



**Westinghouse**

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Reference: SNM-33 (Docket 70-0036)  
Letter from Amy M. Snyder, NRC Senior Project Manager to Henry A. Sepp, Westinghouse Site Manager; dated February 24, 2006

Subject: RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION FOR REVIEW  
OF THE HEMATITE FORMER FUEL CYCLE FACILITY - BUILDING  
DEMOLITION AMENDMENT REQUEST (TAC NO. L52641)

Westinghouse Electric Company LLC (WEC or Westinghouse) has received the NRC's request for additional information dated February 24, 2006. The purpose of this letter is to provide the Westinghouse responses to the NRC's questions. These responses to RAIs numbered 1 through 3 are intended to support the NRC's technical review of an amendment request allowing Westinghouse to dismantle and demolish buildings at the Hematite site. Comments or questions on this material should be addressed to Tracy Chance, RSO at 314-810-3329 or Hank Sepp, Decommissioning Director at 314-810-3368.

Sincerely,



Tracy B. Chance  
Radiation Safety Officer

Enclosure: Westinghouse Response to NRC Request for Additional Information in letter dated March 2, 2006 (TAC No. L52641)

cc: Ms. Amy M. Snyder, NRC Headquarters  
Regional Administrator, NRC Region III  
Mr. Jamnes Cameron, NRC Region III  
Mr. Henry A. Sepp, Westinghouse Electric Company  
Mr. A. Joseph Nardi, Westinghouse Electric Company

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**Westinghouse Response to NRC Request for Additional Information in letter  
dated March 2, 2006  
(TAC No. L52641)**

**NRC Question #1:**

*The licensee has stated that all ventilation systems and process equipment have been removed from the buildings. However, given the lack of consistent information provided previously to the U.S. Nuclear Regulatory Commission (NRC) (e.g., 750-kg uranium, 5-kg UO<sub>2</sub>, 10-kg U<sup>235</sup>), NRC needs to know the type of special nuclear material (SNM) in the buildings, the amount of SNM in the buildings, and the location of the SNM in the buildings. The information should be provided in a table consisting of rows of locations of SNM and columns of mass of SNM (e.g., U<sup>235</sup>) and enrichment (e.g., 5.0 weight percent). Detailed calculations are not needed, so bounding estimates will be sufficient.*

*This information is needed for NRC to determine whether or not there is an Nuclear Criticality Safety (NCS) concern and whether or not the requirements of 10 CFR 70.24 (criticality accident alarm system (CAAS)) need to be met during building demolition activities.*

**Westinghouse Response:**

The inventoried SNM (U<sup>235</sup>) mass for the process buildings is zero grams. There is residual contamination on surfaces that has been affixed to the building surfaces by an encapsulant. Surveys of the process buildings were performed prior to applying the encapsulant. The results of the surveys (5 kg UO<sub>2</sub>, 250 gram U<sup>235</sup> at 5% enrichment) were presented in the Environmental Monitoring Plan response to RAIs dated January 31, 2006 and represent the total of residual contamination left on the surfaces in the former process buildings.

There is no discrepancy in the information provided by Westinghouse regarding the residual contamination remaining in the buildings. The value of 750 kg uranium was derived by NRC staff based on information contained on page 8 of the NRC Inspection Report 07000036/2005-001. That information represented the Westinghouse estimate of the amount of uranium inventory remaining in the buildings at the time of the inspection in early 2005 and has no relationship to the residual contamination remaining after completion of the building cleanout activities. In earlier discussions with NRC staff, Westinghouse stated that, based on a preliminary conservative estimate, the residual contamination remaining on building surfaces was less than 10 kg uranium and that additional surveys would be performed to refine that estimate. Those additional surveys were performed and based on measured results; Westinghouse now estimates that the residual contamination remaining on the surfaces within the buildings is approximately 5 kg of UO<sub>2</sub> at less than 5% enrichment. (The SNM-33 license provides that the safe mass limit is 16 kgs of UO<sub>2</sub> for less than 5% enriched uranium. A detailed sampling program has already demonstrated that the enrichment of the residual uranium within the process buildings is less than 5% enrichment.)

This residual contamination is dispersed over the various surfaces within the buildings and has been fixed in place by use of a fixative to minimize the amount of removable contamination. Since the total amount of fissile material is less than 700 grams of U-235 there is no significant potential for a nuclear criticality. The contamination is relatively uniformly dispersed over the 285,000 square feet of surfaces within the buildings; therefore a detailed table listing the grams of uranium for different surfaces is not necessary for this bounding estimate.

The anticipated total amount of building rubble that will be associated with building demolition is 128,500 cubic feet or 11,700,000 pounds. The resulting average concentration of fissile material is approximately 1 gram of U<sup>235</sup> per 7,600,000 grams of non-fissile material. This concentration is a factor of over 3000 times less than the definition of the fissile exempt concentration for material in 10 CFR 71.15(c)(1).

**NRC Question #2:**

*Assuming that amount of SNM in the answer to question #1 is above the limit in 10 CFR 70.24 (e.g., greater than 700 grams of U<sup>235</sup> in an area), the licensee will need a CAAS during building demolition activities to comply with 10 CFR 70.24. If the licensee wants to pursue an exemption to 10 CFR 70.24, that exemption request needs to provide the basis for why building demolition activities will be performed safely without the CAAS.*

*If a CAAS is required, but an exemption is desired, then this information is needed for NRC to determine whether or not the licensee can be granted an exemption from 10 CFR 70.24 during building demolition activities.*

**Westinghouse Response**

As explained in the response to RAI # 1 above, it is estimated that there is less than 700 grams of U<sup>235</sup> remaining in the former process buildings and that regardless of the bounding assumptions that might be made, the concentration of fissile material that will be present on the building rubble will be far less than the definition of fissile exempt material for transportation. Thus Westinghouse believes that, for the reasons noted in the response to RAI #1, a Criticality Accident Alarm System (CAAS) is not required during the building demolition activities.

If the NRC believes that based on their independent evaluation of bounding assumptions that a CAAS would be required by the regulations, then Westinghouse requests that this response be treated as an application for an exemption from the requirements of 10 CFR 70.24(a) to have a CAAS operational during building demolition activities. Justification for such an exemption is provided above.

**NRC Question #3:**

*Based on the answers to questions #1 and #2, the evaluation of NCS during building demolition activities depends upon how the licensee intends to perform building demolition activities (e.g., one building at a time or all buildings at once). Please provide a description of how building demolition activities will be accomplished with emphasis on how NCS will be maintained.*

*This information is needed for NRC to determine whether the building demolition activities can be performed safely by the licensee to meet 10 CFR 70.22(a)(2) [the license application must contain the activity for which the SNM is requested and the general plan for carrying out the activity], 70.22(a)(7) [the license application must contain a description of equipment and facilities which will be used to protect health and minimize danger to life or property], and 70.22(a)(8) [the license application must contain proposed procedures to protect health and minimize danger to life or property].*

**Westinghouse Response:**

Demolition activities contemplated under this activity will remove above-grade structures and will leave the building floor slabs and foundations in place. The site buildings have reinforced concrete foundations with slabs on grade, and none of the site buildings has a basement. Slab penetrations will be plugged or capped, and the concrete floor slabs will be sealed. Removal of concrete floor slabs will be accomplished in a subsequent phase of work.

The planned method of demolishing the upper portions of the former process buildings is the use of a hydraulic shear and grappler to deconstruct the buildings in a controlled fashion. The principal demolition tool will be track-mounted hydraulic excavator equipped with high-power shears or grappler. The shears will be used to cut steel sheeting and structural members, and the grappler will be used to collect and sort materials. The excavator attachment (i.e., shears or grappler) will also be used as a ram to knock down concrete and concrete block structures. The application of water by fine mist sprays (e.g., fire hose with fan spray) will be the principal method used for controlling the generation of fugitive airborne dust. The demolition of steel frame structures will generally start by shearing away and dropping the metal siding to expose the support columns and beams. The support structure will then be cut sequentially, and the roof and remaining structure brought to the ground. In multi-story buildings, the upper sections of the structure will generally be demolished first, followed by the lower sections. For the highrise portion of Building 260 (Oxide Building), the preferred approach is to topple this structure as a unit, and then cut and size the steel sheeting and framework once the building is on the ground. For structures with reinforced concrete or concrete block bearing walls, the attachment head of the hydraulic excavator will typically be used to penetrate and push in or pull out the walls, leaving the roof and support columns. The shears will then cut the support columns to bring the roof to the ground.

The process buildings are attached under one roof and the method will be to start at one end and work through to the other end of the buildings. However, as previously noted, given the limited quantity of uranium, the steps taken to fix the uranium contamination to the surfaces and the low fissile concentration of the resulting rubble, special provisions for nuclear criticality are not required during demolition activities.

Provisions for employee health and safety during activities are contained in site procedures such as the Radiation Protection Plan and the Health and Safety Plan. The response to the previous RAIs (Westinghouse letter dated January 31, 2006) provided information with respect to the measures which have been taken to protect the public and the environment.