ORISE
OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

June 30, 2004

Mr. Thomas Dragoun
NRR/DRIP
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

SUBJECT: FINAL CONFIRMATORY SURVEY PLAN FOR THE PENELEC LINE SHACK BUILDING, SAXTON NUCLEAR EXPERIMENTAL CORPORATION, SAXTON, PENNSYLVANIA (DOCKET NO. 50-146; TASK 1)

Dear Mr. Dragoun:

Enclosed is the final confirmatory survey plan for the subject area at the Saxton Nuclear Experimental Corporation, Saxton, Pennsylvania. Your comments from our telephone conversation today were incorporated into the final plan. Confirmatory survey activities are scheduled to begin July 6, 2004.

If you have any questions, please direct them to me at (865) 576-3356 or Timothy J. Vitkus at (865) 576-5073.

Sincerely,

Timothy J. Bauer
Health Physicist
Environmental Survey and
Site Assessment Program

TJB:ar

Enclosure

cc: A. Adams, NRC/NRR/OWFN 12G13
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File/0968

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Distribution approval and concurrence:	Initials	Date
Technical Management Team Member	TJV	6/30/2004

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CONFIRMATORY SURVEY PLAN
FOR THE PENELEC LINE SHACK BUILDING
SAXTON NUCLEAR EXPERIMENTAL CORPORATION
SAXTON, PENNSYLVANIA

INTRODUCTION AND SITE HISTORY

The Saxton Nuclear Experimental Corporation (SNEC) facility, built from 1960 to 1962, was licensed to operate a 23.5-megawatt thermal (MWTh) power pressurized water reactor (PWR). Initial criticality was reached on April 13, 1962 and the facility was shutdown on May 1, 1972 after three fuel cycles were completed for a total of 1,005 effective full power days. At shutdown, the facility was placed into a state similar to the now defined U.S. Nuclear Regulatory Commission (NRC) "SAFSTOR" status. The reactor fuel was removed in 1972 and sent to the Atomic Energy Commission's, predecessor to the U.S. Department of Energy (DOE), facility in Savannah River, South Carolina. After the fuel was removed, equipment, tanks, and piping outside of the containment vessel (CV) were removed. From 1972 through 1974, buildings and structures that supported reactor operation were partially decontaminated. The SNEC facility has been maintained in a monitored condition since reactor shutdown.

The GPU Nuclear, Inc. (GPU), a subsidiary of FirstEnergy Corporation, was formed in 1980, and became co-licensees with SNEC for the SNEC facility. GPU is currently decommissioning the SNEC facility on behalf of the site owner, SNEC. A variety of decommissioning activities have been performed at the SNEC site since 1980, which included but not limited to the survey and demolitions of reactor support buildings and structures in 1992, the SNEC Soil Remediation Project completed in 1994, and the SNEC Large Component Remove Project completed in 1998. Most of the decommissioning focus since 1998 has been on the removal of support systems and interior CV concrete.

The Penelec Line Shack, Penelec Garage, Penelec Warehouse, and Penelec Switchyard Building are buildings located on property adjoining the SNEC facility property. While these structures were not directly associated with SNEC facility operation, SNEC used these buildings for

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storage, staging, and other such activities. A comprehensive final release survey of these buildings was performed from October 1988 to June 1989; however, since the time of the survey, decommissioning activities may have impacted these areas. All of the buildings except for the Penelec Line Shack will be demolished, leaving it as the only structure remaining above ground on the SNEC site after the release of the site for public use. GPU used the guidance provided in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (NRC 2001) to plan and perform the final status survey (FSS) of the Penelec Line Shack building (GPU 2004a).

The NRC's Headquarters Office of Nuclear Reactor Regulation (NRR) has requested that the Oak Ridge Institute for Science and Education's (ORISE), Environmental Survey and Site Assessment Program (ESSAP) perform confirmatory surveys of the Penelec Line Shack building.

SITE DESCRIPTION

The SNEC facility is located at 165 Power Plant Road in Saxton, Pennsylvania. The only SNEC buildings remaining on the site are the CV and the Penelec Line Shack building. All other remaining structures are temporary buildings used for decommissioning support activities. The upper portion of the CV, below ground level, will be removed and the area returned to a green pasture condition. The Penelec Line Shack building interior and exterior surfaces have been divided into 15 survey units with a total area of approximately 1,750 square meters.

OBJECTIVES

The objectives of the confirmatory survey are to provide independent contractor field data reviews and to generate independent radiological data for use by the NRC in evaluating the adequacy and accuracy of the licensee's procedures and final status survey (FSS) results.

RESPONSIBILITY

Work described in this survey plan will be performed under the direction of Eric Abelquist, Program Director; Tim Vitkus, Survey Projects Manager; and, Timothy J. Bauer, Project Leader, with ESSAP. The cognizant site supervisor has the authority to make appropriate changes to the survey procedures as deemed necessary. After consultation with the NRC site representative, the

scope of the survey may be altered based on findings as the survey progresses, and additional information provided by the licensee.

DOCUMENT REVIEW

ESSAP will review the licensee's final radiological survey data for adequacy and appropriateness taking into account the license termination plan (LTP, GPU 2004a) and MARSSIM considerations (NRC 2001).

PROCEDURES

Survey activities will be conducted in accordance with the ORISE/ESSAP Survey Procedures and Quality Assurance Manuals (ORISE 2003 and 2004a). Specific procedures applicable to this survey are listed on pages 6 and 7 of this survey plan. Deviations to the survey plan or procedures will be documented in the site logbook.

HEALTH AND SAFETY

A walkdown of the project area will be performed in order to evaluate the area for potential health and safety issues. Additionally, the proposed survey and sampling procedures are evaluated to ensure that any hazards inherent to the procedures themselves are addressed in current job hazard analyses (JHAs). The procedures entail minimal potential hazards that are addressed in current ESSAP JHAs. Personnel will also adhere to the SNEC health and safety requirements. Confirmatory activities are expected to be conducted in areas that do not require radiation work permits or special dosimetric considerations.

REFERENCE SYSTEM

Measurements and sampling locations will be referenced to the existing SNEC grid system.

SURFACE SCANS

Building scans will be conducted on up to 100 percent of the accessible interior and exterior surfaces in of the Penelec Line Shack building for gamma and beta radiation using NaI scintillation, gas proportional, and/or GM detectors. Additional area scans may be performed,

depending on findings as the survey progresses and project time constraints. Particular attention will be given to cracks and joints in the surfaces, exposed concrete surfaces, and other locations where material may have accumulated. All detectors will be coupled to ratemeters or ratemeter-scalers with audible indicators. Locations of elevated direct radiation will be marked for further investigation.

SURFACE ACTIVITY MEASUREMENTS

Construction material-specific background measurements will be collected as necessary from a non-impacted area of the site for correcting gross activity measurements performed on structural survey units. Direct measurements on Penelec Line Shack building interior and exterior surfaces for total beta activity will be performed at any locations of residual contamination identified by surface scans that exhibit radiation levels potentially above acceptable unrestricted release limits established for the site. The number of measurements performed will depend on findings as the survey progresses. Measurement locations will correspond to licensee locations for direct data comparison and/or the location(s) of maximum activity detected during scans. Measurements will be made using gas proportional or GM detectors, coupled to portable ratemeter-scalers. Smear samples, for determining removable activity levels, will be collected from each direct measurement location.

MISCELLANEOUS MATERIAL SAMPLING

At the discretion of the NRC site representative, samples of miscellaneous material such as concrete, paint, sediment, drain, and dust residues may be collected from random locations that are not accessible for direct survey or from locations of elevated direct radiation detected by surface scans.

SAMPLE ANALYSIS AND DATA INTERPRETATION

Samples and data will be returned to ORISE's ESSAP laboratory in Oak Ridge, Tennessee for analysis and interpretation. Samples will be analyzed in accordance with the ESSAP Laboratory Procedures Manual (ORISE 2004b). Smears will be analyzed for gross alpha and gross beta activity using a low background gas proportional counter. Smear data and direct measurements

for surface activity will be converted to units of disintegrations per minute per 100 square centimeters (dpm/100 cm^2). Miscellaneous samples will be analyzed by gamma spectroscopy for gamma-emitting fission and activation products and results reported in units of picocuries per gram (pCi/g). Results will be presented in a report and provided to the NRC.

GUIDELINES

The primary contaminants of concern for the SNEC facility are beta-gamma emitters—fission and activation products—resulting from reactor operation. SNEC elected to use the NRC default screening derived concentration guideline levels (DCGLs) as discussed in Section 5 of the LTP (GPU 2004a) for all identified surface contaminants. SNEC Calculation E900-04-010 provided in the final survey report (GPU 2004b) presents the gross activity DCGL calculation based on the following contaminant mixture: 0.443% Co-60, 59.515% Cs-137, 39.500% H-3, and 0.542% Sr-90. For final status survey measurements, SNEC multiplied the gross activity DCGL, calculated to be 44,434 dpm/100 cm^2 representing all contaminants of concern, by the Cs-137 fraction, 59.515%, and then applied the LTP specified 75% administrative limit. This resulted in a Cs-137 $DCGL_W$ for surface activity measurements of 19,834 dpm/100 cm^2. Surface activity measurement instrumentation was then calibrated to Cs-137. For any elevated areas of contamination identified during the confirmatory survey, surface activity results will be compared to a $DCGL_{EMC}$ calculated using the Co-60 area factors presented in Appendix 5-1 of the LTP. Co-60 area factors were chosen for the mixture to be conservative. Also, the maximum area factor will be capped at 10.1 corresponding to a 1 m^2 area (GPU 2004b).

TENTATIVE SCHEDULE

Field Measurements	July 6 through 8, 2004
Sample Analysis	July 2004
Draft Report	August 2004

LIST OF CURRENT PROCEDURES

Applicable procedures from the ORISE ESSAP Survey Procedures Manual (November 2003) include:

Section 4.0 Quality Assurance and Quality Control

Section 5.0 Instrument Calibration and Operational Check-Out
- 5.1 General Information
- 5.2 Electronic Calibration of Ratemeters
- 5.3 Gamma Scintillation Detector Check-Out and Cross-Calibration
- 5.5 GM Detector Calibration and Check-Out
- 5.6 Proportional Detector Calibration and Check-Out
- 5.11 Floor Monitor Check-Out

Section 6.0 Site Preparation
- 6.2 Reference Grid System

Section 7.0 Scanning and Measurement Techniques
- 7.1 Surface Scanning
- 7.4 Beta Radiation Measurement

Section 8.0 Sampling Procedure
- 8.7 Determination of Removable Activity
- 8.8 Miscellaneous Sampling
- 8.15 Sample Identification and Labeling
- 8.16 Sample Chain-of-Custody

Section 9.0 Integrated Survey Procedures
- 9.1 Background Measurements and Sampling
- 9.2 General Survey Approaches and Strategies

Section 10.0 Health and Safety Control of Cross Contamination

Applicable procedures from the ORISE/ESSAP Quality Assurance Manual (January 2004) include:

Section 3	Training and Certification
Section 4	Instrument Quality Control
Section 5	Sample Chain-of-Custody
Section 6	Analytical Quality Control
Section 7	Data Quality Control
Section 11	Critical Record Handling and Storage

REFERENCES

Oak Ridge Institute for Science and Education (ORISE). Survey Procedures Manual for the Environmental Survey and Site Assessment Program. Oak Ridge, Tennessee; November 2003.

Oak Ridge Institute for Science and Education. Quality Assurance Manual for the Environmental Survey and Site Assessment Program. Oak Ridge, Tennessee; January 2004a.

Oak Ridge Institute for Science and Education. Laboratory Procedures Manual for the Environmental Survey and Site Assessment Program. Oak Ridge, Tennessee; March 2004b.

GPU Nuclear, Inc. (GPU). Saxton Nuclear Experimental Corporation Facility License Termination Plan. Saxton, Pennsylvania; Revision 3, February 2004a.

GPU Nuclear, Inc. Final Status Survey Report Saxton Nuclear Experimental Corporation Penelec Line Shack. Saxton, Pennsylvania; June 2004b.

U.S. Nuclear Regulatory Commission (NRC). Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). Washington, DC; NUREG-1575; Revision 1, June 2001.