GPU NUCLEAR

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November 12, 1999
1940-99-20615

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Subject: Sale of a Portion of Land that is Part of the Oyster Creek Nuclear Generating Station Site Including a Portion of the Exclusion Area - Response to Request for Additional Information (TAC No. MA5644)

In response to your referenced request for information dated October 19, 1999, Enclosure I to this letter provides our response and supporting reference documentation.

If you have any questions regarding this information, please contact Mr. Michael Laggart of my staff at 609-971-4184.

Sincerely,

Michael B Roche

Michael B. Roche
Vice President and Director
Oyster Creek

MBR:MWL

Enclosures

cc: Administrator, NRC Region 1
Oyster Creek NRC Project Manager
Senior Resident Inspector - Oyster Creek

A001

ENCLOSURE 1

Question No. 1:

In accordance with applicable sections in 10 CFR 50.71, state how all records pertaining to release or property on the Forked River Site (FRS) being sold will be maintained until license termination, and provide the location of these records.

Response:

All records pertaining to release of property on the Forked River Site (FRS) being sold will be maintained in accordance with the GPU Nuclear Operational Quality Assurance Plan. Records are located in the Oyster Creek Information Resource Management Center. In addition, because documentation pertaining to the above will eventually be required for the effective decommissioning of Oyster Creek, the records will be assembled and maintained in our 10 CFR 50.75(g) file.

Question No. 2:

GPU Nuclear Calculation C-2820-99-010, "Dose Assessment of Residual Radioactivity on the Forked River Site - Demonstration per 10 CFR 20.1402", dated August 18, 1999, was not enclosed in the submitted package for review. This reference is requested for docketing and NRC staff review.

Response:

GPU Nuclear Calculation C-2820-99-010, "Dose Assessment of Residual Radioactivity on the Forked River Site - Demonstration per 10 CFR 20.1402", dated August 18, 1999 is provided as Attachment 1 to this enclosure.

Question No. 3:

"Sale of the Forked River Site Portion of the Oyster Creek Facility", Attachment 1, Compliance with the Radiological Criteria for License Termination, page 12: Indicates the established screening Derived Concentration Guideline Levels (DCGLS) for soil (pCi/g) are from SECY 98-051. According to SECY 98-242 document, dated October 21, 1998, the only values published, by NRC, were DCGLs for building surface contamination (dpm/100cm2) at the 90th percentile of the output dose distribution. SECY 98-242 included SECY 98-051 (as Attachment 1) and the table for building surface contamination screening DCGLs (as Attachment 2), which was subsequently revised November 11, 1998. Provide the computer code/version along with the parameters used to justify the established DCGLs, and the corresponding outputs.

Response:

SECY 98-242 was published in October of 1998. Our survey was conducted in July of 1998. We therefore designed the survey to the best available information from the NRC at the time.

GPUN is using the default DCGLs, not those developed by our in-house modeling. However, our in-house modeling, using RESRAD 5.82, which changed a few geometry and soil factors, results in similar DCGLs. Our modeling was extremely conservative in assuming that the entire backsite was the area for the contaminated soils, instead of the much smaller parking lot area. Based on information obtained at NRC public meetings, it is our understanding that issues remain with the accuracy of the cesium and transuranic factors in DandD. It therefore appears to be more valid to use the DCGLs we were working with in 1998, and RESRAD 5.82 at this time. However, the actual detection limits for the surveys conducted were substantially less than these DCGLs, providing ample conservative margin in our results. For example, for a class 3 area the MARSSIM suggests sampling and judgmental scanning. Our sampling of the class 3 impacted area included 52 samples. The MARSSIM sample statistics clearly show that less than 15 would be adequate. The detection limits in those samples was, for example, 0.14 pCi/gm of Cs-137 and 0.1 pCi/gm of Co-60, approximately 1% and 3% respectively, of the DCGLs we used. Even if other defaults DCGLs were used, these sample results are well below any default recommendations that we are aware of. The in-situ gamma analysis of the impacted area had detection limits on the order of 0.3 pCi/gm for both Cs137 and Co60. These are also substantially below the DG4006 expectation and also below any other suggested default DCGLs that we are aware of. MARSSIM and DG4006 do not expect in-situ gamma spectroscopy in addition to the scanning and sampling. The in-situ moving gamma spectroscopic scanning performed on the parking lot class 3 area consisted of an estimated 20% of the total area. Since the MARSSIM does not specify an area of coverage for class 3 areas for scanning ('judgmental') but expects '10-100%' in a class 2 area, our scan area clearly exceeds any expectation of scanning extent for a class 3. The detection limits for the scanning measurements were designed to achieve the detection of the DCGLs in use at the time. They vary based on the natural background component but are generally about 30% for the Co-60 DCGL. Since the MARSSIM does NOT require detection limits for scanning in class 3 areas to be below the DCGLw, this also far exceeds the requirements. If different DCGLs are proposed, the detection limits for the scan may or may not be less than the alternative DCGL (for example, we are aware of an approximately 0.9 pCi/gm default DCGL for Cs137 from DandD which we understand to be based on incorrect soil transfer factors). However, since the MDC scan is NOT required to be less than the DCGL for class 3 areas and there is no EMC requirement, the scans performed still fully meet the expectations of MARSSIM, even if the incorrect / lower DCGL for Cs137 is used.

Question No. 4:

"Sale of the Forked River Site Portion of the Oyster Creek Facility", Attachment 1, Compliance with the Radiological Criteria for LicenseTermination, page 13: The 10 CFR 61 waste stream analysis includes tritium, however, no specific sampling was performed to demonstrate the tritium is present on the FRS in quantities greater than background levels. Tritium in groundwater, in the immediate vicinity of the Oyster Creek plant area, was reported to be less than 5% of the Environmental Protection Agency (EPA) drinking water limit of 20,000 pCi/L. Provide information on why specific sampling for tritium in soil should not be required for any part of the FRS.

Response:

Tritium is present in the Oyster Creek waste streams (10CFR61) at concentrations that could conceivably contribute no more than a fraction of 0.0002 to the total dose if present at the abundance in the waste stream. DG4006 provides that analysis of this nuclide would not be required and is adequately characterized by the surrogate gamma emitters. If tritium were present in concentrations consistent with the waste stream, then concentrations on the order of 0.02 pCi/gm might be assumed to be present, which is approximately one-five thousandth of the DCGL. This is equivalent to about 0.005 mrem per year not included in our sampling effort. DG4006 clearly never intended that such analyses be made, since section 2.5.1 expects detection limits 'less than 50% of the DCGLw'. Section 4.7.1 of the MARSSIM expects ''MDC between 10-50% of the DCGL". Even at the most restrictive expectation, the '10%' from the MARSSIM, the hypothetical concentration of tritium at the firing range would be one five-hundredth of the required MDC. Section 2.9 of DG4006 says, "the presence of nuclides that likely contribute less than 10% of the total effective dose equivalent may be ignored". DG4006 also says "When there is a fixed ratio...[such as assumed in the question-assuming tritium is present in the waste stream mix ratio]...Compliance with the radiological criteria for license termination may be demonstrated by comparing the concentration of the single radionuclide that is easiest to measure with its DCGLw."

Question No. 5:

"Sale of the Forked River Site Portion of the Oyster Creek Facility", Attachment 1, Classification of Areas by Residual Radioactivity Levels, page 5: Buildings (1, 12, 14, Spectrum) contain exempt and/or sealed quantities of radioactive material used primarily for training purposes, and for source checking and calibrating instruments. These radiation sources will remain in the buildings (with the exception of the Spectrum building) for use by GPU staff following sale of the property. For clarity, identify the nuclides and activities of the radiation sources. Provide supporting information, in addition to the floor surface contamination survey data submitted, to justify that all areas known to contain radiation sources are classified as non-impacted.

Response:

Attachment 2 is a list of radioactive sources currently located on the Forked River property. These sources are located in buildings that are currently and will remain, after the sale, under the control of the Oyster Creek Nuclear Generating Station. Other than the combustion turbines, GPU is not selling the improvements on the site. The buildings and building contents will still be the property of the licensee. Surveys were conducted in the buildings prior to full clarification of the scope of the sale. The dose assessment based on those surveys was provided in order to be thorough and complete.

Question No. 6:

"Sale of the Forked River Site Portion of the Oyster Creek Facility", Attachment 1, Classification of Areas by Residual Radioactivity Levels, page 5: Buildings (Motor Pool, 8) contained measurable fixed contamination on tools that were either stored or transported to the FRS. An investigation and smear surveys were conducted resulting in no removable contamination. Provide this supporting information to justify that all areas known to contain contaminated material/items are classified as non-impacted.

Response:

Tools with activity from the Oyster Creek Nuclear Generating Station are not stored on the Forked River Site (FRS). In accordance with our procedures, contaminated material is maintained within a "Radiological Controlled Area (RCA)". There was however three occurrences where tools with fixed contamination were inadvertently transported to the FRS. In each case a "Radiological Investigation Report" was initiated. Attached are Radiological Investigation Reports 89-045, 91-002, and 91-057. (See Attachment 3)

Question No. 7:

Historical Site Assessment of the Forked River Site", Attachment 1, Description of Past and Current Operations, page 15: Fourteen truckloads of dirt with activity concentrations up to 0.3 pCi/g Cs-137 and 0.2 pCi/g of Co-60, determined by gamma spectroscopy, were temporarily stored adjacent to/on the Firing Range (FR) parking lot. These areas were classified as Class 3 - impacted. GPU Operations Quality Assurance (QA) Monitoring Report, Serial No. 9114001, dated February 7, 1991, states that the soil was excavated from outside the Radiological Controlled Area (RCA), in June/July 1990, from the area north of the reactor building. The report further mentions that the soil was "spread over the parking lot at the Firing Range by a Facilities contractor unaware of the sampling or concern about the soil." For clarity, define the boundary of the RCA, the volume of soil transported, and the final disposition of the soil onsite. NRC also requests information in isotopic soil analyses in the impacted area for potential alpha/beta emitters which may result from fission, activation, or other licensed activities.

Response:

The boundary of the outside RCA areas at the plant extends from the north east corner of the reactor building, then extends north on the east side of the drywell processing facility, continues north just west of the west wall of new radwaste, then turns eastward just north of new radwaste. At the warehouse it turns south, a few feet west of the warehouse wall and follows (a few feet away) the line of the west and then south wall of the warehouse. About half-way eastward along the south warehouse wall, the RCA boundary turns south and goes essentially straight to the north east corner of the augmented offgas building. It then turns west, along the north wall of

AOG, just north of the fuel oil tank. Just past the fuel oil tank it turns south again until it turns west at a point where it passes just a few feet south of the boiler house. Past the boiler house and stack fan pad, it turns north and connects to the southeast corner of the reactor building. Essentially, the RCA encompasses an extended area only on the east side of the reactor building, but extended north to include the new radwaste building. Small 'satellite' RCAs are present elsewhere, for example around the outside storage tanks west of the turbine building.

The soil consisted of 14 dump truck loads. Each load appeared to be a few (2-3) cubic yards each. As identified in our letter of September 22, 1999, "These soils were removed from the parking lot and placed back on the Oyster Creek site. Reference 7 is the QA monitoring report that documents this event and includes the soil sample results." The exact location of where the soil was deposited is not documented, however the "Oyster Creek site," as referred to in the QA monitoring report, is the area bounded by the intake/discharge canal and Route 9 highway.

Alpha and beta emitting nuclide analyses are not required by the MARSSIM methodology and has not been conducted. Based on the various waste stream analyses used, the alpha and beta emitters, and the other 'hard-to-detect' nuclides (e.g. from 10CFR61) (e.g. Fe55, Sr/Y90, U234, Pu238, Pu239/240, Pu241, Am241, Cm243, Ni59, Ni63, Tc99, C14) are not expected to contribute more than 3% total all combined to the dose assessment. DG4006 clearly never intended that such analyses be made, since section 2.5.1 expects detection limits 'less than 50% of the DCGLw'. Section 4.7.1 of the MARSSIM expects ''MDC between 10-50% of the DCGL". Even at the most restrictive expectation, the '10%' from the MARSSIM, the hypothetical concentration of the highest contributing 'hard-to-detect' at the firing range would be about 2% of the required MDC. Section 2.9 of DG4006 says ''the presence of nuclides that likely contribute less than 10% of the total effective dose equivalent may be ignored'. DG4006 also says 'When there is a fixed ratio...[such as may be assumed based on the waste stream mix ratio]...Compliance with the radiological criteria for license termination may be demonstrated by comparing the concentration of the single radionuclide that is easiest to measure with its DCGLw."

In addition, recent soil sampling immediately around the Oyster Creek plant for strontium-90 showed 15 of 16 samples less than MDA at less than about 0.02 pCi/gm, and one positive at 0.018 pCi/gm (approximately one-onehundredth of the default DCGLs in our 9/22/99 submittal and approximately one-onethousandth of the DCGL from our RESRAD 5.82 modeling). Given the Cesium content of these 'on-site' soils and the Cs137/Sr90 ratios observed, these on-site strontium results further demonstrate that there is no reasonable expectation for 'hard-to-detects' to be relevant for the class 3 area on the Forked River property.

Question No. 8:

"Historical Site Assessment of the Forked River Site", Attachment 1, Potential Contaminated Areas, page 20: Noble gases were observed in the Switchyard Building through a conduit from the condenser bay which was sealed. Provide information that describes this direct exposure pathway to include the time frame at which this event occurred; the identity of the noble gases with emission types, half-lives, and energies; respective concentrations and submersion dose assessment, the method on how the leak was sealed; and a comprehensive analysis that demonstrates a similar event is unlikely to reoccur following sale of the property to justify that the area is classified as non-impacted.

Response:

The Historical Site Assessment (HSA) notation of a possible release of noble gases via a conduit that connected the Condenser Bay to a structure in the switchyard has not been confirmed by a records search. The notation was based solely on personnel interviews, however we believe the information to be correct. It should be noted that the Condenser Bay is normally maintained under a negative pressure with respect to the environment. Therefore any pathways to the environment would not experience a condition leading to noble gases being released to the environment.

Question No. 9:

"Radiological Scoping Survey of the Forked River Site, Soil Sampling, 1998": Soil samples results, provided in Appendix 1, "Laboratory Reports of Gamma Isotropic Analyses of Soil Samples Collected From the Forked River Site" were analyzed by GPU Environmental Radioactivity Laboratory in Harrisburg, PA, in accordance with GPU's procedures and QA plan. Confirm that the QA plan for the Harrisburg lab has been approved by the NRC and that it meets applicable requirements in 10 CFR Part 50, Appendix B. "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants", otherwise submit the QA plan for review.

Response:

The GPU Environmental Radioactivity Laboratory is a department within GPU Nuclear. Specifically, the Laboratory reports to the Radiological Controls department of TMI-1. Activities are conducted in accordance with the "GPU Nuclear Operational Quality Assurance Plan," which is applicable to TMI-1 and OC. NRC Region I has periodically inspected this facility.