August 18, 2000

Mr. G. A. Kuehn, Jr.
Program Director SNEC Facility
GPU Nuclear
TMI Nuclear Generating Station
South Office Building
P.O. Box 480
Middletown, Pennsylvania 17057

SUBJECT: SAXTON NUCLEAR EXPERIMENTAL FACILITY - REQUEST FOR ADDITIONAL INFORMATION, RE: LICENSE TERMINATION PLAN (TAC NO. MA8076)

Dear Mr. Kuehn:

We are continuing our review of your amendment request for Amended Facility License No. DPR-4 for the Saxton Nuclear Experimental Corporation (SNEC) Facility which you submitted on February 2, 2000, as supplemented. During our review of your amendment request, questions have arisen for which we require additional information and clarification. Please provide responses to the enclosed request for additional information within 30 days from the date of this letter. In accordance with 10 CFR 50.30(b), your response must be executed in a signed original under oath or affirmation. Following receipt of the additional information, we will continue our evaluation of your amendment request.

If you have any questions regarding this review, please contact me at (301) 415-1127.

Sincerely,

/RA/

Alexander Adams, Jr., Senior Project Manager
Events Assessment, Generic Communications and
Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-146

Enclosure:
As stated

cc w/enclosure:
See next page

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REQUEST FOR ADDITIONAL INFORMATION
GPU NUCLEAR - SAXTON NUCLEAR EXPERIMENTAL CORPORATION (SNEC) FACILITY
DOCKET NO. 50-146

General Comments

The Saxton Nuclear Experimental Corporation (SNEC) License Termination Plan (LTP), Rev. 0 dated February 2000, provides insufficient information to completely satisfy the criteria (i.e., site characterization, identification of remaining site dismantlement activities, plans for site remediation, detailed plans for the final radiation survey, etc.) specified in 10 CFR 50.82(a)(9). The U.S. Nuclear Regulatory Commission (NRC) staff recognizes that at this stage in the decommissioning process, not all necessary information is available to design the final status survey (FSS) in accordance with current NRC regulatory guidance.

Major areas identified as either ongoing or planned for further characterization, to determine the nature and extent of radiological contamination at the site, include areas below grade in the Discharge Tunnel; concrete structures, pipes, embedded pipes, inaccessible or not readily accessible areas and surfaces; pavement and soil beneath pavement; surface and subsurface soil near the Containment Vessel (CV) and surrounding support tunnel; structures and land areas in the adjoining Penelec property; and the Decommissioning Support Facility. Proposed derived concentration guideline levels (DCGLs) and area factors (in compliance with the radiological criteria for license termination), and other criteria (i.e., updated site-specific estimate of remaining decommissioning costs, supplement to environment report) were not reviewed, and therefore, are not included in this request for additional information. These topics will be addressed in subsequent correspondence.

Because the FSS plan provides a generic overview of the FSS process, SNEC should revise the LTP considering the Specific Comments below and provide input that describes how the information will be used in implementing the FSS. For example, it is not clear how multiple DCGLs are to be integrated into the FSS design, how relative ratios among the various radionuclides using the surrogate approach for modifying DCGLs will be determined, how gross surface activity DCGLs are to be developed, and how the unity rule will be applied for radionuclide-specific measurements.

To facilitate SNEC's request for licence termination, NRC requests that SNEC provide detailed information on the radiological characterization, remediation plan, FSS design, and sampling methodology with a reference to the applicable site procedures and Quality Assurance (QA) practices for the aforementioned areas as it becomes available for NRC review and approval.

Specific Comments

1. Section 2.1.1, page 2-1: States that "Information on systems, components and structures, which have been removed are not provided in this plan." For completeness, reference the documents from which this information may be obtained. Confirm that decommissioning records are being maintained in a 10 CFR 50.75(g) file.

2. Section 2.1.2, page 2-1: Verify that SNEC procedure 6575-QAP-4220.01 also includes QA practices for the National Institute of Standards and Technology- traceable calibration of both field and laboratory instruments used in support of surveys and

sampling for decommissioning activities. (Section 2.5, refers only to operation and source checks for portable radiological instruments using SNEC procedure 6575-QAP-4220.01.)

3. Section 2.2.1, page 2-4: Since decommissioning activities are ongoing and because recent radiologically contaminated areas were identified, confirm whether the estimates and projections given in Table 2-1, "Radionuclide Inventory for the SNEC Facility (2000)"; Table 3.1, "SNEC Facility Decommissioning Person-Rem Estimate"; and Table 3.2, "SNEC Facility Low Level Radioactive Waste Projection" need to be updated, and if so, revise the tables.

4. Section 2.2.4.1.2, page 2-10: The Decommissioning Support Facility (DSF) consists of a prefabricated building that is currently used to support decommissioning operations and contains radioactive material (RAM). The DSF and soil beneath the DSF has not been characterized. Please provide your plans to address this issue.

   Note: Detailed information on the radiological characterization, remediation plan, FSS design, sampling methodology, and remediation of the DSF, and soil beneath the DSF will be required for the NRC to release these areas for unrestricted use.

5. Section 2.2.4.1.4, page 2-11: Several piping sections in the Discharge Tunnel and a pipe believed to be the facility's original radioactive liquid effluent discharge line require further characterization due to the presence of ground water and silt below grade in the tunnel. Due to limited characterization data available (at the time of the LTP submittal) on the soil and ground water beneath the tunnel floor, the NRC staff believes that SNEC should treat these inaccessible areas initially as Class I and work toward rejecting the null hypothesis in accordance with the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). Table 5-2 does not provide initial classifications for the tunnel. Revise this section and table accordingly.

   Note: Detailed information on the radiological characterization, remediation plan, FSS design, sampling methodology, and remediation of the Discharge Tunnel to include the concrete structure, discharge line/pipes, and soil beneath the tunnel will be required for the NRC to release these areas for unrestricted use.

6. Section 2.2.4.2, page 2-12: Surface and subsurface soil characterization was limited to the facility property and immediately adjoining area because of the need for removal of certain structures (CV and support tunnel). Due to prevailing soil conditions and ground water near the surface of the CV and the surrounding support tunnel, subsurface soil has not been completely characterized. Please provide your plans to address this issue.

   Note: Detailed information on the radiological characterization, remediation plan, FSS design, sampling methodology, and remediation of subsurface soil near the CV and surrounding support tunnel will be required for the NRC to release these areas for unrestricted use.

7. Sections 2.2.4.2, page 2-12; and 2.2.4.3, page 2-12: Gamma logging was conducted to compliment analyses of 42 core samples of subsurface soil. Results of the sampling indicated that subsurface soil at depths of at least 10 feet on the north side of the CV require remediation. Although soil samples were collected in the same locations as count rate measurements, NRC staff generally considers the use of gamma logging for screening purposes only. That is, the direct correlation of count rate measurements to isotopic concentrations using gamma logging must be adequately demonstrated. Clarify the intent of gamma logging for subsurface soil and whether this method is proposed for soil remediation to demonstrate compliance. Provide the approved and referenced site procedure for gamma logging. In addition to Holes #10 and #13, given in Table 2-16, elevated concentrations of Cs-137 in subsurface soil are also indicated for Hole #11. Revise this sentence.

8. Section 2.2.4.3, page 2-12: Pavement areas (and soil beneath the pavement) in the facility and surrounding areas have not been completely characterized. The NRC staff recognizes that characterization in some areas may be precluded due to the influence of elevated ambient radiation levels from locations storing RAM and other ongoing decommissioning activities. Please provide your plans to address this issue.

   Note: Detailed information on the radiological characterization, remediation plan, FSS design, sampling methodology, and remediation of pavement areas, and soil beneath the pavement will be required for the NRC to release these areas for unrestricted use.

9. Section 2.2.4.5, page 2-14: Explain how the data from the monitoring wells are representative and appropriate for measuring contaminated ground water onsite, i.e., provide the basis and information for well locations, well depths, ground water elevations, ground water contours, direction of ground water flows (Figure 2-17), hydraulic gradients, hydraulic conductivity, ground water velocity, sampling method, and the isotopic analyses conducted. The basis should include: 1) a discussion on the potential that radionuclides resulting from licensed activities will reach the ground water (water bearing units) and surface water in the surrounding area; 2) the isotopic concentrations and uncertainties for each radionuclide identified in the ground water (providing that the analysis indicates the radionuclides have the potential to contaminate the ground water); and 3) a determination as to whether the potentially contaminated ground water moves beyond the SNEC property.

10. Section 2.6, page 2-19: Because of the recent discovery of other radiologically contaminated areas (i.e., Saxton Steam Generating Station sumps), the information supplied in the LTP is insufficient to indicate that the facility or site has been comprehensively characterized. The NRC requests that SNEC justify why the site characterization conducted is adequate to demonstrate that it is unlikely that significant quantities of residual radioactivity have gone undetected.

    Note: Detailed information on the radiological characterization, remediation plan, FSS design, sampling methodology, and remediation of the sumps to include the concrete structures, and soil beneath the sumps will be required for the NRC to release these areas for unrestricted use.

11. Tables 2-2 through 2-5, page 2-25: From Table 2-1, page 2-24, the predominant radionuclide inventory includes: Am-241, Co-60, Cs-137, Ni-63, H-3, Pu-241, and Sr-90. However, in Tables 2-2 through 2-5, Co-60 and Cs-137 are almost exclusively reported. Clarify the radionuclides of concern for each survey area. Revise the section accordingly or provide the basis for excluding those radionuclides not listed in Tables 2-2 through 2-5.

12. Section 4.3.4, page 4-3: This section states: "Because of the difficulty in excavating beneath an existing structure, remediation of the sub-floor soil may take place after the structure has been demolished." Under this scenario, the CV cannot be released for unrestricted use until the soil beneath the floor has been determined to meet the release criteria. Please provide your plans to address this issue.

    Note: Detailed information on the radiological characterization, remediation plan, FSS design, sampling methodology, and remediation of soil beneath the CV's sub-floor will be required for the NRC to release these areas for unrestricted use.

13. Section 4.4, page 4-3: The recent discovery of radiological contamination in the Saxton Steam Generating Station sumps should be included and discussed in detail.

14. Section 5.2.1, page 5-2: Ni-63 and H-3 were also identified in Table 2-1 as predominant radionuclides, however, these radionuclides were not mentioned in this section. Revise the section accordingly or provide the basis why Ni-63 and H-3 should be omitted as predominate radionuclides.

15. Table 5-9, page 5-36, and Table 5-10, page 5-39: Characteristics and detection sensitivities for the pressurized ion chamber (for exposure rate measurements) and Bicron Micro-Rem meter (for dose equivalent rate measurements) described in "Background Level Determinations," page 5-70, should also be listed in the radiological instrument tables.

16. Sections 5.2.3.2.1, 5.2.3.2.3, and 5.2.3.2.4, pages 5-5 to 5-8: Because there are several references to developing site-specific DCGLs, it is not clear how the screening values are intended to be used in the design of the FSS. Clarify if screening values will be used for planning surveys and demonstrating compliance with the release criteria. Also, clarify how the unity rule or the use of surrogates will be implemented. Provide information as to when the surrogate and gross activity DCGLs will be determined and under what conditions site-specific DCGLs will be used.

17. Section 5.2.3.2.4, page 5-8: Describe the DQOs for the exposure rate measurements performed over open land survey units and explain their utilization in the FSS design. Clarify whether there will be a separate release criterion for exposure rate measurements.

18. Table 5-2, page 5-11, and Section 5.2.4.2, page 5-11: Provide justification to support classification of the Northeast Dump Site as a Class 3 area. For clarity, the NRC staff suggests that Table 5-2 also summarize the survey areas along with the radionuclide concentrations and variability for each survey unit. Explain how a non-impacted area illustrated in Figure 5-1 can be surrounded by an impacted area.

19. Section 5.2.4.4, page 5-14. This section discusses making changes to classification based on "a high degree of confidence." Elaborate as to what constitutes a high degree of confidence.

20. Section 5.4, Table 5-5, page 5-24: The footnote designations used in the table are labeled with numbers, but within the table the footnotes are shown as letters. For clarity, one type of designation should be used consistently. In addition, the scan coverage for a Class 3 area should be revised to reflect a minimum recommended scan coverage of "Judgmental, up to 10%" other than "0 to 10%" as indicated. Also, if preliminary information suggests that there may be locations above the DCGL, the survey unit should not be designated a Class 2 area. This survey unit would be more appropriately considered Class 1 and surveyed accordingly. Justify your approach or revise this section.

21. Section 5.4.3, page 5-27: Clarify the statement: "When instrumentation and techniques used for scan measurements are capable of providing data of sufficient quality as static measurements, they may be used in place of a static measurements." Explain under what conditions will the use of scan measurements be applicable over static measurements. Provide justification as to the applicability of this technique and how the data will be evaluated to demonstrate compliance with the release criteria.

22. Section 5.4.4; Tables 5-7 and 5-8, pages 5-31 and 5-32: Clarify how Class 2 and Class 3 survey units will be reclassified. Explain how a determination will be made if all or a portion of a survey unit is reclassified, and if remediation of the elevated activity will be considered prior to reclassifying a survey unit. Clarify the method that will be used if an area must be upgraded to a higher classification.

23. Section 5.5.2.4.1, page 5-37: Explain how the anticipated site radionuclide mixture ratios and various energies will be accounted for during instrument calibrations. Note that in the MDC_{scan} equation, as referenced from MARSSIM and defined in NUREG-1507, instrument efficiency, ε_i, is the net count rate per 2π surface emission, and the source efficiency, ε_s, is the 2π surface emission rate per the surface activity.

24. Sections 5.5.2.4.2 and 5.5.2.5, page 5-38: Provide the basis (i.e., site-specific relative ratios) for using a beta (β)-gamma surrogate for the purpose of detecting alpha (α) activity. In Table 5-10, explain what calibration sources and variables were used to determine the α- and β-particle efficiencies given (i.e., β-particle total efficiency for Tc-99 would be approximately 12%).

25. Section 5.5.3.4.7, page 5-43: Site characterization identified subsurface soil contamination in several areas. Describe how survey units in these areas will be surveyed in the FSS. Clarify whether these areas will be remediated prior to the FSS.

26. Table 5-16, page 5-64: Clarify the intent of the table. Decision errors are an essential part of the DQO process. Specifically, the Type I (α) error is established by the NRC with the default value being 0.05. The decision errors and the relative shift, Δ/σ, are used to determine the number of measurements necessary to satisfy the selected statistical test. Based upon the selection of the appropriate statistical test, this number can be optimized if Δ/σ is >1. Changes in α will require NRC approval for modification in those instances where sample numbers are unreasonable.

27. "Selecting a Minimum Number of Samples," page 5-67: It is not the intent of MARSSIM to design the survey to match a predetermined sample size. The formal process of establishing DQOs is to develop a survey design that optimizes the power of the statistical test for each individual survey unit. The number of samples required to demonstrate that a survey unit passes the release criteria needs to be determined and provided for each survey unit.

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