

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-352/93-13
50-353/93-13

Docket Nos. 50-352 and 50-353

License Nos. NPF-39 and NPF-85

Licensee: Philadelphia Electric Company (PECo)
P. O. Box 195
Wayne, Pennsylvania 19087-0195

Facility Name: Limerick Generating Station, Units 1 and 2

Inspection at: Wayne and Limerick, Pennsylvania

Inspection Conducted: May 12 - 24, 1993

Inspector: *Richard K. Struckmeyer* 6/4/93
Richard K. Struckmeyer, Sr. Radiation Specialist
Effluents Radiation Protection Section (ERPS) Date

Approved by: *Robert J. Bares* 06/04/93
Robert J. Bares, Chief, ERPS
Facilities Radiological Safety and Safeguards Branch
Division of Radiation Safety and Safeguards Date

Areas Inspected: Announced inspection of the licensee's radiological environmental monitoring program and meteorological monitoring program, including management controls for these programs, and the licensee's program for quality control of analytical measurements.

Results: Within the areas inspected, no safety concerns or violations were identified. The licensee is implementing the above programs effectively.

DETAILS

1.0 Individuals Contacted

1.1 PECo

*J. Ballantine, Supervisor, Environmental Group
*D. Wahl, Health Physicist, Environmental Group
F. Hunt, Nuclear Quality Assurance Assessor
M. Brisan, Nuclear Quality Assurance Assessor
G. Bell, Manager, Site Quality Assurance
*M. Kaminski, Engineer, Nuclear Quality Assurance
J. Melaugh, Supervisor, Maintenance I&C
K. Ralston, Calibration Supervisor, Corporate Labs Division
R. Stadnik, Sr. Engineering Technician, Corporate Labs Division

1.2 Radiation Management Corporation, Inc.

D. Fillman, Sampling Contractor

Other licensee personnel were also interviewed during this inspection.

* Denotes those present at exit interview on May 24, 1993.

2.0 Purpose

The purpose of this routine inspection was to review the licensee's implementation of the Radiological Environmental Monitoring Program and Meteorological Monitoring Program.

3.0 Management Controls

The inspector reviewed the licensee's management controls for the Radiological Environmental Monitoring Program (REMP), including assignment of responsibility, program audits, and corrective actions for identified inadequacies and problem areas in the program.

3.1 Assignment of Responsibility

The inspector reviewed the organization and administration of the REMP. There have been no significant changes since the previous inspection. The program is administered by the PECO Corporate Environmental Group, which reviews the performance and/or analytical data generated by its contractors. Sample collections are performed by Radiation Management Corporation, Inc. (RMC), and routine analyses are performed by Teledyne Isotopes, Inc. Quality control samples are analyzed by the Public Service Electric and Gas (PSE&G) Research

and Testing Laboratory. Results are sent to the Environmental Group, where they are reviewed and compiled into the annual Radiological Environmental Monitoring Program report.

3.2 Audits

The inspector reviewed the following audits of the Radiological Environmental Monitoring Program and the Meteorological Monitoring Program.

Nuclear Quality Assurance (NQA) Audit Report No. A0367461, March 11 - June 9, 1992; LGS Radiological Environmental Monitoring Program (REMP) - Meteorological Monitoring Program (MMP) (dated July 9, 1992).

Nuclear Quality Assurance (NQA) Audit Report No. A0680043, April 1 - 16, 1993; LGS and PBAPS Radiological Environmental Monitoring Program (REMP) and Meteorological Monitoring Program (MMP) (dated May 17, 1993).

Nuclear Procurement Issues Committee (NUPIC) audit of Teledyne Isotopes, Inc., led by New York Power Authority (Audit Number 92-18), August 3 - 6, 1992.

The audits were performed by qualified personnel and were of sufficient technical depth to properly assess the implementation of the programs. Appropriate and timely responses to NQA audit findings were received. Responses to NUPIC audits have been provided by Teledyne, and a follow-up visit to verify compliance with several items has been scheduled for July 1993.

In Audit No. A0680043 (LGS and PBAPS Radiological Environmental Monitoring Program) the auditor stated that future audits of this area would exclude the Meteorological Monitoring Program. A Revision Request to the NQA Master Audit Plan was submitted, in which the auditor noted that MMP data served to establish REMP sampling locations, and do not currently affect the REMP. The Revision Request included a suggestion that the audit of the MMP be included in the audit of the Emergency Plan, since the dose calculation model relies on MMP data to perform dose assessment calculations. This will be reviewed in a future inspection.

4.0 Implementation of the Radiological Environmental Monitoring Program

4.1 Direct Observation

The inspector examined selected sampling stations, including air samplers for iodines and particulates, milk sampling locations, TLD stations, and drinking water composite sampling stations. All air sampling equipment at the selected

locations was operational at the time of the inspection. Milk samples appeared to be available at selected locations. TLDs were placed at locations designated in the Offsite Dose Calculation Manual. The licensee obtains drinking water samples at four indicator and one control station. Station 16C2 is the drinking water station nearest the Limerick site, at 2.4 miles SSE. The licensee stated that electrical power is currently unavailable at this location, which is owned by the water company, and has not been available for approximately two years. Therefore, the composite water sampler can not be operated. The licensee has been compositing weekly grab samples from this location in lieu of using the installed composite sampler. The licensee stated that it has been exploring available alternatives for restoring power and/or relocating the sampler. The licensee indicated its intention to share the cost of installing electrical cable at this location with the operator of the water company. This will permit the licensee to restore the compositor to operability. The licensee anticipates that the composite sampler will be in operation at this location by the end of September 1993. This will be reviewed in a future inspection.

4.2 Review of Annual Reports

The inspector reviewed the Radiological Environmental Monitoring Program 1992 Annual Report. This report provided a comprehensive summary of the results of the REMP around the Limerick Generating Station and met the Technical Specification and ODCM reporting requirements. The inspector also reviewed selected analytical REMP data records for 1993 during this inspection. The reports were complete and the reviewed data indicated no adverse radiological impact on public health or the environment.

4.3 Review of REMP Procedures

The inspector reviewed selected licensee environmental monitoring procedures. Based on this review, the inspector determined that the licensee has good procedures for implementation of the REMP.

The inspector also reviewed the licensee's air sampler calibration procedures and records. Calibrations of orifices and vacuum gauges are performed semi-annually. Results of these calibrations were within the specified acceptance criteria. The inspector had no further questions in this area.

4.4 Intercomparison of TLD Results

The U.S. Nuclear Regulatory Commission (NRC) Direct Radiation Monitoring Network is operated by the NRC (Region I) to provide continuous measurements of the ambient radiation levels around nuclear power plants throughout the United States. Each site is monitored by arranging approximately 30 to 50

thermoluminescent dosimeter (TLD) stations in two concentric rings extending to about five miles from the power plant. The monitoring results are published quarterly in NUREG-0837.

One of the purposes of this program is to serve as a basis of comparison with similar programs conducted by individual utilities which operate nuclear power plants. Four NRC TLDs are collocated with licensee TLDs at the Limerick plant site.

The licensee monitors the environmental radiation levels with two sets of TLDs, one set that is exchanged and read monthly, and another that is exchanged and read quarterly. The licensee's dosimeters, which contain calcium sulfate activated with dysprosium ($\text{CaSO}_4:\text{Dy}$), are supplied and analyzed by Teledyne Isotopes, Inc. The NRC uses the Panasonic Model 801 dosimeter, which contains two elements of lithium borate activated with copper, ($\text{Li}_2\text{BO}_7:\text{Cu}$) and two elements of calcium sulfate activated with thulium ($\text{CaSO}_4:\text{Tm}$). The NRC uses only the calcium sulfate elements for routine environmental monitoring and handling techniques.

During this inspection the monitoring results of collocated TLDs were compared, and the results are listed in Table 1. Only the licensee's quarterly TLDs were considered in this comparison. The NRC "historical average" data are also provided as a basis for comparison of NRC results with those of the licensee. The historical averages shown here are the same as reported in NUREG-0837, Vol. 13, No. 1, for these collocated stations. These reported values are the mean ± 1 standard deviation for all quarters (starting in 1983) for which net data were available. The relatively small standard deviations indicate that the NRC results have remained consistent over the ten-year period. The licensee results are generally somewhat below those of the NRC, and may be due to different methods of calibration of the two systems.

4.5 Quality Control Program for REMP

The inspector reviewed the licensee's program for quality control of analytical measurements for radiological environmental samples. One aspect of quality control consists of measurements of duplicate samples performed by the contractor laboratory. Both the primary and the QC laboratories participated in the EPA cross-check program, and conducted an internal QC program. Periodic reports of QC results are supplied to the licensee. The data indicate, with few exceptions, agreement between the primary contractor laboratory and the QC laboratory. Where discrepancies were found, reasons for the differences were investigated and resolved.

The licensee has a thorough and effective program for review of the analytical data, including QC sample data. The contractor laboratories routinely supply both the final results and the raw data for each sample, and the licensee performs the necessary calculations to check the laboratories' results. The data are subsequently reviewed again prior to publication in the annual REMP report. The inspector had no further questions in this area.

5.0 Meteorological Monitoring Program

The inspector examined the licensee's meteorological monitoring program through direct observation, discussions with personnel, and examination of procedures and records for calibration of equipment. The primary meteorological tower is equipped with wind speed and wind direction sensors at the 30, 175, and 270-foot elevations. There are also temperature sensors at the 26, 171, and 266-foot elevations. The secondary meteorological tower is equipped with wind speed and wind direction sensors at the 30, 159, and 304-foot elevations, and temperature sensors at the 26, 155, and 300-foot elevations. The inspector observed the sensors and their readouts in the equipment house at the base of their respective towers, as well as the readouts in the control room. The meteorological data are available in the equipment houses via analog strip chart recorders. The data are available in the control room via analog strip chart recorders and as a digital display from the system computer.

The licensee performs calibrations of the meteorological sensors and data transmission lines on approximately a semiannual basis. The inspector reviewed selected calibration records, with emphasis on the wind speed, wind direction, and temperature sensors. All reviewed calibration results were within the licensee's defined acceptance criteria. The inspector noted that for the two most recent calibrations of the meteorological equipment reviewed in this inspection, the length of time between calibrations exceeded the six-month interval required by Technical Specifications, but were performed within the maximum allowable extension (not to exceed 25% of the surveillance interval) permitted by Technical Specification 4.0.3. The licensee stated that these extensions of the calibration interval allowed them to "re-synchronize" the dates of the calibrations with the spring and autumn seasons so as to avoid the need to ascend the meteorological equipment towers during adverse winter weather.

The inspector had no further questions in this area.

6.0 Exit Interview

The inspector met with the licensee representatives denoted in Section 1 of this report on May 24, 1993. The inspector summarized the purpose, scope, and findings of the inspection. The licensee acknowledged the inspection findings.

Table 1

Environmental TLD Monitoring Results (mR/quarter)*
Comparison of NRC TLDs Collocated with Limerick TLDs

Monitoring Period	NRC no.: LGS no.:	11 31D1	13 35B1	30 15D1	41 13C1
1991/1st Quarter	NRC	26.5 ± 0.9	21.2 ± 0.8	23.9 ± 0.6	15.5 ± 0.6
	LGS	21.0 ± 1.5	17.2 ± 0.7	18.6 ± 0.4	13.3 ± 0.1
2nd Quarter	NRC	24.9 ± 0.9	21.0 ± 0.8	23.0 ± 0.8	17.1 ± 0.7
	LGS	19.8 ± 0.3	16.3 ± 0.6	18.6 ± 0.1	12.7 ± 0.1
3rd Quarter	NRC	24.0 ± 0.9	20.3 ± 0.8	22.5 ± 0.8	14.9 ± 0.6
	LGS	23.4 ± 0.3	20.1 ± 0.4	21.0 ± 0.4	14.8 ± 0.1
4th Quarter	NRC	26.2 ± 0.9	20.7 ± 0.8	23.4 ± 0.9	16.8 ± 0.7
	LGS	21.6 ± 0.3	17.2 ± 0.4	19.2 ± 0.6	13.6 ± 0.3
1992/1st Quarter	NRC	NC†	NC†	NC†	NC†
	LGS	21.6 ± 0.4	18.6 ± 0.9	18.9 ± 0.3	13.9 ± 0.1
2nd Quarter	NRC	NC†	NC†	NC†	NC†
	LGS	24.6 ± 0.6	17.5 ± 0.7	19.5 ± 0.3	13.0 ± 0.1
3rd Quarter	NRC	26.0 ± 0.9	22.2 ± 0.8	24.1 ± 0.9	16.8 ± 0.7
	LGS	23.7 ± 0.4	21.0 ± 0.4	21.9 ± 0.4	15.1 ± 0.6
4th Quarter	NRC	24.2 ± 1.0	19.9 ± 0.9	21.8 ± 1.0	15.9 ± 0.8
	LGS	21.9 ± 0.3	18.0 ± 0.3	17.8 ± 0.3	13.0 ± 0.1
1993/1st Quarter	NRC	24.9 ± 0.9	20.0 ± 0.7	22.1 ± 0.8	15.8 ± 0.6
	LGS	22.9 ± 0.3	18.0 ± 0.5	20.0 ± 0.4	15.3 ± 0.3
NRC Historical Average	NRC no.:	11	13	30	41
From 1983/1st Qtr to 1992/4th Qtr	average	24.4 ± 2.0	20.5 ± 1.7	22.3 ± 1.9	16.2 ± 1.8

* All results are in milliroentgens and are normalized to a 90-day quarter.

All data are shown as Result ± 1 standard deviation.

† NC = No Comparison (Net data not available for NRC TLDs because transit control was missing).