

February 10, 2005

Mr. G. A. Kuehn, Jr.  
Vice President SNEC and  
Program Director SNEC Facility  
GPU Nuclear, Inc.  
Route 441 South  
P.O. Box 480  
Middletown, PA 17057-0480

SUBJECT: NRC INSPECTION REPORT NO. 50-146/2004-201

Dear Mr. Kuehn:

This refers to the inspection conducted on July 6-8, and October 4-6, 2004, at your Saxton Nuclear Experimental Facility and telephone conferences held on August 26, September 8, 9, and 28, and December 7 and 13, 2004. The inspection included a review of the Final Status Survey (FSS) report for the Penelec Line Shack, a confirmatory survey of the Line Shack, and the review of the site analytical laboratory.

The inspection included selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. The inspector determined that the FSS was conducted in accordance with the recommendations of the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) and requirements in the NRC-approved Saxton License Termination Plan (LTP), revision 3, dated February 2004. The FSS report demonstrated that the ten survey units that comprise the Penelec Line Shack met the release criteria specified in 10 CFR 20.1402. However, the NRC is not releasing these survey units for unrestricted use at this time.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/NRC/ADAMS/index.html>.

Should you have any questions concerning this inspection, please contact Mr. Thomas Dragoun at 610-337-5373.

Sincerely,

/RA/

Patrick M. Madden, Section Chief  
Research and Test Reactors Section  
New, Research and Test Reactors Program  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Docket No. 50-146  
License No. DPR-4

Enclosure: NRC Inspection Report No. 50-146/2004-201

cc: Please see next page

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Saxton Nuclear  
Experimental Corporation

Docket No. 50-146

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U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION

Docket No: 50-146

License No: DPR-4

Report No: 50-146/2004-201

Licensees: FirstEnergy Corporation, GPU Nuclear and  
Saxton Nuclear Experimental Corporation

Facility: Saxton Nuclear Experimental Facility

Location: Saxton, Pennsylvania

Dates: July - December, 2004

Inspector: Thomas F. Dragoun

Approved by: Patrick M. Madden, Section Chief  
Research and Test Reactors Section  
New, Research and Test Reactors Program (RNRP)  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

## EXECUTIVE SUMMARY

Saxton Nuclear Experimental Facility  
Report No: 50-146/2004-201

The focus of this inspection was the review of the licensee's Final Status Survey (FSS) of the Penelec Line Shack, a confirmatory survey of the Line Shack, review of the on-site analytical laboratory, status of the decommissioning program, resolution of elevated survey readings in the "north east dump" area of the site, post remediation isolation of previously released areas, and assessment of the impact on site activities from record flooding of the Juniata River during a hurricane.

The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

Staff from the Oak Ridge Institute of Science and Education under contract to NRC contributed to this inspection report.

### Line Shack Final Status Survey

- The Penelec Line Shack FSS, revision 1, dated August 2004 demonstrated that the facility satisfies the requirements in 10 CFR 20.1402 for unrestricted use.

### Analytical Laboratory Review

- The performance of the on-site analytical laboratory was satisfactory and analysis was conducted in accordance with the FSS.

### Decommissioning Program Status

- Safety reviews, post remediation isolation, and shipments of low level waste continue to be conducted in accordance with regulatory requirements and the license termination plan.

## REPORT DETAILS

### **Summary of Plant Status**

Staffing was downsized as the remediation efforts were completed. The primary activities underway were related to the investigation of elevated readings found during surface scans of soil. The temporary office/lunchroom trailers were relocated to allow for surveys. The Containment Vessel footprint was backfilled to near grade level. Hurricane related flooding of the Juniata River did not impact the contaminated soil areas where work was in progress.

### **1. Penelec Line Shack Final Status Survey**

#### **a. Inspection Scope (IP 69013)**

The inspector reviewed the following to ensure that the requirements of the License Termination Plan (LTP) were met for the Final Status Survey (FSS) of the Penelec Line Shack:

- Saxton Nuclear Experimental Corporation Facility License Termination Plan, revision 3, dated February 2004
- "Final Status Survey Report - Saxton Nuclear Experimental Corporation - Penelec Line Shack", revision 1, prepared by GPU Nuclear, Inc., dated August 2004
- Procedure No. E900-IMP-4520.04, "Survey Methodology to Support SNEC License Termination", revision 6, dated December 17, 2003
- Procedure No. E900-ADM-4500.44, "SNEC Facility Calculation", revision 3, dated April 14, 2004
- Procedure No. E900-ADM-4500.64, "Post Remediation Isolation", revision 2, dated September 30, 2003
- Procedure No. E900-IMP-4520.03, "Establishing a Reference Coordinate Grid System", revision 0, dated July 9, 1999
- Procedure No. E900-ADM-4500.59, "Final Status Survey Planning and DQA", revision 1, dated April 21, 2003
- Procedure No. E900-ADM-4500.60, "Final Status Survey Report", revision 0, dated March 12, 2003
- Procedure No. E900-ADM-4500.39, "Chain of Custody for Samples", revision 4, dated April 17, 2002
- Procedure No. E900-IMP-4520.05, "SNEC Site Calibration Check for the GFPC", revision 0, dated January 22, 2003
- Procedure No. E900-IMP-4520.06, "Survey Unit Inspection in Support of FSS Design", revision 0, dated January 29, 2003
- Procedure No. E900-QAP-4220.01, "Quality Assurance Program for Radiological Instruments", revision 4, dated July 30, 2001

- SNEC Calculation #E900-03-014, "Shonka Line Shack & Warehouse/Garage Pads FSS Survey Design" revision 0, dated July 21, 2003
- SNEC Calculation #E900-04-010, "Assessment of E900-03-014, - Shonka Line Shack & Warehouse /Garage Pads FSS Survey Design" revision 0, dated June 2004
- SNEC Calculation #E900-04-011, "Penelec Line Shack Attic Survey Design" revision 0, dated June 22, 2004
- NUREG-1575 "Multi-Agency Radiation Survey and Site Investigation Manual" revision 1, dated August 2000
- NUREG-1727 "NMSS Decommissioning Standard Review Plan" dated September 2000
- Federal Register/Vol. 63, November 18, 1998 (63 FR 64132), Nuclear Regulatory Commission, "Supplemental Information on the Implementation of the Final Rule on Radiological Criteria for License Termination"

b. Observations and Findings

The Penelec Line Shack was selected for a confirmatory survey because it is the only structure expected to be left intact after site decommissioning was completed. Additionally, the final status survey of 6 of the 10 survey units that make up the Line Shack was performed by a SNEC contractor (Shonka) using very large area probes and proprietary data acquisition and reduction techniques. This same equipment was used to survey class 2 and class 3 surface soil areas. Of the ten survey units for the building, one was MARSSIM class 3, the remainder were class 2. The building was not directly involved with site operations, the licensee presumed that any surface contamination was from wind-borne soil and sediment deposited on exterior and interior surfaces. Initial scans assumed the contaminant to be 100% Cs-137 but this was later revised to a four isotope mix based on characterization data. The derived concentration guideline level used for statistical tests ( $DCGL_w$ ) for each isotope was the default screening value published by the NRC for building surfaces and adjusted downward by licensee conservatism. The gross activity  $DCGL$  used to evaluate survey data was calculated using the MARSSIM technique. The survey Data Quality Objectives, statistical test, decision error values, Lower Boundary of the Grey Region, relative shift and area factors were adopted from the NRC Draft Regulatory Guide DG-4006 "Demonstrating Compliance with the Radiological Criteria for License Termination." Since the survey units were class 2 and 3, surface scans were performed. The line shack attic FSS was completed by SNEC technicians and both scan and static measurements were taken. For these, the COMPASS computer program calculated the number of static survey points. The Visual Sampling Plan (VSP), revision 2, computer program generated random survey point locations. All measurements were less than the assigned  $DCGL_w$ . No statistical analysis of the data was necessary. The inspector determined that the FSS report format, data presentation, and analysis satisfied the requirements specified by LTP section 5.7.2, licensee procedure E900-ADM-4500.60 revision 0, and recommendations in NUREG 1727 section 14.5 and MARSSIM section 8.6.

A confirmatory survey was performed on July 7-8, 2004, and consisted of an 100% scan of accessible floor and wall surfaces, 30 static readings, and 30 smears at the static locations. No measurements exceeded the  $DCGL_w$ . The radiological conditions of the Penelec Line Shack met the approved site-specific release criteria.



c. Conclusions

The Penelec Line Shack Final Status Survey, revision 1, dated August 2004, demonstrated that the facility satisfies the requirements in 10 CFR 20.1402 for unrestricted use.

**2. Analytical Laboratory Performance**

a. Inspection Scope (IP 69013 )

The accuracy and reproducibility of analysis performed by the on-site radiological laboratory was reviewed by in-process inspection and duplicate sample analysis. The inspector review including the following:

- Procedure E900-OPS-4524.33 "Operation of the SNEC Gamma Spectroscopy System" revision 3, dated February 25, 2004
- Procedure E900-OPS-4524.46 "Operation of the Packard Tri-Carb 2550 TR/AB Liquid Scintillation Analyzer" revision 2, dated May 20, 2002
- Procedure E900-IMP-4520.02 "Preparation of Sample Materials for Analysis" revision 5, dated June 16, 2003
- Procedure E900-OPS-4524.43 "Operation of the Portable Gamma Spectroscopy System" revision 0, dated May 23, 2001
- Procedure E900-QAP-4220.02 "SNEC Count Room Quality Assurance Program" revision 3, dated February 6, 2002
- Procedure E900-ADM-4500.39 "Chain of Custody for Samples" revision 6, dated October 1, 2003
- Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment" revision 1, dated February 1979

b. Observations and Findings

The review of the on-site laboratory program included duplicate analysis of 10 soil samples by NRC. There was good agreement of the analytical results between NRC and the licensee's lab. Records indicated that SNEC participates in the Department of Energy (DOE) interlaboratory comparison program "Mixed Analyte Performance Evaluation Program (MAPEP)" with results that consistently fell within the acceptance band. No technical deficiencies were identified.

The inspector noted that site procedures generally followed typical industry practices but recommended editorial changes and technical changes regarding data reporting and quality control based on current DOE practices. SNEC management indicated that the editorial changes will be incorporated during the next routine update of the procedures. Recommendations regarding laboratory quality control will be run in parallel with the current practices and be evaluated by management. The existing SNEC quality control program was based on Regulatory Guide 4.15 as described in the LTP and was properly implemented. A final recommendation regarding the DOE format for reporting data will

not be adopted due to the short time remaining for project completion and the possibility for confusion. SNEC management stated that data reporting has been consistent with RG 4.15 since the beginning of the project and the benefits of this consistency will remain unchanged.

c. Conclusions

The performance of the on-site analytical laboratory was satisfactory and analysis was conducted in accordance with the FSS Program.

**3. Decommissioning Program Status**

a. Inspection Scope (IP 69013 )

The implementation of requirements in the LTP, FSS, 10 CFR 50.59 and 10 CFR 50.82 and remediation of elevated soil hot spots was determined through a review of:

- Saxton letter dated March 18, 2004, Attachment 1, "Biennial 10 CFR 50.59 Report"
- Station Work Instruction SWI-03-001, "Removal of DSF/MHB Tunnel & External CV Shell Penetrations" and "Removal of CV/DSB Ventilation System" revision 0, dated April 17, 2003
- Station Work Instruction SWI-03-002, "CV Shell Removal" revision 0, dated October 28, 2003
- Procedure E900-ADM-4500.54, "Post Remediation Isolation" revision 2, dated September 30, 2003
- Procedure E900-OPS-4524.43, "Operation of the Portable Gamma Spectroscopy System" revision 0, dated May 23, 2001
- SNEC Calculation E900-04-022, "Soil Shipment No. SX-04-015, 016 & 017 - Curie Calculation" dated October 4, 2004
- Shipment manifests number T044062, T044058, and T044060 dated October 6, 2004

b. Observations and Findings

The regulations in 10 CFR 50.59 and 10 CFR 50.82 permit the licensee to conduct remediation and decommissioning activities that are found to satisfy safety criteria specified in these regulations. The inspector reviewed the records and determined that the licensee performed the reviews and maintained the records as required. The Radiation Safety Officer (RSO) stated that it was unlikely that more safety evaluations will be needed at this time except for possible "screening" of certain procedure changes.

Licensee records indicated that 37 survey units were currently controlled under Post Remediation Isolation (PRI) requirements. The purpose of the PRI requirements were to help ensure that survey units that were found to meet the requirements for unrestricted use did not become cross-contaminated by ongoing work in surrounding survey units. The inspector reviewed the results of 5 monthly inspections conducted

between May and September 2004 and concluded that the procedural requirements for routine checks were met. The inspector toured the PRI areas and observed that the unique posting and marking requirements were satisfactory. No intrusions into any PRI area was observed.

In late September 2004, hurricane Jeanne caused massive flooding in the area. The inspector toured the licensee-owned area adjacent to the Juniata River with the RSO and observed mud and debris deposits at about 12 feet above ground level on trees still standing. Severe soil erosion caused a shift in the river bed. Interviews with site personnel indicated that the site areas that were submerged during the storm involved survey units that had completed the FSS and were in PRI status, e.g., the intake and discharge tunnels. Soil areas where remediation was still active were not affected, such as the northeast dump, due to their higher elevation locations. Significant damage to electrical equipment, including all of the analytical laboratory apparatus and computers, was caused by a massive electric system surge during the storm. The licensee was using the portable intrinsic germanium detector to support soil analysis because it was not plugged in and survived the storm. Efforts were underway to repair or replace the laboratory equipment. The inspector noted that the licensee was developing interim procedures to allow work to continue while equipment repairs were completed.

The inspector observed a waste shipment of 21 packages (B-25 reusable box) of LSA soil and debris loaded on 3 flatbed trailers destined for the waste broker (Duratek). The sum total of all radioactivity in the shipment was 0.598 millicurie cesium-137 and 0.0072 millicurie cobalt-60. This is a very low level. The curie content calculation, radiation survey of the trucks, completed Form 540 required by 10 CFR Part 20 Appendix G, and manifest were reviewed and determined to be satisfactory. The inspector noted that some of the completed forms were not required since the waste was not destined for direct burial.

The inspector and the RSO toured the northeast dump area where remediation was in progress. The RSO stated that some contaminated objects were dug up during the followup activities related to elevated readings recorded during surface scans. The pattern of elevated hot spots appeared to be related to the location of "roads" that existed during plant operations. Another pattern indicated that the contaminated objects were all in the same "layer" of the overburden. This information was used to re-classify and resurvey the area. The inspector concluded that the licensee response to the elevated readings was satisfactory.

c. Conclusions

Safety reviews, post remediation isolation, and shipments of low level waste continue to be conducted in accordance with regulatory requirements and the license termination plan.

**4. Exit Interview**

The on-site portion of the inspection scope and results were summarized on July 9 and October 6, 2004, and telephone conferences were held on December 7 and 13, 2004, with members of licensee management. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee.



## PARTIAL LIST OF PERSONS CONTACTED

### Licensee

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### NRC Contractor

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T. D. Herrera, Health Physics Technician  
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## INSPECTION PROCEDURES USED

IP 69013                      Research and Test Reactor Decommissioning

## ITEMS OPENED, CLOSED, AND DISCUSSED

Opened: None

Closed: None

## LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
DCGL	Derived Concentration Guideline
FSS	Final Status Survey
GPU	General Public Utilities
LSA	Low specific activity
LTP	License Termination Plan
ORISE	Oak Ridge Institute of Science and Education
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
NRC	Nuclear Regulatory Commission
SNEC	Saxton Nuclear Experimental Corporation

## REFERENCES

Letter from T. J. Bauer, ORISE, to T. F. Dragoun, USNRC, "Subject: Final Report - Confirmatory Survey of the Penelec Line Shack, Saxton Nuclear Experimental Corporation, Saxton, Pennsylvania (Docket No. 50-146; Task 1)" dated October 7, 2004 (ADAMS accession number ML050320279)

Letter, T.J. Bauer, ORISE to T.F. Dragoun NRC, "Subject: Final Site - Specific Decommissioning Inspection Report No.3 for the Saxton Nuclear Experimental Corporation, Saxton, Pennsylvania (Docket No. 50-146; Task 1) (ADAMS accession number ML050320270)