U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-352/84-57

Docket No. 50-352

License No. CPPR-106 Priority - Category B

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

Facility Name: Limerick Generating Station

Inspection At: Limerick, Pennsylvania

Inspection Conducted: October 2-31, 1984

Inspectors: R. L. Nimitz
R. L. Nimitz, Senior Radiation Specialist — 11/27/84 date

Marie Miller
M. T. Miller, Radiation Specialist — 11/28/84 date

J. J. Kottan
J. J. Kottan, Laboratory Specialist — 11-27-84 date

Approved by: W. J. Pasciak
W. J. Pasciak, Chief, BWR Radiation Safety Section — 11/29/84 date

Inspection Summary: Inspection during the period October 2-31, 1984 (Report No. 50-352/84-57)

Areas Inspected: Routine, announced inspection of the licensee's radiological controls; chemistry and radioactive waste management programs and preoperational testing program including licensee action on previous inspection findings, radioactive waste system testing, process radiation monitor system testing. post-accident sampling system testing, and HVAC system testing. The inspection involved 54 inspection-hours on site by three region-based inspectors.

Results: One violation was identified (failure to adhere to 10 CFR 50, Appendix B, quality assurance requirements when performing work on the Control Room Emergency Ventilation System, paragraph 4).

DETAILS

1.0 Pers - Contacted

1.1 Philadelphia Electric Company

*R. Dubiel, Senior Health Physicist
*R. Titoto, Applied Health Physicist
*G. Leitch, Station Superintendent
**J. Wiley, Senior Chemist
J. Armstrong, Test Engineer
M. Berner, Security Site Access Lieutant
***G. Murphy, Technical Support Health Physicist
***C. Harmon, QA Engineer
C. Endress, Regulatory Engineer
**J. Franz, Assistant Station Superintendent
J. Phklabaum, Licensing Engineer

1.2 Bechtel Power Corporation

W. Hempstead, Start-up Group Supervisor, Group F
J. Barber, Start-up Engineer, HVAC
D. Condliff, HVAC Group Supervisor
V. Navarro, Start-up Engineer
R. Dickinson, Test Engineer

1.3 Gilbert Commonwealth

***L. Dyer, QA Engineer
T. Mackay, Project Nuclear Engineer

1.4 Nuclear Regulatory Commission

**J. Wiggins, Senior Resident Inspector
*W. Borchard, Reactor Inspector

* Denotes those attending the exit meeting on October 12, 1984
** Denotes those attending the exit meeting on November 6, 1984
*** Denotes those attending both exit meetings.

The inspector also contacted other licensee personnel during the inspection.

2.0 Purpose of Inspection

The purpose of the routine inspection was to review the following elements:

- Status of outstanding items in the area of Radiation Protection Program development

- Status of testing of Solid, Liquid and Gaseous Radioactive Waste Systems

During the period October 4-30, 1984, periodic visits were made to the Limerick site to monitor licensee progress in performing preoperational testing.

3.0 Licensee Action on Previous Findings

3.1 (Closed) Follow-up Item (50-352/84-45-01) Licensee to train and qualify Radiation Protection staff in applicable program elements and train security personnel in the issuance on control of dosimetry devices. The licensee established and implemented a well defined initial training and qualification program for radiation protection technicians. Review found that appropriate personnel had been trained and qualified on applicable procedures to support fuel load. The licensee trained security personnel in the issuance and control of dosimetry devices. This item is closed. The licensee has yet to fully establish a Radiation Protection Personnel Retraining and Requalification Program. This program should be established prior to the first refueling of Limerick Unit 1. This matter will be reviewed during a subsequent inspection. (50-352/84-57-11)

3.2 (Closed) Follow-up Item (50-352/84-45-02) Licensee to provide qualified personnel to perform audits of the radiation protection program. The licensee has committed to use corporate radiological controls personnel (or other appropriately qualified personnel) to perform audit of the radiological controls program. This matter is closed.

3.3 (Closed) Follow-up Item (50-352/84-45-03) Licensee to establish methodology to ensure operations shift personnel will be cognizant of significant radiological hazards at on-going work areas, and that Health Physics personnel will be informed of planned operations activities that may change plant radiological conditions. The licensee has established appropriate procedural controls to ensure transfer of such information.

3.4 (Closed) Follow-up Item (50-352/84-45-04) Licensee to establish procedures for high radiation area control and for personnel actions following a fuel handling accident. The licensee has established adequate procedural control for controlling access to high radiation areas (i.e. H.P.-109, Revision 1 and A-85, Revision 1). Appropriate personnel have been trained and qualified in the procedural requirements. Regarding action to be taken following a fuel handling accident, the licensee has established and posted instructions for this purpose and has established appropriate emergency procedures to address situations requiring local evacuations by personnel. Personnel are trained in actions to be taken for evacuation and/or emergencies. This matter is closed.

3.5 (Closed) Follow-up Item (50-352/84-45-05) Licensee to establish and implement a Radioactive Waste Management Organization. The licensee has established and is currently staffing a Radioactive Waste Organization to support radioactive waste non-processing activities (e.g., area decontamination, collection and movement of contamination material in the facility). A clearly defined organization chart with concurrent position responsibilities is in place for this element of the organization. The licensee has not yet established a clearly defined Radioactive Waste Organization to support radioactive waste processing activities. The licensee should establish and implement a radioactive waste organization to support radioactive waste processing activities and should clearly describe the various site organization interfaces and the concurrent responsibilities for supporting these processing activities. The licensee's action on this matter will be reviewe' during a subsequent inspection. (50-352/84-57-01).

3.6 (Closed) Follow-up Item (50-352/84-45-06) Licensee to upgrade the effluent control program. The licensee has implemented acceptable procedures for sampling gases and tritium from the north and south stacks and has implemented acceptable procedure for the control of liquid effluent releases. During this inspection, the licensee provided the inspector with charcoal collection efficiency data for the effluent monitors. This matter is closed.

3.7 (Closed) Follow-up Item (50-352/84-45-07) Licensee to complete testing of safety related ventilation systems to meet Technical Specification requirements. This matter is discussed in Section 4 of this report.

3.8 (Closed) Follow-up Item (50-352/84-45-08) Licensee to complete preoperational testing of the Liquid Radioactive Waste System. This matter is discussed in section 4.4 of the report.

3.9 (Closed) Follow-up Item (50-352/84-45-23) Licensee to establish a Radiological Controls Personnel Retraining Program. The licensee is currently developing such a program. This matter is discussed in section 3.1 of this report.

3.10 (Closed) Follow-up Item (352/84-45-25) Complete Solid Radwaste System preoperational testing. The licensee had completed and approved IP 68.1A, "Solid Radwaste" prior to fuel load. However, several test exceptions remain open. This item is discussed in Section 4 of this report.

3.11 (Closed) Follow-up Item (50-352/84-45-26) Licensee to complete preoperational testing of the Gaseous Radioactive Waste System. This matter is discussed in Section 4.5 of this report.

3.12 (Closed) Follow-up Item (50-352/84-45-27) Licensee to complete testing of Process Sampling Systems. This matter is discussed in Section 4.6 of this report.

3.13 (Closed) Follow-up Item (50-352/84-45-28) Licensee to complete testing of Process Radiation Monitoring System. This matter is discussed in Section 4.6 of this report.

3.14 (Closed) Follow-up Item (50-352/84-45-29) Licensee to complete testing of Reactor Building Recirculation System. This matter is discussed in section 4.7.3 of this report.

3.15 (Closed) Follow-up Item (50-352/84-45-30) Licensee to complete testing of Standby Gas Treatment System. This matter is discussed in Section 4.7.3 of this report.

3.16 (Closed) Follow-up Item (50-352/84-18-14(b)) Licensee to complete testing of the Technical Support Center (TSC) ventilation system. This matter is discussed in Section 4 of the report.

3.17 (Closed) Follow-up Item (50-352/84-18-14(c)) Licensee to ensure Technical Support Center (TSC) radiation monitoring equipment is operable. The licensee calibrated and placed in operation in the TSC a combination particulate, iodine, and noble gas radiation monitoring system. The system was calibrated in accordance with approved procedures (RT-11-00415, Revision 0) and meets the requirements of NUREG-0696, "Functional Criteria for Emergency Response Facilities". The inspector reviewed the equipment and calibration data. This matter is closed.

3.18 (Closed) Follow-up Item (50-352/84-18-14(f)) Licensee to provide supplies of potassium iodide (KI) for use during emergency conditions. The licensee has obtained and placed in storage adequate supplies of KI. The licensee has established procedures for its inventory, control and distribution. This matter is closed.

3.19 (Closed) Follow-up Item (50-352/84-18-14(e)) Licensee to obtain personnel dosimetry to support emergency operations. The licensee has obtained dosimetry to provide personnel monitoring during routine operation and emergency conditions. A sufficient quantity of calibrated high range dosimeters (up to 200 R) are available. Appropriate procedures are established and implemented for control and issuance of the personnel dosimetry (EP-221, Revision 1, and HP-610, Revision 0). This matter is closed.

3.20 (Closed) Follow-up Item (50-352/84-18-15) Licensee to ensure Technical Support Center (TSC) will provide adequate radiological protection to personnel. The licensee evaluated the capability of the TSC structure to protect personnel from direct radiation from the plant and that emanating from radioactive clouds which could envelop the structure. The licensee also evaluated the dose to personnel due to activity which may be drawn into the TSC. Using an NRC published computer code (TACT III) and the source term presented in Final Safety Analysis Report (FSAR) Chapter 15, the licensee determined

that the 30 day integrated whole body dose to personnel in the TSC would be within guidelines specified in 10 CFR 50, Appendix A, General Design Criterion 19 (GDC-19). Licensee review also found that the skin and thyroid dose quidelines of GDC-19 would also be met. In calculating skin and thyroid doses to personnel in the TSC, the license did not make allowance for the use of the TSC emergency ventilation system.

4.0 Preoperation Testing

4.1 General

The inspector examined preoperational testing of the following systems:

- Solid Radioactive Waste System
- Liquid Radioactive Waste System
- Gaseous Radioactive Waste System
- Process Monitoring System
- Post Accident Sampling System
- Safety Related Ventilation Systems

The review was with respect to criteria contained in the following:

- Final Safety Analysis Report, Chapter 14, "Initial Tests Program"
- Regulatory Guide 1.68, Revision 0, "Preoperational and Initial Startup Test Program for Water Cooled Power Reactors"
- Limerick Generating Station Unit 1, Technical Specifications (proposed)

The aluation of the licensee's performance in this area was based on review of documentation, observations by the inspector, and discussions with cognizant licensee personnel.

The review in this area examined among other matters, the following:

- Procedures for testing a system.
- Review and evaluation of test exceptions and test change notices.
- Adequacy of licensee review and resolution of test exceptions.
- Adherance to test procedures.

The following procedures and testing was selectively reviewed:

- IP68.1A, "Solid Radwaste System"
- IP70.1, "Standby Gas Treatment"
- IP72.1, "Gaseous Radwaste Recombiners and Filters"
- IP76.2, "Post Accident Sampling System"
- IP79.2A "Process Radiation Monitors (General Atomic System)"
- IP34.1, "Reactor Enclosure HVAC"
- IP32.2, "Control Room Emergency Ventilation System"
- IP69.3A, "Liquid Radwaste System"
- IP69.1, "Equipment Drain Collection and Storage System"
- IF69.2, "Flow Verification Procedure - Equipment Drain on Floor Drain Collection Sumps"
- T.T.-1.13 "HVAC Filter Testing - Generic"
- T.T.-1.10, "HVAC Flow Balance - Generic"

4.2 General Findings

Within the scope of the review, inspector review found that preoperational testing and review of test results was being performed in an adequate manner. No breakdowns in the testing program or results review was identified.

4.3 Solid Radioactive Waste System Testing

The licensee has completed and approved the preoperational testing of the solid radioactive waste system. No deviations or unacceptable conditions were identified by the inspector.

Within the scope of this review, the following matter remains open and will be reviewed during a subsequent inspection:

- Evaluate and resolve open test exception on procedure IP68.1A to ensure system operability as needed to support low power testing and routine operations. (50-352/84-57-02)

4.4 Liquid Radioactive Waste System Testing

The licensee has completed and approved the preoperational tests of the liquid radioactive waste system. No deviations or unacceptable conditions were identified by the inspector.

Within the scope of the review, the following was noted:

The testing of the liquid radioactive waste system involves testing of a significant number of system and test steps. The licensee's test group generated an comprehensive test summary of testing of the system for presentation to the Test Review Board. The summary clearly identified anomolies, closed exceptions, their resolution and any open exceptions.

Within the scope of this review, the following matter remains open and will be reviewed during a subsequent inspection:

- Evaluate and resolve open test exceptions for procedures IP69.1 and IP69.3A to ensure system operability as needed to support initial criticality. (50-352/84-57-03)

4.5 Gaseous Radioactive Waste System

The licensee has completed and approved the preoperational tests for the gaseous radioactive waste system. No deviations or unacceptable conditions were identified by the inspector.

Within the scope of the review, the following matter remains open and will be reviewed during a subsequent inspection:

- Evaluate and resolve open test exception from procedure IP72.1 to ensure system operability as needed to support low power testing and routine operations. (50-352/84-57-04)

4.6 Process Monitoring System and Post Accident Sampling System

The licensee has completed and approved the preoperational tests for the Process Monitoring System and Post Accident Sampling System. No deviations or unacceptable conditions were identified by the inspector.

Within the scope of the review, the following matter remains open and will be reviewed during a subsequent inspection:

- Evaluate and resolve open test exceptions from procedure IP79.2A as needed to support initial criticality. (50-352/84-57-05)

- Evaluate and resolve open test exceptions from procedure IP76.1 and IP76.2 to ensure system operability, as needed, to support low power testing and routine operations. (50-352/84-57-06)

4.7 Safety Related Ventilation System Testing

The inspector reviewed licensee preoparational testing of the following systems:

- Control Room Emergency Ventilation System

- Standby Gas Treatment System
- Reactor Building Recirculation System
- Technical Support Center Ventilation System Testing

4.7.1 Control Room Emergency Ventilation System

The inspector review of preoperational and surveillance test data for the Control Room Emergency Ventilation System showed that the testing satisfied Technical Specification surveillance requirements.

Within the scope of the review, the following matter requiring licensee attention was identified:

- Establish all surveillance test procedures necessary to satisfy Technical Specification surveillance test requirements for future testing. The licensee used appropriately reviewed and accepted preoperational test data to satisfy initial Technical Specification surveillance requirements.

- Select final testing methodology to be utilized to perform laboratory testing of charcoal. The licensee performed a number of laboratory tests on the charcoal.

The licensee's development of surveillance tests for the Control Room Emergency Ventilation System and selection of laboratory testing methodology will be reviewed during a subsequent inspection. This should be completed prior to first refueling of Limerick Unit 1. (50-352/84-57-07)

Licensee representatives said chlorine and toxic gas detectors were being calibrated and would be installed by fuel load. Calibration data will be reviewed during a subsequent inspection. (50-352/84-57-07)

Within the scope of this review, the following violation was identified:

10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants", states in Criterion V, "Instructions, Procedures and Drawings", "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures or drawings. Instructions, procedures or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished".

Limerick Generating Station Quality Assurance Plan is written to comply with 10 CFR 50, Appendix B, and reiterates, in Section 5.1, the requirement to implement Criterion V.

On October 10, 1984, during a walk-down of the Control Room Emergency Ventilation System, the inspector identified a number of access doors on ducts and plenums of the system to have missing or loose nuts and bolts as follows:

Access Door Location	Bolts and Nuts Missing or Loose
Between HV-020B and HV-020D	4 of 8
Between PD-C 013A and HV-010A	3 of 8
Between HV-010B and PD-C 013B	1 of 8
Between HV-020C and HV-020A	1 of 8
Upstream of Heaters for OBE-192	1 of 4

The inspector noted that the Control Room Emergency Ventilation System is a safety related system and designed to be gas tight. Consequently, the missing and/or loose nuts and bolts on the access doors could compromise the tightness of the system and it's ability to perform its safety function.

Licensee representatives indicated some work had recently been performed on the system. The inspector and licensee were, however, unable to identify any open paper work on the system which would allow for licensee identification and correction of the missing bolts and/or nuts. The licensee was unable at the time of the inspection to identify what particular work activity resulted in the improper reinstallation of the doors. The licensee was also unable to demonstrate that a procedure appropriate to the circumstances (i.e., removal and reinstallation of the access doors) was used. The licensee had previously inspected the system on March 22, 1984 and determined that the access doors had been installed per design.

The inspector discussed the above with licensee representative and indicated that failure to implement the requirements of 10 CFR 50, Appendix B, Criterion V was a violation. (50-352/84-57-08)

The licensee subsequently issued a non-conformance report for the findings, and re-installed the missing nuts and bolts in accordance with a mainenance work request. A quality assurance inspection on October 13, 1984 found the bolts and nuts to be properly installed.

The licensee also performed a walkdown on ventilation systems in the control and reactor buildings. The walkdown indicated that the missing bolts and nuts was not a generic problem but rather isolated to the Control Room Emergency Ventilation System.

The licensee's actions to correct the equipment concerns were timely and adequate to allow fuel loading.

4.7.2 Technical Support Center

The inspector review of Emergency Ventilation System Testing of the Technical Support Center indicated that the system was operable and could perform its safety function.

Within the scope of the following matter requiring licensee attention was identified:

- Select final testing methodology to be utilized to perform laboratory testing of charcoal (50-352/84-57-07)

4.7.3 Standby Gas Treatment System and Reactor Building Recirculation System Testing

The inspector review of licensee preoperational testing of the Standby Gas Treatment and Reactor Building Reactivation System indicates the licensee testing of the system was on-going. A number of test exceptions were outstanding on the preoperational tests for these systems. These exceptions were being reviewed by the licensee. Inspector review of pressure testing, test results for the system indicated the system met vendor specification for leak tightness.

Within the scope of this review the following matter remains open and will be reviewed during a subsequent inspection.

- Evaluate and resolve the open test exceptions from pre-operational test IP70.1, Standby Gas Treatment System, and IP-34.1, Reactor Enclosure HVAC System to ensure system operability as needed to support initial criticality.

- Complete flow balancing and in-place filter and charcoal adsorber-testing of the Reactor Building Recirculate and Standby Gas Treatment System.

- Review the iodine retention efficiency in the Technical Specifications for the Reactor Building Recirculation System. The efficiency used is applicable to systems with humidity control devices. The Reactor Building Recirculation System is not supplied with humidity control devices.

- Establish applicable surveillance procedures to meet Technical Specification surveillance requirements for the Reactor Building Recirculation and Standby Gas Treatment Systems.

The above matters will be reviewed during a subsequent inspection. (50-352/84-57-09)

5.0 Effluent Monitoring and Control

The inspector reviewed the licensee's program for the control of liquid and airborne effluents with regard to proposed Technical Specification requirements. The inspector noted that the licensee had implemented procedures for both tritium and gas sampling at the north and south stack airborne effluent radiation monitors. In addition, the licensee had obtained iodine collection efficiency data for the charcoal cartridges which will be used in the airborne effluent radiation monitors. Also the licensee had trained four chemistry technicians in the method of entering data into the RMMS system so that offsite doses can be correctly calculated in order to demonstrate compliance with Technical Specification requirements. The licensee had not, however, written and implemented a procedure which described data entry and use of the RMMS system by chemistry personnel. The licensee stated that a procedure would be written and implemented in this area. The inspector stated that this area would be reviewed prior to 5% power. (50-352/84-57-10)

The licensee had completed implementation of procedures for the sampling, analysis, and control of liquid effluent releases.

The inspector discussed gas sampling from the process radiation monitors with the licensee. The licensee stated that gas sampling from the process radiation monitors would be performed at the "quick disconnect" fittings used for removing the charcoal cartridges and particulate filters. A review of the licensee's sampling procedure, however, indicated that the procedure had not been modified to include gas sampling in this manner. The licensee stated that this procedure would be modified to reflect actual anticipated practice. The inspector stated that this area would be reviewed prior to 5% power. (50-352/84-57-10)

6.0 Exit Interview

The inspector met with licensee representatives (denoted in Section 1) on October 12, 1984 and November 6, 1984. On October 12, 1984 the inspector summarized the findings of the inspection as of that date. The inspector summarized the purpose, scope, and final findings of the inspection on November 6, 1984.

At no time during the inspection was written material provided to the licensee by the inspector.