



Westinghouse Non-Proprietary Class 3

Westinghouse Electric Company LLC
Hematite Decommissioning Project
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USA

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Our ref: HEM-12-78
Date: July 25, 2012

Subject: REQUEST FOR AMENDMENT OF THE HEMATITE LICENSE TO CLARIFY
CONDITION 15 REGARDING EXEMPTION FROM CRITICALITY
MONITORING SYSTEMS (License No. SNM-00033, Docket No. 070-00036)

Reference: 1) Westinghouse (Hackmann) letter to NRC (Document Control), HEM-11-96,
dated July 5, 2011, "Final Supplemental Response to NRC Request for Additional
Information on the Hematite Decommissioning Plan and Related Revision to a
Pending License Amendment Request (License No. SNM-00033, Docket No. 070-
00036)"
2) NRC (McConnell) letter to Westinghouse (Hackmann), dated October 13, 2011,
"U.S. Nuclear Regulatory Commission Approval of: (1) Westinghouse Hematite
Decommissioning Plan, (2) Revised License Application, (3) Exemption from the
Requirements of 10 CFR 70.24 And 70.22(A)(4), and Issuance of Hematite
License Amendment 57"

The purpose of this letter is to request amendment of Westinghouse Electric Company LLC
(Westinghouse) nuclear materials license SNM-33. The revision is requested to clarify Condition
15 for the exemption from 10 CFR 70.24 requirements for criticality monitoring systems.

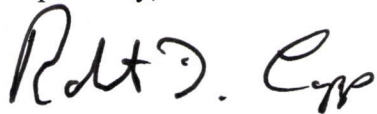
In Reference 1 Westinghouse provided the U.S. Nuclear Regulatory Commission (NRC) a license
amendment request associated with the Decommissioning Plan. Reference 2 provided the
requested amendment.

Subsequent to Reference 2, the Hematite Decommissioning Project identified that a clarification
to the wording of Condition 15 is warranted while certain exhumed items, which potentially
contain materials that interfere with field instrument detection of uranium (e.g., intact containers),
are further characterized, e.g., relocated from a burial area to a Waste Evaluation Area/Material
Assay Area. Attachment 1 is the revised license application request with the changes shown in
redline. Attachment 2 is the justification for the change.

Please contact Dennis Richardson of my staff at 314-810-3376 should you have questions or need
any additional information.

HEM-12-78
July 25, 2012

Respectfully,

A handwritten signature in black ink, appearing to read "R.D. Copp". The signature is fluid and cursive, with the first name "R.D." and the last name "Copp" clearly distinguishable.

Robert D. Copp, Project Director
Hematite Decommissioning Project

Attachments: 1) Revised License Application Request (redline)
 2) Justification for the Change

cc: J. J. Hayes, NRC/FSME/DWMRP/DURLD
 J. W. Smetanka, Westinghouse
 M. LaFranzo, NRC Region III/DNMS/MCID

ATTACHMENT 1

WESTINGHOUSE ELECTRIC COMPANY LLC

**SPECIAL NUCLEAR MATERIAL LICENSE APPLICATION
FOR THE
HEMATITE DECOMMISSIONING PROJECT**

07/25/2012

FESTUS, MISSOURI

**LICENSE NUMBER
SNM-00033**

**U. S. NUCLEAR REGULATORY COMMISSION
DOCKET 070-00036**

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1 STANDARD CONDITIONS AND SPECIAL AUTHORIZATIONS

1.1 NAME, ADDRESS AND CORPORATE INFORMATION

The name of the applicant is Westinghouse Electric Company LLC. The applicant is a limited liability company under the laws of the state of Delaware with principal offices located at 1000 Westinghouse Drive, Cranberry Township, PA 16066 USA. The address at which the licensed activities will be conducted is:

Westinghouse Electric Company LLC
3300 State Road P
Festus, Missouri 63028

1.2 SITE LOCATION

The Hematite facility of Westinghouse Electric Company LLC is located on a site of about 228 acres in Jefferson County, Missouri, approximately 3/4 mile northeast of the unincorporated town of Hematite, Missouri, and 35 miles south of the city of St. Louis, Missouri. Activities involving special nuclear material are conducted within the fenced controlled area near the center of the site and adjacent to the access road, State Road P. These activities include preparation and shipment of scrap and wastes, and related processes incident to the decommissioning of the facility.

1.3 LICENSE NUMBER AND PERIOD OF LICENSE

This application is for Special Nuclear Material License (SNM) No. SNM-00033 (NRC Docket 070-00036). The expiration date for License No. SNM-00033 was revised in Amendment No. 50, issued March 23, 2006, to specify that the license is continued until decommissioning is complete and the NRC notifies Westinghouse Electric Company LLC in writing that the license is terminated.

1.4 **POSSESSION LIMITS**

Westinghouse Electric Company LLC requests authorization to possess the following quantities of byproduct, source and special nuclear material under License No. SNM-00033 (see also the possession limit exemption requested in Section 1.6.4 below). The licensee may possess any Special Nuclear Material (SNM), either Category I or Category II, during decommissioning if handled in accordance with the approved Physical Security Plan, Fundamental Nuclear Material Control Plan, and Nuclear Criticality Contingency Plan for Remediating Contingency Hot Spots.

<i>Item</i>	Material	Form	Maximum Quantity
A	Uranium enriched to a maximum of less than 10 weight percent in the ^{235}U isotope	Any (including only metal powders existing at the Hematite Site on July 1, 2001)	10,000 kilograms ^{235}U
B	Uranium enriched greater than or equal to 10 weight percent and less than 20 weight percent in the ^{235}U isotope	Any (including only metal powders existing at the Hematite Site on July 1, 2001)	9,999 grams ^{235}U
C	Uranium enriched greater than or equal to 20 weight percent in the ^{235}U isotope	Any (including only metal powders existing at the Hematite Site on July 1, 2001)	4,999 grams ^{235}U *
D	Uranium (natural or depleted)	Any (including only metal powders existing at the Hematite Site on July 1, 2001)	2,000 kilograms
E	Cobalt 60	Sealed Sources	40 millicuries total
F	Cesium 137	Sealed Sources	500 millicuries total
G	Byproduct Material including ^{241}Am	Any	400 microcuries total
H	Special Nuclear Material, Source and Byproduct Material as residual contamination	Any	All residual contamination existing at the Hematite site on July 1, 2001

* License conditions for Category III HEU (for less than 1000 grams ^{235}U) and Category II HEU (1000 to 4999 grams of ^{235}U) are defined in the Fundamental Nuclear Material Control Plan and the Physical Security Plan.

1.5 AUTHORIZED ACTIVITIES

This license application requests authorization for Westinghouse Electric Company LLC to conduct the following activities at the Hematite Decommissioning Project:

- 1) Receive, possess, use, store and transfer Special Nuclear Material under Part 70 of the Regulations of the Nuclear Regulatory Commission
- 2) Receive, possess, use, store, and transfer Source Material under Part 40 of the Regulations of the Nuclear Regulatory Commission
- 3) Receive, possess, use, store, and transfer Byproduct Material under Part 30 of the Regulations of the Nuclear Regulatory Commission

The authorized principal licensed activity is to decommission the site in accordance with the Decommissioning Plan (DP) to reduce residual radioactivity to a level that permits termination of the license. With the cessation of all nuclear fuel manufacturing operations on the site, authorized activities are limited to those associated with decommissioning in accordance with 10 CFR 70.38(d). These activities are being undertaken to allow termination of License No. SNM-00033 and release of the site for unrestricted use in accordance with NRC Regulations (10 CFR 20, Subpart E, Radiological Criteria for License Termination). These authorized activities are conducted at any location on the Hematite site.

With respect to the specific possession limits of Section 1.4:

- 1) Items A, B, C and D – use of this Special Nuclear Material and Source Material is limited to those activities necessary to process and package the materials into forms suitable for transfer to other licensed operations or approved recipients. Receipt of any additional materials in these categories is limited to that necessary to complete the decommissioning of the site and facilities. Examples of such receipts would be calibration sources and residual contamination on shipping containers and packages.
- 2) Item E – for instrument calibration and testing.
- 3) Item F – for instrument calibration and testing.
- 4) Item G – for instrument calibration and testing and as residual contamination on shipping containers and packages.
- 5) Item H – for possession of residual contamination on building and equipment surfaces or contaminated waste/materials or contaminated soil/sediment.
- 6) SNM is either Diffuse Material or Potentially Recoverable SNM; these terms are defined in the Fundamental Nuclear Material Control Plan. Diffuse Material is counted in the Line Item H category. Potentially Recoverable SNM is counted against the appropriate Line Item A, B, or C limit.

1.6 EXEMPTIONS AND SPECIAL AUTHORIZATIONS

The following are specific exemptions and special authorizations of this license application:

- 1.6.1 Release of equipment and materials from restricted areas to controlled areas or off-site in accordance with the NRC's "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated April 1993.
- 1.6.2 Notwithstanding the requirements of 10 CFR 70.24, the licensed activity involving any **special nuclear** materials described below shall be exempted from the "monitoring system" requirements under any of the conditions specified below:

1. Low concentration materials ($1.4 \text{ g}^{235}\text{U/L}$ for solids, and $11.6 \text{ g}^{235}\text{U/L}$ for liquids) that are safely subcritical by virtue of their low concentration, irrespective of any other physical conditions, including mass, geometry, moderation, reflection, etc.
2. Materials enriched to less than 0.96 wt.% in the ^{235}U isotope for uranium compounds or less than 0.93 wt.% in the ^{235}U isotope for uranium metal that are safely subcritical because exotic reflectors, moderators and precisely controlled geometric arrangements are not associated with exhumation and disposal activities (ANSI/ANS 8.1).
3. Materials that are contained in authorized packages as defined in NRC/DOT regulations, including 10 CFR 71 and 49 CFR 173.
4. Materials that are exempt from Nuclear Criticality Safety controls (i.e., NCS Exempt Materials) as identified in documented Nuclear Criticality Safety Analyses and Evaluations.
5. Materials within neutronically separate areas containing less than the following isotopic mass amount per separate area:
 - A. $700 \text{ g}^{235}\text{U}$ in uranium enriched to more than 5 wt.% $^{235}\text{U/U}$, and
 - B. $1640 \text{ g}^{235}\text{U}$ in uranium enriched to no more than 5 wt.% $^{235}\text{U/U}$;

Notes: (1) Structure surfaces within the separate area that contain residual ^{235}U surface contamination below an areal density of $10 \text{ g}^{235}\text{U/ft}^2$ are not included in the mass amount for the separate area.

(2) Any ^{235}U in undisturbed subsurface areas is not included in the isotopic mass amount for the separate area.

(3) Neutronically separated areas are to be considered effectively neutronically isolated from all other areas used to store fissile material when either of the following conditions are satisfied:

(a) A minimum edge-to-edge separation distance of 12 feet is maintained between each area used to store fissile material; or

(b) The configuration of each area used to store fissile material, in conjunction with any ~~present~~-fixed shielding that may be present (e.g., concrete block walls) between the areas, is demonstrated by neutron transport calculations to result in effective neutron isolation between each area.

6. Residual materials on surfaces of the site buildings or installed equipment in those buildings including removal and transit of those SNM-bearing materials from the buildings. (Any SNM-bearing materials brought into site buildings must satisfy another provision in this Section 1.6.2 to meet the exemption.)
 7. A Contingency Hot Spot that is in secure storage, is neutronically isolated from other SNM, and is intrinsically safe due to two of its physical parameters (e.g., mass, volume, enrichment, geometry, moderation) being in a known state that is sufficient to render the item safely subcritical. The term 'Contingency Hot Spot' is defined in the *Nuclear Criticality Safety Contingency Plan for Remediating Contingency Hot Spots*. The term 'secure storage' is defined as an area in which dual controlled entry is required as well as tandem operations with oversight.
 8. Exhumed items that require additional characterization, e.g., in a Waste Evaluation Area and/or Material Assay Area, under the conditions described below:
 - A. In-situ radiological survey equipment does not identify the item as a Contingency Hot Spot,
 - B. The item is not consistent with the calibration basis of the radiological survey equipment used (e.g., dense shielded items, intact drums),
 - C. A 12 foot separation distance is maintained between the exhumed item and other exhumed items that are not exempt from Nuclear Criticality Safety control,

Or

 - The item is placed in a container equipped with a spacing collar (at least 18 inches wide providing a minimum physical spacing of 36 inches between similar containers) prior to movement,
 - D. The item is moved from exhumation to a Waste Evaluation Area and/or Material Assay Area with storage in-between,
 - E. Only one CD (or one item if it is too large for a CD) not exempt from Nuclear Criticality Safety control is allowed at a time in a Waste Evaluation Area or Material Assay Area, and
 - F. Controls for a Contingency Hot Spot are applied if the additional characterization (e.g., shielding removed) determines that a Contingency Hot Spot is present.
- 1.6.3 Notwithstanding the requirements of Title 10, Code of Federal Regulations, Part 70, §70.22(a)(4), the licensed activity shall be exempted from the possession limit requirements of Section 1.4 Item C above with respect to the SNM covered by the Westinghouse - U. S. Government Settlement Agreement-In-Principle. If the licensee discovers any such SNM during decommissioning, the SNM shall be handled in accordance with the approved Physical Security Plan, Fundamental Nuclear Material Control Plan, and Nuclear Criticality Contingency Plan for Remediating Contingency Hot Spots.
- 1.6.4 Dismantlement and demolition of site buildings.

1.7 FREQUENCIES

When audit, measurement, surveillance, and/or other frequencies are specified in license documents, the following time spans apply:

- *Daily* means once each 24-hour period, with each covering a span of 30-hours or less
- *Weekly* means once each 7-consecutive-days, with each covering a span of 8-days or less
- *Monthly* means 12-per-year, with each covering a span of 40-days or less
- *Quarterly* means 4-per-year, with each covering a span of 115-days or less
- *Semiannual* means 2-per-year, with each covering a span of 225-days or less
- *Annual* means 1-per-year, with each covering a span of 15-months or less
- *Biennial* means once every 2-years, with each covering a span of 30-months or less
- *Triennial* means once every 3-years, with each covering a span of 45-months or less
- For unspecified time periods, an extension of 0.25 times the period will apply

1.8 DECOMMISSIONING CHANGES

Changes to decommissioning activities shall be evaluated to ensure they are consistent with license conditions and the intent of the NRC approved Decommissioning Plan (DP) and may be made without prior NRC approval subject to the following condition. Revision of any of the following activities described in Chapter 14 of the DP requires NRC approval prior to implementation:

- Increasing the approved radionuclide-specific DCGLs or area factors;
- Increasing the probability of making a Type I decision error above the level stated in the DP;
- Increasing the investigation level thresholds for a given survey unit classification;
- Changing the classification of a survey unit from a more restrictive classification to a less restrictive classification (e.g., Class 1 to Class 2);
- Reducing the coverage requirements for scan measurements; and
- Using statistical tests other than the Sign test or Wilcoxon Rank Sum test for data evaluation.

2 ORGANIZATION AND ADMINISTRATION

See Chapter 9, Project Management and Organization, and Chapter 13, Quality Assurance, of the DP.

3 RADIATION PROTECTION

See DP Chapter 10, Health and Safety Program During Decommissioning.

4 NUCLEAR CRITICALITY SAFETY

See Chapter 10, Health and Safety Program During Decommissioning, and specifically 10.9.1, of the DP.

5 EFFLUENT CONTROL AND MONITORING PROGRAM AND ENVIRONMENTAL MONITORING PROGRAM

See Chapter 11, Environmental Monitoring Program, of the DP.

6 RADIOACTIVE WASTE MANAGEMENT

See Chapter 12, Radioactive Waste Management, of the DP.

7 DECOMMISSIONING PLAN

Westinghouse Electric Company LLC has submitted for NRC approval a DP for the Hematite facility, including a Decommissioning Funding Plan, as required by 10 CFR 70.38, License Conditions 9.E. and 15 (e.g., of SNM-00033, Amendment 53) and §70.25.

8 EMERGENCY MANAGEMENT

The Westinghouse Hematite site is in the progress of decommissioning and has ceased manufacturing operations. Westinghouse has submitted an analysis of the consequences associated with postulated accidents (Westinghouse letter dated August 22, 2002; approved by the NRC in License SNM-00033, Amendment 43). That evaluation showed that the maximum dose to a member of the public due to the release of radioactive material would not exceed the provisions of 10CFR70.22(i)(1)(i). An Emergency Plan is therefore not required to meet the provisions of 10CFR70.22(i)(1)(ii).

ATTACHMENT 2

Justification of Changes to Condition 15 of Amendment 56 to SNM-33 in License Application Dated July 25, 2012

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

Docket No. 070-00036

Justification of Changes to Condition 15 of Amendment 59 to SNM-33 in License Application Dated July 25, 2012

Condition/ Section	Revision	Basis
1.6.2	<p>Was: “Notwithstanding the requirements of 10 CFR 70.24, the licensed activity involving any materials described below shall be exempted from the “monitoring system” requirements under any of the conditions specified below.”</p> <p>Now: “Notwithstanding the requirements of 10 CFR 70.24, the licensed activity involving any special nuclear materials described below shall be exempted from the “monitoring system” requirements under any of the conditions specified below.”</p>	The addition of “special nuclear” as a qualifier for “materials” is necessary since 10 CFR 70.24 only applies to special nuclear material. As written, the text could be misinterpreted to apply to depleted and natural uranium.
1.6.2.2 new	Added: “Materials enriched to less than 0.96 wt.% in the ²³⁵ U isotope for uranium compounds or less than 0.93 wt.% in the ²³⁵ U isotope for uranium metal that are safely subcritical because exotic reflectors, moderators and precisely controlled geometric arrangements are not associated with exhumation and disposal activities (ANSI/ANS 8.1).”	Based on ANSI/ANS-8.1 Section 5.1, there is no credible risk of a criticality accident in any arrangement for material enriched to less than 0.93 wt% ²³⁵ U barring exotic conditions. The material is inherently safe by mere concentration of ²³⁵ U per gram of material and therefore relieved from criticality safety controls.
1.6.2.4 new	Added: “Materials that are exempt from Nuclear Criticality Safety controls (i.e., NCS Exempt Materials) as identified in documented Nuclear Criticality Safety Analyses and Evaluations.”	Material that has been declared as NCS Exempt Material are considered safely subcritical by virtue of its low fissile nuclide concentration. These designations require no controls to ensure the material remains subcritical.
1.6.2.5.A(3)(b)	Was: “The configuration of each area used to store fissile material, in conjunction with any present fixed shielding (e.g., concrete block walls)	Organization of wording has been changed to present better flow for the situation described herein and clearly acknowledge that fixed shielding is not always required (i.e., distance isolating

Condition/ Section	Revision	Basis
	<p>between the areas, is demonstrated by neutron transport calculations to result in effective neutron isolation between each area”</p> <p>Now: “The configuration of each area used to store fissile material, in conjunction with any fixed shielding that may be present (e.g., concrete block walls) between the areas, is demonstrated by neutron transport calculations to result in effective neutron isolation between each area.”</p>	<p>stored fissile material alone may be sufficient).</p>
1.6.2.6.8	<p>Was: N/A.</p> <p>Now: “Exhumed items that require additional characterization, e.g., in a Waste Evaluation Area and/or Material Assay Area, under the conditions described below:</p> <p>A. In-situ radiological survey equipment does not identify the item as a Contingency Hot Spot,</p> <p>B. The item is not consistent with the calibration basis of the radiological survey equipment used (e.g., dense shielded items, intact drums),</p> <p>C. A 12 foot separation distance is maintained between the exhumed item and other exhumed items that are not exempt from Nuclear Criticality Safety control,</p> <p>Or</p>	<p>This exemption is needed based on ANSI/ANS-8.3 Section 4.1.1, which is endorsed by the NRC in Regulatory Guide 3.71. ANSI/ANS-8.3 Section 4.1.1 states that a CAAS should only be installed when it will result in a reduction in total risk. Stated conversely, a CAAS should not be installed when it will result in an increase in personnel risk. ANSI/ANS-8.3 also makes it clear that the hazards associated with false alarms are an important consideration. Given that there is no credible risk of a criticality accident as described below, the hazards associated with personnel evacuating from false alarms increases personnel risk. Thus an active CAAS would be inconsistent with the guidance in this standard, and this fact supports the issuance of the requested exemption.</p> <p>There is no credible risk of a criticality accident associated with the conditions described in the bullets. The item has been buried alongside other items potentially containing fissile material in an environment permeated by water and other potential moderators. No criticality accident has occurred for over 40 years in this state. The conditions described in the subbullets establish separation of</p>

Condition/ Section	Revision	Basis
	<p>The item is placed in a container equipped with a spacing collar (at least 18 inches wide providing a minimum physical spacing of 36 inches between similar containers) prior to movement,</p> <p>D. The item is moved from exhumation to a Waste Evaluation Area and/or Material Assay Area with storage in-between,</p> <p>E. Only one CD (or one item if it is too large for a CD) not exempt from Nuclear Criticality Safety control is allowed at a time in a Waste Evaluation Area or Material Assay Area, and</p> <p>F. Controls for a Contingency Hot Spot are applied if the additional characterization (e.g., shielding removed) determines that a Contingency Hot Spot is present.”</p>	<p>the item from other exhumed items, separation of the item from potential moderators, prompt characterization of the item, and application a criticality alarm monitoring system for a confirmed Contingency Hot Spot. The condition described in the 1.6.2.8.A-F have already been developed and deployed as part of existing nuclear criticality safety assessments conducted in accordance with the requirements of Section 10.9 of the Decommissioning Plan, as modified by responses to requests for additional information.</p> <p>As discussed in the NRC Safety Evaluation Report associated with Reference 2, the exemption is based on “certain fissile material activities instead of just specific areas.” These certain fissile material activities are based on having characterization information for the item’s fissile material content. Although substantial amounts of information is obtained by field instruments, some items require investigation in a Waste Evaluation Area (e.g., intact container contents are removed, potential shielding material area separated, and the contents are sorted using field instruments), and/or in a Material Assay Area (e.g., item or individual drum contents are surveyed by a High Purity Germanium gamma spectroscopy instrument). The application of 1.6.2.1 through 1.6.2.7 depends on the characterization information gained through this 1.6.2.8.</p>