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Washington, DC 20555-0001

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Our ref: HEM-15-81
Date: July 28, 2015

Subject: Hematite Decommissioning Project – Response to U.S. Nuclear Regulatory Commission Review of Westinghouse Hematite Final Status Survey Issues and Associated Technical and Regulatory Bases and Paths Moving Forward (License No. SNM-00033, Docket No. 070-00036)

Reference: 1) NRC (Persinko) letter to Westinghouse (Fussell), dated July 17, 2015, 2015, "U.S. Nuclear Regulatory Commission Review of Westinghouse Hematite Final Status Survey Issues and Associated Technical and Regulatory Bases and Paths Moving Forward"

Dear Sirs,

In a July 8, 2015, telephone call between Mess. Larry Camper and Mike Norato of the NRC, and Mess. Doug Weaver, Joe Smetanka and Jose Emeterio Gutierrez of Westinghouse, the NRC committed to provide to Westinghouse by July 15, 2015, the Nuclear Regulatory Commission's (NRC's) needs regarding information associated with Hematite's Final Status Survey (FSS). The NRC committed to provide a listing of all of the FSS issues, the technical and regulatory bases for the issues and a proposed path forward both from NRC Headquarters and NRC Region III. Also to be provided to Westinghouse were detailed comments regarding the Survey Area Release Record, HDP-RPT-FSS-202. The July 15, 2015, date was subsequently postponed until July 17, 2015

Westinghouse is in receipt of the July 17, 2015, correspondence (Reference 1) which provided a listing of issues from NRC Headquarters and a listing of positions from NRC Region III. The correspondence did not contain detailed comments in regards to HDP-RPT-FSS-202.

Based upon a July 15, 2015, delivery date of the list of issues, the NRC committed to having a call on July 21, 2015, to permit Westinghouse to ask clarifying questions and then a publicly noticed face to face meeting on July 28-29, 2015, in Rockville, MD. The July 21, 2015, call had subsequently been postponed to July 23, 2015, and again postponed until July 27, 2015. Additionally the NRC advised Westinghouse that NRC Region III personnel would not be available for the calls until sometime during the week of August 3, 2015.

Concurrent with the postponement of teleconferences, NRC staff has advised Westinghouse that cognizant NRC personnel will not be made available for the July 28-29, 2015, meeting and that the NRC has rescheduled the meeting for August 10-11, 2015, at the NRC's Rockville office. Based upon the consistent series of postponements Westinghouse is not confident at this time that the August 10-11, 2015, meeting will take place.

The purpose of this letter is to provide to the NRC a response to Enclosure 1 of the NRC letter dated July 17, 2015, (Reference 1) regarding information needed by the NRC Headquarters to resolve Hematite's Final Status Survey issues.

Attachment 1 of this letter contains a summary response to Enclosure 1 of the July 17, 2015, NRC letter attachment titled "Hematite Final Status Survey Issues and Technical and Regulatory Bases."

Westinghouse intends to provide a response to Enclosure 2 of the July 17, 2015, NRC letter attachment titled "Regional Position, Information Follow-up Items from IR070-00036/2015001 and IR070-00036/2015002" approximately one week after the transmittal of this letter.

Please contact Kenneth Pallagi at 314-810-3353, should you have questions or need additional information.

Sincerely,

Gay M. Fussell
Deputy Director,
Hematite Decommissioning Project

Attachment: 1) Westinghouse Hematite Decommissioning Project, Response to NRC attachment to letter "Hematite Final Status Survey Issues and Technical and Regulatory Bases" dated July 17, 2015

cc: J. W. Smetanka, Westinghouse
A. Persinko, NRC/NMSS/DUWP
M. A. Norato, NRC/DUWP/MDB
J. J. Hayes, NRC/DUWP/MDB
P. Louden, NRC Region III/DNMS/MCID
R. J. Orlikowski, NRC Region III/DNMS/MCID
M. M. LaFranzo, NRC Region III/DNMS/MCID

Attachment 1

Westinghouse Hematite Decommissioning Project
Response to NRC attachment to letter "Hematite Final Status Survey Issues and Technical and Regulatory Bases" dated July 17, 2015

Westinghouse Electric Company LLC, Hematite Decommissioning Project

Docket No. 070-00036

Westinghouse Hematite Decommissioning Project
Response to NRC attachment to letter "Hematite Final Status Survey Issues and Technical and Regulatory Bases" dated July 17, 2015

NRC Issue: Inputs into Scan MDC

Summary of Westinghouse Response

While the Hematite Decommissioning Plan as approved by the NRC states that a surveyor efficiency of 1.0 may be used when post processing is utilized, Westinghouse acknowledges that NUREG-1507 recommends a surveyor efficiency of 0.5 to 0.75. As such, Westinghouse would agree to use a surveyor efficiency of 0.75. This value has established precedence with the NRC as it is the same value utilized for the development of scan MDCs at the Breckenridge facility in Michigan where post processing was utilized.

Discussion

Westinghouse will lower the value of the surveyor efficiency from 1.0 to 0.75. Westinghouse's assessment of the value of 0.75 is that it better reflects the actual field conditions under which scanning is performed compared to the minimum value of 0.5 provided in NUREG-1507.

The table below demonstrates how the use of a 0.75 value for surveyor efficiency affects the use of scan MDCs for the HDP:

Scan MDC (pCi/g)			
Surveyor Efficiency	Ra-226	Th-232	Total Uranium (4%)
1.0	1.04	0.75	35.5
0.75	1.21	0.87	40.9

The calculated scan MDC's using a surveyor efficiency of 0.75 in the table above demonstrate that the scan MDC's for Ra-226 and Th-232 are less than the most conservative (Uniform) $DCGL_w$ (1.9 and 2.0 pCi/g respectively), and for Ra-226 only slightly above the "target" MDC of 50% of the $DCGL_w$ (0.95 pCi/g).

As already approved in the DP, a surveyor efficiency of 0.5 will be utilized in situations where post processing of the GWS data is not performed (e.g., situations where GPS cannot be used due to interference). The associated FSS procedures that reference the Scan MDC of a NaI 2x2 probe will also be revised to reflect the change.

Westinghouse has evaluated the impact of adjusting the surveyor efficiency to a value of 0.75 on those survey units in which a value of 1.0 was used when calculating the Scan MDC. The evaluation indicates that the use of the 0.75 surveyor efficiency does not impact the results of any of the FSS results of those survey units.

During ORAU's performance of confirmatory surveys of LSA 10-03 and LSA 10-04, ORAU personnel identified the identical elevated areas as HDP FSS personnel. NRC Region III personnel also performed independent surveys of LSA 10-13 and LSA 10-14, identifying the same elevated areas as HDP FSS personnel.

The fact that the identification of the elevated areas was identical for all parties using each respective scanning technique (although the theoretical technical basis was slightly different) is additional data that supports that adjusting the surveyor efficiency to a value of 0.75 does not impact previously conducted FSS.

NRC Issue: Description of Remediation Activities Following Initiation of Final Status Survey

Westinghouse agrees with the NRC's proposed path forward, and a section will be added to each Survey Area Release Record that details any and all applicable information regarding any remediation that was performed following the initiation of FSS in a survey unit.

Discussion

DP 14.4.3.7 does state "*If remediation is required in only a small area of a Class 1 survey unit, any replacement measurements or samples required will be made within the remediated area at randomly selected locations following verification that the remediation activities did not affect the remainder of the unit. Re-survey will be required in any area of a survey unit affected by subsequent remediation activities.*"

As stated by the NRC, the field logs for LSA 10-11 indicated remediation of an area occurred after the start of FSS. Specifically, a small elevated area was identified by gamma walkover survey in LSA 10-11 and evaluation of the area by on-site soil analysis indicated elevated Ra-226 activity. Given the very low $DCGL_w$ for Ra-226, the decision was made to remove the elevated area. Using a hand shovel, a 1 foot by 1 foot area approximately 9 inches deep was removed. The area was then re-scanned and sampled.

As required by the DP, the FSS staff verified that the remediation activity did not affect the remainder of the survey unit. As such, the post remediation data for that specific area was the final condition FSS data provided in the report.

With the clarification that the NRC desires to evaluate all remediation data subsequent to the initiation of FSS in a survey unit Westinghouse will add a section to the report to provide that information.

NRC Issue: Appropriate Sampling of the Reuse Pile

Summary of Westinghouse Response

Westinghouse believes that this issue has previously been resolved.

Discussion

In Westinghouse letter (Fussell) to NRC (Document Control Desk) HEM-15-66 dated June 30, 2015, Westinghouse stated in regards to the three paths forward proposed by the NRC for evaluating sample results for the reuse stockpiles that "*Westinghouse has completed an assessment of the potential paths forward and has concluded that the optimal path forward of the three potential paths is to place soil in a layer where the MIL for Tc-99 is below the associated DCGL. As a conservative measure, HDP will continue to utilize the Uniform $DCGL_w$ to evaluate the dose impacts of using that particular stockpile of soil as backfill, but also restrict the placement of the reuse soil based on compliance with the MIL for the Surface or Deep CSM's.*" This is options 1 of the 3 option presented by the NRC.

The MIL for Tc-99 will be performed for subsequent evaluations of reuse soil.

NRC Issue: Demonstration of compliance with the dose criteria in 10 CFR 20.1402 based on FSS data

Summary of Westinghouse Response

Westinghouse believes that the dose evaluation in the report considered all plausible sources of residual contamination from licensed material and would appreciate clarification in regards to the term "challenging aspects." The following section describes the "challenging aspects" that were considered by Westinghouse in development of the FSS report template.

Discussion

The discussion of this issue in the technical basis section as provided by the NRC states "the contribution from all sources of residual contamination needs to be considered in the evaluation (e.g., average residual contamination in the survey unit, elevated areas, and groundwater)." The following is information that describes the sources of licensed material residual contamination considered and the associated evaluation.

As an example, in the report for LSA 10-01 and LSA 10-02 section 6.9.1 "LSA 10-01" Westinghouse provided a table with the plausible sources of licensed material residual contamination. Westinghouse considered 1) the dose contribution based upon the average survey unit soil radioactivity; 2) any dose contribution due to an elevated area; 3) ground water dose contribution which was established at a conservative 4.0 mrem/yr; 4) any dose contribution associated with buried piping [which would include structures remaining within a survey unit]; and 5) the dose contribution for any reuse soil in the survey unit. This evaluation was presented in Table 6-8, LSA 10-01 SOF and Dose Summation as provided below.

	AVERAGE SU SOIL RADIOACTIVITY	ELEVATED AREA CONTRIBUTION	GROUND WATER	BURIED PIPING	REUSE SOIL	**TOTAL**
SOF	0.19	N/A	0.16	N/A	0.31	**0.66**
DOSE	4.75 mrem/yr	N/A	4.0 mrem/yr	N/A	7.75 mrem/yr	**16.55 mrem/yr**

Westinghouse believes the evaluations included in the report and the calculation embedded in the above table is an example of the calculations of the evaluations as requested by the NRC. As explained in the Executive Summary section of the report, the report provides the results of Final Status Survey for a survey unit for NRC review. The Executive Summary also (as described in the DP) explains that a Final Status Survey Final Report would be provided to the NRC at the time of the request for license termination and it would include the actual dose attributed to groundwater, reuse soil, etc. The original intent of submitting the report as written was to provide a bounding dose assessment that would facilitate the review by the NRC and support the initiation of backfill operations in a survey unit.

A bounding dose evaluation was conducted to provide assurance to the NRC that the dose for the survey unit would not exceed the dose stated in the report at the time of request for license termination. This was accomplished by providing the actual dose for a survey unit attributed to 1) the average survey unit soil; 2) elevated area contribution; 3) buried piping and structures; and 4) adding a limiting value for groundwater and the most conservative value for the reuse stockpile soil on-site based upon FSS data.

The dose attributed from the survey unit soil is based upon the results of FSS. As provided in the report, the assessment of the survey unit data is to the Uniform DCGLs, which are the most conservative DCGLs. This precludes an assessment to the three stratum conceptual model which would provide a lower dose attributed to the survey unit.

If the three stratum conceptual model were to be used for dose evaluation of a survey unit the following equation is used to determine the survey unit average dose when using the three layer DCGLs and the residual contamination is in a vertical configuration of multiple strata. The NRC and Westinghouse previously came to resolution on this issue in the time frame of December 2011. The resolution resulted in a revision to HDP-PR-FSS-721, *Final Status Survey Data Evaluation,* Section 8.4, *Calculation of the Sum-of-Fractions (SOF).* The equation determines a weighted average for each of the three layers and then the weighted value for each layer is summed to provide a SOF for the survey unit soil. This is a conservative approach and it ensures that the cumulative dose for all three layers are taken in account.

$$\mathrm{SOF}_{avg} = f_{SS}\sum_{i=1}^{n}\left(\frac{\overline{C}_{i,SS}}{D_{i,SS}}\right) + f_{RS}\sum_{i=1}^{n}\left(\frac{\overline{C}_{i,RS}}{D_{i,RS}}\right) + f_{DS}\sum_{i=1}^{n}\left(\frac{\overline{C}_{i,DS}}{D_{i,DS}}\right)$$

where:
- n = Number of measured ROCs;
- f_{SS} = Fraction of the survey unit area at the surface stratum depth;
- f_{RS} = Fraction of survey unit area at the root stratum depth;
- f_{DS} = Fraction of survey unit area at the deep stratum depth;
- $\overline{C}_{i,\,SS}$ = Average concentration for the i^{th} ROC in the surface stratum;
- $\overline{C}_{i,\,RS}$ = Average concentration for the i^{th} ROC in the root stratum;
- $\overline{C}_{i,\,DS}$ = Average concentration for the i^{th} ROC in the deep stratum;
- $D_{i,SS}$ = DCGL for the i^{th} ROC in the surface stratum;
- $D_{i,RS}$ = DCGL for the i^{th} ROC in the root stratum;
- $D_{i,DS}$ = DCGL for the i^{th} ROC in the deep stratum.

To determine the area fractions, the number of systematic locations within the layer is divided by the total number of systematic locations.