

ATTACHMENT 4

Responses to Requests for Additional Information on Decommissioning Plan Chapters 8 and 9 - Non-Proprietary

**Westinghouse Electric Company LLC,
Hematite Decommissioning Project**

Docket No. 070-00036.

Responses to Requests for Additional Information on Decommissioning Plan Chapters 8 and 9

NRC issued requests for additional information (RAI) concerning the Hematite Decommissioning Plan (DFP) in letter dated December 3, 2010. Westinghouse Electric Company LLC (Westinghouse) provides responses to those RAIs herein, with the exception of the RAI HDP-9-Q1 response, which will be provided under separate cover. Some of the responses will result in changes, as noted, to the DP. Those changes will be provided under separate cover.

These RAI responses are organized in the same manner as the RAIs of NRC letter dated December 3, 2010. For each RAI, the NRC's Comment, Basis and Path Forward is reiterated, followed by the Westinghouse Response.

Hematite Decommissioning Plan Chapter 8 – Planned Decommissioning Activities

1. (HDP-8-Q1) Comment: Section 8.2, Site Preparation, of the Hematite Decommissioning Plan (DP) indicates that spent limestone from within the impacted area will be utilized in the construction of a railcar loading pad. This limestone may contain ⁹⁹Tc and could potentially spread contaminated material to a non-impacted area if it were utilized for the loading pad.

Path Forward: Please clarify whether spent limestone having residual radioactivity from onsite was used as fill for the rail car loading pad.

Westinghouse Response

Spent limestone was not used as fill for the rail car loading pad.

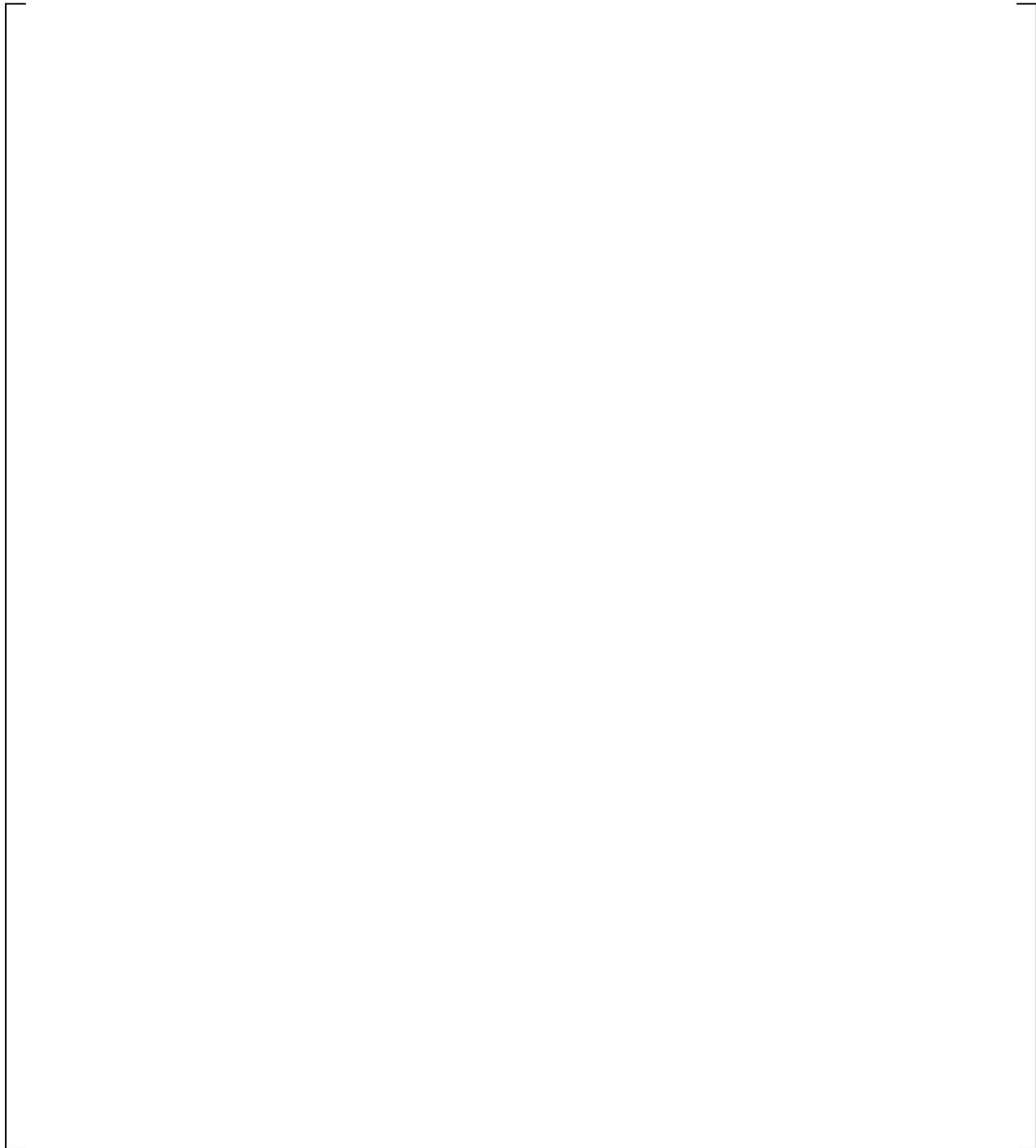
2. (HDP-8-Q2) Comment: Section 8.2 of the DP indicates that a Water Treatment System will be installed in Building 230. However, there are no details on the System.

Basis: In accordance with 10 CFR Part 20.1101(b) and as recommended in Section 17.4.1 of NUREG 1757 Vol. 1, Rev. 2, "Environmental ALARA Evaluation Program", the licensee needs to provide a description of the procedures, engineering controls, and process controls to maintain doses as low as reasonably achievable (ALARA).

Path Forward: Provide a detailed description of the water treatment system components, designed volume capacity and decontamination factors. Provide information on how Westinghouse will ensure effluent releases are maintained ALARA and below liquid release limits.

Westinghouse Response

A detailed description of the water treatment system components, designed volume capacity and decontamination factors is provided below. The water treatment system is designed to maintain effluent releases within liquid release limits and maintain ALARA as described in Chapter 11 of the Decommissioning Plan.



(a) (c)

Water Treatment System Design Volume Capacity:

The water treatment system is sized to allow remediation activities to proceed with minimal interruption due to accumulated water for a reasonable storm condition. Water will be generated from the following sources:

- Water that is within the buried waste that will be exhumed (leachate).

- Ground water that seeps into the excavation from surrounding soil.
- Precipitation that falls directly into an excavation, and
- Precipitation that falls onto waste and adjacent outside waste-processing areas.



(a) (c)

Effluent Monitoring:

In order to accurately measure the concentration in effluent releases, a representative batch sample will be obtained (e.g., sample obtained during tank recirculation) or a composite sampler will be used to obtain samples. The composite sampler is capable of collecting a volume of sample that is proportional to the volume of the discharge over time.

Section 11.1 of the DP, Section 8 of the Effluent and Environmental Monitoring Plan, and response to HDP-C11-Q2 provide additional details related to how Westinghouse will ensure effluent releases are maintained ALARA and below liquid release limits.

Figure 1. Water Treatment System



3. (HDP-8-Q3) Comment: Section 8.3.1, Structures to Be Demolished, of the DP provides no information as to when floor slabs and foundations will be decontaminated or how contamination will be controlled during soil remediation activities or the impact of heavy equipment on the surface contamination of slabs and foundations.

Path Forward: Provide information as to when floor slabs and foundations will be decontaminated, how contamination will be controlled during soil remediation activities and the impact of heavy equipment on the surface contamination of slabs and foundations.

Westinghouse Response

Summary

The floor slabs and foundations of the structures to be demolished will be removed as part of the HDP decommissioning as discussed in Section 8.3.1. Specific floor slab areas may be decontaminated to provide assurance that the final waste form will be accepted for disposal at the selected facility. Contamination is controlled by implementing standard industry contamination control techniques as further described in this section. Decontamination may be performed if required under the existing HDP license or following Decommissioning Plan approval.

Discussion

Industry and Hematite site experience indicates that the majority of contamination on the general surfaces of concrete floors and structures typically resides within a depth of up to 0.725 inch within the concrete. The contamination residing within the concrete matrix is not mobile under almost all operating conditions. It is for this reason that surface removal techniques such as scabbling or concrete shaving are typically used to remove the contaminated concrete at depth. This inherent characteristic itself provides a level of contamination control.

Contamination on concrete surfaces will also continue to be controlled by the existing fixative that has been applied. Routine contamination survey data indicates that the fixative on the interior surfaces of the building remains very effective as a contamination control measure. It is expected that the encapsulating properties of the existing coating will be somewhat compromised during building demolition through contact with heavy tracked equipment and debris. Therefore, the plan for demolition includes a provision to re-apply fixative as the demolition work progresses and when the surfaces are no longer subject to disturbance. The use of the methodologies described below during building demolition and during the period of time until the slabs are removed will ensure that contamination associated with the slabs and foundations will be properly contained, monitored and controlled during building demolition and soil remediation activities. Contamination control will be achieved using a combination of the following methods:

- As building demolition progresses, additional fixative will be applied to the building slabs as needed to ensure a sufficient protective layer is present to minimize any potential for the spread of loose contamination.
- The heavy equipment that is intended to be used on the building slabs during soil remediation activities are vehicles with rubber tires such as articulated heavy dump trucks and front end loaders. Since heavy equipment with tracks would be the most likely type of equipment to result in deterioration of the fixative, the use of tracked

equipment on the slabs will be minimized to the extent practicable during soil remediation activities.

- Section 10.7.1 of the Decommissioning Plan provides that work planning and job coverage contamination control surveys are performed as necessary during the planning process and during the course of the work to confirm anticipated conditions and the adequacy of control measures. These surveillances will provide information to monitor the effectiveness of the fixative over time, and alert the HP staff of a change in conditions that may warrant corrective actions.
 - Post-demolition, if routine surveys determine that removable activity is greater than 200 dpm/100 cm² for either alpha or beta contamination, decontamination activities and application of additional fixative will occur to maintain removable contamination below acceptable levels.
 - Potential spread of contamination from surface water run-off, and surface water run-on will be minimized by the use of physical barriers such as berms, temporary drainage ditches and silt fences.
4. (HDP-8-Q4) Comment: Section 8.4.1, Sanitary Wastewater Treatment Plant (SWTP) and Storm Drain System (SDS), of the DP states that "...drain piping that cannot be accessed for survey may require removal based on an evaluation of historical information, and the information obtained from similar drain components during decommissioning. If this information is incomplete or inadequate to form a reasonable basis that the drain and surrounding soil meet the DCGL, then the drain will be removed and surrounding soil evaluated by radiological surveys and sampling." The statement, as written, appears to indicate that the DCGL evaluation may be based on historical information rather than an actual survey. Contaminated piping would be considered a Class 1 survey area, and would require a complete survey. Additional details are needed on how drain piping will be surveyed and evaluated to meet the DCGL.

Basis: Guidance provided in MARSSIM (NUREG-1575) states that 100% scans should be performed on Class 1 areas.

Path Forward: Provide a description of how potentially contaminated buried piping and surrounding soil will be surveyed and evaluated in Class 1 areas.

Westinghouse Response

Please note that Westinghouse has previously submitted responses to RAIs regarding how potentially contaminated buried piping and surrounding soil will be surveyed and evaluated as Class 1 survey units (HDPC-14-Q5, HDPC-14-Q6 and HDPC-14-Q14). Please refer to those responses which are contained in Westinghouse letter to the NRC HEM-10-80, dated July 30, 2010, Response to Request for Additional Information Concerning Hematite Decommissioning Plan: Chapter 14, Characterization Report and Surrogates Report (License No. SNM-00033, Docket No. 070-00036).

5. (HDP-8-Q5) Comment: DP Section 8.5.3.2.1 indicates that soil remediation in the vicinity of the natural gas pipe line could present significant hazards to the workers and the potential for

disrupting local utility service. The DP indicated that Westinghouse may propose an independent dose assessment for achieving the remediation goal in this area if, at the time of remediation, additional excavation to achieve the desired DCGLs may introduce an unacceptable risk to the workers, environment or the public. The NRC will not approve an alternative plan that does not meet the unrestricted release criteria.

Path Forward: Westinghouse should engage the natural gas company and develop an approach for the safe excavation of the soils so that the unrestricted dose release criterion is met.

Westinghouse Response

Summary

In consideration of the change in approach to the use of area factors discussed below, Westinghouse believes that soil excavation in this area will result in conditions that meet NRC's unrestricted release criteria. If unanticipated actions become necessary to achieve unrestricted release criteria, Westinghouse will engage the natural gas company prior to conducting and activities that encroach upon the right-of-way of the gas pipeline.

Discussion

As indicated in response to RAI HDP-5-Q9 (Westinghouse letter to NRC HEM-10-105, dated October 7, 2010, Remaining Responses to Request for Additional Information Concerning Hematite Decommissioning Plan: Chapter 5, Dose Modeling (License No. SNM-00033, Docket No. 070 00036)), Westinghouse will revise the dose modeling approach to include the calculation of area factors when applying the DCGL defined by the Excavation Conceptual Site Model (CSM). Incorporation of these area factors for the Excavation CSM is expected to provide sufficient flexibility to eliminate the need to directly apply the DCGLs calculated for the Deep CSM, and should provide the basis to demonstrate that this area meets the unrestricted release dose criterion. The second bullet in DP Section 8.5.3.2.1 will be revised as follows:

- The location of the natural gas pipe line running along the south side of the property line will be verified, and its impact on remediation of the evaporation ponds will be evaluated.

The natural gas pipe line, existing railroad line running along the south side of the site property line, and project-installed rail spur will remain in place following license termination. In the event that work activity is required within the natural gas company easement area, the natural gas company will be contacted prior to work to ensure proper safety precautions are employed. If excavation within 5 feet of the natural gas pipe line is necessary, it will be performed in accordance with the requirements of 29 CFR 1926.651, Special Excavation Requirements (Reference 8-15). Shoring or similar protective systems will be used, as necessary.

6. (HDP-8-Q6) Comment: Section 8.6, Surface Water and Groundwater, of the DP, references the Historical Site Assessment (HSA) and the Hematite Radiological Characterization Report (HRCR) as the basis for the determination that the surface water and ground water require no

remediation. However, the sections of the two reports which form the basis for this conclusion are not identified in Section 8.6.

Path Forward: Identify those sections of the HSA and the HRCR which provide basis that there is no need to remediate of surface water and ground water.

Westinghouse Response

Summary

The HSA provides the historical background information about the facility, and the HRCR provides the data that were ultimately used to form an opinion regarding the radiological condition of groundwater. However, the two documents do not detail the process that was used to interpret the data. The details of the interpretation and the basis for the determination that surface and ground water require no remediation are contained in DP Chapter 4, Section 4.4 and 4.5; and in Westinghouse responses to DP Chapter 1, 4, 6 and 7 RAIs. (Westinghouse letters to NRC HEM-10-126, dated December 10, 2010, Partial Responses to Requests for Additional Information on Decommissioning Plan Chapters 1, 4, 6 and 7 (License No. SNM-00033, Docket No. 070 00036); and HEM-10-132, dated December 21, 2010, Remaining Responses to Requests for Additional Information on Decommissioning Plan Chapters 1, 4, 6 and 7 (License No. SNM-00033, Docket No. 070 00036))

Discussion

In response to the DP Chapter 4 RAIs referenced above, Westinghouse provided additional details and updated data (i.e. data collected post DP submittal) that further support that there is no need to remediate surface and groundwater. Westinghouse considers the collective responses to RAIs from Chapters 1, 4, 6, and 7 to be comprehensive documents supporting the following statement from response HDP-1.3-Q1:

Westinghouse has also evaluated groundwater results, which are discussed in detail in DP Chapter 4, section 4.5.4, Discussion of Results. Very low, insignificant, concentrations of ROCs are potentially present in site groundwater sources of drinking water, i.e. the sand-gravel and bedrock aquifers. Westinghouse has specified a method for determining dose from groundwater in DP Chapter 5 Section 5.3.8. The concluding statement in section 5.3.8 reads "Groundwater dose will be calculated by multiplying the groundwater concentration identified, if any, for a given ROC by the corresponding DSR_{GW} listed in Table 5-14.

The contents of supporting RAI responses for Chapters 1, 4,6, and 7 are briefly summarized below:

- HDP-1.3-Q1 Decommissioning Group groundwater criteria
- HDP-4-Q8 Sand/gravel well information
- HDP-4-Q9 Groundwater monitoring data sets for the hydrostratigraphic units
- HDP-4-Q12 Discussion of overburden contamination
- HDP-4-Q13 Bedrock well locations
- HDP-4-Q14 Background statistical data for bedrock wells

HDP-4-Q15 Evaluation of gross alpha/gross beta in bedrock aquifers concluding that the gross alpha/gross beta radioactivity is naturally occurring

HDP-4-Q16 Relationship between radiological contamination found in the hybrid wells and water quality in the lower aquifer-units

Surface water data and monitoring locations were also provided in RAI response HDP-4-Q10. Although there are no plans to directly remediate the surface water, the sediment within the site pond and portions of the site creek below the dam, will be remediated as detailed in the response to RAI HDP-6-Q2.

To clarify DP Section 8.6 it will be revised to read as follows:

The Hematite DP addresses management and controls for surface water and groundwater, to be utilized during remediation tasks. DP Chapter 4 provides a discussion regarding the interpretation of the surface water and groundwater data, and the basis for the determination that surface and groundwater require no remediation.

7. (HDP-8-Q7) Comment: Section 8.6.3, Radiation Protection and Safety Controls, of the DP appears inappropriately titled since its subject material focuses on Environmental Health and Safety Controls.

Path Forward: Indicate whether Section 8.6.3 is appropriately titled.

Westinghouse Response

Westinghouse believes that Section 8.6.3 is appropriately titled. Section 8.6, of which Section 8.6.3 is a subset pertains specifically to surface and groundwater control, particularly during the performance of remediation activities. Section 8.6.3 specifically addresses the control of contaminated or potentially contaminated surface and/or groundwater, and the measures that will be implemented above and beyond the typical radiological control measures specified in Chapter 10, which is referenced. Taken into context with Section 8.6 as a whole, Westinghouse believes that the title to Section 8.6.3 is appropriate.

8. (HDP-8-Q8) Comment: Section 8.7, Final Status Survey (FSS), of the DP indicates that crusting agents or binders may be applied as part of the excavation process.

Path Forward: Provide technical basis for the impacts on the FSS when crusting agents or binders are applied.

Westinghouse Response

Crusting agents or binders will not be applied to surfaces requiring Final Status Survey. To provide clarity, DP Section 8.7 will be revised as follows:

8.7 FINAL STATUS SURVEY (FSS)

Upon completion of the RASS and confirmation that the applicable DCGLs and RGs have been met, excavations will be prepared for FSS as described in Chapter 14 of this plan.

Open excavations will be maintained throughout the FSS process until restoration is authorized. Depending on the season and prevailing weather, excavations may be

covered with tarps to preserve the surface and limit erosion or the potential for generation of dust.

9. (HDP-8-Q9) Comment: Chapter 8 of the DP does not appear to contain a commitment by Westinghouse to conduct decommissioning activities in accordance with approved written procedures.

Basis: The expectation for this commitment is given in NUREG-1757, Vol. 1, Rev. 2, Appendix D, Section VIII on “Planned Decommissioning Activities.” More specifically, it is noted in Sections VIII.a. (Contaminated Structures), VIII.b. (Contaminated Systems and Equipment), VIII.c. (Soil), and VIII.d. (Surface and Ground Water).

Path Forward: Provide a commitment to conduct decommissioning activities in accordance with written, approved procedures.

Westinghouse Response

DP Section 8.1 will be revised by adding the following sentence to the beginning of Section 8.1: “Westinghouse will conduct decommissioning activities in accordance with written, approved procedures.”

10. (HDP-8-Q10) Comment: Chapter 8.0, Planned Decommissioning Activities, of the DP provides the scope of the remaining decommissioning activities. However, it appears that the rail spur and loading pad, soil treatment facility, water treatment system and equipment and soil staging areas and temporary haul roads are not discussed in any detail in the document.

Path Forward: Provide, in Chapter 8, a discussion of the utilization of rail spur and loading pad, soil treatment facility, water treatment system and equipment and soil staging areas and the temporary haul roads during decommissioning activities or reference those sections of the DP where they are described.

Westinghouse Response

Summary

Expanded descriptions of the rail spur and loading pad, soil treatment facility, soil staging areas, and temporary haul roads are discussed in the response below. The water treatment system details are provided in Westinghouse’s response to HDP-8-Q2. Figure 2 provides a conceptual layout of the Hematite support features discussed below.

Figure 2 – Support Features for Hematite (Conceptual)



Discussion

Rail Spur and Loading Pad

The purpose of the Rail Spur and Loading Pad is to allow efficient indexing and loading of gondola railcars for waste shipment.

The Rail Spur is located along the southern boundary of the central tract, immediately north of the Union-Pacific active rail line. The Loading Pad is immediately adjacent to the Rail Spur, and will serve as an operating surface for heavy equipment used to load material into railcars.

The Loading Pad is 50 by 150 feet area that abuts the Waste Holding Area (WHA). The WHA is where waste is received into two or more bins for final disposal characterization prior to being loaded into the railcars.

Waste will be placed into WHA bins and stockpiled by dumping from the northern edge, thus eliminating the need to enter the contaminated area. Stockpiled wastes from the WHA bins will be transported across the loading pad and placed into gondola railcars using heavy equipment that may include a front-end loader or tracked excavator, dependent upon the type of waste material being loaded. Periodic inspections of the ground surfaces adjacent to the railcars will identify and initiate clean-up of waste material that may fall onto the Loading Pad during railcar loading. This immediate clean up activity will reduce the spread of contamination and the effort for final decontamination of the rail spur surface at the conclusion of the project.

Once a gondola car is filled it will be secured and prepared for shipment in accordance with the presiding shipment procedures. Based upon the design of the Rail Spur it is expected that on average five gondola railcars will be filled and made available for each rail shipment.

Soil Treatment Facility

The Volatile Organic Compound Treatment Area (VOCTA), will be located at the northeast end of the northern-most slab of the footprint of the Process Buildings.

The construction and design of the Soil Vapor Extraction (SVE) system is intended to meet the requirements of accumulation units. The accumulation units are specifically designed to meet the regulatory definition of a tank as a condition of the exemptions under 40 CFR 266.230 for Low level Mixed Waste (LLMW) and under 40 CFR 262.34 for hazardous waste. The accumulation/treatment units will be designed, constructed, and operated to meet the applicable requirements for tanks and tank systems under 40 CFR 265.

The VOCTA will be constructed with a base liner, side berms, and sumps installed in the corners to collect run-on water. Treatment will be conducted in specially constructed cells that meet the regulatory definition of a tank, with existing concrete or asphalt pavement serving as the base (and secondary liner) and concrete barriers serving as the structural sidewalls. The tanks will be lined and covered with flexible membrane liner material and outfitted for collection of liquids.

Additionally, the system effluent path is monitored for radioactivity and chemical break through. The system effluent is unlikely to have concentrations of radioactivity or chemicals that are detectable, however effluents will be monitored per the requirements of National Emission Standards for Hazardous Air Pollutants (NESHAPs) and 10 CFR 20.

This system has the capability of generating a limited volume of mixed waste in the form of spent carbon bed filters. This volume of waste is included in the estimate of the mixed waste volume identified in the DP.

Soil Treatment

The majority of Volatile Organic Compounds (VOCs) treatment required during the remedial action will be treatment of VOC impacted soil to meet reuse or disposal criteria. Section 12.4.3.4 of the DP provides a summary of treatment of Toxic-Volatile Organic Compounds in soils designated for re-use. Transfer and consolidation of VOC-impacted soils will occur throughout the remediation of the localized areas of VOC contamination. Piles will be covered during the consolidation phase.

VOC treatment will be conducted by *ex-situ* SVE by which a vacuum is induced by a mechanical blower and the VOCs are stripped and volatilized into the air stream. The exhaust air is then treated to remove particulates and VOCs before it is emitted to the atmosphere. Hazardous waste being accumulated into the units/tanks for treatment that is not rendered and confirmed to be non-hazardous will be removed from the site for disposal within 90 days. For units containing exempt LLMW, the accumulation and treatment time will be as short as necessary to achieve the required degree of treatment, but may extend longer than 90 days.

Soil Staging Areas

There are three primary soil staging areas; the Waste Consolidation Area (WCA) located at the edge of the burial pit location, the Waste Holding Area (WHA) near the railcar loading pad, and the Laydown Area located northeast of the central tract. Each of the areas is described below:

- Waste Consolidation Area and Waste Holding Area

The construction of the WCA and WHA consists of compacted road base material at an average thickness of approximately six inches. Concrete jersey barriers are then placed to form "waste bins." The use of jersey barriers allow for material sorting and segregation, while maintaining the long-term integrity of the physical dividers. The WCA is comprised of four separate bins, allowing the segregation of multiple streams originating from the Burial Pit remediation. The WHA is designed with at least two separate waste bins for stockpiling prior to railcar loading.

- Laydown Area

The Laydown Area is a portion of the site property located northeast of the Burial Pit area, across the Northeast Site Creek, that has been deforested to create the area. The Laydown area is surrounded by a security fence which has gated access to the Controlled Access Area. The Laydown Area allows for the segregation of soil, that is suitable for re-use as backfill and for off-site borrow, by the use of solid barriers. Surface water barriers are placed at the edges of the portion of the Laydown Area to direct storm water to shallow sumps for pumping to a transfer tank for processing through the Water Treatment System.

Haul Roads

A temporary haul road was constructed along the northern portion of the site. The haul road connects the main parking lot with the Controlled Access Area and the newly constructed Laydown Area. A portion of the haul road is located next to the Waste Evaluation Area and

provides access to a truck scale for weighing conveyances. The Haul Road also provides access to a Box Counter system for the performance of radiological assessment of conveyances containing materials originating from the Burial Pit remediation.

Changes and/or Additions to Chapter 8 of the DP

The first bullet Section 8.2 of Chapter 8 of the DP will be revised to state:

- Temporary haul roads will be constructed by removing vegetation and grading the route, followed by placing, spreading and compacting road materials. Temporary haul roads will be maintained throughout the project, as required; then removed prior to FSS of the areas underlying the temporary haul roads. A temporary haul road was constructed along the northern portion of the site. The haul road connects the main parking lot with the Controlled Access Area and the newly constructed Laydown Area. A portion of the haul road is located next to the Waste Evaluation Area and provides access to a truck scale for weighing conveyances. The Haul Road also provides access to a Box Counter system for the performance of radiological assessment of conveyances containing materials originating from the Burial Pit remediation.

The fifth bullet of Section 8.2 of Chapter 8 of the DP will be revised to state:

- A railroad spur and railcar loading pad was constructed near the southeast side of the impacted area of the site to support bulk loading of waste from the Waste Holding Area (WHA). The railcar loading pad was constructed of materials purchased from approved offsite sources. The Loading Pad is immediately adjacent to the Rail Spur, and will serve as an operating surface for heavy equipment used to load material into railcars. The Loading Pad is 50 by 150 feet area that abuts the Waste Holding Area (WHA). The WHA is where waste is received into two or more bins for final disposal characterization prior to being loaded into the railcars.

Section 8.5.2.2 of Chapter 8 of the DP will be revised to state:

VOC-Contaminated Soil

Four types of VOC-contaminated soil are expected to be encountered:

- Mixed waste, having a radioactive component above the appropriate DCGLs, and a component above the threshold defining Hazardous Waste under RCRA;
- Radioactive soil above the DCGL and the RG, requiring treatment;
- Non-radiologically contaminated Hazardous Waste soil above the threshold defining Hazardous Waste under RCRA; or
- Non-radiologically contaminated soil above the RG and requiring treatment, but below the Hazardous Waste threshold.

If the VOC contaminants cannot be successfully stabilized by VOC treatment, the soil will be handled and packaged for off-site disposition as mixed waste. Soil below the RG, and above the appropriate DCGL, will be handled as LLRW.

VOC treatment will be performed by *ex-situ* Soil Vapor Extraction (SVE). The SVE system will be designed, constructed and operated to meet applicable requirements of 40 CFR 262.34, 40 CFR 265.40 and 40 CFR 266.230 (Reference 8-11, Reference 8-12 and Reference 8-13, respectively) for tanks and tank systems.

VOC treatment is conducted by *ex-situ* SVE by which a vacuum is induced by a mechanical blower and the VOCs are stripped and volatilized into the air stream. The exhaust air is then treated to remove particulates and VOCs before it is emitted to the atmosphere. The VOC treatment will be designed to comply with the air emission standards for process vents at 40 CFR 265.1032(a), requiring total VOC emissions of no more than 3 pounds per hour or emissions control of greater than 95 percent efficiency. Hazardous waste being accumulated into the units/tanks for treatment that is not rendered and confirmed to be non-hazardous will be removed from the site for disposal within 90 days. For units containing exempt LLMW, the accumulation and treatment time will be as short as necessary to achieve the required degree of treatment, but may extend longer than 90 days.

The majority of VOC treatment required during the remedial action will be treatment of VOC impacted soil to meet reuse or disposal criteria. Transfer and consolidation of VOC-impacted soils will occur throughout the remediation of the localized areas of VOC contamination. Piles will be covered during the consolidation phase.

Techniques for treatment and handling of VOC-contaminated soil exceeding the RG include:

- Stockpiling or direct loading soil into haul trucks for transfer to the WCA, and subsequent visual inspection at the WCA;
- Loading VOC-contaminated soil into a transfer truck for assay in the HRGS; and,
- Treatment of VOC-contaminated soil in one of two VOC treatment areas: the radioactive side (> DCGL); or, the 'clean' side (< DCGL). Upon verification that treated soil is below the RG and the backfill DCGL, transfer to a lay-down area for re-use. Upon verification that treated soil is below the RG, but remains classified as LLRW, transfer to the WHA for final disposition.

Section 8.5.2.3 of Chapter 8 of the DP will be revised to state:

8.5.2.3 Low Level Radiological Waste (LLRW)

This section describes the techniques used to manage LLRW. Field screening will be performed to establish an initial material classification, followed by sampling and analysis to validate the field screening classification.

There are three primary soil staging areas; the Waste Consolidation Area (WCA) located at the edge of the burial pit location, the Waste Holding Area (WHA) near the railcar loading pad, and the Laydown Area located northeast of the central tract, as described below:

- Waste Consolidation Area and Waste Holding Area

The construction of the WCA and WHA consists of compacted road base material at an average thickness of approximately six inches. Concrete jersey barriers are then placed to form “waste bins.” The use of jersey barriers allow for material sorting and segregation, while maintaining the long-term integrity of the physical dividers. The WCA is comprised of four separate bins, allowing the segregation of multiple streams originating from the Burial Pit remediation. The WHA is designed with at least two separate waste bins for stockpiling prior to railcar loading.

- Laydown Area

The Laydown Area is a portion of the site property located northeast of the Burial Pit area, across the Northeast Site Creek, that has been deforested to create the area. The Laydown area is surrounded by a security fence which has gated access to the Controlled Access Area. The Laydown Area allows for the segregation of soil, that is suitable for re-use as backfill and for off-site borrow, by the use of solid barriers. Surface water barriers are placed at the edges of the portion of the Laydown Area to direct storm water to shallow sumps for pumping to a transfer tank for processing through the Water Treatment System.

The general sequence for excavation, removal and handling of LLRW will be as follows:

- Excavated LLRW will be loaded directly into haul trucks for transfer to the WCA, or stockpiled until a sufficient quantity is available for transport to the WCA, for final visual inspection and assay at the HRGS; and,
- LLRW will be sent to the WHA for stockpiling, loading, verification of compliance with waste acceptance criteria (WAC), and subsequent transportation to off-site disposal facilities. Transportation for off-site disposal will generally be by gondola cars; however, alternate conveyances which meet the requirements of the Waste Management and Transportation Plan (WMTP, Reference 8-10) may also be utilized.

11. (HDP-8-Q11) Comment: The second bullet of Chapter 8.0 seems to imply that Table 8-2 provides a listing of structures which will remain upon license termination. Actually, Table 8-2 is a listing of all site structures and only three of the buildings listed and possibly a fourth will remain upon license termination.

Path Forward: Please clarify the second bullet of Chapter 8.0 and how Table 8-2 relates to the structures that will remain following decommissioning.

Westinghouse Response

Westinghouse concurs that the second bullet of Chapter 8.0 does seem to imply that Table 8-2 provides a listing of structures which will remain upon license termination. However, this was not the intent and the second bullet will be revised to remove the reference to Table 8-2 and will read as follows:

- Decontaminate structures, systems and equipment intended to remain at the time of license termination.

The fourth bullet will be revised to add the reference to Table 8-2 as follows:

Demolish and package for off-site disposal, site buildings and infrastructure not designated for unrestricted release. Table 8-2 provides a listing of the all existing Hematite structures and a description of the previous uses of the structures. Table 8-3 provides a listing of buildings, foundations and paved areas intended to be removed during decommissioning.

An asterisk will be added to Building 235 in Table 8-3 to indicate that this building may remain.

12. (HDP-8-Q12) Comment: Table 8-1 provides a listing of significant Hematite Decommissioning Project plans. Many of the Plans listed in the Table are referenced frequently in the DP as containing the basis for Westinghouse conclusions or actions associated with the decommissioning. However, since some of these Plans have not been provided the staff does not know what actions or conclusions Westinghouse is referring to.

Path Forward: Provide a copy of the Plans or, if such Plans are not provided, include in the DP the information contained in the Plans which forms the basis for the point made in the DP.

Westinghouse Response

The HDP plans listed in Table 8-1 are provided with this response, with the exception of the Fundamental Nuclear Material Control Plan which has been previously submitted (Westinghouse letter to NRC HEM-10-103, September 24, 2010, Revision to Hematite Fundamental Nuclear Material Control Plan for Decommissioning (License No. SNM-00033, Docket No. 070 00036)), and the Final Status Survey Plan FSSP (which has not been finalized). The finalized FFSP will include the information that is ultimately approved in Chapter 14. Chapter 14 of the DP provides essentially all elements that will be contained in the FSS Policy document. In particular:

- 14.1, Release Criteria, including discussion of site-specific, modified and adjusted DCGLs, unity rule and area factors;
- 14.3, Remedial Action Support Surveys, including discussion of field screening methods for the RASS of soil during excavation and field screening methods for the RASS of structures, systems and components;
- 14.4, Final Status Survey Design, including discussion of Data Quality Objectives, survey unit classification, background reference areas, isolation and control measures, sample size determination, scan coverage, investigation levels and process, survey methodologies, survey instrumentation, data assessment and data conclusions; and
- 14.6, Final Status Survey Reporting, including discussion on the preparation of FSS Survey Unit Release Records and FSS Final Reports.

13. (HDP-8-Q13) Comment: In Section 8.1.1, Integrated Safety Analysis, it is stated that an evaluation of the decommissioning activities was completed and showed that the maximum exposed member of the public would not receive a dose which would exceed 1 rem as a result of the release of radioactive materials. A dose acceptance criteria of 1 rem is inconsistent with Part 20 requirements for the exposure of members of the public and ALARA.

Basis: Subpart D of 10 CFR Part 20 establishes dose limits for individual members of the public. According to 10 CFR 20.1301 the total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem in a year, exclusive of the dose contributions from background radiation. The limit is not 1 rem.

Path Forward: Provide the justification for concluding that 1 rem is an appropriate dose criterion for exposure of members of the public.

Westinghouse Response

Westinghouse acknowledges the dose limits for individual members of the public is 0.1 rem in a year in accordance with 10 CFR 20.1301. Through the implementation of the Radiation Protection Program for HDP, Westinghouse currently ensures and will continue to ensure that the maximum total effective dose equivalent to an individual member of the public from the licensed operation does not exceed 0.1 rem in a year.

Section 8.1.1 specifically pertains to the regulatory requirements specified in 10 CFR 70.61 for the licensee to perform an Integrated Safety Analysis in accordance with the format and content specified in 10 CFR 70.62. The discussion in DP Section 8.1.1 of the 1 rem criterion of 10 CFR 70.22(i)(1)(i) addresses a different issue, namely an evaluation related to Emergency Plan requirements. Since it is not pertinent to the Integrated Safety Analysis requirement, that discussion will be deleted. Therefore, DP Section 8.1.1 will be revised to state:

Pursuant to 10 CFR 70 (Reference 8-1; specifically, 10 CFR 70.60), the regulations in 10 CFR 70.61 through 10 CFR 70.76, including requirements for an Integrated Safety Analysis, do not apply to decommissioning activities. Westinghouse has been authorized to conduct decommissioning activities pursuant to 10 CFR 70.38 since NRC license amendment 42, dated April 11, 2002.

14. (HDP-8-Q14) Comment: DP Section 8.1.2 describes how nuclear criticality safety (NCS)-exempt material will be handled. It is unclear what the threshold is for the “NCS exempt” determination.

Basis: NUREG 1757, Vol. 1, states that a description of NCS requirements should be provided.

Path Forward: Please describe “NCS-exempt material” in more specific terms (i.e. what is the mass and/or concentration limit) and the technical basis.

Westinghouse Response

The term “NCS exempt material” used in DP Section 8.1.2 and throughout DP Section 10.9 is reserved for material that, due to low fissile nuclide concentration and/or fissile nuclide mass, does not warrant any controls from a Nuclear Criticality Safety (NCS) standpoint. The definition of “NCS exempt material” is provided below:

Unless otherwise defined and justified within a Nuclear Criticality Safety Assessment (NCSA), NCS Exempt Material is conservatively defined as material containing ^{235}U with an average nuclide fissile concentration not exceeding $0.1 \text{ g}^{235}\text{U}/\text{L}$, or material that comprises no greater than $15 \text{ g}^{235}\text{U}$ and is enclosed within a container with a volume of at least 5 liters.

The above definition will be added to DP Section 10.9.2.1.1. Based on this change, it is not considered necessary to further define this term elsewhere in DP Section 8 and DP Section 10.

For consistency, text from DP Section 8.5.2.1 and DP Section 10.9.2.1.1 will also be revised as follows:

From: “The objective of the in-situ radiological surveys is to identify any item or region of soil/waste with a fissile concentration exceeding 1 gram U-235 in any contiguous 10 liter volume. The 1 gram U-235/10L threshold provides a high degree of assurance that any items with elevated (i.e., non-trivial) levels of U-235 contamination would be identified.”

To: “The objective of the in-situ radiological surveys is to identify materials that do not satisfy the NCS exempt material criteria.”

The technical basis for the limits defined for NCS exempt material above is as follows. The NCS exempt material concentration limit of $0.1 \text{ g}^{235}\text{U/L}$ is significantly below the maximum subcritical infinite sea concentration of $4.0 \text{ g}^{235}\text{U/L}$ that has been derived for nominal soil, and is substantially below a fictitious minimum critical concentration of $1.4 \text{ g}^{235}\text{U/L}$ that has been derived for bounding soil consisting of only SiO_2 per NUREG/CR-6505. The NCS exempt material criteria corresponding to a fissile nuclide mass content of up to $15 \text{ g}^{235}\text{U}$ within a container that has a volume of at least 5 liters has been derived by validated calculations for very large bounding arrays of containers. This has been shown to apply for bounding credible moderation and reflection conditions, and applies irrespective of the container spacing, geometry, and arrangement.

Hematite Decommissioning Plan Chapter 9

Project Management and Organization

1. (HDP-9-Q1) Comment: DP Section 9.2.1 Procedures, does not provide a description of the responsibility and authority of each unit to ensure that decommissioning activities are conducted in a safe manner and in accordance with approved written procedures.

Basis: Checklist item number 4 of NUREG 1757, Vol. 1, Appendix D, Section IX.a indicates that the licensee should provide, "A description of the responsibility and authority of each unit to ensure that decommissioning activities are conducted in a safe manner and in accordance with approved written procedures."

Path Forward: Provide in Section 9.2.1 a description of the responsibility and authority of each unit to ensure that decommissioning activities are conducted in a safe manner and in accordance with approved written procedures.

Westinghouse Response

Response to this RAI will be provided under separate correspondence.

2. (HDP-9-Q2) Comment: Section 9.2.3 states that, "RWPs are further discussed in detail in Chapter 10." However, Chapter 10 does not discuss Radiation Work Permits (RWPs).

Path Forward: Provide in Chapter 10 a discussion of Westinghouse's use of RWPs at Hematite during decommissioning.

Westinghouse Response

A detailed discussion of the use of RWPs is provided within DP Chapter 10. Specifically; a discussion of how RWPs and ALARA Evaluations are developed and approved for Decommissioning tasks and the purpose of the RWP for specifying monitoring requirements for airborne radioactivity is presented in Section 10.2.1; a discussion of ALARA assessments being performed as part of RWP generation is presented in Section 10.3.2; a discussion of using RWPs for access control and presenting workers with radiological conditions, personnel protective equipment (PPE) and proper work practices is presented in Section 10.7; a discussion that the frequencies for work planning and job coverage contamination control surveys are defined in the RWP is presented in Section 10.7.1; and a discussion that the RWP will specify PPE requirements is presented in Section 10.7.3.

3. (HDP-9-Q3) Comment: The Hematite Decommissioning Plan (HDP) provides a Radiation Safety Officer (RSO) job description consistent with NUREG 1757. However, the HDP designates the job title as Radiation Protection Manager and not as the RSO. The descriptions of key HDP managers in HDP Section 9.3 are inconsistent with industry standards and NRC guidance. For example, HDP Section 9.3.5 states that the Radiation Protection Manager will have a minimum of one year of work in applied health physics, industrial hygiene or similar work.

Basis: NRC guidance in Regulatory Guide 1.8 endorses ANSI/ANS 3.1-1993 and ANSI/ASME NQA-1-1983 which is endorsed by the Westinghouse QA Program. ANSI states that the Radiation Protection Manager is required to have 5 years of experience, and RG 1.8 adds that 3 years of experience should be at a level requiring policy planning and decision making related to the programmatic aspects of the radiation program as a whole.

Path Forward: Please clarify whether the qualifications of the key HDP management positions are consistent with industry standards ANSI/ANS 3.1-1993 and ANSI/ASME NQA-1-1983.

Westinghouse Response

Key HDP management position qualifications are not developed from Nuclear Reactor Power Plant standards as provided in ANSI/ANS 3.1-1993.

Westinghouse deferred to the qualifications approved in the NRC License SNM-33 for key HDP management positions. The reason for this is that the Westinghouse QA Program document “Quality Management System”, Revision 5, Appendix A, “Positions On U.S. NRC Regulatory Guides and ASME NQA” indicates that Regulatory Guide 1.8 (which endorses ANSI/ANS 3.1-1993) is “Not applicable to scope of work”. ANSI/ASME NQA-1-1983 is endorsed by the Westinghouse QA Program however it does not contain position experience requirements.

In regard to the use of the job title for the functional area manager of Radiation Protection the correct title is Radiation Safety Officer. Section 9.3 will be revised to clarify the title of the functional area manager of Radiation Protection is the Radiation Safety Officer.

4. (HDP-9-Q4) Comment: DP Section 9.3.5 describes the radiation protection responsibilities; however, the Section is silent as to the Radiation Protection Manager’s ability to stop work.

Basis: NUREG 1757 specifically states that the RSO should have the authority and access to all areas involved in the decommissioning or radioactive material usage at the site and the specific authority and responsibility to stop any operations that, in the RSO’s opinion, are not considered being conducted safely.

Path Forward: Clarify the stop work authority and responsibilities of the Radiation Protection Manager.

Westinghouse Response

DP Section 9.1.2 will be revised by adding the following paragraph:

The RSO has access to all areas of the facility to effectively oversee the implementation of the radiation protection program. The RSO has specific “Stop Work” authority to ensure that work activities are conducted in accordance with the radiation safety requirements contained in work plans and procedures. For Stop Work events initiated by the RSO, the RSO shall also approve the proposed resolution and work restart with concurrence from the Project Director.

5. (HDP-9-Q5) Comment: DP Section 9.1.2 describes the Hematite Decommissioning Project's Stop Work Policy. However, there is no discussion on who possesses the authority for restart.

Path Forward: Provide a description of the process for authorizing restart and who possesses the authority to issue a restart order.

Westinghouse Response

DP Section 9.1.2 will be revised by adding the following description of the Stop Work process and authorization to restart work:

After a person declares Stop Work, personnel in the area immediately put their work in a safe condition and stop work. The individual declaring the Stop Work informs the Supervisor or Manager responsible for the work. The responsible HDP Manager informs the Project Director and the Manager of the appropriate safety discipline (e.g., EH&S, NCS, radiation safety) of the Stop Work. The responsible HDP Manager shall:

- Initiate a review into the basis for the Stop Work,
- Determine how to resolve the issue so work may be safely resumed in compliance with applicable requirements,
- Confirm with the individual who declared the Stop Work, that the proposed resolution resolves the safety concern, and
- Obtain approval from the affected safety discipline manager(s) for the proposed resolution.

The Project Director approves and ensures implementation of the proposed resolution and issues the approval to restart. For Stop Work events initiated by the RSO, the RSO shall also approve the proposed resolution and restart.

6. (HDP-9-Q6) Comment: DP Section 9.3.2 states that the Project Oversight Committee (POC) Chairman designates subcommittees, recommends the committee members, and that, as a minimum, Radiation Protection, Licensing and Operations shall have representatives. It is unclear how the committee can provide effective oversight given that the membership is composed of HDP project personnel and many may have line management responsibilities for implementing the programs that are being reviewed by the POC.

Basis: In Section 17.2.3 of NUREG –1757, Vol. 1, Rev.2 “Decommissioning Management Positions and Qualifications” it is recommended that the information supplied by the licensee should be sufficient to allow the staff to fully understand the responsibilities and minimum qualifications required for each of the management and safety-related positions within the licensee’s decommissioning project organization. The licensee is expected to provide description of the duties and responsibilities of each management position in the decommissioning organization and the reporting responsibility of the position.

Path Forward: Please clarify how the POC will be able to maintain independent oversight and not interfere with the line management responsibility to assure work is safely planned, directed and performed. Update Figure 9-1 to show the relationship between the Radiation Protection, Licensing and Operations organizations to the POC chairman.

Westinghouse Response

In its advisory role, the POC performs its responsibilities separate from the HDP functional management structure. The Project Oversight Committee (POC) has been a requirement of the Hematite license since Amendment 47, dated September 7, 2004. The POC membership has included key line management representatives and the POC Charter has not required the entire compliment of the POC to be independent of line management. The necessity to plan, direct and perform work safely is the responsibility of line management and it is key to the success of the POC that they participate as members.

Although it is not a requirement of the license to have independent or offsite representatives in the POC membership, HDP currently has three offsite representatives, including the chairman. The offsite representation is chosen to include personnel experienced in managing facilities with similarities to HDP. The line management representation is chosen to include the key safety disciplines in consideration of HDP's decommissioning mission. Existing DP Figure 9-1 appropriately depicts the POC in its advisory role as a dotted line reporting relationship to the Project Director, as opposed to being a part of the functional management structure.

7. (HDP-9-Q7) Comment: DP Section 9.3.6 states that Decommissioning Committees will be responsible for providing direction, guidance and overview to ensure compliance. It is not clear how committees will provide direction as this is typically the responsibility of line managers.

Basis: In Section 17.2.3 of NUREG – 757, Vol. 1, Rev.2 “Decommissioning Management Positions and Qualifications” it is recommended the licensee to provide a description of all decommissioning and safety committees, including the membership of the committees, the duties and responsibilities of each committee, and the authority of each committee.

Path Forward: Clarify how committees will provide direction and how this responsibility is differentiated from the responsibility provided line management.

Westinghouse Response

The two standing decommissioning committees described in the DP are the POC and the Work Control Committee (The name of this later committee is currently called the Work Request Review Committee. The DP will be revised to reflect this change.), both of which include cognizant line management representation.

The POC evaluates the effectiveness of and recommends improvements to the Project safety rules, policies, and procedures for accident and illness prevention programs in the workplace, and ensures that associated written updates and changes to policies and procedures of the safety programs are completed. The Project Director is responsible for finalizing decisions on any matter not resolved between HDP functional management and the POC.

The role of the Work Request Review Committee is to identify the acceptable level of work planning necessary to ensure personnel safety and regulatory compliance is implemented throughout the work process. During the review process, the Work Request Review Committee will determine the acceptable path forward for work planning which may include:

- Requiring a Nuclear Criticality Safety Assessment.
 - Prohibiting the requested work from moving forward until approval is received from the U.S. Nuclear Regulatory Commission (NRC).
 - Requiring Project Oversight Committee (POC) approval upon completion of HDP Work Package reviews and approval.
 - Incorporation of Hazardous Waste Operations and Emergency Response (HAZWOPER) EH&S requirements for work related to the HDP Record of Decision (ROD).
- Incorporation of Quality Hold Points and Notification Points into the Work Plan.
8. (HDP-9-Q8) Comment: DP Section 9.3.3 states that the Operations functional area manager will meet minimum qualifications including NCS training. Section 10.9.1.2.1 of the DP describes two levels of NCS training: entry and advanced. It is unclear what level of training the Operations Functional Area Manager will be required to complete.
- Path Forward: Provide clarification as to the specific NCS training that the Operations Functional Area Manager is required to complete.

Westinghouse Response

The HDP Training Plan described in DP section 9.4 requires the Operations Functional Area Manager to complete and maintain both entry level and advanced level NCS Training. The 'entry level' training is provided as a section of General Employee Training. The advanced level training is titled 'Fissile Worker Training', and is required by the procedure for HDP Safety Training.

9. (HDP-9-Q9) Comment: DP Section 9.3.4 states that the Licensing functional area manager will meet minimum qualifications including competency in NCS.
- Basis: NUREG 1757, Vol. 1, states that a description of management responsibilities and technical qualifications of safety personnel should be provided.

Path Forward: Please clarify what is meant by "competency in NCS."

Westinghouse Response

The competency in NCS requirement is fulfilled by the NCS Specialist, who currently reports to the Licensing Manager. Qualifications for the NCS Specialist (formerly 'NCS Engineer') are listed in DP Section 10.9.1.1.2, i.e. a Bachelor's degree in science or engineering, or equivalent, with at least 3 years of nuclear industry experience in criticality safety. DP Section 9.3.4 will be revised by deleting the words 'Competency in nuclear criticality safety'.