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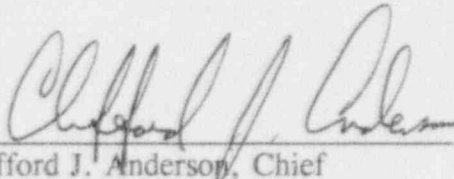
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Facility Name: Limerick Generating Station, Units 1 and 2

Inspection Period: July 7, through August 16, 1993

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8/19/93
Date

EXECUTIVE SUMMARY
Limerick Generating Station
Report No. 93-16

Plant Operations

The formation of an independent verification task force was assessed as a positive initiative to address recent problems (Section 1.2). Several instances of failure to properly store plant equipment in safety related structures resulted in a non-cited violation (Section 1.3).

Maintenance

Control room deficiencies were found to be properly pursued and tracked (Section 2.2). The tripping of an RPS and UPS panel feeder breaker during performance of a surveillance test remains unresolved pending review of the licensee's event investigation (Section 2.3).

Surveillance

Routine surveillances observed were properly conducted and supervised (Section 3.1).

Engineering and Technical Support

PECo aggressively pursued the implementation of the reactor vessel level modification in response to NRC Bulletin 93-03. The modification is ready for connection following entry into the cold shutdown mode (Section 4.1).

Miscellaneous

A previous violation concerning a failure to promptly correct problems associated with RCIC valves was closed based on adequate corrective actions (Section 7.0). An unresolved item concerning the failure of a drywell chiller to trip was closed based on adequate corrective actions (Section 7.0).

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DETAILS

1.0 PLANT OPERATIONS (71707)¹

The inspectors observed that plant equipment was operated and maintained safely and in conformance with license and regulatory requirements. Control room staffing met all requirements. Operators were found to be alert, attentive and responded properly to annunciators and plant conditions. Operators adhered to approved procedures and understood the reasons for lighted annunciators. The inspectors reviewed control room log books for trends and activities, observed control room instrumentation for abnormalities, and verified compliance with technical specifications. Accessible areas of the plant were toured; plant conditions, activities in progress, and housekeeping conditions were observed. Additionally, selected valves and breakers were verified to be aligned correctly. Deep backshift inspection was conducted on July 18, 1993 and August 15, 1993.

1.1 Operational Overview

Unit 1 and Unit 2 operated at full power throughout the inspection period, except for minor power reductions during surveillance testing.

1.2 Independent Verification Task Force

During this inspection period, plant management formed an independent verification task force, to evaluate recent problems with the performance of independent verifications, and to make recommendations to plant management. During the past several months, there have been several instances of inadequate independent verifications. Although none resulted in safety significant events, the potential existed for this to happen if the programmatic weaknesses were not identified and corrected. Two meetings were held during the period, and both were attended by the resident inspectors. The meetings were intended to be open discussions with some brainstorming to identify deficiencies and make recommendations for improvements.

The inspectors found both meetings very open and candid. At the close of the inspection period the recommended actions were being developed for plant management review. In July, a memo was distributed to the work groups to sensitize everyone on what management expectations currently are. The inspectors concluded that actions taken so far have adequately informed plant personnel of the current plant policies concerning independent verifications. Future actions taken will be reviewed by the inspectors to ensure that independent verifications meet established requirements and commitments.

¹The NRC Inspection Procedures used as guidance are listed parenthetically throughout this report.

1.3 Storage of Plant Equipment

On July 21, 1993, during a routine tour through the plant, the inspectors found an unsecured maintenance tool storage cart, on wheels, located in one of the emergency diesel generator rooms. The operations shift manager was made aware of the situation, since Administrative procedure (A)-30.4, Control of In-plant Storage, requires that rolling equipment shall be restrained when not in transit in safety related structures. At the time, no personnel were in the area and no work was ongoing in the room. In response, operations personnel conducted a comprehensive walkdown in the plant and identified other instances of improperly stored equipment. A list of the equipment was generated and corrective actions were initiated. Operations personnel notified the responsible work group for each instance, and requested that the situation be corrected. A followup plant walkdown was conducted to verify that the appropriate corrective actions were completed.

Early in July, quality assurance personnel identified a similar instance during a technical monitoring activity. In this instance, a ground truck was found not properly stored. A deviation was initiated, and immediate corrective actions were verified. Long term corrective actions for this event were not initiated prior to the identification of the July 21 occurrence.

Corrective actions for the July 21 event included: all identified inadequacies were corrected and verified, a memo from plant management to plant personnel detailed the requirements and management expectations, and an event investigation was initiated to determine root causes and to recommend additional corrective actions. Additionally, reminders concerning housekeeping and storage of equipment in the plant have recently appeared in The Possum Hollow Press, an onsite publication available to all plant personnel.

The inspectors reviewed the corrective actions taken and concluded that they were comprehensive. Safety significance is minimal since the potential for damage to safety related equipment was low. This violation, involving the failure to properly store plant equipment as required by administrative procedures, meets the criteria for enforcement discretion of Section VII of the NRC's Enforcement Policy and will not be cited.

2.0 MAINTENANCE (62703)

2.1 Maintenance Observations

The inspectors reviewed safety-related maintenance activities to verify that repairs were made in accordance with approved procedures and in compliance with NRC regulations and recognized codes and standards. The inspectors also verified that the replacement parts and quality control used on the repairs were in compliance with PECO's Quality Assurance (QA) program.

The following maintenance activities were reviewed:

- 2D core spray system outage maintenance
- scram discharge volume water level channel calibration
- emergency diesel generator D14 system outage maintenance

During performance of the maintenance activities, the inspectors observed good coordination between the maintenance, health physics, and quality verification workers. All personnel involved in the activities were found to be knowledgeable and familiar with the activities being performed. The activities observed were performed correctly.

2.2 Control Room Deficiencies

During this inspection period, the inspectors reviewed the status of identified deficiencies in the main control room. Late in 1992 the number of non-outage related control room deficiencies was over 100. Plant personnel initiated a program to reduce the number to be more manageable. In May 1993, the program received more management attention, at a higher level, at the plant, and the deficiencies started to be pursued more aggressively. A performance indicator for senior management review was also initiated. The deficiencies are classified as either non-outage, or outage deficiencies; the outage deficiencies require a plant outage in order to correct the problem.

Plant personnel had reduced the number of non-outage deficiencies to less than 50, at the end of the inspection period. The outage deficiencies are now being pursued to determine their status and if they are scheduled appropriately; approximately 100 of these existed at the end of the inspection period. Plant personnel hold weekly meetings to review the status of the deficiencies, and look at each one individually.

The inspectors discussed the tracking and trending of the number of control room deficiencies with various plant personnel, reviewed the listing of deficiencies, tags and annunciators present in the main control room, and attended a number of the monthly update meetings where this and other performance indicators are reviewed with senior management. The inspectors noted that over the past few months the number of control room deficiencies have been reduced significantly. In particular, the number of lit annunciators in the main control room has been reduced. The inspectors concluded that deficiencies have been properly reviewed and corrected, and there has been appropriate senior management involvement.

2.3 Loss of Power to a Reactor Protection System (RPS) BUS

On August 10, 1993, a loss of 1BY160, 1B RPS and UPS power, occurred on Unit 1 when breaker 1BC24801, 1B RPS and UPS panel feeder breaker, tripped during performance of Surveillance Test (ST)-2-036-622-1, RPS-Electrical Monitoring Channel B Functional Test. All appropriate isolation signals and a "B" side half scram were received. The isolation signals included drywell chilled water, reactor enclosure cooling water, reactor water cleanup, primary containment instrument gas, Unit 1 Reactor enclosure/B standby gas treatment start, and the bypass leakage atmosphere control half of main steam line isolations. In accordance with Event procedure (E)-1BY160, Loss of 1B RPS UPS Power, drywell chiller water, primary containment instrument gas and reactor enclosure cooling water were restored by bypassing the isolation signals. Breaker 1BC24801 was reset and power restored to 1BY160, the "B" side half scram was reset and all isolations were reset. The appropriate systems were restored to normal per General Plant procedure (GP)-8, Primary and Secondary Containment Isolation Verification and Reset. The cause of the breaker trip is under investigation. This issue will remain unresolved pending completion of NRC's review of PECO's final investigation. (50-352/93-16-01)

3.0 SURVEILLANCE (61726)

3.1 Surveillance Observation

During this inspection period, the inspectors reviewed in-progress surveillance testing and completed surveillance packages. The inspectors verified that the surveillances were completed according to PECO approved procedures and plant technical specification requirements. The inspectors also verified that the instruments used were within calibration tolerance and that qualified technicians performed the surveillances.

The following surveillances were reviewed:

ST-6-001-660-1	Main Turbine Stop Valve RPS and EOC-RPT Channel Functional Test
ST-6-001-760-1	Main Turbine Stop and CIV Valve Exercise Test
ST-6-092-312-1	D12 Diesel Generator Slow Start Operability Test Run

The surveillance tests observed were properly conducted by knowledgeable plant personnel, and were properly supervised by management.

4.0 ENGINEERING AND TECHNICAL SUPPORT (71707)

4.1 NRC Bulletin 93-03 Resolution of Issues Related to Reactor Vessel Water level Instrumentation in BWRs

On May 28, 1993, the NRC issued Bulletin 93-03 requesting that hardware modifications be implemented to ensure that the level instrumentation system design be of high functional reliability for long-term operation. This request was made to ensure that potential level errors caused by reference leg degassing will not result in improper system response during transients and accident scenarios, initiated from reduced pressure conditions. Since the level instrumentation plays an important role in plant safety and is required for both normal and accident conditions, the NRC requested that these modifications be implemented at the next cold shutdown beginning after July 30, 1993.

On July 30, 1993, PECO submitted a report providing a description of the hardware modification to be implemented, in accordance with the reporting requirements of the bulletin. This report also included a description of the short term compensatory action taken (Section 1.5 of 50-352, 353/93-14) in response to the bulletin. At the end of this reporting period the modification was completed and installed on both Unit 1 and 2, with the exception of actually connecting to the respective reference legs for the level instrumentation and the control rod drive (CRD) system.

The modification to the reactor vessel water level instrumentation consists of installing a continuous "backfill" system on all four (4) reference legs of the reactor water level instrumentation system. This system will provide a continuous flow of water to the uppermost portion of the reference legs, to the existing condensing chambers, and then back to the reactor vessel via the current steam supply/condensate flow path which connects the condensing chambers to the reactor vessel. The flow rate to the reference legs will exceed the steam condensing rate in the condensing chambers continuously purging the upper portion of the reference legs, limiting the movement of water containing noncondensable gases, from the condensing chamber, into the reference legs provided reference leg leakage is small. The source of water for the "backfill" system will be from the CRD system. The CRD flow will be directed to a point on the instrument side of the reference legs' containment isolation excess flow check valve. The "backfill" system will be designed with flow control and indication capabilities, and will be provided with manual valves and vents to facilitate system startup, maintenance, and testing.

In summary, the inspectors reviewed the modification installation to date, and concluded the PECO has aggressively pursued the implementation of the reactor vessel water level modification in response to NRC Bulletin 93-03. The final connection of the modification is expected to take less than a day to complete, following entry into the cold shutdown mode. The inspectors will continue to review PECO's response to this bulletin.

5.0 PLANT SUPPORT (71707)

5.1 Radiological Protection

During the inspection period, the inspectors examined work in progress in both units including health physics (HP) procedures and controls, ALARA implementation, dosimetry and badging, protective clothing use, adherence to radiation work permit (RWP) requirements, radiation surveys, radiation protection instrument use, and handling of potentially contaminated equipment and materials.

The inspectors observed individuals frisking in accordance with HP procedures. A sampling of high radiation area doors was verified to be locked as required. Compliance with RWP requirements was reviewed during plant tours. RWP line entries were reviewed to verify that personnel provided the required information and people working in RWP areas were observed as meeting the applicable requirements. The activities observed by the inspectors were acceptable.

5.2 Security

Selected aspects of plant physical security were reviewed during regular and backshift hours, to verify that controls were in accordance with the security plan and approved procedures. This review included the following security measures: guard staffing, vital and protected area barrier integrity, and implementation of access controls including authorization, badging, escorting, and searches. Activities observed were acceptable.

On August 10, 1993, the Security Managers of Peach Bottom Atomic Power Station and Limerick Generating Station met with NRC Region I Security Section staff members at King of Prussia, Pennsylvania. The purpose of the meeting was to discuss proposed revisions to the Peach Bottom Security Plan, Contingency Plan, and Training and Qualification Plan, and to brief the staff regarding construction of a new security access facility at the Limerick station. This meeting was closed to the public due to the anticipated extensive discussion of safeguards information. The meeting was an effective forum for open discussion. No commitments were made by any party as a result of the meeting.

6.0 REVIEW OF LICENSEE EVENT AND ROUTINE REPORTS (90712, 90713)

6.1 Licensee Event Reports (LERs)

The inspectors routinely review LERs and performed followup inspections to PECO's actions regarding the disposition of corrective initiatives. The inspectors reviewed the following LERs and found that the events were described accurately, PECO had identified the root causes, implemented appropriate corrective actions and made the required notifications.

LER 1-92-011, Inoperability of channel 'B' of the Main Steam Line Radiation Monitoring system as a result of inadequate electrical separation, Revision 1, Discovery Date: June 5, 1992, Reportability Date: June 16, 1992, Report Date: July 30, 1993.

LER 1-93-008, Manual actuation of the Standby Gas Treatment System and Unit 1 Reactor Enclosure Recirculation Sys. following a motor failure in the normal Reactor Enclosure Ventilation Sys., Revision 0, Event Date: June 27, 1993, Reportability Date: June 30, 1993, Report Date: July 30, 1993.

LER 2-93-007, Spurious Closure of a Traversing Incore Probe system explosive shear valve, a Primary Containment Isolation Valve, due to an indeterminate cause, Revision 0, Event Date: June 17, 1993, Discovery Date: June 22, 1993, Report Date: July 19, 1993.

LER 2-93-009, An inadvertent Primary Containment and Reactor Vessel Isolation Control System actuation (High Pressure Coolant Injection System Isolation) due to a failed Rosemount Transmitter, Revision 0, Event Date: July 16, 1993, Report Date: August 13, 1993.

The inspectors found that the LERs listed above met the requirements of 10 CFR 50.73 and had no further questions regarding these events.

6.2 Routine Reports

Routine reports submitted by PECO were reviewed to verify the reported information. The following report was reviewed and satisfied the reporting requirements.

Station Monthly Operating Report for June 1993, dated July 12, 1993

7.0 FOLLOWUP OF PREVIOUS INSPECTION FINDINGS (92702)

(Closed) Violation (50-353/92-27-02). This violation was cited due to PECO's failure to promptly correct problems associated with reactor core isolation cooling (RCIC) check valves. Plant management determined that the responsible system manager did not perceive the benefit of working on the valves, timely and aggressive troubleshooting was not performed commensurate with the valve's safety significance, and the system manager was not aware of the 10 CFR 21 issues related to the valves.

All of the valves were repaired and tested as necessary. Lessons learned from this event were presented to system managers during training. The training stressed ensuring a balance between performing maintenance and allowing degraded conditions to exist until a scheduled outage. System managers also received training concerning the importance of performing timely troubleshooting to understand component conditions. Additionally, system managers

will be provided with all future 10 CFR 21 notices received related to Limerick components, and all system managers were provided a list of Limerick components known to be affected by previous 10 CFR 21 notices.

The inspectors reviewed the corrective actions and concluded that they adequately addressed the causes of the violation. The inspectors had no further questions.

(Closed) Unresolved Item (50-353/93-09-03). This unresolved item concerned the failure of the 2B Drywell Chiller to trip when the control room hand switch was taken to STOP.

On May 21, 1993, during the break-in runs on the 2A Drywell Chiller, the 2B Drywell Chiller failed to trip. Both chillers were running together during the 2A break-in runs. Additional load was needed for the 2A chiller, so the 2B chiller was to be shutdown. The control room handswitch for the 2B chiller was taken to STOP. The discharge valve was observed by the operators to have closed, but the compressor indication remained red indicating the chiller was still running. An operator was immediately dispatched to the 4 KV breaker to trip the breaker. The breaker was manually tripped. The system manager was contacted to determine the cause of the failure to trip. The auxiliary logic in the breaker cubicle was inspected by the system manager and the shift technical advisor (STA). The chiller trip relay that energizes the trip coil in the breaker cubicle was found disabled. The M2 wire was found lifted from the 105-11708 relay (E-464). The wire was lifted and taped, with the relay screw missing. The activity that lifted the wire in the auxiliary logic had not been identified and remained unresolved pending completion of the review of this event.

On July 19, 1993, PECO completed their investigation and determined that the lead was lifted during the performance of the D22 emergency diesel generator (EDG) Diesel Generator 4KV Safeguard Loss of Power Logic System Functional Test and Outage Testing 18 Month (ST), on March 3, 1993. PECO's investigation focussed on the performance of the ST and the possible causes for the lead not being restored following the test. The surveillance procedure was temporarily changed to lift the lead on the chiller with the breaker in the TEST position, because the chiller was not available for the test. In this condition, the loss of coolant accident (LOCA) trip of the chiller could be verified. The cause of this event was personnel error during the performance of the ST procedure in that there was less than adequate communication between personnel performing the test restoration, and an insufficient independent verification of restoration (IVOR) section, written for the temporary change (TC). Specifically, steps were added through the TC to the procedure in explicit detail giving the panel, relay number, and terminal points. The IVOR section was also temporarily changed with the following statement: "2B Drywell Chiller, 2BK111 restored." The person performing the IVOR for the chiller merely verified the breaker was racked in and indication was on. The IVOR steps, as written in the TC, were not detailed enough to enable the performance of the IVOR to act as an independent barrier to ensure the lead was restored.

The corrective actions for this event included: 1) a voice mail message issued to all technical section supervision to reinforce management's expectations for proper communication during work activities; 2) a memorandum issued to all technical section personnel to reinforce management's expectation regarding procedure use and proper communication techniques; and 3) continued implementation of the Self Check Program as defined in Administrative Guideline (AG)-03 to raise personnel attention to self-checking. In addition, A-47 will be reviewed and revised as necessary to specify the level of detail required for restoration of equipment and lifted leads.

The inspectors reviewed the event and corrective actions taken, and concluded that the corrective actions were adequate. This wiring discrepancy was one of five wiring discrepancies identified by the plant staff between January and May 1993. These recent wiring problems were discussed in a meeting between maintenance and site engineering (Section 2.2 of 50-352, 353/93-14) attended by the inspectors. At that time there were no obvious connections between the events, and the plant staff, as well as the inspectors, concluded that no generic wiring problem existed. The inspectors had no further questions regarding this event and the unresolved item is closed.

8.0 SAFETY ASSESSMENT AND QUALITY VERIFICATION

8.1 Plant Operations Review Committee (PORC) Meetings

During this inspection period the inspectors attended two of the weekly PORC meetings. The inspectors noted that a quorum was present at the meetings and that the meetings were conducted in a professional manner. During one of the meetings the PORC chairman received reports from a number of departments including: Security, Health Physics, Chemistry Radwaste and Engineering. On at least two occasions during these reports, the PORC chairman pointed out to the plant staff that their reports should include a conclusion and/or basis, so that PORC can perform more of an evaluation function. For example the engineering group presented PORC with a list of nonconformance reports (NCR) with a potential to affect operability, reportability or plant startup. The PORC chairman stated that he wanted to see the basis for each NCR and why they were acceptable, not just a list of NCRs, so that PORC could better evaluate the engineering reviews. The inspectors identified no deficiencies.

9.0 MANAGEMENT MEETINGS

9.1 Exit Interviews

The inspectors discussed the issues in this report with PECO representatives throughout the inspection period, and summarized the findings at an exit meeting with the Manager of Operations, Mr. L. Hopkins, on August 16, 1993. PECO personnel did not express any disagreement with the inspection findings. No written inspection material was provided to PECO representatives during the inspection period.

9.2 Additional NRC Inspections this Period

Two Region-based inspections were conducted during this inspection period. Inspection results were discussed with senior plant management at the conclusion of the inspections.

<u>Date</u>	<u>Subject</u>	<u>Inspection No.</u>	<u>Lead Inspector</u>
7/6 - 7/9/93	Radwaste Shipping	50-352/93-17 50-353/93-17	R. Nimitz
7/19 - 7/23/93	Initial Operator Exams	50-352/93-18 50-353/93-18	J. Williams