

# PHILADELPHIA ELECTRIC COMPANY

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February 20, 1986

Docket No. 50-352

Inspection Report: 50-352/85-43

Mr. Samuel J. Collins, Chief  
Projects Branch 2, Division of Reactor Projects  
U.S. Nuclear Regulatory Commission  
Region I  
631 Park Avenue  
King of Prussia, PA 19406

Your letter dated January 23, 1986 forwarded Inspection Report 50-352/85-43 for Limerick Generating Station. Appendix A of your letter addresses one item which does not appear to be in full compliance with Nuclear Regulatory Commission requirements. This item is restated below followed by our response.

## Violation

Technical Specification 6.8.1 requires that plant procedures be established, implemented and maintained, including those procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, for normal operation and equipment control.

Administrative Procedure A-8 implements the methods used to control locking and unlocking of valves and devices required to be locked as shown on station drawings and as directed by operating procedure check-off lists. Also, Piping and Instrumentation Diagram M-11, Sheet 1, Emergency Service Water, Revision 27, depicts all four ESW pump discharge valves as locked-open valves, and System Operating Procedure S11.1.A, Alignment of ESW System, Revision 2, requires establishment of a normal system line-up with these valves opened and locked.

Contrary to the above, ESW Loop B discharge valves 11-0002 B and D were found at 8:00 p.m. on October 31, 1985, in positions other than full open (although locked), and ESW

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pump A discharge valve 11-0002A was found at 12:30 a.m. on November 14, 1985, in an unlocked (full open) condition.

These constitute a Severity Level IV violation (Supplement I).

## Response

### Admission of Alleged Violation

Philadelphia Electric Company acknowledges the violation as stated.

### Reason for the Violation

The mispositioning of the valves was the result of human error contributed to some extent by poor human factors; namely: (1) a special Section XI pump performance oriented test procedure which required the manipulation of the Emergency Service Water (ESW) valves, (2) poor indication of valve position, and (3) administrative weaknesses in the Independent Verification of Restoration (IVOR) process.

Surveillance Tests ST-6-011-231-0 and ST-6-011-232-0 are routine quarterly tests performed by plant operating personnel to verify operability and test the performance of the "A" and "B" Emergency Service Water loops, respectively. The tests satisfy the In Service Testing (IST) requirements of the ASME Code, Section XI. These Surveillance Tests direct the operator to establish an operating configuration to assess ESW pump performance by throttling the pump manual discharge valve. Each time the test is performed, it is necessary to establish a fixed flow rate equivalent to that in previous tests, and equivalent to the datum established at the beginning of the surveillance test program. Since the ESW equipment loads vary depending on plant conditions, it may be necessary to establish a flow rate higher than the datum, and then throttle the discharge valve to obtain the datum flow. Although an absolute determination of the cause of the valve mispositioning could not be made, the most probable cause is that during the performance of the surveillance tests on the "B" ESW loop on July 28, 1985, the "B" and "D" pump discharge valves were throttled to attain the test flow required by the surveillance test, and the valves were not restored to the fully open position. It is

postulated that the incident involving the open but unlocked discharge valve on the "A" pump resulted from the performance of the corresponding surveillance test on the "A" ESW loop on October 6, 1985.

Due to the lack of positive indication of valve position, the throttled position of the valves was not identified during subsequent monthly system line-up surveillance tests or during daily operator rounds.

The test procedure requires recording of the "As Found" position of manipulated valves, the restoration of the valves to the "As Found" condition, and independent verification that the valves are in the correct position. In both events, plant operating personnel failed to follow surveillance test procedures, both in the performance of the test and in the independent verification of valve position following the test.

#### Significance of Violation

The significance of this violation is certain plant operating personnel did not properly execute surveillance test procedures and restore the systems to the pre-test configuration. The immediate safety significance of the event was minimal, since observations made while the "B" and "D" ESW pumps were in operation immediately prior to the discovery of the valves in the less than full open position, indicate that the valves were not closed. An evaluation of the operability of the "B" ESW loop with the valves in their throttled condition concluded that the system would have met its design flow rate. Therefore, the ESW system remained operable throughout the period of the mispositioning of the valves. Subsequent testing demonstrated that with the valve throttled to greater than 90% closed, system design flow could be maintained. With respect to the "A" ESW pump discharge valve which was found open but unlocked, there was no immediate safety significance since the system was in its proper configuration for operation.

Corrective Actions Taken and Results Achieved

Immediate corrective action was taken to fully open and lock the "B" and "D" ESW pump discharge valves, and to lock the "A" ESW pump discharge valve in the open position. This action immediately restored the system to its normal operating configuration.

Corrective Actions to be Taken to Avoid Future Non-Compliance

A thorough investigation of the event was conducted in order to identify all possible causes of the non-compliance, and to identify appropriate corrective actions. It was determined that the position of the ESW pump discharge valves is difficult to assess during the monthly system line up surveillance test, and on daily rounds. A modification to the valve operator is being considered to provide enhanced position indication such that it will be obvious that the valve is full open or full closed.

The surveillance test for pump performance is being revised such that, instead of throttling the pump discharge valve to attain the datum flow, the valve will be left in the fully open position. The observed flow will be compared to flow curves for the pumps, and success criteria will be derived from those curves. By eliminating the need to throttle the discharge valve, the potential for this valve mispositioning will be considerably reduced.

Other pump, valve, and flow test procedures were reviewed to determine if valves were moved to a throttled position. No such tests were identified.

The investigation into the event identified a weakness in the IVOR for the subject test, and also indicated that plant operating personnel did not have a clear understanding as to how IVORs were to be performed. A Memorandum to Shift, discussing the lessons learned from the incidents, was issued. This memorandum addressed suspension and resumption of testing, and shift supervision verification of identified plant discrepancies. In order to eliminate any generic weaknesses in knowledge on how to perform IVORs, a syllabus for operator training was written to be included in the next licensed and non-licensed operator requalification cycle. The training will detail the process to be followed when performing surveillance tests, including IVORs. The IVOR process and the IVOR Data Sheets have been reviewed to

identify possible methods to enhance the equipment return to service process. The results of this review have been evaluated by plant management for implementation.

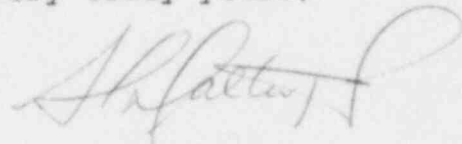
A Routine Test procedure (RT-6-000-982-0) has also been issued to provide for the periodic review of previously issued shift memorandums and standing orders and the re-issuance of appropriate memorandum and orders.

A training program is being developed to provide plant operating personnel with additional guidance on the proper methods of verifying the position of manual locked valves.

Date When Full Compliance Was Achieved

Full compliance on the "B" and "D" pump discharge valve incident was achieved on October 31, when the valves were reopened and locked, and compliance was achieved on the "A" ESW pump discharge valve on November 14, 1985, when the lock and chain were properly reapplied to the valve to assure that it was locked.

Very truly yours,



cc: E. M. Kelly, Senior Resident Site Inspector  
See Attached Service List

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Atomic Safety & Licensing Appeal Board  
Atomic Safety & Licensing Board Panel  
Docket & Service Section (3 Copies)  
E. M. Kelly  
Timothy R. S. Campbell

February 4, 1986