

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 88-07

Docket No. 50-352

License No. NPF-39

Licensee: Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Facility Name: Limerick Generating Station Unit No. 1
and PECo Corporate Office

Inspection At: Limerick, Pennsylvania and Philadelphia, Pennsylvania

Inspection Conducted: March 14-24, 1988

Inspector: Harold I. Gregg 5/4/88
Harold I. Gregg, Senior Reactor Engineer date

Approved by: P. K. Eapen 5/4/88
Dr. P. K. Eapen, Chief Special Test Programs date
Section, EB, DRS

Inspection Summary: Inspection on March 14-24, 1988 (Report No. 50-352/88-07)

Areas Inspected: Routine announced inspection of inservice test program implementation of pumps and valves, review of organizational structure, surveillance procedures and test results, test witnessing, and engineering interface.

Results: No violations were identified, however, four findings were categorized as unresolved items pending licensee's additional action. One of the unresolved items involves four issues that the licensee has been working on as a result of the Peach Bottom IST inspection findings and the Limerick Unit 1 IST meeting. These issues are: IST program control, organizational procedures, valve stroke time limits for all valves and valve stroke time limits for valves with less than ten seconds stroke time (50-352/88-07-01). The other three unresolved items address: (1) control of lubricating a valve stem to meet the stroke time; (2) pump acceptance criteria ranges; and, (3) seismic calculations for an air operated valve.

1.0 Persons Contacted

1.1 Philadelphia Electric Company (Limerick 1 Site)

J. Brittan, Test Engineer
E. Cosgrove, Shift Superintendent
R. Deppi, Chief Operator
* P. Duca, Technical Superintendent
* C. Endriss, Regulatory Engineer
K. Kemper, Sr. Engineer Maintenance
* J. McElwain, Supervisor, Technical Monitoring
* J. Muntz, Technical Engineer
J. Pubert, Assistant Supt. Operational Audits
K. Selby, Performance Monitoring Coordinator
R. Shoff, Surveillance Test Coordinator
J. Spencer, Maintenance Superintendent
C. Smith, Test Engineer
* R. Smith, Lead Auditor, NQA
* J. Verner, Test Engineer - Maintenance
* K. Walsh, Performance Engineer
V. Warren, Test Engineer - Regulatory

1.2 Philadelphia Electric Company (Corporate Office)

W. Alden, Nuclear Services Regulation
G. Beck, Power Plant Design Section Manager
W. Brady, NSSS and Metallurgy Branch Head
J. Gallagher, Vice President, Nuclear Service

1.3 U.S. Nuclear Regulatory Commission (US NRC)

* T. Kenny, Senior Resident Inspector
* L. Scholl, Resident Inspector
J. Richardson, Acting Deputy Director, DRS

* Denotes those present at the exit meeting.

2.0 Inspection Purpose and Scope

The inspection was conducted to review and assess the licensee's implementation of their IST pump and valve test program commitments and other activities associated with IST implementation. The inspection effort includes review of licensee's organizational structure and interfacing groups, verification of adherence to regulatory requirements, ASME Section XI requirements and licensee's commitments, and evaluation of safety consequences.

3.0 IST Program Background

The inspector reviewed the licensee's last IST pump and valve program submittal and background history. Discussions were held with cognizant IST personnel concerning the program, relief requests and resolutions of review concerns. The following inspector determinations were made:

- Limerick Generating Station Unit 1 (LGS-1) Inservice Testing (IST) of pump and valves is part of their Inservice Inspection program (ISI).
- Pump and Valve Inservice Inspection Program Document No. 80A2972 was prepared by Nuclear Energy Services Inc.
- The ISI program (includes Inservice Testing (IST) of Pumps and Valves), is in the first ten year interval of February 1, 1986 (commercial operation date) through January 31, 1996.
- IST of pumps and valves surveillance requirements are invoked in Technical Specification 4.0.5. Regulation 10 CFR 50.55a(g) also requires adherence to ASME Section XI.
- The LGS-1 pump and valve testing commitment is to ASME Section XI, 1980 Edition through Winter 1981 Addenda.
- A meeting between Office Of Nuclear Reactor Regulation (NRR) and their consultant (EG&G) and the licensee was held February 24-25, 1988 at the LGS training center.
 - IST program issues were discussed.
 - NRC positions and licensee positions were made known.

Based on the discussions at the NRR-EG&G/LGS-1 meeting many positions were agreed upon, and the licensee will conform. Several others require further licensee evaluations and final resolution. The licensee has established a July 1, 1988 target date to submit a revised IST program that incorporates the meeting's agreements and additional substantiating positions for several relief requests. Upon receipt and evaluation of the licensee's revised program, NRR will issue a safety evaluation of the program.

In discussions the inspector had with site and corporate licensee personnel, the licensee considered the meeting to be very beneficial.

4.0 IST Programmatic Review

During this inspection several of the IST deficiencies identified at the Peach Bottom (PB) site were also found at Limerick 1. The Limerick IST staff was aware of these deficient areas and has been involved in their

corrective actions. These areas where the licensee is presently involved in corrective actions are combined and are classified as one unresolved item. The details of the issues involved with this unresolved item are described in the following paragraphs.

4.1 Document Control and Administrative Procedure

The IST staff of Limerick is involved with corrective actions related to the control of their program document and their administrative procedure which assigns responsibilities of IST personnel.

This inspection noted that the IST program was not being adequately maintained as a controlled document and that the licensee's administrative procedure A-80 revision 1 is not current with present IST activities. As a result of similar findings at Peach Bottom, PECO corporate engineering, LGS and PB are actively involved with Gilbert Associates to develop the method to control the entire ISI program and program revisions, including IST, defining responsibilities, referencing the surveillance tests, defining methods to incorporate major and minor modifications and updating of the administrative procedure.

Several meetings have been held with Gilbert Associates and PECO corporate engineering and both Peach Bottom and Limerick site engineers. The inspector reviewed meeting notes dated February 23, 1988. PECO corporate engineering has the lead and will coordinate this effort and will be formally charged with future IST program overview responsibility. The final plan matrix, and agreement on a schedule for completion is targeted for the end of March 1988.

4.2 Valve Stroke Time

During the review of valve stroke testing for the "A" and "B" loop ESW valve tests (ST-6-011-203-0 Revision 1 for "A" loop and ST-6-011-206-0 Revision 2 for "B" loop), the inspector noted that the ST maximum allowable stroke times in many instances were far in excess of actual stroke times. This issue was a topic of discussion at the NRR/LGS IST meeting in February 1988 and further licensee evaluation is required. The maximum stroke times are to be based on actual times, vendor information, system input plus a reasonable factor, and would not exceed the most limiting requirement. From the inspector's review of other STs during the inspection, the maximum valve stroke time issue was seen as a generic issue involving many STs which requires licensee attention.

4.3 Valve Stroke Time Alert Limits

The inspector noted in each of the STs review (ST-6-011-203 Revision 1, ST-6-A61-200-1 Revision 5, ST-05-231-1 Revision 11) valve stroke tests, the bases for stroke time less than 5 seconds was not required. This is not in accordance with the ASME Code requirements IWV-3417(a). This issue was discussed with licensee personnel who stated that this also was topic of the NRR/LGS IST meeting. At that meeting, agreement had been reached and LGS will modify the 150% requirement to include valve stroke times of two seconds to and including 10 seconds, and that an alert limit is not required for stroke time less than two seconds.

4.4 Unresolved Item Status

The licensee is presently involved in evaluations and corrective actions in each of the above paragraph items. Based on the actions being taken at the time of this inspection, these items have been grouped as one unresolved item pending the licensee's evaluations and NRC review of the licensee's finalized corrective action plans (50-352/88-07-01).

5.0 IST Organization

The IST personnel are part of the Technical Engineering Performance Group. A Test Engineer has responsibility to see that the IST Plan is implemented. This engineer reports to the Results Engineer who has had prior experience as the IST Test Engineer. The next reporting level is a Senior Engineer who also had prior IST lower level experience. Above this level there is the Technical Engineering Superintendent who reports to the Plant Manager. The Surveillance Test Coordinator interfaces with IST personnel and reports to the Programs Engineer.

All the IST personnel and the Surveillance Test Coordinator are located in the same area. The IST personnel appear to be a cohesive group, technically capable and knowledgeable of IST issues.

6.0 Test Schedule Adherence

The IST pumps and valve testing is a system oriented program that is computer driven. The Surveillance Test Coordinator has the responsibility to have the computer listing contain all required pump and valve IST required tests.

A weekly computer listing specifies the scheduled date and the overdue date for each test scheduled that week. The list is further divided into ten separate lists of tests that go to the department responsible for that test. A master test file computer list is issued on a daily basis for use by the test coordinator. This list contains the three previous test dates, the last test scheduled date and the next test date which includes the 25% Technical Specification additional allowance.

The inspector reviewed the past three test results of the "A" Core Spray Pump and Valve Flow Test (ST-6-052-231-1) and "B" Core Spray Pump and Valve Flow Test (ST-6-052-232-1). Each of the six tests were performed quarterly as required by ASME Section XI. In other test result records that were reviewed during this inspection, test schedule adherence was also verified and was met.

7.0 Review of Surveillance Test Procedures and Test Witnessing

7.1 Liquid Radwaste Valve Test Witnessing (ST-6-A61-200-1)

The inspector witnessed the stroke testing of air operated valves HV-61-111 and HV-61-131 being performed on March 17, 1988 from the control room. Due to several past problems with the valves the test frequency was changed from quarterly to monthly. The inspector observed the operator perform the test, and verified that the stroke time of the valve HV-61-111 was 15.68 seconds and valve HV-61-131 was 10.83 seconds. Both stroke times had not varied significantly from their last test and both times were within the ST specified alert limit time (of 1.25 times the last stroke test time) and maximum allowable time of 30 seconds. The inspector further verified from the Technical Specification Table 3.6.3-1 that the maximum allowable stroke time was 30 seconds. The test was effectively performed and data was properly recorded.

The inspector reviewed the corrective maintenance history records for the above valves and determined that except for packing leakage, the valve problems were more related to auxiliary appurtenances such as a defective solenoid valve and limit switch. Therefore, prior stroke time problems were not due to a defect in the valve itself.

7.2 "A" and "B" Loop ESW Valve Test (ST-6-011-203-0 Rev.1 for "A" Loop and ST-6-011-206-0 Rev.2 for "B" Loop)

The inspector reviewed the results of "A" loop valve tests performed February 13, 1988, January 13, 1988 and December 13, 1987 and "B" loop valves tests performed March 14, 1988 and February 12, 1988. This ST was originated after several repeated stroke time problems and valve stroke testing was changed from quarterly to monthly. These STs were also revised to permit lubrication of the stem and restroking of the valve for those valves that exceed their alert limits. The prior stroke time problems were thought to be caused by infrequency of valve stroking and drying of the packing. Because of this the licensee increased the test frequency to monthly to improve wear-in of the packing and to allow ESW system fluid to aid in packing lubrication.

From the inspectors review of the last three monthly tests of the "A" loop valves, and the last two monthly tests of the "B" loop valves, no valves exceeded the alert stroke time, no stem lubrication was performed and the more frequent testing appears to be beneficial.

The inspector did have a concern regarding control of lubrication of the stem for a retest of valves that exceed alert range criteria. While this action would improve the valve, the valve would be deemed satisfactory without formal cover page indication that lubrication was performed that enabled the stroke time to be decreased. Since the maximum allowable stroke time is much in excess of the alert stroke time and time wasn't exceeded, other departments would not be aware of the stem lubrication activity. This issue is unresolved pending the licensee's evaluation and NRC review of the licensee's actions regarding this matter. (UNR 50-352/88-07-02).

7.3 "A" Loop Spray Pump, Valve and Flow Test (ST-6-052-231-1 Rev. 11)

The inspector reviewed the licensee's ST procedure and the past three test results (tests performed 12/22/87, 9/23/87, and 6/19/87). The tests were performed on a quarterly schedule as required and there were no unsatisfactory results.

The inspector noted that the Table I listing of allowable ranges of test results for the core spray pumps (page 17 in the procedure) defined the differential pressure range limits of acceptable range, alert range, and required action range. However, the licensee's limits were noted as extending beyond those specified in Table IWP-3100-2 of the ASME Section XI Code. (For example the licensee's acceptable differential pressure range limit is .88 to 1.07 whereas the ASME Code is .93 to 1.02.)

The licensee acceptance range position was developed by PECO corporate engineering as documented in the attachment to their memorandum of February 8, 1985. Corporate engineering added a flow instrument accuracy tolerance to obtain the broader acceptance range. This is not in accordance with the Code and no formal code interpretations were presented to the inspector. Therefore, there does not appear to be adequate justification for the licensee's position.

In each of the test results reviewed by the inspector, the actual test results were within the more narrow Code limits and there did not appear to be a need for the licensee to expand the range. This item is unresolved pending NRC review of further justification by the licensee. (UNR 50-352/88-07-03)

7.4 "A" Loop Core Spray Pump, Valve and Flow Test Witnessing (ST-6-052-231-1 Rev.11)

The inspector witnessed the test performed on March 23, 1988. The first portion of the test, that of the 1AP206 pump and associated valves, was observed from the Control Room. The second portion of the test, that of the 1CP206 pump was observed from the C pump room at elevation 177.

The testing was performed satisfactorily and pump operational characteristics and valve stroke times were acceptable. During the test of the C pump, the licensee's test personnel noted that the external actuating arm of the 12"-300# Anchor Darling check valve on the pump discharge line was apparently disengaged from the disc. Although flow rate is determined by instrumentation, the system test engineer was properly recording the defective actuating arm problem in the test data so that further action would be taken.

While witnessing the test in the C pump room, the inspector noted that valve HV-11-101G (a 2" Rockwell valve, with a Fisher air cylinder actuator) had no support other than the inline piping. Due to its long extended unsupported mass, the inspector asked to see the seismic calculations for this valve. Information to enable the inspector to verify seismic acceptability was not available prior to the inspection exit. This item is unresolved pending the licensee providing seismic calculations and NRC's review. (50-352/88-07-04)

8.0 Engineering Support

The inspector discussed the engineering interface with IST site personnel. The inspector also visited the corporate offices and met with engineering staff-personnel involved with IST. Engineering support is available and has been provided to the site. Corporate engineering support of IST is further being expanded as evidenced from the licensee's meeting minutes of the Peach Bottom IST issues and the engineering actions being taken. Corporate engineering also was a lead participated in the February 1988 IST meeting with NRR.

Corporate management has recently undergone significant change which could lead to further engineering change. Personnel interviewed were optimistic regarding all recent changes and they believe engineering effectiveness will be improved.

9.0 QA Interface

The inspector reviewed the LGS Surveillance Test Program/ISI Functional Audit (Audit No. AL 87-94 ST) performed 12/31/87. The inspector noted that this audit reviewed the ISI program plan, many test procedures, test

logs, test results completions, measurement instrument occurrence and other issues involved with IST. Unacceptable instrument accuracy was identified by the licensee. The inspector concluded that QA does interface with IST implementation. However, the inspector noted that the QA audit attributes did not include sufficient reviews and comparisons of the procedure technical requirements versus ASME code requirements. (Examples: pump acceptance ranges, valve stroke time criteria, etc.) The Cognizant QA personnel agreed to incorporate more technical requirements in the attribute lists for future audits.

During discussions with QA personnel, the inspector noted that the actions being taken by corporate engineering, LGS and PB regarding document control and organizational procedures were not fully known by QA. Better inter-departmental communication would make the QA interface more effective.

10.0 Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations or deviations. Unresolved items are discussed in paragraphs 4.4, 7.2, 7.3 and 7.4 of this report.

11.0 Exit Meeting

The inspector met with the licensee's representative (identified in paragraph 1.0) at the conclusion of the inspection on March 24, 1988, to summarize the findings of this inspection.

During this inspection, the inspector did not provide any written material to the licensee. The licensee representatives did not indicate that this inspection involved any proprietary information.