January 11, 2013

Mr. Robert Copp
Director, Decommissioning Project
Westinghouse Electric Company
Nuclear Fuels
3300 State Road P
Festus, MO 63028

SUBJECT: NRC INSPECTION REPORT 07000036/12004(DNMS) – WESTINGHOUSE ELECTRIC COMPANY (HEMATITE)

Dear Mr. Copp:

On December 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Westinghouse Hematite facility located near Festus, Missouri. The purpose of the inspection was to determine whether decommissioning activities were conducted safely and in accordance with NRC requirements. Specifically, the inspection focused on management organization and controls, radiation protection, effluent control and environmental protection, and waste management. The enclosed report presents the results of this inspection, which were discussed with yourself and other members of your staff during a telephonic exit meeting on December 12, 2012.

The inspection consisted of an examination of decommissioning activities at the Westinghouse Hematite facility as they relate to safety and compliance with the Commission's rules and regulations. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, and interviews with personnel.

Based on the results of this inspection, the NRC has determined that no violations of NRC requirements occurred.

In accordance with Title 10 of the Code of Federal Regulations (CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

We will gladly discuss any questions you may have regarding this inspection. If you have questions, please feel free to contact Michael LaFranzo or Jeremy Tapp of my staff at 630-829-9865 or 630-829-9862, respectively.

Sincerely,

/RA/

Christine A. Lipa, Chief
Materials Control, ISFSI
and Decommissioning Branch
Division of Nuclear Materials Safety

Docket No. 070-00036
License No. SNM-00033

Enclosure:
Inspection Report No. 07000036/12004(DNMS)

cc w/encl: Hematite Distribution Service List (see attached)

We will gladly discuss any questions you may have regarding this inspection. If you have questions, please feel free to contact Michael LaFranzo or Jeremy Tapp of my staff at 630-829-9865 or 630-829-9862, respectively.

Sincerely,

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cc w/encl: Hematite Distribution Service List (see attached)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No.:	07000036
License No.:	SNM-00033
Report No.:	07000036/12004(DNMS)
License:	Westinghouse Electric Company, LLC
Facility:	Former Hematite Fuel Manufacturing Facility
Location:	3300 State Road P Festus, Missouri
Inspection Period:	August 4, 2012 through December 12, 2012
Inspectors:	Michael M. LaFranzo, Senior Health Physicist Jeremy Tapp, Health Physicist Peter Lee, Health Physicist, Ph.D., CHP
Approved By:	Christine A. Lipa, Chief Materials Control, ISFSI, and Decommissioning Branch Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

Westinghouse Electric Company, LLC
Hematite Fuel Manufacturing Facility (Decommissioning)
NRC Inspection Report 07000036/12004(DNMS)

This routine decommissioning inspection evaluated the Westinghouse Electric Company's (WEC) on-going decommissioning activities at its Hematite facility, Festus, Missouri. This routine decommissioning inspection focused on management organization and controls, radiation protection, effluent control and environmental protection, and waste management.

Management Organization and Control

The management oversight program was adequate to ensure U.S. Nuclear Regulatory Commission (NRC) compliance in the areas observed by the inspectors. (Section 1.0)

Radiation Protection

The licensee's staff worked safely and in compliance with NRC regulations and licensee procedures. (Section 2.0)

Effluent Control and Environmental Protection

Oak Ridge Associated Universities (ORAU) had obtained environmental samples and performed walk-over surveys of burial pit areas as part of an independent radiological confirmation and verification activity for the NRC. The NRC has reviewed the ORAU results and there are no open issues. Consequently, NRC considers IFI 07000036/12-03-01 closed. (Section 3.1)

The NRC had continued to review the licensee's transport modeling, effluent calculations and offsite dose calculations to ensure compliance with NRC regulations. The NRC does not have any additional questions regarding transport modeling or effluent calculations at this time. Consequently, NRC considers unresolved item (URI) 07000036/11-02-01 closed. (Section 3.2)

Radioactive Waste Management

The licensee had decided to permanently reduce burial pit soil excavation lift-depths to six-inches. The NRC is satisfied with the licensee commitments and, consequently, considers information follow-up item (IFI) 07000036/12-01-01 closed. (Section 4.0)

Report Details

1.0 Management Organization and Controls (88005)

a. Inspection Scope

The inspectors reviewed the licensee's management oversight program to determine if management meetings and management walk-arounds were effective tools to assist in the implementation of the radiological program.

b. Observations and Findings

The inspectors attended management meetings where licensed activities were discussed. The inspectors noted that the management meetings were organized and discussions were sufficiently detailed to reasonably address safety concerns on site.

The inspectors observed management walk-arounds which are designed to observe licensed activities and determine if procedures are being implemented as required. The inspectors noted that the management walk-arounds were adequate to determine compliance with procedural implementation.

No findings of significance were identified.

c. Conclusions

The inspectors noted that the management meetings and walk-arounds were effective tools to assist in the implementation of the radiological program.

2.0 Radiation Protection (83822)

a. Inspection Scope

The inspectors interviewed licensee staff and technicians involved in radiation protection activities to determine if they had adequate knowledge to ensure safety and compliance with NRC requirements.

Radiation protection program procedures were reviewed to determine if they were consistent with regulatory requirements and included appropriate limits, precautions and controls.

b. Observations and Findings

The inspectors observed soil excavation activities and interviewed staff associated with those activities. The inspectors found that staff had performed excavation activities with adequate knowledge to ensure radiological safety. Observed soil excavation activities were performed adequately and in accordance with sound radiation safety practices.

The inspectors observed licensee staff performing personal radiological surveys exiting radiologically controlled areas and found licensee staff were performing adequate surveys to ensure radiological control of radioactive material.

No findings of significance were identified.

c. Conclusions

The inspectors noted that the licensee staff worked safely and in compliance with NRC regulations and licensee procedures.

3.0 Effluent Control and Environmental Protection (88045)

3.1 Independent Environmental Sampling

a. Inspection Scope

On June 12 and 13, 2012, the NRC contracted with ORAU to obtain a selected quantity of environmental samples from the licensee's facility as part of the NRC's Quality Control review of the licensee's program. The review action was being tracked as IFI 07000036/12-03-01. During this inspection period, the NRC reviewed the ORAU's final report.

b. Observations and Findings

On June 12 and 13, 2012, three staff from ORAU visited the licensee's facility to obtain spilt environmental samples. The spilt environmental samples were taken from monitoring wells NB-71 and GW-W and sediment sampling points SS-17 and SS-52. Spilt soil samples were also taken from the waste handling bins, two samples, and the soil re-use area, two samples. The waste handling bins contain contaminated soil, above the unrestricted release criteria, which the licensee will ship to an authorized disposal facility. The soil re-use area contains soil which is below the unrestricted release criteria and will remain on-site. The ORAU staff also performed a radiological survey walk-over of an area in the burial pits designated South-5.

On September 21, 2012, ORAU submitted the Final Report for Independent Confirmatory Survey Summary and Results for the Hematite Decommissioning Project (ML12279A200) to the NRC. Within the report, ORAU had made three observations concerning the licensee's performance. During the inspection period, the NRC reviewed the licensee's performance related to ORAU's three observations and determined that the licensee was in compliance with NRC requirements and reasonable environmental sampling practices.

No findings of significance were identified.

c. Conclusions

The NRC reviewed ORAU results as documented in a report dated September 21, 2012 and determined that the licensee was in compliance with NRC requirements and reasonable environmental sampling practices. Consequently, IFI 07000036/12-03-01 is considered closed.

3.2 Well Effluent Release

a. Inspection Scope

The NRC inspectors and the NRC Project Manager continue to review circumstances, transport modeling and effluent calculations regarding an unanticipated and unevaluated release of technetium (Tc)-99 identified in Monitoring Well BD-02, which was tracked as URI 07000036/11-02-01. The purpose of the review was to determine if the licensee was in compliance with NRC regulations relating to radiological off-site release.

b. Observations and Findings

On June 27, 2011, the licensee obtained a water sample from Monitoring Well BD-02 for which the analysis noted substantially higher levels of Tc-99 (30,300 pCi/L) and total uranium (32.26 pCi/L) than in previous samples. Historically, the licensee's water samples from Monitoring Well BD-02 averaged approximately 5,723 pCi/L for Tc-99 and 1.0 pCi/L for total uranium. A re-analysis of the sample yielded equivalent results.

On December 1, 2011, the licensee provided the NRC with a document titled "Fate and Transport Modeling for Well BD-02 at the Westinghouse Hematite Site" concerning possible release mechanisms of the Tc-99 to monitoring well BD-02 and pathway of the contamination from the well through the ground water.

On December 7, 2011, the licensee developed a document which provided, based upon licensee modeling of water intake to a member of the public, a dose estimate of 0.035 mrem/year for Tc-99 and 0.05 mrem/year for uranium, within the aquifer, at approximately 165 feet downstream of the monitoring well BD-02.

The NRC identified several licensee assumptions concerning the transport modeling and effluent release estimates that could significantly increase the licensee's estimated dose. In response to NRC concerns, the licensee obtained the services of a consulting firm to develop models and determine potential dose consequences associated with the release of licensed material. After further NRC review, the licensee has agreed to continue reviewing pathways for this release.

Based upon the information available, the NRC believes the licensee is taking appropriate actions to ensure compliance with Title 10 of the Code of Federal Regulations (CFR) Part 20 releases and does not have any additional questions at this time. Consequently, URI 07000036/11-02-01 is considered closed.

No findings of significance were identified.

c. Conclusions

The NRC does not have any additional questions concerning Monitoring Well BD-02 regarding transport modeling or effluent calculations at this time. Consequently, the NRC considers URI 07000036/11-02-01 closed.

4.0 Radioactive Waste Management (88035)

a. Inspection Scope

The inspectors reviewed the licensee's radioactive waste program to determine if they were characterizing and disposing of waste in accordance with NRC requirements.

b. Observations and Findings

As part of the radioactive waste characterization program, the licensee performed radiological surveys (or scans) using a Sodium-Iodide (NaI) probe on a flat plot of potentially contaminated soil. The licensee refers to this as the in-situ radiological survey program. The in-situ radiological survey program scans 100 percent of the surface soil to ensure the removal of discrete material and then quantifies the activities of uranium (U)-235. The scan cannot detect Tc-99 in the soil.

During the inspection period covered by Inspection Report No. 07000036/2012-001 and this inspection period, the inspectors reviewed the licensee's in-situ radiological survey program and could not determine whether concentrations of U-235 in discrete material could be detected as required by the Decommissioning Plan (DP) and NRC regulations. Specifically, the licensee was performing in-situ radiological surveys and then removing the first 12 inches of soil for disposal or re-use and the NRC had additional questions on whether the licensee scans could: (1) identify contaminated soil with an average concentration exceeding 0.1 grams/liter of U-235 within 12 inches of soil; and (2) detect 15 grams of U-235 within 12 inches of soil.

The DP and associated Safety Evaluation Report (SER) and responses to requests for additional information (RAI) (ML110270200) define Nuclear Criticality Safety (NCS) Exempt Material as the following: "Unless otherwise defined and justified within a nuclear criticality safety evaluation, NCS Exempt Material is conservatively defined as material containing U-235 with an average nuclide fissile concentration not exceeding 0.1 grams U-235/liter, or material that comprises no greater than 15 grams U-235 and is enclosed within a container with a volume of at least 5 liters." In addition, the DP and associated documentation describe the purpose of the Gamma Walkover Surveys (GWS) as the following: "The objective of the in-situ radiological surveys is to identify materials that do not satisfy the NCS Exempt Materials criteria."

Figure 1 of HEM-12-MEMO-041 provides an illustration that appears to indicate that the licensee may not be able to detect 15 grams of U-235 below approximately 6 inches of soil with a radiological detection set point of 19,000 counts per minute. In addition, the same document does not definitively state that the licensee could detect 15 grams of U-235 or exceeding 0.1 grams of U-235/liter in the first 12 inches of soil. Also, the scan set point of 19 K is based on a concentration of U-235 of 0.924 g/cc in a lump of soil (Table 2-3, NSA-TR-10-12 Rev. 2). The actual concentration of U-235 in the discrete material or lump of soil could be greater than 0.924g/cc. Due to the attenuation of low energy gamma radiation emitted from U-235, the detector response could be much less than 19,000 counts per minute.

The in-situ radiological scan surveys are also the primary method of determining that a shipment of licensed material meets an exemption from classification as fissile material.

Specifically, the licensee is required, in part pursuant to 10 CFR 71.15(c)(1), to ensure that licensed material, as to be exempt from classification as fissile material, must contain no more than 180 grams of fissile material distributed within 360 kilograms of contiguous non-fissile material.

During this inspection period, the licensee had voluntarily committed on a permanent basis to reduce the thickness of soil removal after each in-situ scan from 12 inches to a 6 inch depth in all burial pits and other areas where such scans would be necessary in any future activities. With the licensee's commitment, the NRC determined that the in-situ radiological surveys can detect the following quantities of U-235 in soil at a depth of 6 inches: (1) an average nuclide fissile concentration not exceeding 0.1 grams U-235/liter; (2) material that comprises no greater than 15 grams U-235 and is enclosed within a container with a volume of at least 5 liters; and (3) 180 grams of fissile material distributed within 360 kilograms of contiguous non-fissile material.

No findings of significance were identified.

c. Conclusions

Based upon the licensee's commitments to the NRC to reduce the thickness of soil removal after each in-situ scan to 6 inches depth in all burial pits and other areas where such scans would be necessary in any future activities, the inspectors determined that the licensee could ensure that radiological in-situ surveys could identify NCS Exempt Materials or fissile exempt material in soil as defined in the DP and 10 CFR 71.15(c)(1), respectively. Consequently, the NRC considers IFI 07000036/12-01-01 closed.

Attachment: Supplemental Information

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

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J. Smetanka, Vice President, Operations Support for Westinghouse Nuclear Fuel
R. Copp, Director, Hematite Decommissioning Project
D. Richardson, Manager, Licensing
G. Rood, Radiation Safety Officer
M. Malin, Environmental, Health & Safety Manager
W. Mattern, Manager, Security Operations
D. Ridenhower, Manager, Occupational Health & Safety
K. Davis, Licensing

INSPECTION PROCEDURES

IP 88005	Management Organization and Controls
IP 83822	Radiation Protection
IP 88045	Effluent Control and Environmental Protection
IP 88035	Radioactive Waste Management

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened	Type	Summary
None		

Closed	Type	Summary
IFI 070-00036/12-03-01	IFI	ORISE Environmental Sample Analysis
URI 07000036/11-02-01	URI	Adequacy of transport modeling and effluent
IFI 07000036/12-01-01	IFI	Adequacy of Soil In-Situ Radiological Survey

Discussed	Type	Summary
None		

Attachment

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
CFR	Code of Federal Regulations
CPM	Counts Per Minute
DNMS	Division of Nuclear Materials Safety
DP	Decommissioning Plan
GWS	Gamma Walkover Survey
HDP	Hematite Decommissioning Project
IFI	Information Follow-Up Item
IP	Inspection Procedure
IR	Inspection Report
NaI	Sodium Iodide
NCS	Nuclear Criticality Safety
NRC	U.S. Nuclear Regulatory Commission
ORAU	Oak Ridge Associated Universities
RAI	Request for Additional Information
SER	Safety Evaluation Report
SNM	Special Nuclear Material
Tc	Technicium
U	Uranium
URI	Unresolved Item
WEC	Westinghouse Electric Company

DOCUMENTS REVIEWED

DO-08-004, “Hematite Decommissioning Plan,” Rev. 0

HDP-ECC-11-WP-001, “Site Preparation and Maintenance Activities,” Rev. 1

HDP-PO-EM-001, “Effluent and Environmental Monitoring Plan,” Rev 3

HDP-PO-HP-100-2 (Form), “HDP Effluent and Site Release Limits,” Rev 1 (January 10, 2012 and March 15, 2012)

HDP-PO-QA-001, “Project Quality Plan”

HDP-PR-EM-016, “Pumping of Accumulated Surface Water,” Rev. 1

HDP-PR-FSS-710, “Final Status Surveys and Radiological Sampling of Re-Use Soil”

HDP-PR-HP-413, “ISOCS Operation and Data Verification,” Rev. 8 and 9

HDP-PR-HP-423, “HPGe Sample Analysis,” Rev. 5

HDP-PR-HP-425, “Sample Analysis Quality Control,” Rev. 0

HDP-PR-HP-501, “Radiation Work Permits,” Rev. 3

HDP-PR-HP-515, “Personnel and Equipment Decontamination,” Rev. 0

RWP-RP-12-G005, “Burial Pit and Other Site Remediation Zones”

RWP-RP-12-G006, “Radioactive Material Areas”

HDP-PR-HP-601, “Remedial Action Support Surveys,” Rev. 4

HDP-PR-HP-606, “Sampling in NCS Designated Areas,” Rev. 1

HDP-PR-LI-001, “Regulatory Reporting,” Rev 3

HDP-PR-LI-005, “Facility Change Management,” Rev. 2

HDP-TBD-WM-905, “Burial Pit Waste Shipment Classification”

HDP-PR-WM-903, “Waste Material Control and Tracking,” Rev. 3

HDP-PR-WM-905, “Waste Sampling Method, Labeling and Custody,” Rev. 2

HDP-PR-WM-906, “Waste Classification, Sample Analysis and Reporting,” Rev. 0

HDP-PR-WM-912, “Waste Disposition Plan for NCS Exempt Material Exceeding 0.1 grams per liter of U-235”

HEM-10-137 (Attachment 1), “Responses to Requests for Additional Information on Decommissioning Plan Chapters 8 and 9,” January 24, 2011

HEM-12-MEMO-041, “Compliance with USEI Disposal Criteria,” April 18, 2012

HRP-3750 – HASP, “ECC Health and Safety Plan,” Rev. 0

NSA-TR-10-12, “Calibration Analysis for 235U Response from Burial Pit Waste Materials at the Hematite Facility”, Rev. 2

NSA-TR-09-15 “Nuclear Criticality Safety Assessment of Buried Waste Exhumation and Contaminated Soil Remediation at the Hematite Site,” Rev. 1

“Technical Basis Document for use of GARDIAN-III for Survey of WEC/Hematite Soils,” November 2, 2011

US NRC SER, “U.S. NRC Safety Evaluation Report on Westinghouse Amendment Request for Approval of Hematite Decommissioning Plan and Associated Supporting Documents,” October 2011 (ML112101690)

WP-ECC-2010-501, “Waste Staging, for approval by the Hematite Decommissioning Project (HDP),” Rev. 0

WP-ECC-2010-504, “Waste Loading and Handling, for approval by the Hematite Decommissioning Project (HDP),” Rev. 4

WP-ECC-2010-505, “Excavation and Exhumation,”

WP-ECC-2010-508, “Handling and Transport of Fissile Material,” Rev. 2

WP-ECC-2010-510, “Waste Staging,” Rev. 1

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