

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-353/88-07

Docket No. 50-353

License No. CPPR-107

Priority -

Category B

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

Facility Name: Limerick Nuclear Generating Station, Unit 2

Inspection At: Limerick, Pennsylvania

Inspection Conducted: March 7 - 11, 1988

Inspectors: *H. van Kessel*
Henri F. van Kessel, Reactor Engineer

4-14-88
date

Approved by: *P. K. Eapen*
Dr. P. K. Eapen, Chief Special
Test Programs Section, EB, DRS

4/14/88
date

Inspection Summary: Inspection on March 7 - 11, 1988 (Inspection Number
50-353/88-07)

Areas Inspected: Routine Unannounced Inspection of the Preoperational Test Program, including the review of preoperational test procedures, review of the preoperational test program implementation, test witnessing of an initial pump run, a review of the use of startup pump suction strainers, and the review of QA/QC interface with the preoperational test program.

Inspection Results: No violations or deviations were identified. A previous unresolved item concerning "asterisk items" in the preoperational test procedures was resolved through the introduction of Logic Functional Test (LFT) Procedures (for details see attached report)

1. Persons Contacted

Philadelphia Electric Co.

R. Ballou, Startup Supervisor (NSSS)
D. Chronomitz, Startup Engineer
D. Cook, Construction Engineer
*D. A. DiPaolo, QA Branch Head
L. C. Dyer, QA Engineer
G. Feenstra, Startup Coordinator
*B. J. Foote, Lead Engineer (Bechtel)

G. C. Kelly, QA Engineer
*G. Lauderback, Startup QC Supervisor
*H. Lilligh, QA Manager (Bechtel)
*K. W. Meck, QA Coordinator (Mechanical)
*P. L. Naugle, Assistant Superintendent Limerick 2
*L. J. Pons, Resident Project Engineer
*K. G. Stout, QC Engineer (Bechtel)
W. J. Ullrich, Startup Manager
*H. R. Wiegler, Startup Superintendent (Operations)

U.S. Nuclear Regulatory Commission

R. A. Gramm, Senior Resident Inspector
R. L. Fuhrmeister, Resident Inspector

*Denotes those present during exit meeting held on March 11, 1988

2. Preoperational Test Program

2.1 Preoperational Test Program Implementation

A review was made of the handling of temporary strainers for pumps. It was found that a temporary bypass/jumper (TBJ) log is maintained in accordance with the requirements of the Startup Administration Manual (SAM). The TBJ Log Master copy is presently being kept in the startup enclosure under the care of the startup supervisor for NSSS. It will be transferred to the control room after turnover of a sufficient number of subsystems to startup. Very few temporary strainers have been installed at this time. All of the temporary strainers, installed to date are located in the wet well which is inaccessible at this time. Installation of these strainers (in 4" HCB - 206 and 207) was accomplished via Startup Work Orders (SWO) 269 D-001 and 269A-003, respectively.

It was found that the temporary strainers for pump suction which are installed via Startup Technical Program procedures (ref. 1 and 2) are not recorded in the TBJ Log. Such strainers are installed via a SWO initiated by a prerequisite in the aforesaid procedures and are removed via SWO initiated by a restoration step in same. The

inspector looked at the suction strainers installed on the Turbine Enclosure Cooling Water (TECW) pumps prior to the initial run of TECW Pump A. (See para. 2.3). The temporary suction strainers were found to have no equipment identification or temporary modification tag. According to administrative procedure AD6.8, Rev. 1, paragraph 5.4.b, the temporary strainer should be identified by attaching a Temporary Modification Tag which shows the procedure and step number instead of the component ID. This discrepancy will be followed during future inspections, as this item was reviewed as a representative sample for future safety related systems.

It was established that the sequence of events for temporary strainer installation is as follows.

1. Blue Tag Testing of the pump has been completed i.e. uncoupled motor run, motor/pump alignment.
2. The temporary strainers are installed under Startup Work Order (SWO) prior to initial run of the pump.
3. The initial run of the pump is done in accordance with Startup Technical Program Procedure TT1.1 (ref. 1)
4. The flushing of the subsystem is done in accordance with the applicable flush procedure (ref. 2).
5. A restoration step in the flush procedure takes the temporary suction strainer out.
6. If the Startup Engineer wishes to keep the temporary suction strainer in during pre-operational testing of the sub system, a test exception has to be written against this item. Such test exceptions are logged in the Startup Punch List, and are subject to continuous tracking until removed from the list.

2.1.1 References

1. Startup Technical Program Procedure TT1.1, rev. 0, approved by Startup Superintendent on 9-28-87, "Driven Mechanical Equipment Testing."
2. STP Procedure 2 F 15.1, Rev. 1, "System cleanness Verification Flush Procedure Startup System 15A, Turbine Enclosure Cooling Water", approved by Startup Superintendent on 9-18-87.
3. STP Procedure 2 FB 15.1, rev. 0, "Flow Balance Procedure Startup System 15A, Turbine Enclosure Cooling Water," approved by Startup Superintendent on 9-28-87.

2.2 Preoperational Test Procedure Review

The preoperational test procedure 2P-83.2, rev. 0, "Automatic Depressurization System (NSSS), Startup System 83D", approved by TRB on November 10, 1987 was reviewed both administratively and technically. The administrative review was accomplished for the following attributes:

- Management review and approval
- Procedure format
- Clarity of stated objectives
- Prerequisites
- Environmental conditions
- Acceptance criteria and their sources
- References
- Initial conditions
- Attainment of test objectives
- Test performance documentation and verification
- Degree of detail for test instructions
- Restoration of system to normal after testing
- Identification of test personnel
- Evaluation of test data
- Independent verification of critical steps or parameters
- Quality control and assurance involvement

Additionally, the inspector checked all installations of temporary jumpers in channels A and E and their removal and reviewed all of the steps in the A and E channels against the logic diagram from the FSAR

It was found that all of the jumpers installed were also removed in a later step of the procedure. All of the devices in the A and E channels were addressed (tested) in the procedure.

No discrepancies, violations, or deviations were identified by the inspector within the scope of this inspection.

2.3 Witnessing Initial Run of TECW Pump A

The inspectors witnessed the initial pump run of the Turbine Enclosure Cooling Water Pump 2AP 103 in accordance with STP procedures TT 1.1, rev. 0, (ref. 1 of Section 2.1) and 2 F15.1, rev. 1 (ref. 2 of section 2.1). The initial run (ref. 1 of 2.1) is a prerequisite of the flush procedure (ref. 2 of 2.1.)

The inspector made the following observations during the test:

- (1) Housekeeping around the pumps was satisfactory,
- (2) Test instruments all had a calibration sticker, which showed these instruments to have a valid calibration,
- (3) Good communications with the control room and the motor control center locations were established prior to the test,
- (4) Master copies of the procedures were available at the pump location. These procedures were used effectively by the startup engineer,
- (5) A PECO QA inspector was present to witness the test with a prepared surveillance check list, and
 - (6) The temporary strainers for TECW pumps A&B did not have a Temporary Modification Tag or other equipment identification.

The initial run of TECW Pump A was invalid. Pressure readings were too low. It was determined that dirt had gotten into the snubbers of the discharge and differential pressure instruments. The snubbers were removed and the test repeated successfully.

Pump vibration was found to be high. Motor temperature was found to be approximately 150°F. This also is on the high side. A check will be made on the alignment of the pump.

Apart from item (6) above, no violations or non compliances were observed by the inspector. For comments on item (6) above see section 2.1.

3. Licensee Action on Previously Identified Items

(Closed) Unresolved Item 50-353/88-04-01: "Optional Steps in Preoperational Test Procedures (Asterisk Items)."

The Blue Tag Tests (BTTs) were used to skip the equivalent steps in the preoperational test procedure (POT) for the same logic circuit ("Asterisk Items").

The BTT produces a marked up schematic logic diagram (yellow lined) which identifies what part(s) of the logic circuit has been tested. There are no written test instruction (procedural steps) for the BTT. The yellow lined logic diagram would be the only test record. In addition, the BTT is not done in the exact same way as done by the asterisk steps in the POT Procedure. The BTT, therefore, does not produce a verifiable test record and cannot be accepted as a substitute for the logic testing as done under the asterisk steps in the POT procedure.

Startup management has responded to this finding with the introduction of the Logic Functional Test (LFT) procedures.

The LFT Procedure uses most of the asterisk steps in the applicable POT Procedure as written, or as modified, to suit the LFT. The LFT basically reperforms the corresponding BTT but with specific test instructions (Steps) which have to be signed off. The resulting LFT test record will become an integral part of the POT record, subject to the same review and approval requirement (including those of the TRB).

Two LFT Procedures had been written to try out the concept described above. Both LFT Procedures were executed successfully.

The administrative procedure AD. 7.0 (ref. 3) has been revised to incorporate the requirements of the new Logic Functional Tests.

The inspector has reviewed the documents below with the licensee and has no further questions at this time.

- (1) Procedure LFT 2 P-18.1, Rev. 0, "Logic Functional Test Instrument Air System Startup Subsystems 18A and B", test procedure approved March 3, 1988; Test partially completed on March 4, 1988.
- (2) Procedure LFT 2P-15.1, rev. 0, "Logic Functional Test Turbine Enclosure Cooling Water System Startup System 15A", Test procedure approved February 27, 1988, test results approved on March 3, 1988.
- (3) Administrative Procedure AP7.0, rev. 2, "Startup Technical Program," approved on February 25, 1988

(Closed) Unresolved Item 88-04-02, "Availability of the Schematic Diagram in the Field for Blue Tag Test"

There was no requirement in the pertinent administrative procedure (EE 11.11) for the Electrical Engineering Field Engineer (EEFE) to have the schematic diagram available in the field to mark it up (yellow line) as a test record. This meant that the EEFE could elect to yellow line his schematic diagram, after the test, in the field office. Such yellow lining would be based on memory.

Electrical Engineering Division procedures EE 11.11, "Inspection and Testing Procedure Implementation" was revised (and approved) on March 9, 1988 (rev. 18) to incorporate the requirement in question (paragraph 6.3.2.1)

The inspector has reviewed the above procedure revision with the licensee and has no further questions at this time.

4. QA/QC Interface

A review was made of the completed audit of the RPV Code Hydrostatic Test as performed by the PECO Audit Team in February 1988, and reported in Audit Report No. 2M-567.

The inspector observed that the audit did not produce any unsatisfactory findings. The checklist appeared to cover all of the important acceptance criteria. None of these criteria were violated during the test.

No unacceptable conditions were observed by the inspector.

5. Independent Effort

The inspector attended a meeting on March 7, 1988 concerning the tie-in of liquid and solid radwaste facilities of unit 2 with the existing parallel facilities of unit 1. There are a number of temporary facilities necessitated by the absence of the tie-in at this time. A sequence of construction activities has been delineated to minimize the potential exposure of personnel and the contamination of the new piping of Unit 2. These construction activities include the eventual isolation of the temporary facilities and the brief periods required for the final tie-in of radwaste piping.

The inspector pointed out that the NRC inspection responsibilities for the radwaste facility tie-in are carried by other specialists in Region I. These activities are not a routine part of the preoperational testing activities mostly because of the expertise required in the areas of health physics and shielding design. The handout material of the meeting will be turned over to the assigned inspectors in Region I for information and planning.

6. Plant Tours

The inspector made a tour of the plant including the control building, turbine building, the Diesel Generator Enclosures, and 3 elevations in the Reactor Enclosure to observe the status of construction, work in progress, housekeeping, testing activities and cleanliness.

No unacceptable conditions were noted.

7. Unresolved Items

Unresolved items are matters about which more information is required in order to determine whether they are acceptable, an item of noncompliance, or a deviation. New unresolved items in this report are identified in paragraph 2.1.

8. Exit Interview

At the conclusion of the site inspection, on March 11, 1988, and exit interview was conducted with the licensee's senior site representatives (denoted in Section 1). The findings were identified and previous inspection items were discussed.

At no time during this inspection was written material provided to the licensee by the inspector. Based on the NRC Region I review of this report and discussions held with licensee representatives during this inspection, it was determined that this report does not contain information subject to 10 CFR 2.790 restrictions.