

October 28, 2002

Mr. G. A. Kuehn, Jr.
Vice President SNEC and
Program Director SNEC Facility
GPU Nuclear, Inc.
Route 441 South
P.O. Box 480
Middletown, PA 17057-0480

SUBJECT: SAXTON NUCLEAR EXPERIMENTAL FACILITY - DISCUSSION TOPICS FOR
OCTOBER 31, 2002, MEETING (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 Facility which you submitted on February 2, 2000, as supplemented. As part of our review, we have arranged a meeting with you that is open to public observation on October 31, 2002, to discuss details of our review of your application related to submission of Revision 1 of the License Termination Plan. The details of the meeting were sent to you under separate cover.

To facilitate our discussions on October 31, 2002, please find enclosed comments and issues that were identified during our review of Revision 1 of your License Termination Plan. The enclosure is not a request for additional information and may not contain all technical issues identified by the staff. Following our meeting, we may issue a request for additional information based on the outcome of the meeting.

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

Sincerely,

/RA/

Alexander Adams, Jr., Senior Project Manager
Research and Test Reactors Section
Operating Reactor Improvements Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-146

Enclosure: As stated

cc w/enclosure:
See next page

Saxton Nuclear
Experimental Corporation

Docket No. 50-146

cc:

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TEMPLATE #: NRR-106

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**DISCUSSION ISSUES FOR MEETING BETWEEN THE NRC AND SNEC STAFFS
OCTOBER 31, 2002**

HEALTH PHYSICS ISSUES

COVER LETTER:

1. Consider revision of licence conditions under Section 2.E as follows:

Revise condition (d) text as "...related minimum detectable concentrations (for both scan and fixed measurement methods);"

Delete condition (e) result in significant environmental impacts not previously reviewed. This condition is already contained in condition (b) violate the criteria of 10 CFR 50.82(a)(6)(iii) [i.e, Result in significant environmental impacts not previously reviewed.].

CHAPTER 1.0 GENERAL INFORMATION

2. Section 1.3, Plan Summary, page 1-2:

Revise the approval of proposed changes to be the same as those stated in the Cover Letter.

CHAPTER 2.0 SITE CHARACTERIZATION

3. Section 2.2.4.1.7.1, Intake Tunnel Characterization Results, page 1-1:

The first paragraph states "Approximately 1 square foot of surface area was surveyed." It is unclear whether the 1 square foot total was scanned or 1 square foot every 10 feet of tunnel length was scanned. This statement needs to be clarified.

4. Section 2.2.4.1.8.5, Conclusions, page 2-19:

Consider revising the following sentence in the third paragraph follows: "Robotics was employed for the majority of this work as the small diameter pipes, ~~as the~~ confined spaces, and presence of water made manned entry difficult."

5. Section 2.6, CONCLUSIONS, pages 2-33 to 2-34:

Consider revision of "No positive results were detected >10' below the surface." to "No positive results above background were detected >10' below the surface."

6. Section 2.7, REFERENCES, page 2-36:

Neither the text, tables, nor figures in Chapter 2 referred to Reference 2-21, TLG Services, Inc. report, "The Saxton Facility Reactor Vessel, internals, Ex-Vessel Lead, Structural Steel and Reactor Compartment Concrete Shield Wall Radionuclide

Inventory”, December, 1995 (TLG Document No. G01-1192-003). Delete this reference or cite it in Chapter 2.

7. Table 2-1, Radionuclide Inventory for the SNEC Facility (2002), page 2-39:

This table was revised to include two new columns, i.e., “Remaining Fraction” and “Total CV Activity Estimate (mCi).” Clarify the determination and use of the factor “0.26” throughout the Remaining Fraction column.

8. Tables 2-3a, 2-3b, 2-3c and 2.6a, pages 2-40, 2-42, 2-43, and 2-51:

During the public meeting on health physics issues (May 22, 2002), SNEC agreed to revise Tables 2.3a, 2.3b, and 2.6a to clarify sample type descriptions (e.g., scrap samples - paint, concrete, etc.) and corresponding footnotes added as appropriate. Please revise Tables 2-3a and 2-3b to resolve this issue. Also, Table 2-3c needs to be revised to indicate scrap sample type. Regarding Table 2-6a, the sample data for the DSF Roof, Debris from Inside Air Conditioner Housing - SXOT951 needs to be revised (as agreed to at the public meeting) to indicate the radionuclide analyzed.

9. Table 2-28, Site Access Roads, page 2-86:

The number of standard deviations is not stated for the data in this table. Please address.

10. Table 2-29, Listing of all “Hard to Detect Nuclides”/Transuranic Analysis, pages 2-87 to 2-95:

During the public meeting on health physics issues (May 22, 2002), SNEC agreed to revise Table 2-29 to include clarifying footnotes (i.e., state the analytical techniques used, other radionuclides analyzed but not listed, and that blanks indicate no sample analysis done). Please revise Table 2-29 to include this information.

11. Table 2-30 (Cont'd), CV Backfill & Subsurface Sample Results (see Figures 2-31 and 2-32):

Entries numbered 123 and 124 refer to subsurface sample data located at Grout Curtain Hole # 37. There is no such location identified on Figure 2-32, SNEC CV Grout and Well Installation Plan. Please revise the LTP to rectify this matter.

12. Figure 2-18, SNEC FACILITY - SSGS DISCHARGE TUNNEL, page 2-137:

During the public meeting on health physics issues (May 22, 2002), SNEC agreed to revise Figure 2-18 to indicate sampling locations. Please revise Figure 2-18 to include this information.

13. Figure 2-29, Soil Remediation Near SNEC CV, page 2-148:

Regarding the “area of current excavation,” the figure provides no reference distances for the excavation boundaries. Thus, the extent of remediation is not clear. Please provide a frame of reference with distances or delete this figure.

14. Figure 2-30, SNEC Facility CV, page 2-149:

This figure is a sketch that shows the approximate depth of remediation efforts to date around the CV structure. Since this figure does not provide geophysical boundaries regarding the non-impacted region below the CV, it cannot be used to depict this region. During the public meeting on health physics issues (June 21, 2002), the NRC staff explained that the LTP needs to include a figure(s) that clearly indicate the boundary of the non-impacted region under the CV. Figures/text specifying the non-impacted region boundaries were not included in LTP Rev. 1. A separate figure with text that clearly depicts the geophysical boundaries of the non-impacted region needs to be provided.

CHAPTER 5.0 SNEC FACILITY FINAL STATUS SURVEY PLAN

15. Section 5.1.1, Purpose, page 5-1:

Reference 5-5, NUREG-1575, “Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM),” should also be cited as a document cited and reviewed in the process of preparing the final status survey plan.

16. Section 5.2.4.2.2, Class 2 Area, page 5-10:

Consider revising the first sentence to read: “Class 2 areas are those that have or have had prior to remediation, a potential for radioactive contamination or known contamination, but are not expected to contain material greater than the DCGLs.”

17. Table 5-2, Initial Classifications of Site Areas, pages 5-10:

Consider changing the Column 1 title “Survey Unit Number” to “Survey Area Number.”

Interior Vertical Wall of CV Shell: Although the Description column specifies that this area is a wall, the Survey Unit Area column designates it as a ceiling. Please address.

Type of DCGL Used: Confirm that volumetric DCGLs will not be used to assess contamination in the SSGS.

18. Section 5.2.5.1, Survey Design Overview, page 5-16:

The third paragraph of this section states, “When necessary, a two-stage sampling process may be used IAW Reference 5-20. This sampling approach allows a second set of samples to be taken to meet the requirements of the statistical design of the survey. When used, this process will be incorporated as an option in the original survey design for the area.” Per the Saxton Public Meeting Minutes, June 21, 2002, regarding the use of “Two Stage or Double Sampling” in final status surveys, the NRC staff stated that the LTP needs to indicate those survey units where this method may be used to show release criteria compliance. Section 5.2.5.1 does not indicate the criteria to be

applied when making the determination that Two Stage or Double Sampling will be applied to a survey unit. In addition, use of Two Stage or Double Sampling increases the Type I decision error. Consequently, to use this process without identifying the applicable survey units in the LTP would require additional license amendments after the LTP is approved.

19. Section 5.2.10, Schedule, page 5-24:

This section states "Final survey activities are planned and will be discussed with the NRC in advance to allow scheduling of the required public meeting on the License Termination Plan." Per 10 CFR 50.82(a)(9)(iii), "The NRC shall also schedule a public meeting in the vicinity of the licensee's facility of upon receipt of the of the license termination plan." The required public meeting was held on May 25, 2000, after LTP Revision 0 (dated February 2000) was submitted by the licensee. There is no regulatory requirement to hold additional meetings. The sentence above needs to be explained or deleted from the LTP.

20. Section 5.4, SURVEY DESIGN, page 5-26:

Item 1 - Use of "Two Stage or Double Sampling" needs to be addressed in the design package. Consider revising the text to read "A brief overview describing the final status survey design, and a description of the use of "Two Stage or Double Sampling" when applicable."

Item 2 - Each survey design package needs to include a clear description of the boundaries for each survey area or unit. Consider revising the text to read "A description and map or drawing of impacted areas of the site, area, or building classified by residual radioactivity levels (Class 1, Class 2, or Class 3) and divided into survey units, with an explanation of the basis for division into survey units and the boundaries for each survey unit or area indicated. Maps should have compass headings indicated."

21. Section 5.4.4.5, Resurvey, page 5-38:

The second paragraph of this section states "In the case where a new survey unit is separated out from an existing survey unit or an existing survey unit is subdivided, Class 3 survey units need only additional randomly located measurements to complete the survey data set." When elevated contamination is identified in a Class 3 area and the area is subsequently subdivided into different classifications, the survey for the remaining Class 3 area needs to be repeated. In other words, taking of additional samples from the revised Class 3 area to supplement those now contained in the new subdivided area(s) classified as Class 1 or Class 2 is not permitted. Consider revising this paragraph to state "In the case where a new survey unit is separated out from an existing survey unit or an existing survey unit is subdivided, Class 3 survey units need to have the survey repeated to obtain a new survey data set."

22. Section 5.5.2.4.4, Static MDC for Structural Surfaces, page 5-46:

Item 5 states "Other correction factors may be applied to the above equation as deemed appropriate." This statement is vague; clarification of the term "other correction factors" needs to be provided.

23. Section 5.5.3.4.7, Subsurface Soil Contamination Survey, page 5-51:

The text at the end of the first paragraph states "Additionally, *in-situ* measurements may be considered when any layer exhibits results approaching 50% of the release criteria." The purpose of these measurements needs to be explained.

24. Section 5.5.3.5, Investigation Measurements, page 5-54:

In Section 2.2.4.2, "Soil," the third paragraph on page 2-20 states "Gamma bore logging will not be used as a stand alone technique for characterization or Final Status Survey but rather as a compliment to sampling." In order that the term "compliment to sampling" is consistently used throughout the LTP, consider revising the final sentence in Section 5.5.3.5, "Investigation Measurements," to state "Therefore, GPU Nuclear, Inc. will consider using gamma-logging as a compliment to sampling in areas where..."

25. Section 5.5.5.1, Other Scan Measurements, pages 5-54 to 5-55:

Regarding 100 percent scanning of an area with high detection efficiency instrumentation, this section states "Therefore, the need to measure a finite number of randomly selected survey points are reduced or eliminated. Consequently, some scan survey measurement efforts performed for initial phase and/or investigative purposes, may be accepted as final survey data provided the following conditions are met..." In contrast to this statement on the use of such instrumentation, Section 5.4.3, "Static Measurements," states - "However, GPU Nuclear, Inc. has agreed that soil samples will still be collected in open land areas additional to these semi-automated scan survey or *in-situ* gamma spectrometry special measurement techniques." In the latter case, SNEC has told the NRC staff (at public meetings) that the number of sampling points for the final status survey will be determined by the MARSSIM process. Consequently, once determined, the number of sample points cannot be reduced or eliminated. This inconsistency between the two sections needs to be rectified. Furthermore, Section 5.5.5.1 needs to specify the survey unit types or characteristics (e.g., embedded pipes) for which scan measurements may be accepted as final status survey data.

26. Section 5.8, DEFINITIONS, page 5-66:

The definition for *scoping survey* states "Surveys such as investigative surveys used to provide a quick look at conditions before or during FSS work. These surveys are not necessarily documented." This definition needs to be revised since scoping survey activities are performed for a preliminary risk assessment or to provide input for additional characterization and are not conducted during the final status survey. Consider replacing this definition with that which is in NUREG-1575, Rev. 1.. i.e., "A type of *survey* that is conducted to identify: 1) radionuclide contaminants, 2) relative radionuclide ratios, and 3) general levels and extent of contamination."

DOSE MODELING

27. Consider referencing in the LTP the specific MicroShield analysis used in support of Equation 6-1. In referencing these calculations, consider stating that any future analysis using MicroShield in support of Equation 6-1 will use the same conceptual model and input parameters (with possibly the exception of the concentration) as those used in the referenced analysis.

FINANCIAL

28. Please list outstanding decommissioning work and the basis for the statement that it will cost \$13.0 million to complete this work.

GROUND WATER

29. Please incorporate your responses to the RAIs, the radiological analytical results from the groundwater sampling events, and other appropriate hydrogeological data into the revised LTP. This should include updating all text, tables, figures, and calculations in the LTP for the aforementioned items where these items have been replaced by more current analysis and data.

Please discuss as a minimum the following items in the LTP Groundwater Section:

- a. Description of the overburden and bedrock water-bearing units at this site. (Note that the revised LTP has an adequate description of these units and this topic is included here only for purposes of having a complete list.)
- b. Discussion of the groundwater monitoring program at this site. This should include a discussion on the different phases in their monitoring program (i.e., what wells were installed, when, why). A map delineating the location of the overburden and bedrock wells. (Revised LTP is adequate except several monitoring wells installed during the fall/winter of 2000 are not discussed. Some of these are very important wells, for example, the nested background wells OW-3 and OW-3R and others -- OW-4, OW-4R, OW-5, OW-5R, and OW-6.)
- c. Recent groundwater-level configuration maps representing the overburden and bedrock units. Also, discuss any changes in the groundwater-level configuration maps under drought and extremely wet conditions. The groundwater flow directions or patterns should be discussed and shown on the maps. The groundwater flow in the bedrock should also be discussed based upon observed water levels and the fractures and structural features in the bedrock units. (This information was not included in the LTP, but it was included in the items listed above.) The licensee should also provide a table that lists the groundwater levels over time at this site for the different monitoring wells. The licensee staff or consultants provided the NRC staff with a table with this information during the April 2002 groundwater sampling event. This table provides information on the variations in the groundwater levels during seasonal and wet and dry climatic periods.
- d. Groundwater flow rates in the two water-bearing units should be discussed. Account for ranges in the hydraulic conductivity of the different rock materials;

impact, if any, of climatic conditions on hydraulic heads and flow rate; and the impact of bedrock structure (fractures and bedding planes) on the flow rate in the bedrock unit. (This information was not included in the revised LTP.)

- e. The groundwater flow rates should be used with potential plant-generated radionuclides to calculate travel times from the industrial area to the surface water discharge in the Raytown Branch of the Juniata River. Where appropriate, the K_d 's of the different radionuclides need to be used. Discuss the potential ranges in these travel times within both water-bearing units for the different potential radionuclides. (This information was not included in the revised LTP.)
- f. Discuss the analytical results of the radionuclides present in the groundwater. This discussion should include all potential plant-generated radionuclides, including the hard-to-detect. (The licensee's discussion is adequate. However, the licensee's conclusion on page 2-26 that results from Table 2-32 confirms that there are no radionuclides related to plant operations present in the monitored groundwater is not correct. Table 2-32 does not include all the monitoring wells that were sampled during the April 2002 sampling event. This table contains only results from the wells that NRC collected a split sample. Also, NRC analyzed their groundwater samples for H-3, Cs-137, Cs-134, Co-60, and the hard-to-detect radionuclides while the licensee apparently analyzed their groundwater samples for H-3, Cs-137, Cs-134, and Co-60.)