

U. S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 84-60  
84-13  
Docket No. 50-352  
50-353  
License No. CPPR-106/NPF-27 Priority - Category B & C  
CPPR-107 A

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

Facility Name: Limerick Generating Station, Unit 1

Inspection at: Limerick, Pa.

Inspection Conducted: October 1 - 31, 1984

Inspectors: J. Wiggins for 11/5/84  
S. K. Chaudhary, Senior Resident Inspector Date

J. Wiggins 11/5/84  
J. T. Wiggins, Senior Resident Inspector Date

R. W. Borchardt 11/5/84  
R. W. Borchardt, Reactor Engineer Date

J. Wiggins for 11/5/84  
M. Krasopoulos, Reactor Engineer Date

J. Wiggins for 11/5/84  
H. Kerch, Lead Inspector Date

Approved by: Robert M. Gallo 11/16/84  
R. M. Gallo, Chief, Reactor Projects Date  
Section 2A

Inspection Summary: Combined Inspection Report for Inspection Conducted  
October 1 - 31, 1984 (Report Nos. 50-352/84-60, 50-353/84-13)

Areas Inspected: Routine inspections by the resident inspectors, and 13 region-  
based inspectors of: followup on outstanding inspection items; followup on  
construction deficiency reports; followup on TMI Action Items; witnessing of  
initial fuel load activities; general walkthrough inspections; preoperational test

result evaluation and test exception resolution; review of installation records for RHR piping; solenoid-controlled valves in the Control Rod Drive Hydraulic System; followup on an allegation regarding general employee training; and a meeting of the ACRS Subcommittee. This inspection involved 167 hours for Unit 1, 3 hours for Unit 2 by resident inspectors, and 124 hours for Unit 1 by region-based inspectors.

Results: No violations or significant unresolved items were identified. Particularly noteworthy during the period were the actions taken by both NRC Region I and the licensee in support of the issuance of the Operating License. The license, NPF-27, was issued on 10/26/84.

## DETAILS

### 1. Persons Contacted

#### Philadelphia Electric Company (PECo)

J. Clarey, Project Construction Manager  
J. M. Corcoran, Field QA Branch Head  
J. Doering, Operations Engineer  
P. Duca, Technical Engineer  
C. Leitch, Station Superintendent  
J. Milito, Field Engineer  
J. Spencer, Director, Startup

#### Bechtel Construction Incorporated

R. Bulchis, Project Engineer  
W. McCullough, Project Startup Engineer  
G. Memula, Resident Project Engineer

#### General Electric Company (GE)

R. Ballou, Startup Operations  
A. Jenkins, Operations Manager  
P. Pagano, Startup Operations

Also, during this inspection period, the inspectors discussed plant status and operational readiness with other supervisors and engineers in the PECo, Bechtel and GE organizations.

### 2. Followup on Outstanding Inspection Items

#### 1) Violations

(Closed) Violation 50-352/84-29-05: Level III ultrasonic examination personnel have not met the ASME Section XI code requirements for calibration.

The licensee revised procedure 80A1565 (Ultrasonic Examination General Requirements) paragraph 8.2.1 to incorporate the following:

"Evaluation of all recorded indications shall be made in accordance with the requirements of the referenced ASME Boiler and Pressure Vessel Code, Section XI, Article IWB-3000. If evaluation requires verification or additional information, the minimum required documentation shall include a calibration data sheet and data sheets for changes or new data."

This procedure was approved and issued for use on 9/20/84. Licensee contractor Level III personnel have been instructed to observe and comply with the procedure revision requirements. The inspector reviewed the procedure change and the actions taken by the licensee

to instruct site NDE Level III personnel of the requirements. An overall assessment of the impact of the use of an incorrect calibration standard is that it has caused unnecessary repairs.

(Closed) Violation 50-352/84-29-06: Nonconformance reports not issued for deficient conditions identified during preservice inspections.

The licensee has reviewed all ultrasonic test data and has issued Nonconformance reports (NCRs) numbered S866M, S867M, S868M, and S869M to document reported indications not reported on NCRs. The licensee has reported that no additional rejectable indications existed which were not reported on nonconformance reports. Review of the ultrasonic data by the inspector did not reveal any other welds that required a nonconformance report.

## 2) Unresolved and Follow Items

(Closed) Follow Item 50-352/83-19-09: Licensee to check for adequacy of flow in all ESW flow modes.

The Startup group ran a special flow balance test on the ESW system. In this test, various system alignment combinations were established and the differential pressures across ESW-supplied components were measured. Included in the combinations were alignments in which one ESW loop supplied all 4 diesel generators and alignments with discharge paths through the RHRSW system to the cooling tower and spray pond. The results of this special test were documented in Startup Field Report (SFR) 54A-28.

The inspector reviewed the test results and discussed them with a representative of the licensee's Mechanical Engineering Division. The results indicated that the flow to RHR motor oil coolers could not be demonstrated adequately if one ESW loop was supplying all 4 diesel generators. The licensee's representative indicated that the actual flow to the coolers may have been adequate, however, the d/p measurement accuracy was not sufficient to verify this flow. As a result, the representative of the Mechanical Engineering Division recommended to the site staff procedure changes and a technical specification change to prohibit connection of all 4 diesel generators to one loop and to restrict the use of the ESW system to supply the reactor enclosure circulation water (RECW) system and turbine enclosure circulating water (TECW) system.

The inspector reviewed PORC-approved revisions to the following procedures which implemented the changes recommended:

- S 11.1A Alignment of ESW System
- S 11.8A Alternate Cooling of RECW Heat Exchangers
- S 11.8B Alternate Cooling of TECW Heat Exchangers
- S 11.8C Alternate Cooling of Reactor Recirculation  
Pump Seal and Motor Oil Coolers
- S 13.1A Startup of RECW System
- S 14.1A Startup of TECW System

Further, the inspector noted the recommended change to TS 3.7.1.2(a)(3) which required, upon loss of an ESW loop, the licensee to declare all equipment aligned to that loop inoperable. The inspector was further informed that this change was provided to NRR.

The inspector had no further questions regarding the performance of ESW for Unit 1 operations. However, he noted that the problems identified in the SFR potentially adversely affect Unit 2 operation because, with both units operating, each ESW loop would be normally aligned to supply 4 diesel generators. The inspector will follow this item as Unit 2 progresses. (50-353/84-13-01)

(Closed) Follow Item 50-352/84-20-03: Review Licensee's actions on deteriorating gaskets on radwaste tank.

The inspector was concerned with the deterioration of rubber gaskets for spool pieces on line HCC-9 on the Floor Drain Demineralizer Tank. The inspector reviewed the licensee's evaluation as documented in SFR 69F-12 and determined that it adequately addressed the inspector's concerns. The Floor Drain Demineralizer liner extends to the nozzle flange and forms a gasket between the demineralizer and the mating pipe. The liner is designed for this application and the apparent deterioration resulted from a failure to trim off the excess liner material. The Floor Drain Demineralizers are the only radwaste components with a liner and therefore no generic concern exists.

(Closed) Unresolved Item 50-352/84-24-01: Standby Gas Treatment (SGTS) Design

As stated in NRC Inspection Report 84-24, the licensee proposed deferring connection of the SGTS to the refueling floor zone until the first refueling outage. NRR conducted a safety evaluation of the proposal and approved it on October 2, 1984. Supplement 2 to the Limerick SER documents the staff's finding in section 6.2.3. The licensee will be required to connect the refueling floor zone to the SGTS prior to the movement of irradiated fuel. This requirement will be a license condition of the Limerick Unit 1 Operating License.

On the basis of the NRR safety evaluation and the applicable license condition, the inspector has no further questions at this time.

(Closed) Unresolved Item 50-352/84-24-02: Electrical separation criteria does not conform to Regulatory Guide 1.75.

The inspector reviewed a draft of Section 8.4.1 of Supplement 3 to the Safety Analysis Report (SSER-3) in which NRR documented its review and acceptance of the licensee's Wyle Test Report 46960-3 titled "Electrical Raceway Separation Verification Testing for Limerick Generating Station Units 1 and 2" and the resulting cable separation criteria. Further, SSER-3 documents NRR's review and acceptance of Wyle Test Report 46960-4 "Electrical Separation Verification Testing on Terminal Blocks and Panel Meters" and the resulting separation criteria for channel separation inside panels.

(Closed) Unresolved Item 50-352/84-27-03: ESW pump shaft heat treatment documentation appears incorrect.

The inspector noted that the licensee verified that the ESW pump shafts were made of materials which were tempered to 1225°F and air cooled for 8 hours. The applicable CMTRs verified this condition. Further, the licensee revised Design Specification 8031-M-12 on 7/16/84 for the ESW and RHRSW pumps to show the shaft materials as ASTM 276 TP 410T, ASTM A-296 Gr CA-15T, or ASTM A-582 TP 416T.

(Closed) Unresolved Item 50-352/84-29-01: No procedure for the review of dendritic structures for the preservice inspection program.

The licensee issued procedure 83A0769 Rev. 0 "V.T. Technique for Identifying Dendritic Structures in Welds" on 8/17/84. The inspector reviewed this procedure and found it acceptable.

(Closed) Unresolved Item 50-352/84-29-04: Review of preservice inspection data for geometric reflectors.

The licensee performed a 100% review of the preservice ultrasonic data and identified 142 welds that had geometric reflectors with ultrasonic amplitude responses of 50% or greater. The reflectors were not plotted as required. The licensee selected a sample size of 20 welds based on Mil-Std 105D Level II. The welds were re-examined and geometric reflectors plotted. The inspector reviewed the re-examination data and found that the data confirms that the reported indications were I.D. geometry.

(Closed) Unresolved Item 50-352/84-29-07: Resolution of ANI's concerns regarding the preservice inspection program.

The inspector reviewed the documentation provided by the ANI and the licensee dealing with improper weld surface preparation preventing ASME 10% transducer overlap. A demonstration was presented by the licensee to the ANI and the ANI has accepted the demonstration as verification that the required volume on the piping welds can be examined. This meets the ASME Section V paragraph T-140 code requirement.

(Closed) Unresolved Item 50-352/84-47-03: Deficiencies in general fire protection features i.e., inadequate housekeeping, unfinished installation of fire protection systems, etc.

The fire protection, safe shutdown inspection, identified deficiencies in the plant's fire protection features such as inadequate housekeeping conditions, non-functional sprinkler and water curtain systems due to unfinished installations and missing parts, from the inventory of hose stations.

The inspector reviewed the actions taken by the licensee to correct the deficiencies described above.

The inspector toured vital and non-vital areas and observed the plant housekeeping and the condition of recently installed sprinkler and water curtain systems. The inspector also randomly checked the equipment inventory furnished with the fire hose stations.

No unacceptable conditions were identified. This item is resolved.

(Closed) Unresolved Item 50-352/84-47-05: Additional fire fighting strategies required.

The inspector reviewed the fifty-three (53) fire fighting strategy procedures developed by the licensee in accordance with the requirements of 10 CFR 50 Appendix R, Section III, K.12. In addition the inspector "walked down" the following randomly selected procedures to verify their adequacy:

- Procedure F-R-304 #1 Safeguard System Access Area (Elevation 217') Fire Area 44, Revision 0
- Procedure F-R-309 #1 Safeguard System Isolation Valve Area (Elevation 217') Fire Area 43, Room 309, Revision 0
- Procedure F-A-323 #1 Class 1E Battery Room (Elevation 217') Fire Area 3, Revision 0
- Procedure F-R-109 #1 HPCI Pump Room (Elevation 177') Fire Area 34, Revision 0
- Procedure F-R-110 #1 Core Spray Pump Room A (Elevation 177') Fire Area 35, Revision 0

No unacceptable conditions were identified. This item is resolved.

(Closed) Unresolved Item 50-352/84-47-06: Surveillance Test Procedures not available for review.

The inspector reviewed the following surveillance test procedures the licensee committed to fully develop and implement prior to fuel load:

- \*Procedure ST-5-022-800-0, FSWS Diesel Driven Pump Fuel Analysis, Revision 0
- \*Procedure ST-6-022-320-0, FSWS Operability Verification, Revision 0
- Procedure ST-7-022-250-0, FSWS Flow Test, Revision 0

- \*Procedure ST-7-022-325-0, Yard Fire Hydrant and Fire Hose Operability Verification, Revision 0
- \*Procedure ST-7-022-374-0, Electrically Supervised Fire Door Weekly Position Check, Revision 0
- Procedure ST-7-022-550-0, Triennial Fire Drill, Revision 0
- Procedure ST-7-022-600-0, Fire Door Channel Functional Test, Revision 0
- Procedure ST-7-22-730-0, FSWS Air/Water Nozzle Flow Test, Revision 0
- Procedure ST-022-920-0, Fire Rated Assembly Inspection, Revision 0
- \*Procedure ST-7-022-921-0, Fire Damper Inspection, Revision 0
- Procedure ST-7-022-922-0, Sealed Fire Penetration Inspection, Revision 0

The licensee explained that procedures ST-7-022-323, Halon System Operability Verification, ST-6-022-353-0, Halon System Inventory and ST-6-022-453-0, Halon System Line-up Verification, are not ready for review because the preoperational tests of the Halon Fire Protection Systems have been deferred (ref. letter T. M. Novak, Assistant Director, Division of Licensing to E.G. Bauer, Jr., Vice President and General Counsel P.E. Co. dated October 2, 1984. Subject: Limerick Generating Station, Unit 1, Draft License.)

The licensee committed to complete the procedures and preoperational testing of the Halon Systems prior to Operational Mode 2 (initial criticality) per the above referenced letter.

In addition to reviewing the above documents, the inspector reviewed the maintenance/inspection/test records of the asterisked (\*) items to verify compliance with the Proposed Technical Specifications and established Procedures.

No unacceptable conditions were identified. This item is resolved.

(Closed) Unresolved Item (50-352/84-47-07): Inadequate Fire Brigade Training Program.

The inspector reviewed the following licensee procedures associated with the Fire Brigade Training Program and determined that the licensee complies with the applicable Regulatory requirements:



- Procedure RT-7-022-980-0, Fire Brigade Training Review, Revision 0
- Procedure RT-7-022-981-0, Quarterly Fire Brigade Meeting Review, Revision 0

The licensee explained that the above procedures were established in order to effectively monitor the training received by the Fire Brigade members.

No unacceptable conditions were identified. This item is resolved.

(Closed) Unresolved Item 50-352/84-49-05: Clarification of A-7 to define the "at the controls" area in the control room.

The inspector reviewed a PORC-approved revision (Rev. 1) to A-7 which clearly and accurately reflected the definition of "at the controls" contained in FSAR Section 13.5.

### 3) Construction Deficiency Reports

(Closed) CDR 84-00-19: ASCO 4-way solenoid valves.

The licensee reported on 9/4 and 9/5/84 a problem associated with the apparent misapplication of ASCO 4-way pilot solenoid valves (Model NP344A71E) as air control valves to the operators of 9 ESW system valves. Because the air supply to these pilot solenoid valves did not assure the complete travel of the solenoid valve pistons, the ESW valves would not stroke properly. The licensee indicated the corrective actions to be taken involved replacement of the 4-way pilot valves with 3-way valves and replacement of the manual shutoff valves in the air system to the solenoids.

The inspector reviewed Design Change Package 0510 and Startup Work Orders 54A207 and 208 which implemented the proposed corrective actions on the following 19 valves: HV-11-051A/B, 52A/B, 54A/B, 55A/B, 041, 044, 071, 074, 121, 123, 124, 125, 126, 127 and 128. Further, the inspector reviewed Startup Work Authorization 54A-62 which documented the acceptable retesting of the above valves.

### 4) TMI Action Items

(Closed) TMI Item I.C.7: NSSS vendor review of power ascension and emergency operating procedures.

The inspector verified that the GE Startup organization onsite was acceptably involved in the development, review and implementation of the power ascension test program and its procedures.

In section 13.5.2.3 of the Safety Evaluation Report (SER), NRR determined that, since the licensee had implemented emergency procedures based on the BWROG guidelines, no further NSSS-vendor review of procedures was required.

(Closed) TMI Item II.B.1: Reactor Coolant System Vents

As discussed in section 15.9.1 of the SER, the requirement for venting the reactor coolant system at Limerick would be met by the safety relief valves if the licensee provided positive relief valve indication. In section 7.5.2.2 of the SER, NRR accepted the acoustical valve position indication system.

The inspector verified the installation of the acoustical system as indicated by P & ID M-41 and verified its operability to have been demonstrated in the Automatic Depressurization System preoperational test 1P83.2.

(Closed) TMI Item II.E.4.2: Containment Isolation Dependability

NUREG 0737 required the licensee to be in compliance with the following seven positions prior to receiving an operating license.

- (1) Containment isolation system designs shall comply with the recommendations of Standard Review Plan Section 6.2.4 (i.e., that there be diversity in the parameters sensed for the initiation of containment isolation).
- (2) All plant personnel shall give careful consideration to the definition of essential and nonessential systems, identify each system determined to be essential, identify each system determined to be nonessential, describe the basis for selection of each essential system, modify their containment isolation designs accordingly, and report the results of the reevaluation to the NRC.
- (3) All nonessential systems shall be automatically isolated by the containment isolation signal.
- (4) The design of control systems for automatic containment isolation valves shall be such that resetting the isolation signal will not result in the automatic reopening of containment isolation valves. Reopening of containment isolation valves shall require deliberate operator action.
- (5) The containment setpoint pressure that initiates containment isolation for nonessential penetrations must be reduced to the minimum compatible with normal operating conditions.
- (6) Containment purge valves that do not satisfy the operability criteria set forth in Branch Technical Position CSB 6-4

or the Staff Interim Position of October 23, 1979 must be sealed closed as defined in SRP 6.2.4, item II.3.f during operational conditions 1, 2, 3, and 4. Furthermore, these valves must be verified to be closed at least every 31 days.

- (7) Containment purge and vent isolation valves must close on a high radiation signal.

In section 6.2.4.3 of the SER, the NRC staff concluded that the licensee has complied with the requirements of this item. The inspector verified through review of preoperational test results that the Containment Isolation and Nuclear Steam Supply Shutoff System functions as necessary to meet the requirements of this item.

The staff's acceptance of this item in the SER was partially based on the applicant's commitment provided in a letter dated August 4, 1983. In the August 4, 1983 letter the licensee stated that 1) when the purge system is in operation during operating modes 1, 2 and 3, only 1 of the 2 trains of Standby Gas Treatment System (SGTS) will be in use and, 2) when the purge system is in use, both SGTS trains will be operable. The inspector verified that these commitments have been incorporated into the current draft of station procedure S57.1.A "Inerting Primary Containment".

(Closed) TMI Item II.F.2: Instrumentation for Detection of Inadequate Core Cooling.

In section 4.4.7 of Supplement 2 to the SER (SSER-2), NRC documented its acceptance of the Limerick reactor water level monitoring system as the instrumentation required to address this item. Because no modification of the installed plant instrumentation was necessary, and because this instrumentation has been routinely inspected during construction, the inspector considered this item closed.

(Closed) TMI Item II.K.3.16 Reduction of Challenges and Failures of Relief Valves -- Feasibility Study and System Modification.

This item proposed a number of methods for reducing the challenge and failure rates of relief valves. The licensee was directed to perform a feasibility study and implement those methods which reduce relief valve challenges without compromising performance. The licensee endorsed the BWROG response described in NEDO-2491, "BWR Owners Group NUREG 0737 Implementation: Analysis and Positions Submitted to the US NRC".

In section 15.9.4 of the SER, the NRC staff determined that the licensee's plans to implement the following recommendations from NEDO-2941 were acceptable and effective in reducing SRV challenges and failures.

- (1) low water level isolation setpoint
- (2) low-low set relief logic system or equivalent manual actions
- (3) reduced MSIV testing frequency

The inspector verified that the reactor pressure vessel low water level setpoint for MSIV closure has been lowered from level 2 to level 1. This setpoint was satisfactorily tested during the performance of preoperational test 1P-59.1 "Containment Isolation and Nuclear Steam Supply Shutoff System (NSSSS)". The low-low set relief logic system or equivalent manual action recommendation is intended to ensure that a single relief valve will follow the initial pressurization and the remaining safety relief valves will not actuate. The licensee will accomplish this recommendation through manual actuation of relief valves as directed in station trip procedure T-101 "RPV Control". This MSIV testing frequency is specified in section 4.4.7 of the final draft of technical specifications issued on September 21, 1984. A reduction in the number of MSIV isolations will result in a corresponding reduction in the number of relief valve challenges.

(Closed) TMI Item II.K.3.18: Modification of ADS Logic.

In section 15.9.4 of the SER, NRC accepted the licensee's plans to modify the ADS logic such that the high drywell pressure requirement for ADS actuation would be bypassed after a sustained low reactor vessel water level condition and that an ADS inhibit switch would be added.

The inspector determined that the above modification had been implemented at Limerick. The high drywell pressure requirement is now bypassed after 6.5-7.5 minutes and inhibit switches are now connected and placed on the main control room ADS panel. Further, the inspector verified that the modified logic was successfully tested during preoperational test 1P83.2A.

(Closed) TMI Item II.K.3.21: Restart of Core Spray and Low Pressure Coolant Injection System.

As discussed in section 1.13 of the FSAR, the licensee adopted the recommendation of the BWROG on this item which was to retain the standard system logic design. In section 7.3.2.2 of the SER, NRC documented its acceptance of the licensee's position.

(Closed) TMI Item II.K.3.25: Effect of Loss of AC Power on Pump Seals.

As discussed in SER section 15.9.4, NRC found that the licensee had acceptably addressed the concern regarding loss of seal cooling to the recirculation pumps using the reactor enclosure cooling water (RECW) system, the emergency service water (ESW) system or the control rod drive (CRD) hydraulic system. Each of the pumps in these systems was to have been powered by the emergency onsite power sources.

The inspector verified that the power supplies to the below listed pumps were as shown:

<u>PUMP</u>	<u>POWER SUPPLY</u>	<u>REFERENCE(DWG.)</u>
A RECW pump	440V MCC D134-R-H	E 57 Sh 1
B RECW pump	440V MCC D144-R-H	E 57 Sh 1
A ESW pump	4160V safeguards bus D11	E-15
B ESW pump	4160V safeguards bus D12	E-15
C ESW pump	4160V safeguards bus D13	E-15
D ESW pump	4160V safeguards bus D14	E-15
A CRD pump	4160V safeguards bus D13	E-15
B CRD pump	4160V safeguards bus D14	E-15

As indicated in the FSAR and SER, each of the above power supplies would be available during accident conditions.

### 3. Plant Tour

#### 3.1 Unit 1

Periodically during the inspection period, the inspectors toured the Unit 1 containment, the reactor enclosure, the control enclosure, the turbine enclosure, the diesel generator enclosures, the radwaste enclosure, and the off gas enclosure. The inspectors examined preventive and corrective maintenance, surveillance testing, tagging of equipment, housekeeping, radiological control practices, security and general plant operations. Following issuance of the Operating License, the inspectors routinely toured the control room to verify proper control room manning, procedural compliance, safety system availability, and nuclear instrumentation operability. Operating logs, the jumper-bypass log, operating orders and plant trouble reports were reviewed to verify that all technical specification requirements were met. Interviews and discussions were routinely conducted with licensee operators and staff. In addition, a valve lineup verification check was performed on the Standby Liquid Control System.

##### 3.1.1 Control Room Emergency Fresh Air System

During a control room tour on 10/30/84, the inspector, at about 11:00 a.m., noted that an alarm existed which indicated trouble with the A control room emergency fresh air system (CREFAS). This system consists of two independent trains each of which includes a heating unit, a charcoal filter and a fan. Technical Specification 3.7.2 requires both trains operable in Mode 5. The inspector

discussed the alarming condition with the shift supervisor who subsequently informed the inspector (on 10/31) that the alarm had apparently resulted from a low fan discharge flow condition which occurred when the fan was last operated. This condition would prevent the automatic startup of the A train and thus render the A train inoperable. The operator cleared the alarming condition during the afternoon of 10/30 and, subsequently, surveillance test ST-1-078-301-0 was successfully performed at 8:15 p.m. to verify operability of the train.

The inspector, on 10/31/84, discussed the matter with the Operations Engineer to determine when the alarming condition could have occurred. TS 3.7.2 allows a 7 day outage period for a single train, but the TS would not have permitted entry into Mode 5 if the alarming condition existed on 10/26/84 when fuel loading began. The Operations Engineer investigated the matter and informed the inspector that the condition probably developed on 10/29/84. During the day shift on 10/29, shift supervision had authorized an I&C technician to perform work on radiation detectors for the CREFAS. A trip of the C channel would have resulted in the automatic startup of the A fan without a suction path being available, thus resulting in a low flow trip of the fan.

The inspector reviewed preoperational test 1P32.2 and drawings E-495 and E-496 to confirm the basis for the sequence of events described by the Operations Engineer. Further, the inspector discussed with the Operations Engineer the need for shift operators to be more knowledgeable about the causes of the various alarming conditions in the control room.

The inspector identified no violations. However, the inspectors will continue to monitor operator's knowledge of alarms during subsequent operational safety verification inspections.

### 3.1.2 Comparison of Procedures to Control Room Panel Controls

The inspectors compared the nomenclature for pump, valve and switch controls used in selected emergency and normal operating procedures to that which appeared for these controls on control room panels. Several discrepancies were noted, particularly in the following procedures:

- Operation Transient Procedure (OT) 101-Bases
- Special Event Procedure (SE)-1
- Transient Response Procedure - 221
- Drywell HVAC System Checkoff List S77.1.A

The inspector determined that the discrepancies which were noted were caused by either typographical errors in the procedures or by a change in labeling of the main control panels as a result of the Human Factors modifications which had been implemented. Prior to these modifications, the control switches were labeled on the panels using the Bechtel nomenclature for the switch itself

(e.g., switch HS-05-102A). After the modifications, the switches were labeled to identify the component controlled by the switch (e.g., valve HV-05-102A). Subsequent to the modifications, however, the affected station procedures were not revised to reflect the new nomenclature.

The inspectors discussed this matter with the Station Superintendent. The Station Superintendent indicated awareness of the problem and described preliminary plans for corrective action. These plans involved detailed procedure-to-panel comparisons to be performed by Bechtel for the licensee. However, as of the time of the discussion, the Station Superintendent could not provide the inspectors with a prioritized schedule for these corrective actions, but committed to do so. The inspectors will review the scope of the plans and the prioritized schedule during a subsequent inspection. (50-352/84-60-01)

### 3.2 Unit 2

During the inspection period, the inspector toured Unit 2 to assure adequate control over housekeeping and in-storage maintenance of equipment during the suspension of activities. On 10/23/84, the inspector identified five minor problems including:

- o three pipe spools with missing end caps
  - Elev. 313 Area 17 3 ft. east of 26 line
  - Elev. 313 Area 14 10 ft. west of 29 line
  - Elev. 201 Area 18 8 ft. south of column F
- o an uncapped short length of piping at Elev. 278, azimuth 205 of the drywell
- o an intermittently operating heater for the 2B reactor water cleanup pump motor at Elev. 283 Area 14

The inspector informed a representative of the licensee's Quality Assurance organization who assured corrective actions were begun. The inspector had no further questions and identified no violations.

## 4. Preoperational Test Evaluation and Test Exception Resolution

- 1) The inspector reviewed the following preoperational test reports to evaluate test results acceptability. Further, he verified the adequacy of the licensee's evaluation of test results, the adequacy of test exception and test change notice resolution and the licensee's compliance with established review and evaluation procedures. The inspector also performed selected independent calculations to assure acceptance criteria were met.

1P 58.2 Redundant Reactivity Control System

1P 85.2 Freeze Protection and Heat Trace System

- 2) The inspector reviewed the licensee's resolution of test exceptions that were generated during the performance of the preoperational test program. Documentation reviewed included Startup Work Authorizations (SWA), Startup Change Requests (SCR), Startup Field Reports (SFR), Engineering Disposition of Deviations and reperformance of selected sections of the applicable preoperational test. The results of these reviews will be included as part of inspection report 50-352/84-64.

No violations were identified.

#### 5. Initial Fuel Load Activities

The inspector periodically observed the licensee's activities associated with the preparations for initial fuel load of the core. These activities were inspected for compliance with LGS administrative and fuel handling procedures, radiological control practices, NRC regulations and license requirements. The inspector paid particular attention to those activities associated with the following fuel handling procedures:

SP-FH-008	Startup Source Loading
SP-FH-010	Source Cask Movement From Cask Washdown Pit to Refuel Floor
SP-FH-011	Source Cask Assembly
SP-FH-012	Source Cask Fire Shield Removal
SP-FH-013	Source Cask Cavity Chemistry Sampling

On October 26, 1984, the NRC issued Operating License No. NPF-27 to Philadelphia Electric Company for Limerick 1. Pending Commission approval the license restricted the licensee to power levels not to exceed five percent of rated power. The inspector observed the license review meeting held on October 26 prior to the commencement of fuel loading. The resident inspector and region-based inspectors continuously observed fuel loading activities during the period of October 26 - October 29, 1984. The results of this observation will be documented in inspection report 50-352/84-64.

No violations were identified.

#### 6. Reactor Protection System Actuation

On October 31, 1984 a full scram occurred as a result of a high flux signal on Intermediate Range Monitor (IRM) 'B'. The Reactor Protection System was in the non-coincident mode with the shorting links removed during the initial fuel load of the core. The high flux signal was caused by an I&C technician performing maintenance per maintenance request form (MRF) 8403201 without informing the on-shift control room operators of his actions. Because the control room operators were not aware that this maintenance was in progress, IRM 'B' was not placed in bypass prior to disconnecting the power supply cable to the detector. The MRF did not have instructions for blocking or for the



placement of information tags which may have helped prevent this occurrence. All rods were already fully inserted and no fuel was being moved at the time of the scram. Fuel load operations were temporarily suspended until the Station Superintendent gave his permission to recommence. An information tag was subsequently placed on the IRM bypass switch and the importance of adequate communications was reemphasized to the applicable personnel. No violations were identified.

7. Review of Installation Records for RHR Piping

On 10/25/84, the inspector, in company with representatives of the licensee's Engineering and Research QA organization, performed a walkdown inspection of the full flow test lines for the B and D RHR pumps. The focus of the review was those sections of piping near the intersection of the G and 21.5 lines on elevation 217 of the Unit 1 Reactor Enclosure. The piping spools selected for review were:

18" GBB-107-2-1,2,3  
 18" GBB-108-2-1  
 18" GBB-118-3-1,2,3  
 18" GBB-119-5-3,4,5,6,7,8,8A,8B

On 10/26/84, the inspector reviewed the quality control records for the installation inspections of the above spools, the hydrostatic test records for the spools, and the material requirements for these lines. Based upon this review, the inspector determined that the spools were 18" Schedule 40S, ASME SA-106 Grade B Carbon Steel, with a 0.375 inch average (.328 inch minimum) wall. The design pressure for these spools was 420 psig. The installation and hydrostatic test records were identified as follows:

<u>Spool/line</u>	<u>Installation</u>	<u>Hydrostatic Test</u>
18" GBB-107-2-1,2,3	QCIR M51-GBB-107-2-2-1 Inspected 1977-78 Closed 6/27/81	QCIR M51-1M-49A-35-3-1 Performed 4/83 Pressure = 679 psig
18" GBB-108-2-1	QCIR M51-GBB-108-2-2-1 Inspected 1977-81 Closed 11/12/82	Same as above
18" GBB-118-3-1,2,3	QCIR M51-GBB-118-3-2-1 Inspected 1977-79 Closed 7/27/83	Same as above
18" GBB-119-5-3,4,5,6,7,8,8A,8B	QCIR M51-GBB-119-5-2-1 Inspected 1977-79 Closed 11/8/83	QCIR M51-1M-49A-39-3-1 Performed 4/83 Pressure 640 psig

The above records indicated that the spools were properly installed, were undamaged during installation or rework and were hydrostatically tested in accordance with the ASME Code with satisfactory results.

No violations were identified.

8. Solenoid-Controlled Valves in the Control Rod Drive (CRD) Hydraulic System

On October 6, 1984, an event occurred at Susquehanna, Unit 1, in which 4 control rods failed to scram upon demand during testing. The cause of the failure was attributed to a problem in the control rod scram pilot solenoid valves in which the use of polyurethane for an internal component resulted in the valves sticking. These valves were ASCO three-way, diaphragm-type, piloted valves; one each per CRD hydraulic control unit (HCU), operated by two solenoids.

In response to a request from Region I, the inspectors reviewed the design of the CRD system at Limerick with representatives of General Electric and the Station staff and checked the installation of the various system solenoid valves in the field. The results of the review indicated that the Limerick design did not include either single or dual solenoid valves using polyurethane materials. The table below summarizes the components found in use at Limerick and the materials used.

<u>Valve</u>	<u>Normally Energized (NE) Normally Deenergized (ND)</u>	<u>Manufacturer</u>	<u>Double Solenoid</u>	<u>Soft Part Material</u>
Scram Pilot Valves	NE	ASCO	No	BUNA-N
Scram Backup Valves	ND	ASCO	No	BUNA-N
SDV <sup>(1)</sup> Vent & Drain Valves	NE	VALCOR	Yes	BUNA-N
RRCS <sup>(2)</sup> Backup Valves	ND	VALCOR	No	BUNA-N
RRCS Alternate Rod Insertion Valves	ND	VALCOR	No	BUNA-N

<u>Valve</u>	<u>Normally Energized(NE) Normally Deenergized(ND)</u>	<u>Manufacturer</u>	<u>Double Solenoid</u>	<u>Soft Part Material</u>
RRCS SDV Vent & Drain Valves	ND	VALCOR	No	BUNA-N

- (1) SDV = Scram Discharge Volume  
 (2) RRCS = Redundant Reactivity Control System

During their review, the inspectors also noted that the licensee's independent review groups were aware of the problem and had initiated appropriate reviews. These groups, namely the Independent Safety Engineering Group (ISEG) and the Nuclear Review Board, were acting as a result of information obtained from the INPO Nuclear Network.

The inspectors had no further questions. No violations were identified.

#### 9. Security

On October 30, 1984 at approximately 11:00 a.m., the inspector witnessed two licensee Quality Control (QC) personnel pass through a key card-controlled security door in the administration building without using their key cards and without receiving the proper clearance from the key card reader. The two QC personnel had originally entered the Administration building during a 10 minute computer outage and were granted entrance through alternate means allowed by the security plan. Upon computer restoration, normal procedure would have security personnel update the computer for all those people who had entered the security area during the computer outage. However, this had not been completed for the two QC personnel at the time they attempted to gain access to the Protected Areas through the security door in question. Consequently, when they attempted to badge through with their key card, they received an error light and they were not granted access. The inspector was passing through the door in the opposite direction when the two QC personnel took advantage of the open door to bypass the security accountability system. The inspector questioned the two QC personnel to verify that they had indeed bypassed the security control system. The inspector further determined that they were authorized access into the protected area through that particular door per the Plan and that security controls were effective in preventing them from entering any vital area after they had improperly entered the protected area.

The inspector brought this situation to the licensee's attention, who then initiated corrective actions. Corrective actions included discussions with the two individuals by the Station Superintendent and the issuance of a Station Superintendent memorandum to all site personnel emphasizing site access control procedures. The inspector later reviewed those corrective actions and determined that they adequately addressed the issue. The inspector has no further questions at this time, but will continue to monitor licensee activities in this regard.

10. Followup on Allegations Regarding General Employee Training

On September 14, 1984, NRC Region I received an anonymous allegation which indicated that there were individuals who were cheating on General Employee Training (GET) examinations. GET has been given to all personnel that require access to the radiologically controlled areas of the plant. The allegor indicated that the answers to a GET test were being sold to individuals before they took the test.

The resident inspectors, upon direction from regional management, informed the Station Superintendent of the allegation on 9/14/84 and requested that he review the matter. On September 18, the Station Superintendent provided a plan of action to determine the scope of the potential problem and to increase the security of the GET examination process.

On 10/12/84, the Station Superintendent informed the resident inspector that, during the previous evening, a GET instructor noticed another instance of apparent cheating. This time a piece of paper was obtained from one individual on which there were the answers to 25 multiple choice questions. This second matter was referred to the licensee's corporate security organization.

On 10/18/84 and on 10/19/84 the inspectors reviewed two reports on the GET problems, which contained the results of the PECO investigation and the licensee's evaluation of the scope of the problem. On 10/19, the inspectors met with representatives of PECO corporate Security, the Nuclear Training Coordinator and the Station Superintendent to discuss the reports and to discuss corrective actions identified by the licensee.

Included in the discussion were the actions the licensee took to identify the most probable examination that was compromised (multiple examinations are used to discourage cheating); to identify and interview those individuals who may have been involved in the problem and to assure that all personnel requiring unrestricted plant access were properly trained.

The corrective actions included a commitment to reexamine and retrain, as necessary, a group of individuals who were selected because they most closely fit the profile of those who were the subject of the allegation. The licensee committed to complete the reexamination process prior to initial criticality.

The inspectors had no further questions and no violations were identified.

11. ACRS Subcommittee Meeting

The ACRS Subcommittee for Limerick met on 10/9-10/84 to discuss emergency preparedness, security, the Probabilistic Risk Assessment (PRA) and the Severe Accident Risk Assessment (SARA). The resident inspector, a reactor engineer, the Limerick Project Section Chief and Branch Chief, the Emergency Preparedness Section Chief and the Technical Assistant (TA) to the Director, Division of Project and Resident Programs (DPRP) attended and participated in the 10/9/84 meeting at which the first two areas were discussed. The TA-DPRP attended the 10/10 meeting at which the PRA and SARA were discussed.

12. Inspection Preparatory to Operating License Issuance

The inspectors, routinely during this period, provided information to Region I regarding the status of construction completion, preoperational test completions, the inspection program completion and the status of open inspection items. This information was used to form the basis for Region I's recommendation for license issuance.

No violations were identified.

13. Exit Meeting

The inspectors discussed the issues and findings in this report throughout the inspection period and at an exit meeting held with Messrs. J. Corcoran and G. Leitch on November 2, 1984. The licensee was requested to identify the issues and findings, as discussed at the exit meeting, which contained proprietary information. No items containing proprietary information were so identified.