

SAXTON NUCLEAR

Saxton Nuclear Experimental Corporation
Policy and Procedure Manual

Number

6675-PLN-4542.01

Title

Revision No.

SNEC Radiation Protection Plan

0

Applicability/Scope

Responsible Office

Effective Date

All SNEC Activities

6675

This document is within QA plan scope

☒

Yes

☐ No

Safety Reviews Required

☒

Yes

☐ No

List of Effective Pages

Page	Revision	Page	Revision	Page	Revision	Page	Revision
1.0	0						
2.0	0						
3.0	0						
4.0	0						
5.0	0						
6.0	0						
7.0	0						
8.0	0						
9.0	0						

Signature

Date

SNEC Radiation Safety Officer

SNEC Assistant

Saxton General Manager/VP, SNEC

President, SNEC

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Table of Contents

	<u>Page</u>
1.0 <u>Article 1</u> Foundation for the SNEC Radiological Controls Program	3.0
2.0 <u>Article 2</u> Responsibilities of Workers	3.0
3.0 <u>Article 3</u> Audits, Reviews and Reports on the SNEC Radiological Controls Program	5.0
4.0 <u>Article 4</u> Radiological Controls Training	6.0
5.0 <u>Article 5</u> Control of External Exposure	6.0
6.0 <u>Article 6</u> Control of Internal Exposure	7.0
7.0 <u>Article 7</u> Control of Radioactive Contamination	7.0
8.0 <u>Article 8</u> Control of Radioactive Materials	8.0
9.0 <u>Article 9</u> Organization for Radiological Controls	9.0

SNEC Radiation Protection Plan**0****1.0 ARTICLE 1 Foundation for the Saxton Nuclear Experimental Corporation Radiological Controls Program**

The Saxton Nuclear Experimental Corporation Radiation Protection Plan sets forth the philosophies, basic policies, and objectives of Saxton Nuclear Experimental Corporation (SNEC) Radiological Controls Program. The objectives of the radiological controls program are to control radiation hazards to avoid accidental radiation exposure, to maintain exposures within the regulatory requirements, and also to maintain exposures to workers and the general population, as low as is reasonably achievable (ALARA). These philosophies, policies, and objectives are based on, and implement, the regulations of the Nuclear Regulatory Commission (NRC), as contained in Title 10 of the Code of Federal Regulations, Parts 19, 20, 50, and 71, and appropriate Regulatory Guides, specifically, 1.86 (1974), 8.8 Rev.3 (1978), 8.10 Rev. 1-R (1975), 8.13 Rev. 1 (1975), and 8.15 (1976). The SNEC Radiation Protection Plan is based on these references, and therefore, they are not repeated throughout the remainder of this document.

Specific details as to how the SNEC Radiation Protection Plan is implemented shall be promulgated by use of the SNEC Radiological Controls Procedure Manual (RCPM). Further references to the SNEC RCPM are not repeated throughout this document.

Strict compliance with the SNEC RCPM is required so work will be done according to predetermined work practices. If strict compliance is not possible, work under that procedure shall be stopped and supervision shall be consulted to resolve the problem.

This SNEC Radiation Protection Plan is being written primarily to increase the effectiveness of the Radiological Controls Program at the Saxton site. Procedures shall provide adequate guidance and specify appropriate methods or techniques to ensure that the performance of each activity is in accordance with sound radiological control principles, and is in compliance with applicable regulatory provisions. The RCPM shall be prepared, reviewed, approved, and controlled as described in the SNEC Administrative procedures.

The SNEC Radiological Controls Program is to be fully integrated into each phase of operations at the Saxton site. The SNEC Radiological Controls Program, when carried out as specified, will assure that activities at Saxton will be performed in accordance with the as low as reasonably achievable (ALARA) philosophy.

In order to meet these objectives, the program must be carried out by each person involved in activities at SNEC. Each person involved in Saxton activities has some degree of responsibility for the Radiological Controls Program. Failure of any person to recognize this responsibility, or to comply with issued procedures, will not be tolerated. A radiologically safe operation will be achieved, if each individual carries out his or her responsibility.

The performance of each manager and supervisor must demonstrate support for the commitment by top management of Saxton Nuclear Experimental Corporation to a strong and effective Radiological Controls Program.

2.0 ARTICLE 2 Responsibilities of Workers

Although personnel specially trained in radiological controls normally oversee radioactive work, each individual involved in this work must constantly remain aware of the potential radiological problems. Each individual is responsible for maintaining his or her exposure as low as reasonably achievable. Each

SNEC Radiation Protection Plan**0**

individual's actions directly affect his or her exposure, contamination, and overall radiological problems associated with the work. The following rules shall be followed by individuals to minimize radiological problems:

1. Obey promptly "stop-work" and "evacuate" orders of Radiological Controls personnel.
2. Obey posted, oral, and written Radiological Controls instructions and procedures, including instructions on Radiation Work Permits.
3. Wear TLD and self-reading dosimeter where required by signs or by Radiological Controls personnel. Report unexpected exposure and/or lost/off scale dosimeter to the Radiological Controls personnel.
4. Keep track of personal radiation exposure status and avoid exceeding exposure limits.
5. Remain in as low a radiation area as practicable to accomplish work.
6. Do not loiter in radiation areas.
7. Do not smoke, eat, drink, or chew in radiologically controlled areas unless specifically authorized by the Radiation Safety Officer.
8. Wear anti-contamination clothing and respiratory protection properly and wherever required by signs or Radiological Controls personnel.
9. Remove anti-contamination clothing and respiratory protection properly to minimize spread of contamination.
10. Survey or be surveyed, for contamination when leaving a contaminated area or a radiological control point. Notify Radiological Controls personnel if contamination is found.
11. For a known or possible radioactive spill, minimize its spread and notify Radiological Controls personnel promptly.
12. Do not unnecessarily touch a contaminated surface or allow clothing, tools, or other equipment to do so.
13. Place contaminated tools, equipment and solid waste on disposable surfaces (for example, sheet plastic) when not in use and inside plastic bags when work is finished.
14. Limit the amount of material that has to be decontaminated or disposed of as radioactive waste by bringing only necessary tools and equipment into the RCA.
15. Notify Radiological Controls personnel of faulty or alarming radiation protection equipment.
16. Report the presence of open wounds to Radiological Controls personnel prior to work in areas where radioactive contamination exists. Report immediately if a wound occurs while in such an area.

SNEC Radiation Protection Plan**0**

17. Notify Radiological Controls personnel prior to or upon returning to the site after medical administration of radiopharmaceuticals.
18. Assure a mentally alert and physically sound condition for performing assigned work.
19. Ensure that your activities do not create radiological problems for others, and be alert for the possibilities that the activities of others may change the radiological conditions to which you are exposed.
20. Supervisors must recognize their responsibility to be at the work site to ensure that radiological controls practices and procedures are enforced. Supervisors should encourage suggestions for exposure reduction during and after work is completed.
21. In order to initiate voluntary participation in, or obtain additional information about the control of occupational exposure during the periods in which an individual is pregnant, believes she might be pregnant, or intends to become pregnant, the individual must notify the GPUNC Medical Department of the pregnancy or the possibility of being pregnant or the intent to become pregnant.

3.0 **ARTICLE 3** Audits, Reviews, and Reports on the Saxton Nuclear Experimental Corporation Radiological Controls Program

As indicated in Article 2, each individual is responsible for maintaining his or her radiation exposure as low as reasonably achievable while completing the scope of work they are required to perform. Each individual will be required to comply with the applicable procedures of the SNEC RCPM and the specific radiological controls prescribed for work in which they are engaged.

In order to ensure that these requirements are being met, and to assist all site personnel in understanding and complying with these requirements, a system of audit and review procedures shall be established including criteria for timely and appropriate corrective action. The following audit and review procedures shall be used:

1. Radiological Control technicians shall monitor and aid the performance of each individual insofar as radiological work practices are concerned.
2. Radiological assessments shall be conducted at the direction of the President, SNEC.
3. Quality Assurance audits shall be conducted of the SNEC Radiological Controls Program by technically qualified persons from GPUNC. The audits will be conducted in accordance with procedures as outlined in the TMI-1 Quality Assurance Plan. The Quality Assurance Methods, Operations, and Audit group will schedule these audits and will provide personnel from their own department and/or outside contractors, as appropriate, to conduct the audits. These audits shall cover the applicable portions of the SNEC Radiation Protection Plan and any applicable procedures in the SNEC RCPM. These audits shall be conducted at the request of the President, SNEC.
4. In addition to these reviews and audits, a system shall be employed to identify radiological control deficiencies. A radiological control deficiency is defined as either a violation of an established procedure or a practice which could and should be improved.

SNEC Radiation Protection Plan**0**

Such deficiencies are recorded in an Awareness Report. This system shall be as specified in the RCPM and embodying the following concepts: An Awareness Report may be initiated by any individual who observes a deviation from good radiological practice. These reports shall be evaluated by the RSO for desirable, or necessary, corrective action. The purpose of this system is to identify all deficiencies, regardless of how small or inconsequential, correction of which will result in an improved Radiological Controls Program.

5. The Nuclear Regulatory Commission (NRC) also inspects and reviews the SNEC Radiological Controls Program.
6. In the event all the preceding measures fail to prevent a radiological incident, an investigation shall be conducted to determine the cause(s) of the incident and to determine the corrective action(s) and improvements needed.

4.0 ARTICLE 4 Radiological Controls Training

Radiological Controls procedures and personnel to be used at Saxton are fundamentally the same as those used at TMI. Radiological controls personnel used at Saxton will meet or exceed the qualifications of ANSI - N 18.1 - 1971 or be formally qualified through an NRC approved TMI Radiological Controls training program. Briefing on SNEC site specific information will be provided by appropriate SNEC personnel prior to granting unescorted access to the site.

5.0 ARTICLE 5 Control of External Exposure

Control of radiation exposure is based on the assumption that any exposure, no matter how small, involves some risks; however, exposure within the accepted limits represents a small risk compared with normal hazards of life. Therefore, the policy of Saxton Nuclear Experimental Corporation is to maintain exposure to individuals and total person-rem's as low as is reasonably achievable. SNEC management, as well as each individual worker, shall take an active role in radiation exposure reduction.

To aid in exposure reduction, administrative radiation exposure control levels shall be established. Work involving radiation exposure shall be pre-planned. Major exposure jobs shall require that radiological controls be incorporated in the design, that written procedures be prepared, and that pre-job briefing and rehearsals be conducted prior to commencing work. A Radiation Work Permit will be required for any work or entry to restricted areas that would involve or create any of the following: (a) high radiation area, (b) airborne radioactivity area, and (c) contaminated area, or (d) those radiation areas specified in applicable procedures.

Restricted areas used to control personnel access to radiation and radioactive material shall be defined, access controlled, and posted in accordance with 10 CFR 20.203.

Radiological Controls personnel shall be exempt from the RWP issuance requirement during the performance of their assigned radiation protection duties providing they are following radiological control procedures for entry into High Radiation Areas.

SNEC Radiation Protection Plan**0**

To evaluate radiological conditions, radiation surveys shall be conducted for air activity, removable surface contamination and external radiation at regular intervals. Surveys are performed in order to (a) monitor the suitability of control measures, (b) evaluate the needs for additional controls, (c) evaluate trends for ALARA purposes, and (d) evaluate radiological conditions in areas routinely entered without radiation work permit coverage. Surveys in unrestricted areas are provided to ensure the effective control of radioactive material. Unusual conditions detected in the performance of either a routine or special survey shall immediately be brought to the attention of SNEC Management. Portable radiation survey instruments will be calibrated quarterly, to assure a consistent, reliable, and predictable response to radiation levels. Records of surveys shall be maintained on file. Calibration of instruments will be done in accordance with applicable TMI procedures.

6.0 ARTICLE 6 Control of Internal Exposure

The policy of Saxton Nuclear Experimental Corporation is not to have any significant internal exposure to personnel from radioactivity associated with the Saxton facility. For personnel exposed to radioactivity during their work, this means that no one should receive from internal radioactivity more than 1/10 of the radiation exposure that 10 CFR 20 would allow one to accumulated in a quarter.

Controls in other parts of this SNEC Radiation Protection Plan to minimize internal radioactivity, such as control of surface contamination and control of wounds, are not repeated in this article. The following controls are to minimize internal exposure from airborne radioactivity:

1. Engineering controls and controls on personnel access shall be applied to the maximum extent practicable so that radioactive work does not increase the amounts of airborne radioactivity inhaled. When no other controls are practicable, respirators shall be used. Those who may need to use respirators shall be medically qualified, trained, tested for respirator efficiency, and re-qualified in this respirator program at least annually by appropriate TMI procedures.
2. Airborne radioactivity shall be measured regularly in areas where personnel may be exposed. Continuous monitoring, representative of air the person is breathing, shall be performed to supplement periodic measurements during work which has the potential to cause a worker to receive measurable internal radioactivity.

Internal radioactivity shall be measured in accordance with appropriate TMI procedures.

7.0 ARTICLE 7 Control of Radioactive Contamination

Radioactive surface contamination shall be controlled in order to minimize possible inhalation or ingestion of radioactivity and to minimize buildup of radioactivity in the environment. Measures to contain radioactivity and to minimize the number and extent of areas contaminated shall be taken in order to minimize personnel radiation exposure, to simplify subsequent personnel and area or facility decontamination, and to minimize the need to rely on anti-contamination clothing.

The limit used to verify the absence of contamination shall be 100 CPM, as measured with a pancake GM detector.

The surface contamination limit for unrestricted release of materials and equipment are as follows:

SNEC Radiation Protection Plan**0**Beta-Gamma

<u>Smearable</u>	<u>Total</u> (Fixed and Smearable)
1000 DPM/100 cm ²	5000 DPM/100 cm ²

Alpha

<u>Smearable</u>	<u>Total</u> (Fixed and Smearable)
20 DPM/100 cm ²	300 DPM/100 cm ²

The surface contamination limit for the unrestricted release of structures are as follows:

Beta-Gamma

<u>Smearable</u>	<u>Total</u> (Fixed and Smearable)
1000 DPM/100 cm ²	Average - 5000 DPM/100 cm ²

Alpha

<u>Smearable</u>	<u>Total</u> (Fixed and Smearable)
20 DPM/100 cm ²	Average - 100 DPM/100 cm ²

Emphasis in planning, training and working shall be placed on minimizing the numbers of occurrences and amounts of radioactivity involved in occurrences of radioactive surface contamination of person's skin or of areas not controlled for radioactive surface contamination. Each such occurrence shall be reviewed in detail to determine how to correct deficiencies and improve control of radioactivity.

8.0 ARTICLE 8 Control of Radioactive Materials

A radioactive material control system shall be established to ensure radioactive material is not lost or misplaced in a location where personnel could unknowingly be exposed to radiation and to prevent the uncontrolled spread of radioactivity to areas where the public might be affected. The system shall include the following requirements.

1. The number of areas in which radioactive materials are stored shall be minimized.
2. Radioactive material storage area(s) shall be approved by the SNEC RSO and SNEC General Manager before use.
3. The numbers of radioactive items and the amount of radioactivity in storage shall be minimized.
4. Radioactive items shall be identified as radioactive before removing them from a restricted area.

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SNEC Radiation Protection Plan

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5. Radioactive materials removed from the Exclusion Area, or removed from a restricted area outside the Exclusion Area, shall be controlled in accordance with an accountability procedure which ensures the materials are not lost or improperly handled during the transfer, or subject to unauthorized removal. This accountability procedure shall require inventory of radioactive materials which remain outside of such areas.
6. Each incoming or outgoing shipment of radioactive material shall be handled in strict compliance with detailed written procedures.

Each case in which radioactive material is lost or unaccounted for shall be reviewed in detail to determine the potential amount of radiation exposure personnel might unknowingly receive, to correct deficiencies, and to improve control of radioactive materials.

9.0 ARTICLE 9 Organization for Radiological Controls

Each individual has responsibility for radiological control; consequently, the organization for the entire Saxton Nuclear Experimental Corporation represents the organization for radiological controls.

However, the Saxton FSO is responsible for ensuring that a high-quality radiological controls program is established and maintained. It is the responsibility of the SNEC Radiation Safety Officer to evaluate radiological conditions and recommend precautionary measures.

At times when demands upon the SNEC Management are sufficiently heavy to require a temporary increase in staff, qualified personnel from GPU Nuclear Corporation and its contractors will be used. Non-Radiological Controls personnel will be fully integrated into the department under the direction of the Saxton General Manager. Radiological Controls personnel will be fully integrated into the Radiological Controls Department under the direction of the Radiation Safety Officer. Support services (instrument calibration, respirator protection, bioassay, TLD/dosimetry and training) will be provided by the TMI - Nuclear Assurance Division (GPU Nuclear). These support services will be administered to ensure the quality of services provided meet the commitments of the SNEC Radiation Protection Plan.