacted to assist in diagnosing the cause of failure. The system engineer was unavailable, however another engineer with some familiarity with Reactor Building ventilation, but not fully cognizant of the operational details and maintenance history of the isolation dampers assisted. When the damper was cycled for troubleshooting, damper closing times were all within the ten second time period specified by Technical Specification 4.6.5.2. It was apparent that cycling the damper enabled it to return to its expected performance level. This is contrary to what would be expected if the failure was caused by a failed component, and is the reason that it was concluded in the surveillance evaluation that mechanical binding was the probable cause of the event. It was demonstrated that frequent stroking of the damper allowed it to perform satisfactorily, and, in the absence of specific evidence of component malfunction, it was determined that increasing the surveillance frequency would demonstrate continued operability.

CONCERN 2: The licensee assuming the failure on April 19, 1989 to be caused by the solenoid valve and not promptly disassembling the valve to determine if it was the cause of the failure prior to declaring the damper operable.

RESPONSE: The system engineer and representatives from the Electrical Maintenance Department (EMD) were present at the surveillances subsequent to the April 5th event. During a successful surveillance on April 12, 1989, no indications of mechanical binding were detected. EMD and the system engineer were also present during the unsuccessful surveillance on April 14, 1989. There were again no signs of binding. The solenoids appeared to function properly, but this was impossible to tell in the field. Based upon past maintenance history and a lack of indication that other components were malfunctioning, the solenoid valves were replaced. As was done during all previous successful repairs, the emphasis was placed on restoring the damper to operability, with detailed examination of the failed part to follow. Following solenoid valve replacement, the damper was tested satisfactorily, after which it was declared operable. Prior to tearing down the solenoid valves, it was decided that the actual operation of the valves would be simulated in an attempt to detect a malfunction. A test rig was constructed which was a reasonable approximation to the actual installation.

Additionally, it was further decided that actual conditions would be more closely simulated by energizing the solenoid for a period of time before running the test. All the preconditions for a suitable test were satisfied, and the test was performed on April 21, 1989. Following this, the valves were disassembled and inspected.

CONCERN 3: The licensee's failure to promptly take action (i.e., declare the damper inoperable and pursue corrective action) when the disassembly of the solenoid valve revealed it was not the cause of the failure.

RESPONSE: Subsequent to the damper failure on April 19, 1989, conceivable modes of damper failure were examined, and two were considered to be most probable. The first was the solenoid valve failure, and both valves were replaced immediately. A second possible failure mode was restricting of damper movement by the air cylinder that opens the damper. As a preventive measure, it was decided to replace the air cylinders of damper 1VR05YA, regardless of the findings of the solenoid valve inspection. Replacement was complicated by the presence of supporting struts in the duct, at least one of which had to be removed to allow access to the cylinders. Since the struts were seismic supports, an evaluation had to be performed by the engineering department (BWRED) to determine if a strut could be removed on an operating unit. This was being pursued prior to the solenoid valve testing.

The testing of the solenoid valves, witnessed by the senior resident inspector did not reveal any malfunction of the solenoid valves. No clear indication of valve failure was found during the subsequent disassembly. The testing was felt to be inconclusive, however, and did not rule out solenoid valve failure as a cause of the slow damper closing.

Continued operability of the damper was based upon the successful closing after repair, and the finding that solenoid valve failure could not be ruled out as a cause.

The air cylinders were replaced as soon as the evaluation from BWRED was received that allowed removal of the supporting struts for access. Inspection of the cylinders revealed the conditions that are believed to be the actual root cause of the event. The air cylinder failure was a previously unencountered failure mechanism. The only other failure of an air cylinder was in November of 1984, involving another damper. The circumstances of that event were different in that the cylinder failed to open the damper properly, but the damper movement was not restricted by a binding cylinder. The actual failure mechanism was not obvious, and was only able to be determined by replacement and inspection of suspected components.

CONCERN 4: The licensee's failure to adequately determine the service life of the solenoid valves and the failure to ensure that the solenoid valves were changed out prior to the end of what they thought the service life to be.

RESPONSE: The recommended service life of the ASCO HT series solenoid valves is 4 years for the resilient parts, and 30,000 hours, or approximately 3.4 years, for the coil when energized. This information had been conveyed to the station from ASCO via Gargent & Lundy in a November, 1984 letter. The solenoid valve failures at the station had all been a result of "soft parts" embrittlement, and none have been attributed to coil failure. The limiting factor in determining solenoid valve service life is thus properly considered to be the life of the resilient parts. Once the originally installed solenoid valves were replaced, none of the solenoid valves have been kept in service beyond the manufacturer's recommended service life of 4 years, and none have failed. Rebuilding or replacement of these valves has been put on the station surveillance schedule, which will track their replacement after a very conservative service life of approximately 18 months. This measure has been in effect since September, 1988, and, by itself, should be even more effective in minimizing the likelihood of solenoid valve failure than will the component replacement.

CONCERN 5: When the lower solenoid valve for damper 1VR04YA was scheduled for replacement due to its service life having expired, the replacement did not occur as scheduled and damper 1VR04YA subsequently failed.

Work request L75842 was written on February 2, 1988 to rebuild or replace the bottom solenoid of damper 1VR04YA. This was intended to be completed during L1R02, but the work was not identified as being outage-related, and was set aside in deference to higher priority outage work.

CONCERN 6: The licensee committed to a component change in 1985 for the solenoid valves. To date this change has not occurred. The licensee does not appear to have been very aggressive in pursuing this change.

Numerous problems have been encountered in the attempt to install the upgrade ASCO model NP series valve. Below is a brief summary of the events leading up to the current situation:

ASCO and CECO had agreed to replace the solenoid valves with a different model in 1979. In 1984, it was discovered that the replacement valves were never shipped. When the valves were received at the station, it was then determined that the shelf life of the valves had expired. No rebuild kits were available at the time, and the valves were kept in a QA/QC hold area. The

storeroom had concerns about discrepancies in part numbers between the purchase order and the models received. Station Nuclear Engineering Department (SNED) had to determine that the valves received were in fact the proper replacements. In September of 1987, an evaluation was received by the station from SNED stating that the valves in question were the correct replacement. Concurrently, there were additional QA/QC questions that had to be answered. When it appeared that all appropriate issues in this matter were properly addressed, Component Replacement packages were completed and sent to the Electrical Maintenance department in December, 1988, for installation. EMD had a concern that the conduit connection to the new solenoid valves may not be seismically adequate, and an additional evaluation had to be performed by BWRE. This question was resolved in December, 1988. On January 30, 1989, the Purchasing Department of CECO was notified that there was a potential problem with the kits that were used to rebuild the replacement valves whose shelf life had expired. These valves must now be rebuilt again prior to installation, this time by the manufacturer. ASCO is aware of the upcoming Unit 1 outage, and has stated in a letter that they will expedite the order so that the station can still plan on implementing the component replacement during the respective unit outages.

The above listed impediments were not insurmountable and could have been overcome in a more timely manner had the replacement been aggressively pursued. The primary reason the replacement was not given a higher priority was the fact that the NP valve was basically the same as the HT version, except that the elastomers are more tolerant of radiation fields. Because these solenoid valves are not in a significant radiation field, the change out was not aggressively pursued.