U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Report No. 50-352/85-03

Docket No. 50-352

License No. NPF-27 Priority -- Category B

Licensee: Philadelphia Electric Company

2301 Market Street

Philadelphia, Pennsylvania 19101

Facility Name: Limerick Generating Station, Unit 1

Inspection At: Limerick, Pennsylvania

Inspection Conducted: January 24 - February 1, 1985

Inspectors:

J. Linville, Senior Resident Inspector — 3/8/85 date

for R. Blough, Senior Resident Inspector — 3/8/85 date

for L. Doerflein, Senior Resident Inspector — 3/8/85 date

for L. Plisco, Resident Inspector — 3/8/85 date

for J. Beall, Project Engineer — 3/8/85 date

Approved By:

R. Gallo, Chief, Section 2A, Division of Reactor Projects — 3/26/85 date

Inspection Summary:
Inspecton on January 24 - February 1, 1985 (Inspection Report No. 50-352/85-03)
Areas Inspected: Special announced operational assessment team inspection of the Limerick facility management controls over operational, surveillance testing, and maintenance activities and programs. The inspection involved 227 hours on site by four resident inspectors and one region based inspector.

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Results: In general there are adequate management controls in place to support full power operation. One violation involving inoperability of the Main Steam Isolation Valve - Leakage Control System due to surveillance test procedural inadequacy and operator oversight (paragraph 5.4) was identified. Other licensee weaknesses identified during the inspection included Plant Operations Review Committee involvement in procedure reviews (paragraph 3.0), control of access to the control room (paragraph 4.1), the Temporary Procedure Change process (paragraphs 5.2 and 7.2), documented review of surveillance test data by responsible department supervision (paragraph 5.2), management overview report of the maintenance program (paragraph 6.1.8), control of Environmental Qualification Reports (paragraph 6.1.2), completion of the Automatic Depressurization System valve checkoff list prior to initial plant startup (paragraph 7.4), and the process for providing NRC inspectors unescorted access to the facility (paragraph 8.0).

DETAILS

1. Persons Contacted

In addition to the licensee representatives present at the entrance and exit interviews and identified in the attachment to the report, the team interviewed numerous other operators, maintenance personnel, instrument and control technicians, quality assurance personnel, contractor personnel and supervisory personnel and discussed the activities being observed.

2. Scope

The purpose of the Operational Assessment Team inspection was to determine the readiness of the Limerick facility for full power operation by evaluating the effectiveness of management controls over operational, surveillance testing and maintenance activities at low power operation. The methods of evaluation used included procedure review, personnel interviews, document review, facility tours, and direct observation of activities. Particular emphasis was focused on the interfaces among the various groups for planning, accomplishment, and review, and on the plant management oversight and review of these activities.

3.0 Management Overview

The inspector reviewed selected administrative procedures covering preparation of administrative procedures, Plant Operations Review Committee (PORC) activities, preparation of safety evaluations, plant housekeeping, notification of NRC, working hour restrictions, and reporting of defects and noncompliances for compliance with Technical Specifications and other NRC requirements. Selected management personnel were interviewed regarding their responsibilities in the above areas and in general plant readiness for full power operations. In addition, the inspector attended a scheduled PORC meeting on the evening of January 29, 1985 and independently reviewed the documents reviewed by PORC at the meeting. The inspector also reviewed PORC minutes covering the period November 20, 1984 to December 19, 1984 and a sample of the procedure changes documented as reviewed by PORC subcommittees in the minutes for PORC meeting 84-125, conducted on December 11, 1984. A memorandum on PORC subcommittees, issued by J. L. Franz, dated September 9, 1983, and QA audit no. AL84-20PR, covering PORC activities, were also reviewed.

Personnel interviewed were professional, knowledgeable and dedicated to safe and reliable plant operations. With one exception the administrative procedures and their implementation were found to be adequate and consistent with Technical Specifications and other NRC requirements. Administrative Procedure A-4, "Plant Operations Review Committee Procedure", Revision 2 permits PORC subcommittees, comprised of one permanent PORC member and two other individuals, one of whom is a member of the plant staff designated by the Station Superintendent and the other of whom is knowledgeable in the area under review, to review and approve certain procedures and programs in lieu of PORC full committee review. Procedure A-4

further requires that the results of PORC subcommittee reviews be presented to PORC either orally or in the form of a written list and that subcommittee reviews be documented in the PORC minutes. To date plant practice has been to submit to the full PORC a list of procedures reviewed by a PORC subcommittee and document that they were reviewed and approved by that PORC subcommittee. While the practice of having a subcommittee perform a detailed review of specialized procedures and programs is recognized as good, Technical Specification 6.5.1 requires a PORC quorum, consisting of the chairman or his designated alternate and four members, for the performance review of procedures specified by Technical Specification 6.8. Not presenting the results of the subcommittee reviews for questioning, consideration and approval at a PORC meeting which satisfies the quorum requirements is a weakness (352/85-03-01).

4.0 Operational Readiness of Shift Operations

The inspector interviewed managers and operators, observed control room activities, accompanied an auxiliary operator on his rounds, and reviewed procedures and records to assess the readiness of the shift organization for full power operation. The following paragraphs include the details of the areas examined and the respective findings.

4.1 Organization and Shift Staffing

The inspector noted that the licensee has implemented a six shift rotation with each shift meeting the staffing requirements delineated in Technical Specification 6.2.2. Each shift has two on-duty licensed Senior Reactor Operators (SRO's), two on-duty licensed Reactor Operators (RO), a degreed Shift Technical Advisor (STA), and several non-licensed operators. An off-duty RO is assigned to each shift to prepare blocking permits. In addition, the licensee has three newly licensed SRO's which the licensee indicated would be added to the shift rotation to help relieve the administrative burden of the shift supervisor and provide additional SRO tours of the plant. Based on observations and interviews, the inspector determined that the operators were aware of plant status, knowledgeable in administrative controls, and acted professionally.

The inspector reviewed various logs to verify that the logs required by procedure A-7, "Shift Operations," were maintained and to assess the effectiveness of the logs. These logs included the Unit 1 Reactor, Control Room, Shift Supervision, and Shift Technical Advisor logs. In addition, several operator aides were reviewed. These included logs such as the equipment status and Limiting Condition for Operation logs. In general the inspector found the logs were well maintained and provided sufficient information to communicate significant operational information, shift operating activities, surveillance and test activities in progress, and problem descriptions and resolution.

The inspector also witnessed two shift turnovers to assess turnover effectiveness. The inspector noted that the turnovers were conducted in accordance with procedure A-7. Turnover activities include log review by oncoming shift, a verbal turnover, a panel walkdown, and completion of a turnover check list. In addition, the entire oncoming shift attends a shift briefing given by the Shift Superintendent. Briefing attendance includes startup test, chemistry, health physics, contractor, and maintenance personnel. The discussion includes plant status, LCO's in effect, and scheduled testing. The inspector found the turnovers thorough and effective in providing good communication and coordination among all departments on shift. The quality of shift turnovers is a strength. However, the fact that the shift briefings are held in the control room is a concern because the briefing may be distracting to the on duty licensed operators.

The inspector found the controls for limiting access to the control room to be ineffective. Besides the shift turnover briefings, the inspector observed several occasions when an apparently excessive number (over 20) of people were in the control room. As noted above, this may be distracting to the operators. The administrative controls on limiting access are not always enforced, and a gate at one of the control area entrances is ignored. The apparent lack of effective control room access is a weakness (352/85-03-02). Following the identification of this concern to the licensee and prior to the end of the inspection, the inspector noted improvements in access control. Continued management attention will be necessary to maintain this positive trend.

The inspector noted that site management conducts daily meetings with first line supervisors and with contractors. The inspector attended one of these meetings and noted that items discussed included plant status, problem areas and their resolution, test schedules, and need for support from other departments. As with the shift turnover briefings, these meetings are effective in promoting effective communications and coordination among various departments and are a licensee strength.

During one of the meetings noted above, the licensee also discussed the status of annunciators. The inspector noted that the licensee is actively pursuing the resolution of alarming annunciators. The inspector reviewed the annunciator log and noted that it contained an entry for each alarming annunciator with information on the acceptability of the alarm for existing conditions, the cause, and corrective actions being taken. The licensee's program to eliminate alarming annunciators is beneficial to safe and efficient operation and is also a licensee strength.

No unacceptable conditions were noted.

4.2 Observations During Plant Tours

The inspector made both escorted and unescorted plant tours. During the tours, the inspector found very little evidence of dirt, debris or graffiti throughout the plant. Personnel were frequently observed cleaning to maintain this condition. The apparent positive management attitude towards housekeeping and implementation of that attitude are licensee strengths.

During plant tours the inspector also noted that components such as valves, gauges, and panels were clearly labeled and identified. Systems were marked with flow arrows. This type of labeling enhances operation and is considered a licensee strength.

No unacceptable conditions were noted.

4.3 Temporary Circuit Alterations

The inspector reviewed Administrative Procedure A-42, "Procedure for Control of Temporary Circuit Alterations (TCA's)," and determined that the procedure was thorough and provides adequate control over the installation and removal of Temporary Circuit Alterations (jumpers and lifted leads). The procedure applies to both electrical and mechanical TCA's and requires the performance of safety evaluations and double verification on the installation and removal of safety related TCA's. The TCA control form, which contains narratives on the reason and detail of the alteration as well as the impact on operations, is prepared by the worker. The Shift Technical Advisor (STA) reviews the TCA for classification and impact. The Shift Superintendent reviews and authorizes all TCA's. When safety evaluations are required, they are approved by the Plant Operations Review Committee (PORC) prior to installation of the TCA.

The inspector reviewed the TCA log as well as several applied and restored TCA control forms to verify proper implementation of this program. The inspector noted that there were 85 active TCA's on Unit 1, 26 of which were classified as safety related. The inspector identified one TCA, No. 98 on the Diesel Fire Pump, which was improperly classified and had no safety evaluation. The licensee agreed that this TCA was misclassified and promptly initiated a safety evaluation. The inspector reviewed the PORC approved safety evaluation, and agreed that for the TCA on the Diesel Fire Pump, no unreviewed safety question existed. To prevent recurrence, the licensee indicated that operators would be informed, via the night order book, and STA's instructed, via a letter, on the fire protection system classification requirements delineated in procedure A-42.

During the review of TCA control forms, the inspector also noted that one active TCA, No. 85 on the Refuel Bridge, had no signatures for hanging or checking the tag. In addition, two out of 14 restored TCA's reviewed (No. 54 and 66) did not have the independent verification signatures. The inspector verified that TCA No. 85 was actually installed and determined that the missing signatures for TCA Nos. 54 and 66 appeared to be only a documentation problem.

The inspector concluded that the licensee's controls over TCA's were adequate and that, except for the minor problems noted above, the system was being effectively implemented.

No unacceptable conditions were noted.

4.4 Locked Valve Controls

The inspector reviewed procedures A-85, "Operations Lock Application and Key Control Procedures," and A-8, "Procedure for Control of Locked Valves," to determine the adequacy of the licensee's key control, especially that associated with locked valves.

The inspector determined that the control of keys was adequate. The keys are maintained in a locked cabinet in the Shift Superintendent's office. The issuance of keys is authorized by shift supervision. A key control tag is filled out when a key is removed from the controlled key cabinet. This tag identified the key number, name of person using the key, signature of the authorizing individual and status of the lock. The tag replaces the key in the cabinet. The key cabinet is jointly audited by both shift superintendents during turnover to ensure that all keys are accounted for. The inspector examined the controlled key cabinet and completed control tags and did not identify any discrepancies with the implementation of this system.

The inspector also determined that the controls for changing the position of a locked valve were adequate. The shift supervisor maintains a "Locked Valve Log" which records alterations to normally locked valves. Entries in this log include valve number, description, normal position, initials of the shift supervisor authorizing the change, restored position of valve, name of the individual performing the restoration and name of the individual performing the restoration independent verification. The inspector reviewed this log, observed its use during the repositioning of one valve, and found that controls were properly implemented.

However, during the programmatic review, the inspector noted that the licensee did not have a controlled locked valve list as required by procedure No. A-8. This was previously identified by the Quality Assurance Department in audit no. AL84-58 PR, and a noncompliance report was issued. The licensee did have a contractor prepare a locked valve list, however, this list was apparently never approved.

The licensee recognized a need to add valves to this list (for example, instrument root valves and valves required for secondary containment) which resulted in several uncontrolled locked valve lists. The licensee presently relies on the P&ID's and operating procedure checkoff lists to identify the locked valves, however, these may be incomplete. For example instrument root valves are not shown on P&ID's or included in the procedure checkoff lists. The licensee acknowledged this problem and the inspector noted that, prior to completion of this inspection, the licensee consolidated all the uncontrolled locked valve lists. The licensee indicated that this list would be approved by the Plant Operations Review Committee and included in procedure A-8. The licensee also stated that the P&ID's and procedure checkoff lists would be reviewed against the approved locked valve list and updated as necessary to accurately reflect the locked valve status.

No unacceptable conditions were noted.

4.5 Equipment Status Controls

The inspector reviewed procedure A-41, "Procedure for Control of Safety Related Equipment," to assess the adequacy of the licensee's administrative controls over the release and return to service of safety related equipment for maintenance and surveillance testing. The inspector noted that removal of equipment from service for maintenance, including the protective tagging (blocks), or surveillance testing requires the shift supervisor's (a licensed Senior Reactor Operator) authorization on the Maintenance Request Form (MRF), the blocking permit, or the surveillance test procedure respectively. Released equipment is identified by blocks on the control room panels and the information in the "Status Sheet of Equipment Undergoing Tests" logs maintained by the Control Operator and the Assistant Control Operator (both licensed Reactor Operators). These logs provide information on tests in progress and track them through completion including test results, restoration independent verification, and final status of equipment operability. Restoration from maintenance includes the requirements for independent verification during block removal and satisfactory performance of post maintenance testing prior to declaring a piece of equipment or system operable. Based on the procedure review and discussions with licensee personnel, the inspector determined that the licensee has adequate controls in place for the removal from and return to service of safety related equipment.

The inspector reviewed the licensee's post maintenance testing controls which are implemented by Appendix 3 to procedure A-26 on corrective maintenance. Following completion of a job, section 5 of the MRF is filled out to specify the corrective action taken. This section may also identify any testing that was performed (for example, calibration of an instrument). The MRF is then reviewed by the STA who, based on engineering experience and some departmental guidance,

determines what, if any, additional testing is required to declare the equipment operable. This testing is usually a portion of or a complete surveillance test. The STA identifies and approves the post maintenance testing requirements on an Operational Verification Form (OVF). The shift supervisor reviews the OVF for adequacy and authorizes the testing. The testing must be satisfactorily completed and the OVF signed off before the shift supervisor will sign for acceptance on the MRF and declare the equipment operable. The inspector did not observe implementation of any post maintenance testing, however, based on the fact that equipment cannot be declared operable until the OVF is completed and that the adequacy of the testing is approved by one degreed engineer and one licensed individual, it appears that the licensee has established adequate control over post maintenance testing.

No unacceptable conditons were noted.

4.6 Procedures

The inspector spotchecked several operating and annunciator response procedures to verify that they were controlled and maintained available for operator use. Although the inspector found that not all annunciator response cards had been approved by the PORC, he determined that the response cards for all safety related annunciators were approved as discussed in an FSAR committment. The licensee stated that all annunciator response cards would eventually be approved by PORC. No violations were identified.

The inspector also reviewed the licensee's responses, dated November 4, 1983 and August 31, 1984, to Generic Letter 83-28 as well as procedure GP-18, "Scram Review Procedure," to verify that the licensee has established an adequate procedure covering post trip reviews. The procedure requires that the STA complete the procedure's checkoff list using information from interviews with involved personnel, data from applicable recorder traces, the process computer Sequence of Events and Post Trip Logs, and the Sentinel printout from the Emergency Response Facility Data System. Copies of the recorder traces and computer printouts are attached to the trip report. The Operations Engineer is responsible for reviewing the completed checkoff list and performing the safety assessment of the trip. The procedure requires verification of proper operation of the Reactor Protection System, the Emergency Core Cooling Systems, the Primary Containment Isolation System, and safety related electrical equipment. The inspector also noted that the procedure identifies the requirements for reactor restart as well as for PORC review of unresolved items and equipment failures. Because there were no plant trips prior to the review, the inspector did not review implementation of the post trip review procedure. However, based on the reviews that were made, the inspector determined that the licensee's scram review procedure was adequate.

The inspector also noted that the licensee uses informational aids throughout the plant. These aids may be drawings, tables, tags, etc., which are posted in order to aid the operator in execution of approved operations or alert him to unusual plant conditions. These operator aids are controlled and implemented by procedure A-95, " Operator Aids." The inspector reviewed the licensee's system and determined that the operator aids were helpful in the conduct of plant operations. The inspector noted that procedure A-95 requires a periodic review of the operator aids file to ensure that all outstanding aids are necessary and technically correct. However, the inspector noted that no reviews have yet been planned or done. The inspector informed the licensee that specific review frequency requirements would ensure that they are done. The licensee acknowledged the comment.

No unacceptable conditions were noted.

5.0 Surveillance Testing Program

5.1 Surveillance Testing Program Implementation and Scheduling

The Technical Specification (TS) Surveillance Testing Program, which is described in Administrative Procedure A-43, Revision 4, "Surveillance Testing Program", was reviewed to verify that formal administrative controls have been established and effectively implemented to support surveillance testing for operation of the unit.

The review established that responsibility for the administration of the Surveillance Testing (ST) Program has been assigned in writing to the Technical Engineer and that adequate controls have been established to implement the ST program. The Surveillance Test Coordinator (STC), appointed by the Technical Engineer, is responsible for scheduling, rescheduling, documenting and filing in support of the ST program.

A computerized Master Test Schedule (MTS) is used to schedule and track the completion of approximately 1500 TS surveillance tests. The MTS is distributed weekly by the STC to the responsible supervisors for implementation. The MTS includes, for each responsible group, the test number and title, the applicable operational condition, the frequency, and the scheduled date. The responsible supervisor, or designated alternate, updates the surveillance test status on the MTS and returns it to the STC at the completion of the test week (Monday to Monday).

The MTS tracks the frequency and due dates for the TS surveillances and provides a weekly test schedule for the items currently due. The system calculates the available grace periods for each surveillance, based on the Technical Specification Section 4.02 criteria, and lists the most limiting date as the violation date on the schedule. The program also tracks late tests and provides an "Out of Surveillance Report" to assist in coordinating and monitoring the program.

A comprehensive surveillance test index, which cross references Technical Specification, ASME code and FSAR requirements to the applicable surveillance test procedure, is also maintained by the STC. The inspector discussed concerns with the STC about the control of the index, specifically the process used to update the document when Technical Specifications are amended. The STC stated that he was on distribution for TS amendments and that he was responsible for updating the index, the MTS, and the test program if necessary.

Twenty surveillance tests required by the Technical Specifications were verified to be properly referenced on the test index, dated January 24, 1985. The tests were included on the MTS and the designated frequency for the surveillances were in accordance with the Technical Specification requirement. The weekly MTS for the period January 28 through February 3, 1985 was reviewed.

The inspector conducted interviews with the Technical Engineer, STC, and four responsible supervisors to discuss their responsibilities associated with the surveillance program and their interfaces with the other groups. All were knowledgeable of the scheduling process and well versed in the coordination required between groups.

Based on the above reviews and discussions, it was concluded that the provisions established to control the scheduling, performance and documentation of the surveillance test program by Procedure A-43 have been properly implemented, and that the MTS system is working effectively and is capable of providing the controls necessary to support plant operation.

The inspector also reviewed completed event-related surveillance tests performed by the chemistry group for two occurrences of out-of-service monitoring equipment during the month of January, 1985. In both cases, the surveillances were performed in the frequency required by Technical Specifications.

No unacceptable conditions were noted.

5.2 Surveillance Procedures and Records

The inspector reviewed selected surveillance test procedures to verify that the format and content conformed with the requirements of ANSI N18.7-1976 and that the test methodologies were technically adequate to conduct a valid test. Various plant systems and surveillance tests, which were assigned to various plant functional groups for implementation, were selected for review. Administrative Procedure A-47, Revision 3, "Procedure for Preparation and Control of Surveillance Test Procedures", which provides the measures used to control the surveillance procedures, was also reviewed. The test procedures were reviewed to verify that the following were included:

-- Specified prerequisites and precautions

-- Acceptance criteria consistent with Technical Specifications

-- Instructions to ensure that systems or components are restored to operation following testing

All procedures reviewed would result in a surveillance test measurement that accomplished the stated objectives and that would provide the desired operability demonstration for the associated system.

Station records of surveillance tests previously performed were reviewed on a sampling basis for the following attributes:

-- Tests were in conformance with Technical Specifications

-- Completed tests were properly reviewed as required by facility administrative requirements

-- Tests were performed within the time frequencies specified by Technical Specifications

-- Appropriate action was taken for any item which failed to meet the acceptance criteria

-- Tests were performed by qualified individuals

During the review the inspector identified two weaknesses associated with the controls of surveillance testing activities. One weakness involved the temporary procedure change process, and the other weakness was the review process for completed surveillance tests. Additionally, one surveillance procedure did not correctly restore the associated system to an operable status, and is discussed further in section 5.4.

The inspector discussed the controls for temporary procedure changes with several responsible supervisors. Administrative Procedure A-3, Revision 2, "Procedure for Temporary Changes to Approved Procedures", controls the process. A temporary procedure change (TPC) is defined in A-3 as a change made to an approved procedure for the purpose of performing a safety-related activity in a manner other than as specified in the procedure. The temporary change is a one-time occurrence in that the approval given for the temporary change applies only to the current use or current series of uses of the procedure. The temporary changes are initially approved by two permanent PORC members, and then reviewed by the full PORC within fourteen days.

The inspector found that the temporary change process was cumbersome and prone to errors. First, since the change is applicable once, and is only included permanently upon procedure revision, the chance exists that an incorrect or incomplete procedure will be performed if the procedure is not changed prior to use. One group interviewed stated they had just reviewed a copy of the last completed test in an uncontrolled test file to see if a change had been approved for it. Additionally, there were examples found where a temporary change was approved for a typographical error on a TS acceptance criteria, but on later tests the acceptance criteria was altered, and no procedure change was issued. The responsible work group stated the error was an "obvious" typographical error and a TPC was therefore not required. No formal review of the change was documented to verify that the intent of the original procedure as required by TS 6.8.3 was not altered. The inspector verified that the change did not affect the intent of the original procedure. The TPC process requires further licensee review and is a weakness (352/85-03-03).

Administrative Procedure A-43 states that at the completion of testing, the Shift Supervision or designated alternate shall review and sign the test, or for tests that Shift Supervisors are not required to review, the responsible supervisor will review and sign the test. The signature on a successfully completed test means that all signature or information spaces are filled in as required and all other steps are within required limits. All of the tests reviewed by the inspector, with the exception of chemistry surveillance tests, were reviewed by shift supervision. Very few of the surveillance tests are formally reviewed by the responsible supervisor for the test, and the burden of the review process is placed on the operators. The chemistry surveillance tests reviewed were required to be signed by the Chemistry Supervisor, or designated alternate, but the inspector noted four week old surveillance tests that had not yet been reviewed because one step of the procedure required computer data entry. The review process for determining successful completion of surveillance testing is a weakness (352/84-03-04).

5.3 Surveillance Observation

The inspector observed the performance of two surveillance tests involving safety-related systems to ascertain that surveillance of safety-related systems is being conducted in accordance with license requirements.

The following surveillance activities were observed:

-- ST-2-040-607-1, MSIV Leakage Control System - Main Steam Line Pressure Functional Test (PIS-40-IN661P), performed January 29, 1985

-- ST-2-047-611-1, RPS-Scram Discharge Volume Water Level-High; Division IIB, Channel B2 Functional Test (LISH-47-IN601D) performed on January 31, 1985

The following conditions were observed:

-- The surveillance test procedure conformed to Technical Specification requirements

-- Required administrative approvals were obtained prior to initiating the test

-- Testing was accomplished by qualified personnel in accordance with an approved test procedure

-- Required test equipment was in calibration

-- Technical Specification LCO's were met

-- The recorded test data were accurate and complete

-- The system was properly returned to service and independently verified by a qualified individual

-- The test results met Technical Specification requirements

-- The surveillance test was completed within the required frequency

During the observation the inspector discussed with the technicians the steps they would take if unacceptable conditions were identified during the test, or the action they would take if an error was identified in the test procedure. These technicians were highly knowledgeable and appeared well trained in surveillance testing activities and actions required in abnormal situations.

No unacceptable conditions were noted.

5.4 Main Steam Isolation Valve-Leakage Control System Alignment

During a control room tour on January 28, 1985, the inspector noted that all of the status indication lamps for components of the Main Steam Isolation Valve-Leakage Control System (MSIV-LCS) were extinguished on panel 10C626, although Technical Specifications required the system to be operable. When questioned, the control room operators responded that this was the normal alignment. Additionally,

there was a sign posted on the panel that directed that the breakers remain open during normal plant operation. The plant was in Operational Condition 2.

The inspector reviewed operating procedures S40.3.A(B), "Setup of the Main Steam Isolation Valve-Leakage Control System Inboard (Outboard) System for Normal Operation of the Nuclear Boiler". In the associated checkoff lists (COL) the breakers for the three blowers (one inboard, two outboard) and four heater strings were required to be closed, but were apparently open. However, the breakers for the system isolation valves and depressurization valves were required to be locked open and were locked open as required. The inspector asked the Shift Superintendent if he was aware of the reason that the blower and heater breakers were open, since it was contrary to the COL, and he stated he was not aware of any reason. The inspector noted that the last completed COL performed on the system and on file was dated December 20, 1984. This COL had verified that the heater and blower breakers were closed.

Further investigation revealed that on December 27, 1984 the monthly surveillance test ST-6-040-320-1, MSIV-LCS Operability Test, was performed. Review of the surveillance test found that in the system restoration step of the procedure, the blower and heater breakers were incorrectly required to be opened, leaving the system out of the normal alignment. The surveillance test was again performed on January 27, 1985, but misaligned after the completion of the test in accordance with the surveillance test procedure.

Technical Specification Limiting Condition for Operation 3.6.1.4 requires that two independent MSIV leakage control subsystems be operable in Operational Condition 2. During the period between December 29, 1984 and January 30, 1985, while the unit was in Operational Condition 2, both MSIV-LCS subsystems were inoperable since the circuit breakers for the associated blowers and heaters were misaligned (opened) because of an incorrect surveillance test procedure. This is a violation of Technical Specification 3.6.1.4 (352/85-03-05).

After being informed of the violation, the licensee immediately performed a COL on the system and shut the appropriate breakers. Additionally, the licensee initiated action to correct the deficient surveillance procedure to prevent recurrence.

FSAR Section 6.7 states that the MSIV-LCS is manually initiated and designed to permit actuation within about 20 minutes after a postulated design basis LOCA. Review of emergency procedure SE-10, "LOCA", identified that SE-10 did not include steps for the operator to close the blower and heater breakers, and would not have assured proper alignment of the system for operation under accident conditions.

The inspector asked to see the documentation to show that the other MSIV-LCS breakers required to be operated prior to a LOCA were accessible and that guidance had been given to the operators concerning the best route to the breaker panels. The licensee did not have the documentation available at the conclusion of the inspection. Documentation is required to provided to demonstrate that the MSIV-LCS breaker panels are accessible under post accident conditions, and that operators have been provided adequate guidance on the proper route to the panels. This item is unresolved (352-03-06).

The inspector discussed with the licensee the basis for the system configuration with the MSIV-LCS isolation valve breakers open. FSAR Section 6.7, which discusses the MSIV-LCS does not state that the isolation valve breakers remain open during plant operation. The licensee provided General Electric Engineering Change Notice (ECN) NJ48904, dated October 11, 1983, which prescribed opening the circuit breakers for the MSIV-LCS valves (i.e. F001B-K, F002B-K, F006, F007, F008, and F009). This was approved to prevent single failure in one division from causing the valves to open or remain open when system conditions require them to be closed.

In response to FSAR Question 421.50, the licensee stated that the motive power to the MSIV-LCS is removed during plant operation to provide the high pressure-low pressure system interlocks (HPLPSI) described in FSAR Section 6.7. Section 6.7 also states that the electrical power for the valves is removed during plant operation by locking the MCC breakers in the open position. Therefore, the current alignment is as described in the FSAR.

6.0 Maintenance

During this inspection several professionals in the station Maintenance Engineering and Technical Engineering staffs were interviewed. The inspector noted that these individuals had a conservative attitude and good safety perspective. The quality and attitude of these staff members is a strength.

6.1 Program Reviews

As described below, the inspector reviewed various documents and interviewed engineers, supervisors, technicians and craftsmen to assess the status and adequacy of maintenance programs.

6.1.1 Equipment Problem Identification

The licensee uses an Equipment Trouble Tag (ETT) system for in-plant identification of equipment deficiencies. Personnel are encouraged to tag and report all problems noted. Personnel interviewed by the inspector were aware of, and

in support of, the system. During tours, the inspector noted that equipment deficiencies were generally tagged. The ETT is used to generate a Maintenance Request Form (MRF) to initiate corrective maintenance planning. During tours, the inspector selected ten ETT's in-plant and requested that the licensee show traceability to an MRF. In eight cases, the ETT was the subject of an active MRF. In two cases, the MRF had been closed but the ETT had not been removed. This is a concern because the ETT could delay reporting of a repeat failure. The licensee had been aware of the problem of failure to remove ETT's and is planning, as a check on the maintenance craftsmen, to require operators to verify removal of the ETT when they clear the blocking permits (tagout) associated with an MRF.

6.1.2 Job Classification

The inspector reviewed procedures and interviewed personnel responsible for safety classification of maintenance items. Classification of work and specification of procedure requirements is performed by the station Maintenance Engineering and I&C Engineering staff. The licensee is currently upgrading procedures to provide additional guidance on quality requirements and QC involvement for maintenance on Fire Protection equipment, Seismic Class IIA hangers, ASME components, and non-Q-listed equipment in close proximity to Q-listed equipment. The inspector reviewed a sampling of MRF's for proper work classification; no inadequacies were noted. However, one concern was noted in documents supporting work classification. Specifically, the methods for maintaining Environmental Qualification Reports and changes thereto did not include formal revision controls. For example, revisions to the Electrical Equipment Qualification Reports are not numbered. This practice can result in the use of a copy that is not complete or up-to-date. This is a weakness (352/85-03-07) and is discussed also in Section 6.1.9.

6.1.3 Job Planning

The inspector also reviewed procedures for job planning and found that detailed job planning is performed by technical and supervisory personnel in the Maintenance Division (for mechanical and electrical maintenance) and Research and Testing Division (for I&C Maintenance). Planning includes specifying the procedures to be used and is subject to QC approval. Procedures include mandatory QC inspection points, but additional QC inspections or notification requirements are frequently added in the review process. No inadequacies were noted.

6.1.4 Work Authorization

The inspector reviewed methods of authorizing maintenance work. These functions, including Technical Specification reviews, removing equipment from service, and specifying special administrative controls (such as fire watches or ignition service controls), are performed by the operating shift. No inadequacies were noted.

6.1.5 Reference Document Controls

The inspector reviewed the licensee's measures to ensure that (1) the appropriate reference documents are used, and (2) changes to vendor guidance are factored into maintenance programs. Procedure references and vendor technical manuals to be used are specified on the MRF during job planning. The licensee maintains a controlled library containing vendor documents and has assigned drawing numbers to the documents. Maintenance personnel interviewed were aware of the requirement to use controlled procedures and vendor documents.

Review of changes to vendor guidance is the responsibility of the corporate Nuclear Safety Section (NSS). The NSS receives information from a variety of sources, screens it for station applicability, and routes applicable information to the station Independent Safety Engineering Group (ISEG). The ISEG performs detailed reviews, makes specific recommendations to station staff, and tracks completion/resolution of items. The inspector interviewed the ISEG supervisor, reviewed governing procedures, spot-checked documentation of open issues, and reviewed tracking systems. No unacceptable conditions were noted.

The licensee is currently working with an industry group on a program to ensure utilities receive the latest manuals and guidance from vendors. This program was not reviewed in this inspection.

6.1.6 Measuring and Test Equipment Control (MTE)

The inspector reviewed procedures for MTE control, interviewed supervisors and craftsmen, toured the maintenance MTE storage area, and reviewed a sampling of usage records. The calibration status of equipment usage in the plant was also checked. No inadequacies were identified.

During review of maintenance division procedures, the inspector verified that measures are included for evaluation of the impact of out of tolerance "as found" readings during calibration. Since the maintenance calibrated tool room has recently been recently opened, no such evaluations have been received yet. However, personnel were aware of their responsibilities for the evaluations.

No unacceptable conditions were identified.

6.1.7 QC Involvement

The inspector reviewed procedures and interviewed supervisors and workers in the QC maintenance and I&C organizations to determine the extent and adequacy of QC involvement. The inspector determined that QC is extensively involved in maintenance activities. This involvement includes both mandatory witness points and monitoring/surveillance.

The inspector reviewed QC involvement in the job classification and planning process. For jobs classified as Q-listed, Fire Protection, Seismic Class IIA, ASME, or as non-Q equipment in close proximity to Q-listed equipment, QC review and approval of the planning is required. Although QC does not currently review or concur on classification for other non-Q jobs, QA audits do include work classification. The licensee stated that to provide QA/QC overview of work classification adequacy, a periodic QC surveillance of non-Q MRF's will be implemented.

No unacceptable conditions were identified.

6.1.8 Management Information System

The inspector interviewed station maintenance engineers and reviewed various computer printouts to assess the capability to provide station management overview and evaluation of maintenance status, work backlogs, trends, and program effectiveness. The inspector concluded that current information systems provide job status tracking in formats useful to workers and supervisors, but does not provide information for the management overview described above. This is a weakness (352/85-03-08).

6.1.9 Preventive Maintenance and Spare Parts

The inspector reviewed procedures and interviewed personnel involved with development of the Preventive Maintenance (PM) and Spare Parts programs. The inspector found that the processes for developing these programs were thorough and well-thought-out; this is a strength. For example,

during PM program development the licensee reviewed vendor recommendations, the Architect Engineer program, and numerous industry sources (including INPO). Additionally the System Startup Engineer was required to provide written recommendations on system PM. For spare parts classification, the licensee is developing written engineering bases for Q versus non-Q determinations; these evaluations are reviewed independently of the originator. A third review is provided by the station's Senior Maintenance Engineer. The Maintenance Engineer is deeply involved in both the PM program and the Spare Parts program.

With regard to the PM program, the inspector found that PM requirements of the Environmental Qualification (EQ) Reports (for both electrical and mechanical equipment) have not yet been entered into the computer system for PM scheduling and tracking. The licensee has reviewed the report and prioritized the work for entering items into the system based on required PM frequencies. The licensee has determined that no PM requirements for EQ are currently in jeopardy of being missed. The inspector will review this item during a subsequent inspection (352/85-03-09).

In reviewing the EQ Reports the inspector determined that the methods for controlling these documents did not provide the user the capability to determine whether the copy of the EQ Report was complete and up-to-date. In the case of the Electrical Equipment EQ Reports, revisions are not numbered. The lack of formal controls over these documents is a weakness (352/85-03-07) and has been previously discussed in Section 6.1.2.

6.1.10 Training and Qualification of Personnel

The inspector reviewed procedures, followup methods, and lesson plans for the training of maintenance personnel in nuclear plant systems. Maintenance Division craftsmen and their supervisors receive several special training sessions on administrative controls applicable to their job classifications. The Supervising Engineer, Maintenance Division, selects the topics and tracks completion of an individual's training. Also, selected personnel have received technical training on a wide variety of nuclear plant maintenance topics.

The inspector noted that Architect-Engineer craftsmen are sometimes detailed to Maintenance Division. Although these individuals are directly supervised on the job by licensee sub-foreman, they also have received training on nuclear plant administrative controls.

The training discussed above is in addition to General Employee (site access) Training and basic craftsman training, which were not reviewed in this inspection.

Professional employees in the station Maintenance Engineering group pursue a self-guided indoctrination and familiarization program specified by the Maintenance Engineer. They also receive a two-week BWR systems course from the Training Department. Additionally, all maintenance department Junior Technical Assistants received on-the-job training onsite through a cooperative program while obtaining Associate's Degrees.

No unacceptable conditions were identified.

6.1.11 Control of Temporary Services

Procedure A-30, "Plant Housekeeping", contains a general prohibition against temporary placement of equipment, material scaffolding, or shielding that will impact equipment operability or accessibility. Persons interviewed were knowledgeable in this area.

The licensee plans to implement additional procedures for controlling scaffolding and shielding. The inspector discussed the proposed scaffold controls with licensee personnel. All scaffolding will be numbered and tagged and will be subject to a pre-installation review. The licensee committed to implementing these controls by April 1, 1985, and to also include a post-installation inspection of scaffolds by a supervisor or an independent group. The inspector will review licensee actions during a subsequent inspection (352/85-03-10).

The inspector discussed control of temporary shielding with the Radiation Protection Manager (RPM). No temporary shielding has been needed yet due to the low plant radiation levels. The procedural controls are still in the developmental stage. The RPM stated that any temporary shielding needed before completion of the procedures would be done as a modification, thus ensuring the appropriate engineering and safety evaluation. All temporary shielding material is under the control of the RPM's ALARA staff.

No unacceptable conditions were identified.

6.2 Plant Tours

The inspector toured the maintenance shops with an Assistant Foreman. Areas toured included office areas, tool issue and calibrated tool storage, rigging equipment storage, and general work areas. Storage of calibrated tools and of rigging equipment was acceptable. The inspector reviewed an Item Handling Report for lifting a heavy load on the refuel floor. He reviewed the manufacturer's certification for each piece of rigging equipment used. No inadequacies were noted. However, the inspector noted that the licensee's procedure, MA-7, "Handling of Q-listed Items and Heavy Loads", does not require the craftsmen to show load calculations. The inspector stated that the calculations appeared to be an important feature of planning the heavy load lift and should be shown in order to allow review by craft supervision and, when required for the particular lift, by shift supervision. The licensee is reviewing MA-7 for changes. The inspector will review the licensee's action during a subsequent inspection (352/85-03-11).

While touring the weld rod oven room, which was being set-up, the inspector noted that several of the ovens had failed their initial temperature control checks. The licensee stated that adjustable controls were on order and the ovens were deenergized. The inspector questioned the failure to tag the ovens. The licensee stated that the shop is not yet set-up for Q-listed welding, no Q-listed weld rod is in the shop, and the entire oven room is being kept locked until the ovens are calibrated. Upon further review, the licensee determined that the weld rod oven procedure, Standard Work Instruction No. 17, does not specify the appropriate tag for an out-of-tolerance oven. The licensee stated that the procedure would be changed to clarify when and how a defective oven is to be tagged. The inspector will review the licensee action during a subsequent inspection (352/85-03-12).

The inspector toured various areas of the plant several times to evaluate housekeeping and equipment conditions and to verify that proper administrative controls were being applied to work in progress.

No unacceptable conditions were noted.

6.3 Maintenance Observations

The inspector reviewed documentation and administrative controls, checks on calibration status of test equipment, toured the work area, and interviewed personnel (craftsmen, supervisors, QC Engineers) involved in the following jobs.

-- Maintenance Request Form (MRF) 8501409, HPCI Equipment Area Differential Temperature. I&C technicians determined that the faulty differential temperature indication was due to reversed leads at the switch. Therefore, the switch, which inputs to primary containment isolation logic had been inoperable for some time. The inspector noted that the licensee had initiated a Suspected Licensee Event Report and had started an investigation. The resident inspectors were aware of this item. The inspector did not identify any inadequacies in the activities he observed or reviewed.

-- MRF 8501412, HPCI Lube Oil Cooling Water Valve. The cooling water valve Limitorque actuator had failed due to water penetration from a nearby fluid leak. The inspector noted that the valve is "environmentally qualified," as listed in the EQ report. The inspector therefore expressed concern that the valve would be rendered inoperable by water penetration during routine operations. Initial licensee investigation indicated that the water had penetrated a power cable conduit connection about six-inches from the box and that the problem may be due to either inadequate sealing or improper orientation of the conduit. The inspector noted other Limitorque valves of similar design and orientation in the plant. Pending licensee evaluation and subsequent NRC review, the environmental qualification of installed Limitorque valve operators is unresolved (352/85-03-13).

-- MRF's 8501388, 8501389, 8501473, and 8501513, HPCI Remote Servo. Due to the timing of the maintenance activities the inspector was not able to observe in-progress work. On January 26, 1985, the licensee declared HPCI inoperable due to oscillation of the controls. Troubleshooting under MRF 8501388 indicated a faulty remote servo. The servo was replaced with the Unit 2 servo, but prior to declaring HPCI operable, it was determined that the environmental qualification of the component could not be documented. A decision was made to rebuild the original part, but work was delayed due to licensee concerns about ability to ensure environmental qualification of the rebuilt servo. The inspector attended a licensee meeting with vendors on January 31, 1985 during which the concerns were resolved. The inspector also toured the work area, reviewed documentation and interviewed personnel involved in the job. The inspector noted that QA had issued several Apparent Deficiencies for this job, including the following:

-- Lack of a job-specific blocking permit (tagout)

-- Lack of adequate evaluation prior to transfer of Unit 2 items to Unit 1

-- Failure of QC coverage to identify the above deficiencies

No inadequacies beyond these identified by QA were noted. At the end of the inspection, work was ongoing and HPCI remained inoperable.

7.0 Safety System Status Verification

The inspector selected certain safety systems for status verification based on the report by Brookhaven National Laboratory under contract to the NRC, entitled "Limerick Systems Prioritization and Inspection Program Recommendations." The systems selected were Residual Heat Removal (RHR) Service Water, Core Spray, RHR Low Pressure Coolant Injection (LPCI) Mode, and the Automatic Depressurization System (ADS).

7.1 RHR Service Water System

Controlled copies of the system Piping and Instrumentation Drawing (P&ID), the Surveillance Tests (STs) for Loops "A" and "B", the valve alignment Checkoff List (COL), and the system startup procedure were used during the physical walkdown of all normally accessible piping and components. The Spray Pond Pump House was inspected and found exceptionally clean and free of debris. All system valves with one exception were verified as correctly positioned. Valve HV-12-005, the RHR Service Water/Emergency Service Water intertie valve was closed instead of open. The valve was closed during an earlier ST, and the system restoration procedure did not call for the valve to be re-opened. The valve was later opened by the licensee pending a review of the system performance characteristics. Licensee personnel indicated that preliminary results show that the valve position does not affect normal system performance and that the COL may be changed to show the valve shut. The inspector conducted an independent review of the system and agrees that having HV-12-005 closed would not impair normal system operation. The inspector had no further questions on this matter at this time.

The inspector examined the fire wall separating the two halves of the pump house. Instrument panel root valves were checked open. These valves are not part of the system COL but are part of a separate instrument valve - root valve COL. This list is completed periodically by Instrument and Control technicians. The inspector reviewed the list for completeness on a sampling basis. No deficiencies were identified.

The RHR Service Water system enters the Reactor Enclosure at the service water pipe tunnel. The relief valve blocking valves for the "A" and "B" headers were found locked open in accordance with the P&ID although the COL showed that the valves should be closed. The valves were locked open recently, were entered into the locked valve list, and no COL had been done on the system since the valves were locked open. A proposed COL revision, which is in the process of being approved, shows the valves as locked open. The pressure relief valve on the "A" header (001A) was found passing a solid stream of water during system operation. The valve continued to pass water after the system was secured with only static head present in the line. An equipment trouble tag was placed on the valve.

No violations were identified.

7.2 Core Spray System

Controlled copies of the system P&ID and the latest revision of the system COL were used during the physical walkdown of the Core Spray System. The COL did not incorporate any Temporary Procedure Change (TPC) that might have been made if an operator had conducted an unscheduled COL. During walkdown of the CS system, the inspector noted a discrepancy between the system and the latest COL revision, i.e., valve 1071C was incorrectly identified on the COL as 1017C. Upon further investigation, the inspector found that this same discrepancy had been identified in August 1984, but the COL had not yet been revised to correct the discrepancy. On the COL used in August 1984, the operator had crossed out and corrected the incorrect valve number. In September 1984, another operator performed a CS walkdown using the same revision as that used in August. However, this operator missed the discrepancy and initialed the non-existing 1017C valve as being closed. It appeared that the operator used a COL that was the same revision as that used in August, but that was not annotated to reflect the previously identified discrepancy. In this example, the licensee's system for assuring that operators have available to them up-to-date COL's for system walkdowns was not adequate. The licensee is currently revising the COL's for safety systems to incorporate the latest TPC's and expects this program to resolve this concern.

The system configuration and control room indication was compared with the P&ID, which was free of the editorial errors found in the COL. No system deficiencies were identified. Two valves were found locked closed, but neither system document showed these valves other than closed. The licensee's locked valve list was in the process of revision and the latest draft indicated both of the identified valves were locked closed.

No violations were identified.

7.3 RHR LPCI Mode

Controlled copies of the system P&ID's and the latest revision of the system COL were used during the physical walkdown of the RHR system lineup for the LPCI Mode of operation. The two documents disagreed on the proper position for one valve (1040E) with the COL calling for it to be closed and the P&ID showing it as open. The valve was open which was confirmed to be the correct position. The COL had an outstanding TPC correcting the position but this was not contained on the COL similar to the discrepancy discussed in section 7.2 of this report.

Fourteen valves were observed to be locked closed although the COL and P&ID's showed them closed only. The licensee's locked valve list was being revised and the latest draft contained all the valves in question as locked closed. The in-situ system valve lineup was compared with the P&ID and the control room indications with no deficiencies noted.

No violations were identified.

7.4 Automatic Depressurization System

Controlled copies of the system P&ID and the latest revision of the COL were used during the physical ADS walkdown. The system COL had not been performed prior to startup. While portions of the system in containment were checked as part of a separate procedure and numerous system surveillance tests had verified system operability and lineup, failure to perform a complete system lineup prior to initial startup is a weakness (352/84-03-14). The COL contained editorial errors and minor label problems. In addition, switch 10Y201-06 was incorrectly listed in the COL as 10Y201-08 and neither switch was labelled on panel 10Y201. The accessible portions of the system were compared with the P&ID and control room indication. No system deficiencies were identified. The licensee plans to revise the system COL as part of the program described in section 7.2 of this report.

No violations were identified.

8.0 Inspector Access

Upon arrival at the site on January 28, 1985, unescorted access authorization for team members was delayed for more than three hours. This time is in excess of the one hour access requested by NRC Region I. The delay appears to have been caused by generic radiation protection training and whole body counts, and administrative delays due to inadequate coordination among the groups involved in the processing including training, security and radiological protection. At each step there were delays associated with finding personnel to process, obtain and fill out additional forms, and prepare access devices such as dosimeters, TLDs and badges. The unnecessary delay in providing unescorted inspector access is a weakness (352/85-03-15).

9.0 Conclusion

Based on the review detailed above it appears that the licensee has established and implemented the administrative controls necessary to support full power operations. The professionalism, knowledge level and dedication of the licensee staff to safe conservative plant operation is a noteworthy strength.

10.0 Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance or deviations. Unresolved items identified during this inspection are discussed in paragraphs 5.4 and 6.3.

11.0 Management Interviews

The team met with licensee management and other personnel indicated in the attachment to discuss the scope of the inspection on January 28, 1985. During the inspection the team leader met with licensee management daily to discuss findings as they were identified. On February 1, 1985 the team met with licensee management and other personnel indicated in the enclosed attachment to summarize the findings as they are discussed in this report. No written material was provided to the licensee by team members during the inspection.

ATTACHMENT

Persons Contacted

Philadelphia Electric Company

J. Armstrong, Assistant Operations Engineer
J. Burke, Quality Assurance Auditor, Electric Production
W. Casey, Superintendent, Station Section, Maintenance Division
D. Clohecy, Quality Assurance Engineer, Engineering & Research
J. Corcoran, QA Supervising Engineer, Maintenance Division
J. Cotton, Maintenance Engineer
J. Doering, Operations Engineer
P. Driehaus, Engineer, Independent Safety Engineering Group
P. Duca, Technical Engineer
C. Endriss, Regulatory Engineer
K. Folta, Site Operations QC Supervisor
J. Franz, Assistant Station Superintendent
E. Gibson, Quality Assurance Engineer (Bechtel)
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G. Kelly, Lead Site Quality Assurance Engineer (Bechtel)
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