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OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

March 13, 2003

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

SUBJECT: FINAL SITE-SPECIFIC DECOMMISSIONING INSPECTION PLAN FOR THE SAXTON NUCLEAR EXPERIMENTAL CORPORATION, SAXTON, PENNSYLVANIA (DOCKET NO. 50-146; TASK 1)

Dear Mr. Dragoun:

Enclosed is the final Site-Specific Decommissioning Inspection Plan for the Saxton Nuclear Experimental Corporation, Saxton, Pennsylvania, for Task 1 with your comments incorporated.

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

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Enclosure

cc: A. Adams, NRC/NRR/OWFN 12G13
E. Abelquist, ORISE/ESSAP
W. Beck, ORISE/ESSAP
T. Vitkus, ORISE/ESSAP
File/0968

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P. O. BOX 117, OAK RIDGE, TENNESSEE 37831-0117

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Process Per
AA Adams

FINAL
SITE-SPECIFIC DECOMMISSIONING INSPECTION PLAN FOR THE SAXTON NUCLEAR EXPERIMENTAL CORPORATION SAXTON, PENNSYLVANIA

At the request of the Nuclear Regulatory Commission's Office of Nuclear Reactor Regulation, the Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education has prepared the site-specific decommissioning inspection plan below for the Saxton Nuclear Experimental Corporation (SNEC) in Saxton, Pennsylvania. This plan should be used as a checklist. The major elements of this site-specific inspection plan include the following eight areas:

1.0 GENERAL

2.0 IDENTIFICATION OF CONTAMINANTS AND DCGLS

3.0 AREA CLASSIFICATION

4.0 FINAL STATUS SURVEY PROCEDURES AND INSTRUMENTATION

5.0 ANALYTICAL PROCEDURES

6.0 IN-PROCESS AUDIT OF RADIOLOGICAL SURVEY TECHNICIANS

7.0 CONFIRMATORY SURVEY MEASUREMENTS

8.0 QA/QC AND DATA MANAGEMENT PROCEDURES

The following Nuclear Regulatory Commission (NRC) Inspection Procedures may be used for guidance, in part, during this inspection:

- Inspection Procedure 83801 – Inspection of Final Surveys at Permanently Shutdown Reactors
- NRC Inspection Manual, Chapter 2561 "Decommissioning Power Reactor Inspection Program"

Portions of the following documents and computer software applications will be used for guidance during this inspection:

- NUREG-1575 "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)"
- License Termination Plan, Saxton Nuclear Experimental Corporation
- NUREG 1757 Volume 1 and Draft Volume 2 "Consolidated NMSS Decommissioning Guidance"

- NUREG-1700 "Standard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans"
- "Quality Assurance Manual for Office of Nuclear Material Safety and Safeguards"
- ASME-NQA-1, the "Quality Assurance Program Requirements for Nuclear Facilities," Quality Assurance Manual for the Office of Nuclear Material Safety and Safeguards
- Environmental Survey and Site Assessment Program, "Survey Procedures Manual"
- Environmental Survey and Site Assessment Program, "Quality Assurance Manual"
- COMPASS v1.0
- Other guidance as directed by the NRC/NRR Project Manager

1.0 GENERAL

1.1 Review past records of spills or other releases of radioactive material and documentation of cleanup.

1.2 Tour plant areas to obtain familiarity with the facility, surrounding areas, and decommissioning work completed. Review the licensee's plans and schedule for completing further decontamination work and surveying of the facility.

2.0 IDENTIFICATION OF CONTAMINANTS AND DCGLS

2.1 Review previous measurement and analytical results to confirm the nature of the site information and contaminants at the site. In particular, review the data that relate to the licensee's determination of radionuclide ratios, fractional contributions to total activity and variability.

2.2 Review the derived concentration guideline levels (DCGLs) that the licensee will use for outdoor soil areas, structure surfaces, and/or rubblized structures. Verify that the licensee has accounted for all media for which final status surveys will be designed.

2.3 Evaluate how the DCGLs will be implemented—e.g., use of surrogate measurements and modified DCGLs, gross activity DCGLs, $DCGL_{EMC}$s—to determine how samples/measurements will be compared, implementation of the unity rule, and how radionuclide variabilities—specifically modification of σ—will be integrated in DCGL implementation.

3.0 AREA CLASSIFICATION

3.1 Based on plant area tours and review of characterization and other survey results, evaluate the licensee's technical basis for site classification as impacted versus non-impacted.

3.2 For impacted areas, review the available information and data used for initially classifying the areas as Class 1, 2, or 3.

4.0 FINAL STATUS SURVEY PROCEDURES AND INSTRUMENTATION

4.1 Land Area Survey Instrumentation

4.1.1 Evaluate the instrument sensitivity for scan surveys of land areas. Review the scan MDC in terms of the soil DCGL(s). Ensure that *a priori* scan MDCs adequately account for modified DCGLs if a surrogate approach or the unity rule is used.

4.1.2 Review the equipment set up and performance check procedures.

4.2 Building Surface Survey Instrumentation

4.2.1 Review the calibration and performance check procedures. Ensure calibrations will account for any environmental or other factors that could potentially impact performance. Evaluate the appropriateness of the calibration source energies in determining instrument efficiencies and any applied weighting factors relative to the radionuclides of concern. Evaluate the licensee's selection of surface efficiency value(s). Review the survey instrumentation operational checkout procedures and acceptance parameters.

4.2.2 Review both the scanning and static measurement MDC determinations.

4.2.3 Review the procedures for field use of instrumentation and evaluate that any *a priori* factors that may impact use in the field have been accounted for, such as scan speed and background variability. Review training records of personnel who will operate survey instrumentation.

4.3 Final Status Survey Procedures

Review final status survey procedures and planning documents for the following:

4.3.1 Verify the adequacy of reference areas selected by the licensee for assessing background contributions to surface activity levels and radionuclides in soils or other volumetric media.

4.3.2 Review procedures for establishing survey unit boundaries. Review maps showing preliminary survey unit designations.

4.3.3 Review available radionuclide variability (σ) data that will be used for calculating required sample size. Additionally, determine whether the analytical methods and instrumentation used for the initial σ calculations are comparable to those that will be used during final status surveys.

4.3.4 Review procedures for required scan coverage based on survey unit classification.

4.3.5 Review methods for determining area factors that will be used for evaluating areas of elevated activity detected during scans.

4.3.6 Review proposed investigation levels and adequacy relative to the required and actual scan MDCs.

4.3.7 Review selection process for sample locations in survey units.

4.3.8 Review proposed procedures and any associated factors for surveying embedded piping or other difficult to access or inaccessible areas.

4.3.9 Review sampling and chain-of-custody procedures.

5.0 ANALYTICAL PROCEDURES

ESSAP performed an inspection of the SNEC analytical procedures during the period March 27 through 29, 2001. The following items will be reviewed for additions and/or modifications that have been incorporated since the 2001 inspection.

5.1 Review the laboratory instrumentation that will be used for sample analysis. Determine appropriateness and sensitivity of the selected equipment for the radionuclides of concern.

5.2 Review the licensee's laboratory analytical procedures for radiological analyses. Specifically:

5.2.1 Evaluate the laboratory's sample preparation techniques—geometries used for gamma spectrometry on soil samples, etc.

5.2.2 Review the protocol the laboratory uses to interpret the gamma spectrometry results, particularly the radionuclide total absorption peaks used to identify various contaminants.

5.2.3 Review the laboratory QA/QC procedures, including duplicates, blanks, and matrix spikes. Determine the frequency of analysis for each of the QC checks. Determine whether the laboratory participates in an adequate cross-check or performance evaluation program, such as that offered by EML and EPA.

5.3 Analyze split-samples of media such as soil, building debris, and water for comparison with SNEC's on-site laboratory results.

6.0 IN-PROCESS AUDIT OF RADIOLOGICAL SURVEY TECHNICIANS

Review the licensee's radiological survey technician's implementation of the final status survey. Specifically:

6.1 Understanding of the concepts of the License Termination Plan (LTP) and associated documents and procedures as outlined in the Final Status Survey Training Manual.

6.2 Adherence to the specification of the Survey Requests (SR) generated by the licensee for final status survey field implementation.

6.3 Performance of surface scans using the audible output—in particular, that the radiological survey technician passing the detector over the surface being measured is the individual listening to the audible output.

7.0 CONFIRMATORY SURVEY MEASUREMENTS

Select survey units for confirmatory surveys. Survey unit selection should be chosen randomly and/or judgmentally based on data reviews and in-process audits of radiological survey technicians.

7.1 Land Area Surveys

Perform gamma surface scans using NaI scintillation detectors coupled to ratemeters with audible indicators. Scans should be performed over 50 to 100% of selected areas to evaluate the average gamma activity level and evaluate the areas for the presence of elevated areas. Collect five samples from each selected area.

7.2 Building Surface Surveys

Perform alpha+beta surface scans using gas proportional detectors coupled to ratemeter-scalers with audible indicators. Scans should be performed over 50 to 100% of selected survey units. Areas of elevated radiation will be marked for further investigation. Direct measurements will be performed in each survey unit—the number performed will be dependent on the licensee's modified guideline levels and surface scan results. Direct measurements will also be performed at locations corresponding to licensee measurements for direct data comparison.

8.0 QA/QC AND DATA MANAGEMENT PROCEDURES

ESSAP performed an inspection of the SNEC QA/QC and data management procedures during the period March 27 through 29, 2001. The following items will be reviewed for additions and/or modifications that have been incorporated since the 2001 inspection.

8.1 Review the licensee's QA/QC procedures as they relate to final status survey personnel training requirements and final status survey data acceptance criteria.

8.2 Review the licensee's data management system that will be used to track field and analytical results.