

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-387/84-25
50-388/84-32
Docket No. 50-387
50-388
License No. NPF-14 Priority - Category C
NPF-22 - C
Licensee: Pennsylvania Power and Light Company
2 North Ninth Street
Allentown, Pennsylvania 18101

Facility Name: Susquehanna Steam Electric Station, Units 1 and 2

Inspection At: Berwick, Pennsylvania

Inspection Conducted: July 22-27, 1984

Inspectors: R. L. Nimitz 8/17/84
R. L. Nimitz, Senior Radiation Specialist date

R. L. Nimitz for 8/17/84
J. J. Kottan, Radiation Laboratory Specialist date

Approved by: W. J. Pasciak 8/17/84
W. J. Pasciak, Chief, Effluents Radiation Protection Section date

Inspection Summary: Inspection on July 22-27, 1984
Combined Report No. 50-387/84-25; 50-388/84-32

Areas Inspected: Routine unannounced inspection of: licensee action on previous inspection findings; radiation protection organization; selection; qualification and training; external and internal exposure control; audits; ALARA; and start-up testing of Unit 2. The inspection involved 80 inspection-hours on site by two NRC region-based inspectors.

Results: No violations were identified.

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DETAILS

1. Persons Contacted

1.1 Licensee Personnel

- T. Kelley, Chemistry Technician, Level II
- *K. Mattern, Power Production Engineer
- T. Widner, Health Physicist (Corporate)
- V. Concel, Lead Engineer, Support Group
- T. Borek, Chemistry Technician, Level I
- *R. Doebler, Chemistry Supervisor
- L. Vnuk, Senior Chemist
- D. Miller, Chemistry Foreman
- K. Roush, Nuclear Technical Training Supervisor
- *J. Graham, Senior Compliance Engineer
- *J. Lindberg, Senior NQA Analyst
- *R. Prego, QA Supervisor - Operations
- *M. Buring, Health Physics Supervisor
- *H. Riley, Health Physicist

1.2 NRC

- *R. Jacobs, Senior Resident Inspector

*Denotes those individuals attending the exit meeting on July 27, 1984

The inspector also contacted other personnel.

2. Purpose of Inspection

The purpose of this routine safety inspection was to examine the following program elements:

Unit 1 and Unit 2

- Licensee action on previous inspection findings
- Radiation Protection Organization
- Selection, Qualification and Training of Radiation Protection Personnel
- External Exposure Controls
- Internal Exposure Controls
- Audits
- ALARA

Unit 2

- Start-up Testing including:

- Radiation Surveys
- Effluent Treatment and Control
- Reactor Water Chemistry

3. Licensee Action on Previous Inspection Findings

- 3.1 (Closed) Follow-up Item (50-387/82-02-14): Licensee procedures for analysis of breathing air are generally not consistent. Also, no evaluation performed to determine if the vendor, which analyzes breathing air quality, uses appropriate methodology to perform such tests. The inspector reviewed Procedure HP-TP-752, "Respiratory Production Program," and Procedure HP-HI-007, "Evaluation of Grade D Air Sample Results." These two procedures were adequately revised to eliminate inconsistencies. Licensee Quality Assurance personnel stated that they believed that an audit of the vendor, who analyzes the licensee's breathing air samples, was performed. However, documentation of the results of this audit could not be located. The results of the licensee audit of the vendor's capability to perform acceptable analysis of breathing air samples will be reviewed during a subsequent inspection (50-387/84-25-01)
- 3.2 (Closed) Follow-up Item (50-387/82-27-03): Licensee to establish and implement a Radiation Protection Technician Retraining Program. The licensee has established and is implementing a Radiation Protection Technician Retraining Program. This matter is further discussed in section 5 of this report.
- 3.3 (Closed) Follow-up Item (50-387/82-43-01): Licensee to upgrade neutron radiation survey meter calibration program. The licensee sent a neutron survey meter to the National Bureau of Standards (NBS) for calibration. The licensee used the calibrated instrument to verify the dose rates from his Am-Be neutron source. However, at the time of the inspection, the following deficiencies were identified:
- the neutron source dose rates and applicable acceptance criteria had not been included in appropriate procedures and/or instructions
 - neutron dose rates and a fixed geometry had not been established for neutron survey meters other than the instrument model sent to NBS.

Licensee representatives indicated appropriate action would be initiated to address these deficiencies. The licensee's action on these deficiencies will be reviewed during a subsequent inspection (50-387/84-25-02).

- 3.4 (Closed) Follow-up Item (50-387/82-43-04): NRC to complete review of licensee ALARA Program. The inspector reviewed the licensee's job preplanning, on-going job review, and post-job evaluation methodology

for purposes of maintaining occupational exposures ALARA. The results of the review are discussed in section 10 of this report.

- 3.5 (Closed) Follow-up Item (50-387/83-17-01): Licensee to establish program to ensure that Health Physics Specialists, rotated into other program areas, are adequately trained and qualified to assume the responsibilities of the new program areas. The licensee rotated the Specialists back to their initial positions and established a training and qualification program with which to train and evaluate the Specialist prior to the Specialist being assigned responsibilities in the new program area. The licensee's actions on this matter are acceptable.
- 3.6 (Closed) Follow-up Item (50-387/83-17-02): Licensee to assess potential intake of airborne radioactive material for a worker who performed work under Radiation Work Permit No. 83-341. The inspector review of licensee whole body count data for this worker indicated no intake of airborne radioactive material occurred. This matter is closed.
- 3.7 (Closed) Violation (50-387/83-17-03): Licensee failed to adhere to procedures for performing airborne radioactive material surveys. The inspector reviewed this matter with respect to the corrective actions described in a Pennsylvania Power and Light Company letter dated January 20, 1984. The review indicated the corrective actions were adequate and implemented.
- 3.8 (Closed) Follow-up Item (50-387/83-17-04): Licensee to resolve deficiencies identified in the occupational exposure records program. The licensee implemented appropriate corrective action to resolve the identified deficiencies. The inspector review of applicable procedures and documentation did not identify any deficiencies.
- 3.9 (Open) Follow-up Item (50-387/83-17-05): Licensee to establish procedure for use in determining intake of airborne radioactive material by personnel based on whole body counting of the personnel. The licensee had not established a procedure for this purpose at the time of the inspection. The licensee initiated action to develop such a procedure. Inspector examination of whole body count data did not identify a situation where such a procedure would be needed for determination of airborne radioactive material intake. This matter remains open.
- 3.10 (Closed) Follow-up Item (50-387/83-17-06): Licensee to resolve deficiencies identified in the area of determination of operability of health physics sample counting instrumentation and source checking of high range survey meters. The licensee revised appropriate procedures to include statistical analysis techniques for analysis of daily source checks of counting instrumentation. The techniques are adequate to determine operability of the instrumentation. The licensee procured a source and constructed a source holder for use in

checking the higher ranges of survey meters. Appropriate procedures and source reading acceptance criteria were established. This item is closed.

3.11 (Closed) Follow-up Item (50-387/83-18-04): Licensee to review adequacy of correction factors for neutron dosimeters worn by personnel in Unit 1 Drywell. During the performance of surveys in Unit 2 Drywell, the licensee collected data with which to evaluate the adequacy of the correction factor for the neutron dosimeters worn by personnel in Unit 1. The licensee has not yet received the data from the contractor that performed the measurements. The licensee's evaluation of this data will be reviewed during a subsequent inspection (50-387/84-25-03).

3.12 (Open) Follow-up Item (50-387/83-28-02): Licensee to complete Incident Report for a spill of radioactive liquid which occurred in Unit 1 on December 9, 1983. Licensee to also review process and instrumentation diagrams (P&IDs) to identify need for clarification of the P&IDs. The licensee completed the Incident Report (No. 1-83-242) and its review on February 5, 1984. The report included actions to prevent recurrence. The licensee revised P&IDs to clarify valve final position on loss of electric power and/or air for the applicable valves. The inspector review identified the following matters requiring additional review:

- The licensee was unable to provide the final valve position of five valves listed in the incident report in the event the valves lost electric power and/or air. The valves were:

HV-26665
 HV-27101
 HV-26907
 HV-29927
 HV-17190

Consequently, the inspector could not determine if appropriate P&IDs should be revised to clarify the final valve positions.

- Procedure NDI-QA-15.2.7, "Drawing Change Control," contained an attachment which referenced sections of the procedure which provided guidance for immediately posting drawing change notices. However, review indicated the referenced sections (6.9.3 thru 6.9.7) were missing from the procedure.

These matters remain open and will be reviewed during a subsequent inspection.

3.13 (Closed) Follow-up Item (50-388/83-30-04): NRC to review licensee start-up radiation surveys for Unit 2. The inspector reviewed surveys performed outside the Drywell at 0%, 3%, and 17% power and surveys performed inside the Drywell at 20% power. No deficiencies

were identified. The surveys were performed in accordance with applicable start-up test procedures and the results were properly reviewed. The following matters remain open and will be reviewed during a subsequent inspection:

- NRC review of surveys performed inside the Drywell of Unit 2 at 40% power
- Licensee performance and review of surveys for Final Safety Analysis Report Test Condition 6.

Follow-up item (50-388/84-32-01) will be used to track these matters. This is further discussed in section 9 of this report.

- 3.14 (Closed) Violation (387/84-05-02): Failure to follow gas flow proportional counter calibration procedure. The licensee modified the gas flow proportional counter calibration procedure to reflect actual laboratory practices. A review of current data indicates that the licensee is following the procedure.
- 3.15 (Closed) Follow-up Item (387/84-05-03): Proportional counter QC procedures. The licensee prepares new control charts when counter parameters change, and instrument maintenance and repair logs are maintained as required.
- 3.16 (Closed) Follow-up Item (387/84-05-04): Resolution of inter-laboratory intercomparison disagreements. A review of recent interlaboratory comparison data, both radiological and nonradiological, indicated that the licensee had attempted to resolve any intercomparison disagreements promptly. In addition, the licensee has included particulate filters, charcoal cartridges, and gas samples in the radiological intercomparison program.
- 3.17 (Closed) Follow-up Item (387/84-05-05): Chemistry training program. The licensee has implemented a chemistry training program with a chemistry foreman designated as a training coordinator. Also, a new procedure qualification checklist is in use which includes the analysis of unknown spiked samples where applicable.
- 3.18 (Closed) Follow-up Item (387/82-02-23): Effluent release controls. The licensee has implemented procedures to control liquid effluent releases.
- 3.19 (Closed) Follow-up Item (397/83-18-01): Contaminated oil sampling. The licensee has implemented a procedure for sampling and analyzing oil prior to release from the site. The oil is tested for water, which is separated if present, and counted on the gamma spectrometer to a preset lower limit of detection. The procedure requires that oil containing any level of radioactivity be treated as radioactive waste.

- 3.20 (Open) Follow-up Item (387/82-25-02): Power loss to airborne effluent radiation monitor control terminal. The licensee is planning to review a proposed set of modifications to the airborne effluent radiation monitors, including the power loss to the monitor control terminal. The planned modifications which result from this review will be reviewed by the NRC in a subsequent inspection.
- 3.21 (Open) Follow-up Item (387/83-28-01; 388/83-30-02): Primary containment monitor sample line representativeness. The licensee has not yet evaluated the effect of the change in the diameter of the sample lines on particulate sample representativeness. This area will be reviewed during a subsequent inspection.

4. Organization and Staffing

The inspection reviewed the organization and staffing of the Radiation Protection Organization with respect to criteria contained in the following:

- Unit 1 and Unit 2 Technical Specification 6.2, "Organization"
- Procedure AD-00-700, Revision 6, "Conduct of Health Physics"

The licensee's performance in this area was based on:

- review of back-shift staffing and organization
- review of day shift staffing and organization
- discussion with cognizant licensee personnel.

Within the scope of this review, no violations were identified. The licensee appeared to be effectively staffed and organized to maintain radiological controls in Unit 1 and Unit 2.

Within the scope of this review, the following recommendation for improvement was identified:

- The licensee created and staffed the position of Assistant Foreman Radioactive Waste; however, this position and its associated responsibilities, authorities, and reporting requirements are not described in AD-00-700. The licensee should update this procedure to reflect the new position.

5. Selection, Qualification and Training

The inspector reviewed the selection, qualification and training of selected radiation protection personnel. The review was with respect to criteria contained in the following:

- Unit 1 and Unit 2 Technical Specification 6.3, "Unit Staff Qualifications"
- Unit 1 and 2 Technical Specification 6.4, "Training"
- Procedure AD-00-700, Revision 6, "Conduct of Health Physics"
- Procedure AD-00-730, Revision 2, "Health Physics Training Programs"
- Licensee Memorandum: Subject: Health Physics Technician Retraining, dated November 30, 1983

The licensee's performance in this area was based on:

- review of selected radiation protection personnel records including those of personnel performing back-shift radiation protection coverage
- review of radiation protection personnel performance
- discussions with cognizant licensee personnel.

Within the scope of this review, no violations were identified.

The licensee was selecting, training and qualifying personnel consistent with procedural requirements.

6. External Exposure Control

The inspector reviewed the following aspects of the licensee's external exposure control program:

- performance, documentation, and maintenance of radiation surveys
- issuance, adherence to, and adequacy of Radiation Work Permits
- use of properly calibrated survey instrumentation
- issuance and use of proper personnel monitoring devices
- generation and maintenance of external exposure records and/or exposure reports
- posting and/or access control to radiation and high radiation areas.

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

- Unit 1 and Unit 2 Technical Specification 6.8, "Procedures and Programs"
- Unit 1 and Unit 2 Technical Specification 6.11, "Radiation Protection Program"

- Unit 1 and Unit 2 Technical Specification 6.12, "High Radiation Area"
- 10 CFR 20, "Standards for Protection Against Radiation"
- Applicable licensee radiation protection procedures.

Within the scope of this review, no violations were identified. The licensee is implementing an adequate and effective exposure program.

Within the scope of this review, the following recommendations for improvement were identified:

- Incorporate additional guidance in Procedure NDI-QA-2.5.3, Revision 2, "Administration of Susquehanna SES Site Access Program," regarding initiation of site access termination. The procedure guidance does not ensure that the termination exposure reports requirements of 10 CFR 20.408 will be adhered to. The issuance of the reports is commensurate upon dosimetry personnel receiving documentation initiated by NDI-QA-2.5.3.

7. Internal Exposure Control

The inspector reviewed the following aspects of the licensee's internal exposure control program:

- performance of surveys
- use of engineering controls
- performance of bioassays
- generation and maintenance of internal exposure records and/or exposure reports.

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

- Unit 1 and Unit 2 Technical Specification 6.11, "Radiation Protection Program"
- 10 CFR 20, "Standards for Protection Against Radiation"
- Applicable licensee radiation protection procedure.

The licensee's performance in this area was based on:

- examination of whole body counting records
- review of airborne radioactivity sampling data
- discussion with cognizant personnel.

Within the scope of the review, no violations were identified. No instances of personnel intakes of airborne radioactivity in excess of 40 mpc-hours was identified. The licensee was implementing an acceptable internal exposure control program.

8. Audits

The inspector reviewed licensee radiological controls audits with respect to criteria contained in:

- Unit 1 and Unit 2 Technical Specification 6.5, "Audits"
- Procedure NQAP 9.1, Revision 6, "Audits"

The licensee's performance in this area was based on:

- discussions with licensee audit personnel
- review of the following audits:
 - Audit #0-83-14, "Audit of Health Physics/Chemistry," dated July 18, 1984
 - Audit #0-83-28, "Solid Rad Waste Processing," dated December 9, 1983

Within the scope of this review, no violations were identified. The licensee developed appropriate audit plans for use during the audits and followed up audit findings needing resolution.

9. Start-up Testing (Unit 2)

9.1 Radiation Surveys

The inspector reviewed the Start-up Radiation Survey Program with respect to criteria contained in the following:

- Procedure S.T. 2.1, "Start-up Program Radiation Surveys,"
- Final Safety Analysis Report (FSAR), Chapter 14, "Initial Tests Program,"
- ANSI/ANS - 6.3.1, 1980, "Program for Testing Radiation Shields in Light Water Reactors,"
- ANSI - N323, 1978, "Radiation Protection Instrumentation Test and Calibration,"
- Regulatory Guide 1.68, November 1978, "Preoperational and Initial Start-up Test Programs for Water-Cooled Power Reactors (LWR)."

The licensee's performance in this area was based on:

- review of radiation survey data from outside
- discussions with cognizant personnel.

Within the scope of this review, no violations were identified. The following matters remain open and will be reviewed during a subsequent inspection (50-388/84-32-01).

- NRC review of surveys performed inside Drywell at 40% power
- Licensee performance of surveys at FSAR Test Condition 6

9.2 Chemical/Laboratory Controls

9.2.1 Chemistry

The inspector reviewed the chemistry programs of Unit 2 with respect to the Technical Specification (TS) requirements. The licensee was performing the TS required tests and analyses of reactor water for radionuclide and chemical concentrations and is controlling water quality as required. The inspector also reviewed the operation of the gaseous radioactive waste processing system. The licensee has sampled the off gas system, both pretreatment and post treatment, and with the available data determined that the system is operating in accordance with the design. In addition, the inspector examined the Unit 2 turbine building and reactor building airborne effluent monitors and noted that the monitors were operational, and, based on instrument readings, the samplers were operating isokinetically. The inspector toured the facility and examined the radwaste sampling panel and radwaste processing sampling points, the Unit 2 turbine building sampling panel, and the reactor building sampling panel. The licensee has a general sampling procedure which is used for sampling the above locations. The sampling valves in the turbine building, reactor building, and radwaste sampling panels are clearly labeled to prevent taking an incorrect sample. However, the valves used for sampling the radwaste processing streams are not labeled. Sample line purge times or volumes are not specified for these sampling points. The inspector discussed this area with the licensee, and the licensee stated that specific sampling procedures would be developed. The inspector stated that this area would be reviewed during a subsequent inspection (387/84-25-04; 388/84-32-02).

The inspector reviewed the licensee's offsite dose calculation manual (ODCM) and results of several monthly and quarterly dose calculations. The inspector discussed the exchange of plant effluent information between the plant chemistry personnel and

the corporate health physics personnel who perform the offsite dose calculations with the licensee. The inspector also discussed proposed changes to the licensee's ODCM implementing procedures that will result in more timely dose results and projected dose results.

No violations were identified in this area.

9.2.2 Laboratory Quality Assurance/Quality Control Program

The inspector reviewed the laboratory QA/QC program. The licensee has realigned the chemistry organization with one chemistry foreman having the responsibility for implementing the laboratory QA/QC program. The inspector reviewed the licensee's current laboratory QA/QC program and noted the licensee was implementing the procedures as required. The inspector also noted that the licensee's QA/QC program was being revised and the licensee is currently rewriting many of the QA/QC procedures or writing new procedures in this area. The inspector stated that the new laboratory QA/QC program would be reviewed in a subsequent inspection after its completion and implementation (387/84-25-05; 388/84-32-03).

The inspector also reviewed the licensee's chemistry technician training and certification program. In the training area, the licensee has also realigned the chemistry organization with one chemistry foreman having the responsibility for implementation of the chemistry training program. The training program consists of procedural qualification and formal classroom training as well as courses given by system and instrument vendors. A two-year technician certification program has been implemented and is being actively pursued. The certification program consists of eight weeks of classroom and laboratory training per year given by the Nuclear Training Group and procedure qualification under the direction of the chemistry training foreman. The procedure qualification requires the analysis of unknowns where applicable. The inspector reviewed the training records of randomly selected individuals and noted that the records were well maintained and appeared to be current for records maintained by both the chemistry training foreman and the Nuclear Training Group. No violations were identified.

10. ALARA

The inspector reviewed selected aspects of the licensee's ALARA Program with respect to criteria contained in the following:

- Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Plants Will be as Low as Reasonably Achievable," Revision 3, 1978.

- Regulatory Guide 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposures as Low as Is Reasonably Achievable," 1975.

The licensee's performance in this area was based on:

- discussions with licensee personnel
- review of ALARA packages for a number of inspector selected radiation work permits.

Within the scope of the review, no violations were identified. Licensee personnel were adequately implementing the ALARA Program.

Within the scope of this review, the following recommendations for improvement were identified:

- establish procedural guidelines to compare actual task man-hours, man-rem, percent task completion to estimated man-hours, man-rem, and percent task completion in order to identify situations requiring additional ALARA reviews and/or corrective actions.

The licensee's ALARA Program will be reviewed during subsequent inspections.

11. Exit Interview

The inspector met with licensee personnel (denoted in section 1) at the conclusion of the inspection on July 27, 1984. The inspector summarized the purpose, scope and findings of the inspection. At no time during this inspection was written material provided to the licensee by the inspector.