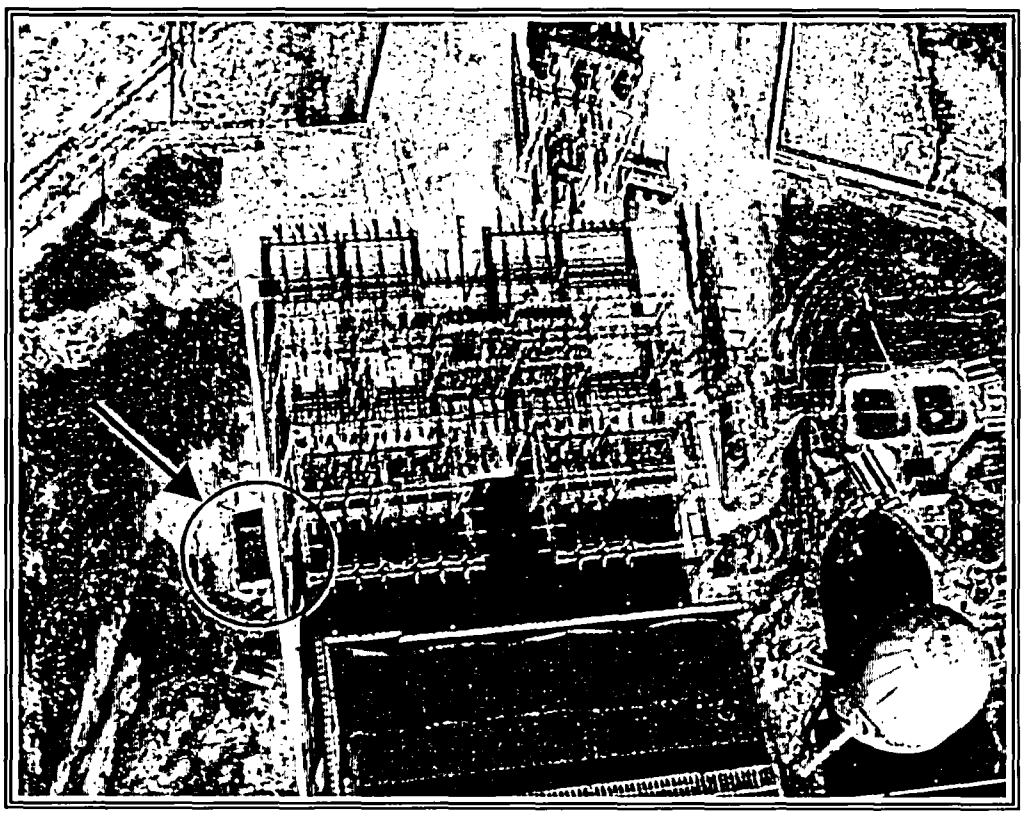
Final Status Survey Report
For
Saxton Nuclear Experimental Corporation
PENELEC Switch Yard Control Building



Old Photo of PENELEC Switch Yard Area Showing Location of Control Building

Prepared by GPU Nuclear, Inc.

July 2005

Final Status Survey – PENELEC Switch Yard Control Building

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Final Status Survey – PENELEC Switch Yard Control Building

Executive Summary

This report presents the results and conclusions of the Final Status Survey (FSS) conducted by GPU Nuclear, Inc. within/on the PENELEC Switch Yard Control Building (PSYCB) (El. 811'). This facility is located along the western fence line of the Switch Yard (SY), adjacent to the Switch Yard substation. This FSS report provides applicable summary results from surface measurements of the facilities structural components. The work associated with this FSS was performed in accordance with the SNEC License Termination Plan (LTP) (**Reference 9.1**), and was performed between March of 2005 and June 2005. The approximate location of the PENELEC Switch Yard Control Building (PSYCB) is shown in **Figure 2**.

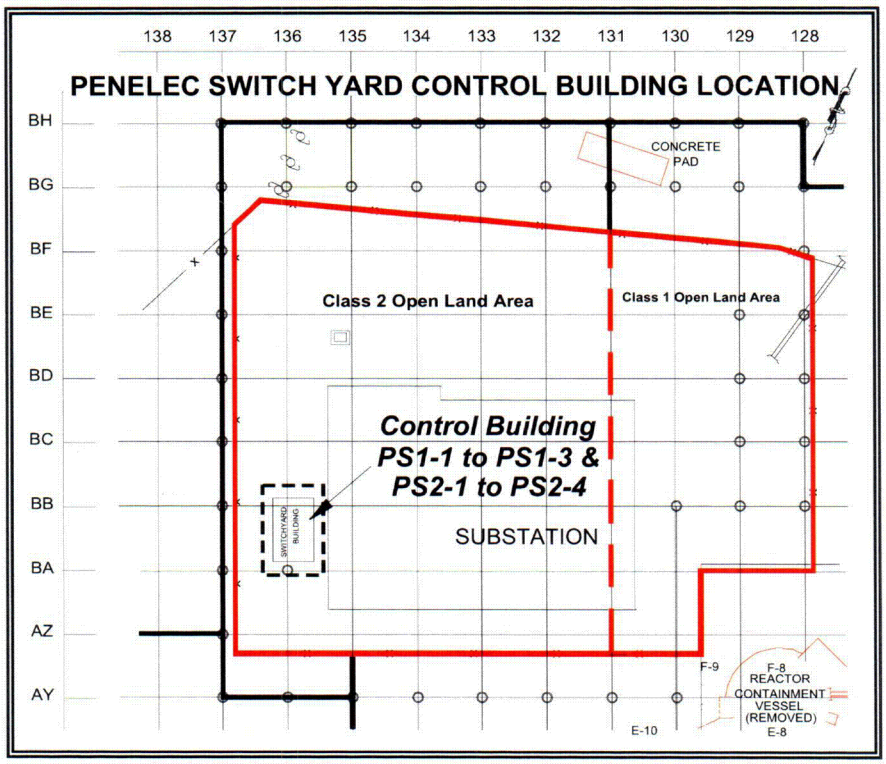

Figure 2, SNEC site map section showing the PENELEC Switch Yard Control Building with current survey unit designations.

The original area Classification map found in the SNEC LTP (**Reference 9.1**), listed the Switch Yard Control Building as being part of area OL8. A re-evaluation of the area Classification placed the Switch Yard Control Building in the OL12 area. The survey design defined more appropriate survey unit names for the Switch Yard Control Building. None of these changes lowered previous survey area Classifications as stated in **Reference 9.1**, **Table 5-2**).

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Structures of the Switch Yard Control Building that have been identified for survey work are shown in **Figure 3**. The Switch Yard Control Building is listed as a Class 3 structure. Because of personnel safety concerns, a portion of the roof was restricted from scanning activities, and personnel were not permitted any closer than twelve (12) inches from switching equipment in the interior of the building. For reasons discussed later in this report, this structure has been surveyed in accordance with Class 2 survey criteria.

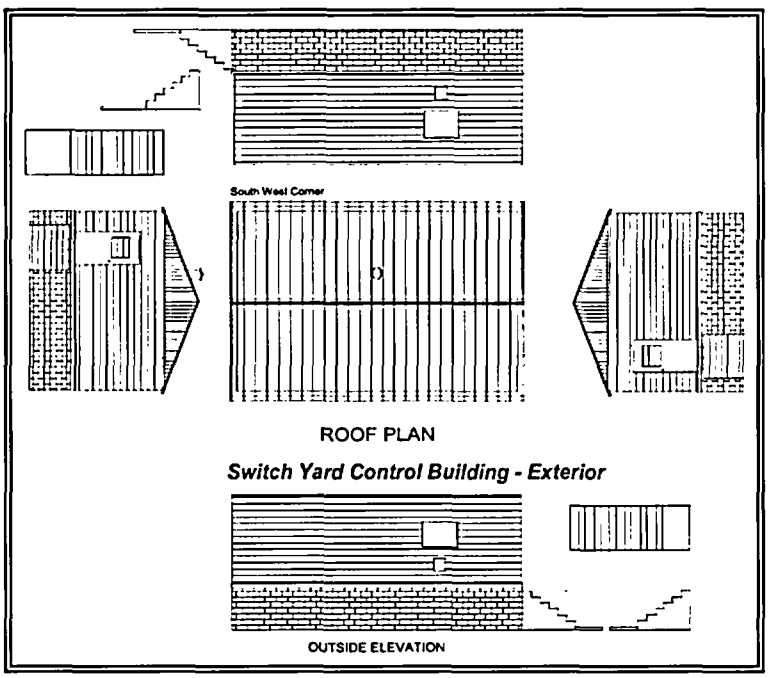

Figure 3, Exterior of PENELEC Switch Yard Control Building.

The PSYCB structure has been divided into the individual survey units listed below:

Interior

- PS1-1 – Painted concrete floor surfaces (~45 m^2)
- PS1-2 – Painted steel surfaces (deck plate and doors) (~19 m^2)
- PS1-3 – Aluminum siding and ceiling materials (walls & ceiling) (~131 m^2)

Exterior

- PS2-1 – Concrete block walls (~41 m^2)
- PS2-2 – Unpainted concrete (base walls, side walk and steps) (~24 m^2)
- PS2-3 - Unpainted steel sheet metal (roofing materials) (~68 m^2)
- PS2-4 – Aluminum siding (upper walls) (~63 m^2)

Final Status Survey – PENELEC Switch Yard Control Building

The PENELEC Switch Yard Substation is an active power handling facility. It contains energized electrical equipment and high voltage transport systems capable of delivering lethal electrical discharges well over 100,000 volts. Consequently, a limited survey approach is applied in this hazardous environment.

The PENELEC Switch Yard Control Building (PSYCB) survey data was collected from each survey unit according to data collection requirements specified in the FSS design criteria. The following types of measurements were performed on external and internal structures of the PENELEC Switch Yard Control Building:

1. Gas Flow Proportional Counter (GFPC) scan measurements were performed on approximately 65.5 m^2 of PSYCB surface area (interior and exterior combined). The total surface area of this building is about 391 m^2 and includes all the materials listed in the survey design (**Appendix A-1**). Therefore, greater than 10% of the PSYCB surface area has been scanned which is in accordance with **Reference 9.1**, **Table 5-5** (for a Class 2 or 3 survey area).

2. Seventy-seven (77) static GFPC measurements were performed in all PSYCB survey units (interior and exterior combined not including repeat and QC measurements). All measurements were performed using a random start systematically spaced triangular grid system in accordance with Class 2 survey criteria, which reduced the possibility of re-classifying and consequently re-surveying a hazardous area.

The mean gross activity concentration was less than the applicable DCGLw in each respective survey unit. No alarm points were exceeded, and therefore no areas required investigation as required by the SNEC LTP (**Reference 9.1**) This collection of FSS data demonstrate that each survey unit meets the radiological criteria for unrestricted use specified in 10 CFR 20.1402 (**Reference 9.2**).

Based on the results of this final status survey effort, GPU Nuclear, Inc. concludes that the PENELEC Switch Yard Control Building meets the NRC requirements for release to unrestricted use.

1.0 Purpose and Scope

This report presents the results and conclusions of the final status survey performed on the following PSYCB structures:

Interior

- PS1-1 – Painted concrete floor surfaces (~45 m^2)
- PS1-2 – Painted steel surfaces (deck plate and doors) (~19 m^2)
- PS1-3 – Aluminum siding and ceiling materials (walls & ceiling) (~131 m^2)

Exterior

- PS2-1 – Concrete block walls (~41 m^2)
- PS2-2 – Unpainted concrete (base walls, side walk and steps) (~24 m^2)
- PS2-3 - Unpainted steel sheet metal (roofing materials) (~68 m^2)
- PS2-4 – Aluminum siding (upper walls) (~63 m^2)

These surveys provide the information required by 10 CFR 50.82(a)(11) (**Reference 9.3**) and the SNEC License Termination Plan (LTP), and demonstrate that these areas meet the radiological criteria for unrestricted use specified in 10 CFR 20.1402.

2.0 Survey Area Description

2.1 Overview of the PSYCB

The PENELEC Switch Yard Control Building (PSYCB) is contained within the area formed by site grid markers BA-137 and BB-137 on the west, and BA-136 and BB-136 on the east (see **Figure 2** and **Reference 9.4**). This area is adjacent to an active electrical distribution facility (substation), and plays an important roll in the control of substation activities. Consequently a clear set of safety rules and conditions were in affect during all survey activities in and around the PSYCB facility.

The PSYCB facility has been re-modeled at some point in its history and appears to be the newer of the two remaining buildings on the PENELEC site. This is important in that newer building materials can impact the selection of representative background materials. The roof of the PSYCB facility is high enough to place survey personnel uncomfortably close to overhead power handling equipment in the substation area. The yard area around the building was surveyed under other survey design criteria and will not be discussed in this report.

In the interior of the facility, a series of batteries line the west wall. These units are tied in to the operation of the substation control system. Control instrumentation located in metal cabinets near the center of the facility, cover a significant portion of the floor space. Cabling connecting PSYCB controls to control systems in the substation exit the building through a cable chase built into the floor of the facility. Survey work in this building required surveyor discretion when approaching these active power control systems.

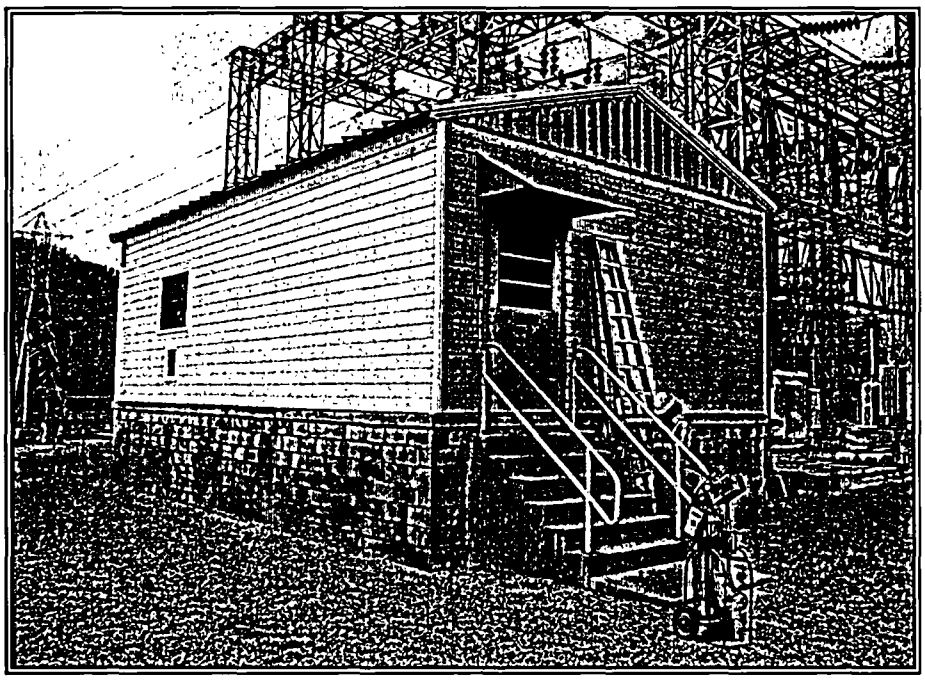

Figure 4, Southwest corner of PENELEC Switch Yard Control Building.

3.0 Operating History

3.1 PENELEC Switch Yard and Control Building

The Switch Yard Control Building and substation area were built at about the same time as the coal fired Saxton Steam Generating Station (SSGS). The facility has been physically modified since the time it supported only the operation of the SSGS facility. Switch Yard facilities are currently used to regulate and supply electricity to customers in western Bedford County and part of Huntington County.

3.1.1 PENELEC Switch Yard Control Building Remediation Status

While remediation has been applied in the Class 1 open land area of the Switch Yard, no remediation has been performed in the western Class 2 area, nor in/on the PSYCB facility.

3.2 SNEC Facility Plant Operations

The Saxton Nuclear Experimental Corporation (SNEC) facility included a pressurized water reactor (PWR), which was licensed to operate at 23.5 megawatts thermal (23.5 MWth). The reactor, containment vessel and support buildings have all been removed from the site. The facility is owned by the Saxton Nuclear Experimental Corporation and is licensed by GPU Nuclear, Inc. The SNEC facility is maintained under a Title 10 Part 50 license and associated Technical Specifications. In 1972, the license was amended to possess but not operate the SNEC reactor.

The facility was build from 1960 to 1962 and operated from 1962 to 1972 primarily as a research and training reactor. After shutdown in 1972, the facility was placed in a condition equivalent to the current SAFSTOR status. Since then, it has been maintained in a monitored condition. The fuel was removed in 1972 and shipped to a (now DOE) facility at Savannah River, South Carolina, who is now the owner of the fuel. As a result of this, neither SNEC nor GPU Nuclear, Inc. has any further responsibility for the spent fuel from the SNEC facility. The building and structures that supported reactor operation were partially decontaminated by 1974.

In the late 1980's and through the 1990's, additional decontamination and disassembly of the containment vessel, support buildings and large and small component and equipment removal was completed. Final decontamination and dismantlement of the reactor support structures and buildings was finished by 1992. Large component structures, pressurizer, steam generator, and reactor vessel were removed in late 1998. Containment vessel removal (to below grade) and backfill was completed in late 2003. Currently, decontamination, disassembly and demolition of the SNEC facility buildings and equipment has been completed and the facility is in the process of performing the Final Status Survey for unrestricted release and license termination.

4.0 Site Release Criteria

The site release criteria as applied to the PENELEC Switch Yard area including the PSYCB, corresponds to the radiological dose criteria for unrestricted use per 10 CFR 20.1402. The dose criteria is met "if the residual radioactivity that is distinguishable from background radiation results in a Total Effective Dose Equivalent (TEDE) to an average member of the critical group that does not exceed 25 mrem/yr, including that from

groundwater sources of drinking water, and that the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA)."

Levels of residual radioactivity that correspond to the allowable dose to meet the site or survey unit release criteria were derived by analyses using either the building occupancy (surface area) or resident farmer (volumetric) scenarios. The dose modeling for these scenarios is explained in Chapter 6 of the SNEC LTP (**Reference 9.1**). The derived concentration guideline levels (DCGLs) determined in the LTP form the basis for satisfying the site release criteria.

As described in Chapter 6 of the SNEC LTP (**Reference 9.1**), a correction to the gross activity DCGLw is made to address de-listed radionuclides and provide a reasonable SNEC established safety factor. The SNEC facility has instituted an administrative limit of 75% for the allowable dose (DCGLw) for all measurement results. Thus the de-listed radionuclide dose is accounted for by using the 75% administrative limit.

4.1 PENELEC Switch Yard Control Building DCGLw Values

The PENELEC Switch Yard is adjacent to site areas OL1 and OL2 (on the east). Since remediation efforts in the Class 1 area of the Switch Yard (PS4-1) are thought to have resulted from contamination spread from the OL1 and OL2 areas, the sample listing from OL1/OL2 has been used to represent the PENELEC Switch Yard area. The resulting DCGLw values are provided in **Table 1** (from **Reference 9.5, Attachment 2-1 to 2-8**). Since the PSYCB facility is composed of structural surfaces a gross activity DCGLw value is listed for this facility.

Table 1, PENELEC SWITCH YARD CONTROL BUILDING DCGLw VALUES

Gross Activity DCGLw (dpm/100 cm^2)
44,317 (33,238 A.L.) (mix is 60 % Cs-137)

Note: A.L. is the SNEC administrative limit.

5.0 Final Status Survey Design/DQO Process

The Data Quality Objectives (DQO) process is a series of planning steps based on the scientific method for establishing criteria for data quality and developing survey designs. The level of effort associated with planning is based on the complexity of the survey. Large, complicated sites generally receive a significant amount of effort during the

planning phase, while smaller sites may not require as much planning effort. Planning radiological surveys using the DQO Process can improve the survey effectiveness and efficiency, and thereby the defensibility of decisions. The use of the DQO Process assures that the type, quantity, and quality of environmental data used in decision making will be appropriate for the intended application. It provides systematic procedures for defining the criteria that the survey design should satisfy, including when and where to perform measurements, the level of decision errors for the survey, and how many measurements to perform.

SNEC facility Survey Designs (SD's) (**Appendix A-1**) are developed in accordance with applicable sections of the SNEC License Termination Plan (LTP) (**Reference 9.1**), and applicable site procedures (e.g., **Reference 9.6**). During development, characterization activities were reviewed along with any post-remediation survey or sampling activities (as applicable). Survey unit variability was established from the best available or most representative measurement and/or sampling data. The Compass computer program (**Reference 9.7**) was then used to develop MDCscan parameters (for structural surfaces), the number of survey or sampling points in each survey unit, and other DQO design parameters. For open land areas, methodology from NUREG-1507 (**Reference 9.8**) is used to calculate MDCscan values that are then input to the Compass computer program. The Visual Sample Plan (VSP) (**Reference 9.9**) computer code is then used to place sample points on structural diagrams. Additional points are typically added at this planning stage to compensate for possible field losses. For structural surfaces, representative background values were extracted from previous measurements of non-impacted like-materials of similar age whenever possible.

The following tables provide the DQO parameters used in the survey designs for the PENNELEC Switch Yard Control Building. **Table 2** provides the DQO parameters for the interior of the PSYCB facility.

Table 2, DQO/Design Parameters/Results – PSYCB Interior

Survey Unit	PS1-1	PS1-2	PS1-3
Survey Design Calculation. No.	E900-05-004		
SNEC Survey Request No.	SR-195 (Interior)		
Survey Area Classification	Class 3		
Total Estimated Area in Survey Unit (m^2)	~ 45.3	~ 19	~ 130.6
Material Type	Painted Concrete	Painted Steel	Aluminum
Scanning Goal (m^2)	9.9 (22%)	~ 7.8 (41%)	15 (11.5%)
Actual Area Scanned (m^2)	9.9 (22%)	~11.9 (63%)	15 (11.5%)
Applicable Statistical Test	WRS		
Type I Decision Error (α)	0.05		
Type II Decision Error (β)	0.10		
Gross Activity DCGLw (dpm/100 cm^2)*	44,317 (33,238 A.L.)		
Gross Activity DCGLw (cpm)	4,607 (A.L.)	4,607 (A.L.)	5,863 (A.L.)
LBGR (cpm)	4,510 (A.L.)	4,560 (A.L.)	5,760 (A.L.)
Estimated σ (cpm)	34.5	17.8	36.8
Actual σ From Survey Unit (cpm)	18.6	33.7	32.4
Δ/σ (Planning Value)	2.81	2.64	2.89
Static Measurements Required by Compass	8	9	8
Static Measurements Specified by VSP**	10	10	10
Estimated Scan MDC (dpm/100 cm^2)	1,154	1,052	907
Scan Speed (cm/sec)	~2		
Survey Instrument Type	L-2350-1, w/43-68 GFPC Probe		
Instrument counts/disintegration (c/d)	0.115	0.115	0.143
GFPC Scanning Alarm Point (gcpm)	> 700	> 600	> 700
Detector Gap to Surface (inches)	Contact		
Detector c/d Correction for Surface Coatings	0.8	0.8	1.0

* A.L. is the SNEC Facility Administrative Limit (75% of the applicable DCGLw).

** VSP is Visual sample Plan. VSP is used to plot points on diagrams. Typically several additional points are added during this process to compensate for losses in the field.

The data provided in **Tables 2** and **3** were collected from the appendices, references and actual survey results of the facility.

Table 3 provides the DQO parameters for the exterior structural materials of the PENELEC Switch Yard Control Building.

Table 3, DQO/Design Parameters/Results – Interior

Survey Unit	PS2-1	PS2-2	PS2-3	PS2-4
Survey Design Calculation. No.	E900-05-004			
SNEC Survey Request No.	SR-203 (Exterior)			
Survey Area Classification	Class 3			
Total Estimated Area in Survey Unit (m^2)	~ 40.5	~ 24.3	~ 67.7	~ 63.4
Material Type	Concrete Block	Unpainted Concrete	Unpainted Steel	Aluminum
Scanning Goal (m^2)	~ 7 (17%)	~ 9.5 (39%)	~ 10.1 (15%)	~ 8 (13%)
Actual Area Scanned (m^2)	~ 7 (17%)	~3.6 (15%)	~ 10.1 (15%)	~ 8 (13%)
Applicable Statistical Test	WRS			
Type I Decision Error (α)	0.05			
Type II Decision Error (β)	0.10			
Gross Activity DCGLw (dpm/100 cm^2)*	44,317 (33,238 A.L.)			
Gross Activity DCGLw (cpm)	5,863 (A.L.)	5,863 (A.L.)	5,863 (A.L.)	5,863 (A.L.)
LBGR (cpm)	5,750 (A.L.)	5,760 (A.L.)	5,810 (A.L.)	5,760 (A.L.)
Estimated σ(cpm)	37.7	34.5	20.3	36.8
Actual σ From Survey Unit(cpm)	93.9	115.8	61.4	26.3
Δ/σ (Planning Value)	2.99	2.99	2.61	2.89
Static Measurements Required by Compass	8	8	9	8
Static Measurements Specified by VSP**	10	9	18	10
Estimated Scan MDC (dpm/100 cm^2)	975	924	841	907
Scan Speed (cm/sec)	~2			
Survey Instrument Type	L-2350-1, w/43-68 GFPC Probe			
Instrument counts/disintegration (c/d)	0.143	0.143	0.143	0.143
GFPC Scanning Alarm Point (gcpm)	> 800	> 700	> 600	> 700
Detector Gap to Surface (inches)	Contact			
Detector c/d Correction for Surface Coatings	1.0			

* A.L. is the SNEC Facility Administrative Limit (75% of the applicable DCGLw).

** VSP is Visual sample Plan. VSP is used to plot points on diagrams. Typically several additional points are added during this process to compensate for losses in the field.

5.1 Survey Design for the PSYCB

The initial scanning goal for this facility was set at ~67 m^2. A review of the radiological survey data shows that approximately 65.5 m^2 of the PSYCB were actually scanned, or about 17% of the entire 391 square meters estimated for this facility[1]. This is adequate for either a Class 2 or 3 survey area (**Reference 9.1, Table 5-5**). In most cases, areas were selected for scanning using a random selection process (see **Appendix A-1, Attachment**

[1] Some surface areas of this facility were not included in the survey design (see **Appendix A-1**, Section 1.1).

5-1, 5-6, 6-1 to 6-3). However, to address personnel safety issues a degree of control was necessary in some areas, and therefore some scan areas were assigned.

Some survey units in the PSYCB facility are painted surfaces while others are unpainted. Samples of paint thickness were obtained from the painted areas and used to evaluate the mean paint thickness for these survey units (contamination is assumed to be under the paint layer). Once determined, a correction factor was applied to appropriately reduce the detection efficiency over painted surfaces (see **Appendix A-1, Attachment 3-1** to **3-3**).

The alarm point (AP) for scanning all seven (7) survey units was set between > 600 and > 800 gross counts per minute (gcpm) (see **Appendix A-1, Table 4**). Since ~400 gross counts per minute is approximately equal to 1,200 dpm/100 cm^2 (**Appendix A-1, Attachment 4-1**), 600 to 800 gross counts per minute yield a dpm/100 cm^2 value much less than 33,238 dpm/100 cm^2. In fact, Compass calculates a value of approximately 5,000 net counts per minute as the applicable DCGLw equivalent (see **Appendix A-1, Table 1**). Note that the highest gcpm encountered in any of the seven survey units was 663 gcpm. Assuming a background value of at least 200 cpm from any material type, the maximum net value encountered in any survey unit was less than 10% of the DCGLw. Therefore these survey units were appropriately classified as Class 3 survey units.

Background count rates from various material types were used as input values for the Compass computer program. These values were selected from like materials from a similar time period whenever possible. In some cases this was not a possibility and a reasonable match was identified. Mean background count rates for various material types are presented in **Appendix A-1, Attachment 8-1** through **8-4**.

Initial variability measurements were taken from the PSYCB facility or from the Switch Yard area, and are provided in **Appendix A-1, 9-1** to **9-5**.

6.0 Final Status Survey Results

6.1 Summary of Survey Results for PS1-1 (Interior Painted Concrete Floor)

Static measurement results for this survey unit are listed in **Table 4**. DQO values are provided in **Table 2**. All scans were less than the alarm point. This survey unit meets the release criteria of **Reference 9.1**.

	Table 4, PS1-1 - SR-195 GFPC Measurements	
	Location No.	**OW-cpm**
1	P-Concrete Floor FP1U	371
2	P-Concrete Floor FP2U	337
3	P-Concrete Floor FP3U	366
4	P-Concrete Floor FP4U	390
5	P-Concrete Floor FP5U	355
6	P-Concrete Floor FP6U	330
7	P-Concrete Floor FP7U	378
8	P-Concrete Floor FP8U	363
9	P-Concrete Floor FP9U	358
10	P-Concrete Floor FP10U	378
	Average⇒	**363**
	Sigma⇒	**18.6**
	Minimum⇒	**330**
	Maximum⇒	**390**
	FSS-1546	
	OW-cpm is the open widow count rate	

6.2 Summary of Survey Results for PS1-2 (Interior Painted Steel)

Static measurement results for this survey unit are listed in **Table 5**. DQO values are provided in **Table 2**. All scans were less than the alarm point. This survey unit meets the release criteria of **Reference 9.1**.

	Table 5, PS1-2 - SR-195 GFPC Measurements	
	Location No.	**OW-cpm**
1	P-Steel Graiting & Doors FP1U	226
2	P-Steel Graiting & Doors FP2U	237
3	P-Steel Graiting & Doors FP3U	257
4	P-Steel Graiting & Doors FP4U	293
5	P-Steel Graiting & Doors FP5U	265
6	P-Steel Graiting & Doors FP6U	278
7	P-Steel Graiting & Doors FP7U	277
8	P-Steel Graiting & Doors FP8U	225
9	P-Steel Graiting & Doors FP9U	200
10	P-Steel Graiting & Doors FP10U	196
	Average⇒	**245**
	Sigma⇒	**33.7**
	Minimum⇒	**196**
	Maximum⇒	**293**
	FSS-1558	
	OW-cpm is the open widow count rate	

6.3 Summary of Survey Results for PS1-3 (Interior Aluminum Siding)

Static measurement results for this survey unit are listed in **Table 6**. DQO values are provided in **Table 2**. All scans were less than the alarm point. This survey unit meets the release criteria of **Reference 9.1**.

	Table 6, PS1-3 - SR-195 GFPC Measurements	
	Location No.	**OW-cpm**
1	Al-Walls & Ceiling FP1U	218
2	Al-Walls & Ceiling FP2U	259
3	Al-Walls & Ceiling FP3U	263
4	Al-Walls & Ceiling FP4U	340
5	Al-Walls & Ceiling FP5U	284
6	Al-Walls & Ceiling FP6U	283
7	Al-Walls & Ceiling FP7U	266
8	Al-Walls & Ceiling FP8U	258
9	Al-Walls & Ceiling FP9U	241
10	Al-Walls & Ceiling FP10U	288
	Average⇒	**270**
	Sigma⇒	**32.4**
	Minimum⇒	**218**
	Maximum⇒	**340**
	FSS-1548	
	OW-cpm is the open widow count rate	

6.4 Summary of Survey Results for PS2-1 (Exterior Unpainted Concrete Block)

Static measurement results for this survey unit are listed in **Table 7**. DQO values are provided in **Table 3**. All scans were less than the alarm point. This survey unit meets the release criteria of **Reference 9.1**.

	Table 7, PS2-1 - SR-203 GFPC Measurements	
	Location No.	**OW-cpm**
1	Concrete Block Walls FP1U	263
2	Concrete Block Walls FP2U	290
3	Concrete Block Walls FP3U	342
4	Concrete Block Walls FP4U	288
5	Concrete Block Walls FP5U	284
6	Concrete Block Walls FP6U	355
7	Concrete Block Walls FP7U	317
8	Concrete Block Walls FP8U	571
9	Concrete Block Walls FP9U	399
10	Concrete Block Walls FP10U	438
	Average⇒	**355**
	Sigma⇒	**93.9**
	Minimum⇒	**263**
	Maximum⇒	**571**
	FSS-1536	
	OW-cpm is the open widow count rate	

6.5 Summary of Survey Results for PS2-2 (Exterior Unpainted Concrete)

Static measurement results for this survey unit are listed in **Table 8**. DQO values are provided in **Table 3**. All scans were less than the alarm point. This survey unit meets the release criteria of **Reference 9.1**.

Table 8, PS2-2 - SR-203 GFPC Measurements		
	Location No.	OW-cpm
1	Unpainted Concrete FP1U	407
2	Unpainted Concrete FP2U	326
3	Unpainted Concrete FP3U	663
4	Unpainted Concrete FP4U	433
5	Unpainted Concrete FP5U	448
6	Unpainted Concrete FP6U	449
7	Unpainted Concrete FP7U	408
8	Unpainted Concrete FP8U	284
9	Unpainted Concrete FP10U	280
	Average⇒	411
	Sigma⇒	115.8
	Minimum⇒	280
	Maximum⇒	663
	FSS-1828	
	OW-cpm is the open widow count rate	

6.6 Summary of Survey Results for PS2-3 (Exterior Unpainted Steel Roofing)

Static measurement results for this survey unit are listed in **Table 9**. DQO values are provided in **Table 3**. All scans were less than the alarm point. This survey unit meets the release criteria of **Reference 9.1**.

Table 9, PS2-3 - SR-203 GFPC Measurements		
	Location No.	OW-cpm
1	Steel Roofing FP1U	442
2	Steel Roofing FP2U	307
3	Steel Roofing FP3U	265
4	Steel Roofing FP4U	273
5	Steel Roofing FP5U	419
6	Steel Roofing FP6U	329
7	Steel Roofing FP7U	282
8	Steel Roofing FP8U	259
9	Steel Roofing FP9U	283
10	Steel Roofing FP10U	384
11	Steel Roofing FP11U	295
12	Steel Roofing FP12U	269
13	Steel Roofing FP13U	294
14	Steel Roofing FP14U	427
15	Steel Roofing FP15U	273
16	Steel Roofing FP16U	269
17	Steel Roofing FP17U	265
18	Steel Roofing FP18U	284
	Average⇒	312
	Sigma⇒	61.4
	Minimum⇒	259
	Maximum⇒	442
	FSS-1560	
	OW-cpm is the open widow count rate	

6.7 Summary of Survey Results for PS2-4 (Exterior Aluminum Siding)

Static measurement results for this survey unit are listed in **Table 10**. DQO values are provided in **Table 3**. All scans were less than the alarm point. This survey unit meets the release criteria of **Reference 9.1**.

	Table 10, PS2-4 - SR-203 GFPC Measurements	
	Location No.	OW-cpm
1	Aluminum Siding FP1U	258
2	Aluminum Siding FP2U	252
3	Aluminum Siding FP3U	268
4	Aluminum Siding FP4U	225
5	Aluminum Siding FP5U	251
6	Aluminum Siding FP6U	253
7	Aluminum Siding FP7U	211
8	Aluminum Siding FP8U	255
9	Aluminum Siding FP9U	206
10	Aluminum Siding FP10U	192
	Average⇒	237
	Sigma⇒	26.3
	Minimum⇒	192
	Maximum⇒	268
	FSS-1559 & 1574	
	OW-cpm is the open widow count rate	

7.0 Data Assessment

7.1 Assessment Criteria

Final status survey data has been reviewed to verify authenticity, appropriate documentation, quality, and technical acceptability. The review criteria for data acceptability are:

1) The instruments used to collect the data were capable of detecting the radiation of the radionuclide of interest at or below the investigation levels.

2) The calibration of the instruments used to collect the data was current and radioactive sources used for calibration were traceable to recognized standards or calibration organizations.

3) Instrument response was checked before, and when required, after instrument use each day data was collected.

4) Survey team personnel were properly trained in the applicable survey techniques and training was documented.

5) MDC values and the assumptions used to develop them were appropriate for the instruments and the survey methods used to collect the data.

6) The survey methods used to collect the data were appropriate for the media and types of radiation being measured.

7) Special instrument methods used to collect data were applied as warranted by survey conditions, and were documented in accordance with an approved site Survey Request procedure.

8) The custody of samples that were sent for off-site analysis was tracked from the point of collection until final results were provided.

9) Final status survey data consists of qualified measurement results representative of current facility status and were collected in accordance with the applicable survey design package.

If a discrepancy existed where one or more criteria were not met, the discrepancy was reviewed and corrective action taken (as appropriate) in accordance with site procedures.

7.2 Survey Variations

7.2.1 Impact of Electrical Hazards

The main variation in this survey effort was that some portion of this facility could not be accessed because of the serious electrical hazard present in the substation and PSYCB. This was addresses by limiting surveys (scans or static measurements) to areas where personnel safety could be optimize. In addition, Class 3 structural areas were surveyed as though they were Class 2 structural areas, since laying out survey points using the random start systematically spaced triangular grid system is actually easier than laying out a series of purely random locations. Thus survey point layout time was reduced. It was also recognized that if some structural survey units were shown to be Class 2 areas and not Class 3 areas, these surveys would have to be re-done. Treating them as Class 2 areas from the start lessened the possibility of having to return and perform additional surveys in a hazardous area.

7.3 Quality Control Measurements

Repeat scan measurements and surface measurements were performed and met the applicable acceptance criteria established in Section 4.6 of SNEC Procedure E900-IMP-4520.04 (**Reference 9.11**). Quality Control (QC) measurements are reported in each of the applicable **Appendices (A-2 & A-3)**. All QC measurements are taken in accordance with the requirements of **Reference 9.1** and applicable site procedures which requires that at least 5% of all samples, scans or static survey points be re-done. No discrepancies are reported for these survey units and at least 5% or more of fixed point and scan measurements were repeated with acceptable results. No samples were taken.

7.4 Assessment Summary

Statistical testing of the data does not need to be performed for these final status surveys since the data clearly show that the survey unit(s) meet the site release criteria. These survey units clearly meet the criterion because of the following:

1. ☒ All measurements in the survey units were less than or equal to the DCGLw, and/or
2. ☐ A background reference area was used within a structural survey design, and the difference between the maximum survey unit measurement and the lowest background reference area measurement are less than or equal to the DCGLw, and/or
3. ☐ The mean concentration in every survey unit was less than or equal to the DCGLw, and any elevated measurement area was shown to be within the release criteria established for the SNEC facility in accordance with the SNEC LTP.

8.0 Final Status Survey Conclusions

The FSS for the PENELEC Switch Yard Control Building was performed in accordance with the SNEC LTP and site implementing procedures. Final status survey data were collected and meet and/or exceed the quantity and quality specified for this survey unit as prescribed by the applicable survey design. The survey data for each survey unit met the following conditions:

1. The mean gross activity concentration on surfaces within all PSYCB (PS1-1, PS1-2, PS1-3, PS2-1, PS2-2, PS2-3 and PS2-4) survey units is less than the applicable DCGLw.

2. No remediation was used to reduce levels of residual radioactivity below concentrations necessary to meet DCGLw values.

These conditions satisfy the release criteria established in the SNEC LTP and the radiological criteria for unrestricted use given in 10 CFR 20.1402. Therefore, it is concluded that the PENELEC Switch Yard Control Building as described in this report are suitable for unrestricted release.

9.0 References

9.1 SNEC License Termination Plan

9.2 Code of Federal Regulations, 10 CFR 20.1402.

9.3 Code of Federal Regulations, 10 CFR 50.82(a)(11).

9.4 SNEC Facility Site Area Grid Map - Drawing Number SNECRM-020.

9.5 SNEC Calculation E900-05-002, "PENELEC Switch Yard, Class 1 Area – Survey Design".

9.6 SNEC Procedure E900-IMP-4500.59, "Final Site Survey Planning and DQA"

9.7 COMPASS computer program, Version 1.0.0, Oak Ridge Institute for Science and Education.

9.8 NUREG-1507, "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions".

9.9 Visual Sample Plan computer program, Version 3.0, Battelle Memorial Institute.

9.10 SNEC Facility Historical Site Assessment Report, March 2000.

9.11 SNEC Procedure E900-IMP-4520.04, "Survey Methodology to Support SNEC License Termination".

9.12 SNEC Procedure E900-ADM-4500.60 "Final Status Survey Report".

9.13 NUREG 1575 "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM), revision 1 August 2000.