

Westinghouse Electric Company Hematite Former Fuel Cycle Facility 3300 State Road P Festus, MO 63028 USA

U.S. Nuclear Regulatory Commission Document Control Administrator Washington, DC 20555 Direct tel: (412) 374-4652

Direct fax:

Our ref: HEM-06-20

Date: February 22, 2006

Attention: Ms. Amy Snyder

Subject: Submittal of Additional Information to Support Request for an Amendment to

License Number SNM-33 (Docket 070-000036)

In response to discussions with members of NRC staff, Westinghouse is submitting the following additional information to support our request for an amendment to License Number SNM-33 referenced above. This information is for clarification to update the current license application.

- Condition #13 of the current license is no longer applicable and should be deleted.
   This license condition relates to a specific license exemption that was issued to Westinghouse to permit the shipment of certain waste materials in bulk form.
   With the revisions that have been made to the NRC and DOT transportation regulations for the transport of fissile exempt material, the provisions authorized by this license condition are not used and therefore the specific exemption is no longer required.
- 2. The reference to the letter dated March 6, 2001 in the current license should be deleted as it is no longer applicable. This letter provides a commitment schedule for conducting further Criticality Safety Program Updates (CSPU) for equipment that would be used during the equipment cleanout phase of decommissioning. All process equipment has been cleaned out and removed from the buildings with the exception of certain large pieces of equipment that will be removed during building demolition. Thus the commitments incorporated by that letter are no longer applicable.
- 3. Attached is a clean copy of Page 5-4 of the license application to replace the poor quality page currently in your possession.
- 4. Attached is an updated copy of the Table of Contents for the license application. This copy includes all chapters of Part 1 of the license application and only Chapter 14 of Part 2 of the application. The others chapters in Part 2 are no longer applicable given the current status of decommissioning the buildings.

11mss01

If you have any questions concerning this submittal please contact me at 412-374-4652.

Sincerely,

A. Joseph Nardi, Supervisory Engineer Environment, Health and Safety

#### Attachments

cc:

A. Snyder, NRC, HQ

M. Thorpe-Kavanaugh, NRC, HQ Mr. Hank Sepp, Westinghouse

Mr. Tracy Chance, Westinghouse

Table 5 - 1 **Environmental Monitoring Program** 

Sample medium	Sampling Points	Collection & Analysis Frequency	<u>Sample</u> <u>Type</u>	Type of Analysis	Action Level	<u>Table No</u> . – Note (4)
Operational Effluents Monitoring Program:						
Air Effluent	Exhaust Stacks	Continuous & Analyze Weekly	Particulate	Note (1)	5 x 10 <sup>-14</sup> μC/ml – Note (2)	13-1
Air Effluent	Conversion Offgas Stack	Continuous & Analyze Weekly	Gaseous &	Note (1) Particulate		13-17 – Note (5)
Liquid Effluent	Site Dam	Continuous & Analyze Weekly	Composite	Note (1)	3 x 10 <sup>-7</sup> μC/ml - Note (3)	13-3, 13-18
	Sewage Treatment Outfall	Weekly	Grab	Note (1)	3 x 10 <sup>-7</sup> μC/ml - Note (3)	13-14
Operational Environm	nental Monitoring Program					
Air	3 On-site Remote	Continuous & Analyze Weekly	Particulate	Note (1)		13-2
Surface Water	Joachim Creek Above & Below Site Creek Outfall	Monthly	Grab	Note (1)		13-4, 13-5
	Joachim & Site Creek Confluence	Quarterly	Grab	Note (1)		13-6
Ground Water	Plant Well	Monthly	Grab	Note (1)		13-10
	Offsite Well (Hematite)	Quarterly	Grab	Note (1)		13-6
	3 Monitoring Wells For Evaporation Ponds	Quarterly	Grab	Note (1)		13-7, 13-8, 13–9
	South Vault Sample Monitoring Well	Quarterly	Grabs	Note (1)		13-11
	3 Burial Ground Monitoring Wells	Quarterly	Grabs	Note (1)		13-12, 13-13
Soil	4 Locations Surrounding Plant	Quarterly	Grab	Note (1)		13-15
Vegetation	4 Locations Surrounding Plant	Quarterly	Grabs	Note (1)	<i>}</i>	13-16, 13-19
Sediment	Site Creek Below Site Dam	Annual	Grab	Note (1)	,	
Notes		<del></del>				

#### Notes:

- (1) One or more of the analysis types given in Section 5.1.3.(2) Action Level applies in the accessible unrestricted areas.

- (3) Action Lever is average at the site boundary.
   (4) This column correlates samples points with data tables in Chapter 13 "for information only."
   (5) Monitoring results for this stack are included in Table 13-1 as "Total Microcuries" released for all stacks.

## TABLE OF CONTENTS

Section		<u>Page</u>
PART I	LICENSE CONDITIONS	
Chapter 1 -	STANDARD CONDITIONS AND SPECIAL AUTHORIZATION	ONS 1-7
1.1 1.2 1.3 1.4 1.5 1.6	Name, Address and Corporate Information Site Location License Number and Period of License Possession Limits Authorized Activities Exemptions and Special Activities	1-1 1-1 1-2 1-2 1-3 1-5
Chapter 2 -	ORGANIZATION AND ADMINISTRATION	2-30
2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 2-10 2-11	Organization and Administration Organizational Responsibilities and Experience Requirement Project Management Contractor Support Organizational Assignments Project Oversight Committee Training Policies and Procedures Quality Assurance Investigations and Reporting Periodic Progress Reports Stop Work Authority Resumes Hematite Project Management Organization	2-1 ents 2-1 2-4 2-5 2-7 2-8 2-9 2-14 2-16 2-21 2-22 2-23 2-24 2-30
Chapter 3 -	RADIATION PROTECTION	3-13
3.1 3.2	Special Administrative Requirements Technical Requirements	3-1 3-2
Chapter 4 -	NUCLEAR CRITICALITY SAFETY	4-23
4.1 4.2	Administrative conditions Technical Criteria	4-1 4-5
Chapter 5 -	ENVIRONMENTAL PROTECTION	5-4
5.1 5.2	Effluent Control Systems Environmental Monitoring	5-1 5-2
License No. S		Date: 2/22/06 Page: i

## TABLE OF CONTENTS (continued)

Section		<u>Page</u>
Chapter 6 -	SPECIAL PROCESSES	6-3
6.1 6.2 6.3 6.4 6-5	Proprietary Information Occupational Safety Emergency Utilities Radioactive Waste Management Deleted	6-1 6-1 6-2 6-2 6-3
Chapter 7 -	DECOMMISSIONING PLAN	7-1
Chapter 8 -	EMERGENCY PROCEDURE	8-1
PART II	SAFETY DEMONSTRATION	
Chapter 9 -	DELETED	9-12
Chapter 10 -	DELETED	10-14
Chapter 11 -	DELETED	11-16
Chapter 12 -	DELETED	12-8
Chapter 13 -	DELETED	13-21
Chapter 14 -	NUCLEAR CRITICALITY SAFETY	14-79
14.1 14.2 14.3 14.4 14.5 14.6 14.7 14.8	Administrative and Technical Procedures Preferred Approach to Process Design Basic Assumptions Fixed Poisons Structural Integrity Policy and Review Program Analytical Models and Their Validation Special Controls Data Sources	14-1 14-2 14-2 14-26 14-26 14-32 14-32
Chapter 15 -	DELETED	15-84

License No. SNM-33

Docket No. 70-36

Revision 2

Page: ii

Date: 2/22/06

## **LIST OF TABLES**

Table No.		<u>Page</u>
Chapter 4 -	CRITICALITY SAFETY	
4-1	PART A. Safe Unit Limits Meeting Fractional Critical Criteria for Surface Density Modeling	4-18
4-1	PART B. Other Operational Limits: UO <sub>2</sub> with 5 w/o or less <sup>235</sup> U	4-19
4-2	Aqueous Solution Limits for <sup>235</sup> U Enrichments Less Than or Equal to 5 w/o <sup>235</sup> U	4-20
4-3	Minimum Spacing Areas for Homogeneous and Heterogeneous Mass and Geometric Limits	4-21
4-4	Controlled Parameters for Criticality Safety of Major Plant Processes	4-22
4-5	Processes and Vessels With SIU Based Controls	4-23
Chapter 5 -	ENVIRONMENTAL SAFETY	
5-1	Environmental Monitoring Program	5-4
Chapter 14 -	NUCLEAR CRITICALITY SAFETY	
14-1	Critical Reflected Parameters for Homogeneous UO <sub>2</sub> – Water Systems	14-36
14-2	Critical Limits for UO <sub>2</sub> , UO <sub>2</sub> F <sub>2</sub> , and UO <sub>2</sub> (NO <sub>3</sub> ) <sub>2</sub> for Uranium Enriched to 5 w/o <sup>235</sup> U in Aqueous Solutions	14-36
14-3	Critical Parameters for Unclad, 10.9 g/cc, 0.40" OD (UO <sub>2</sub> Pellet Columns in Water; Alternate Bias Curve Basis)	14-37
14-4	DP-1014 Critical Parameters for Unclad, 10.9 g/cc, 0.40" OD (UO <sub>2</sub> Pellet Columns in Water)	14-38
14-5	UKAEA Handbook Critical Parameters for Unclad, 10.96 g/cc, 0.40" OD (UO <sub>2</sub> Pellet Columns in Water)	14-39
14-6	Critical and Subcritical (0.95) Parameters for Unclad, 10.9 g/cc, 0.40" OD (UO <sub>2</sub> Pellet Columns in Water; Reference Bias Curve Basis)	14-40
14-7	Critical and Subcritical Parameters for Reflected, Unclad, 10.9 g/cc (UO <sub>2</sub> Pellet Columns in Water)	14-41
14-8	Critical Parameters for Unclad, 0.40" OD (UO <sub>2</sub> Pellet Columns at Two Densities; Reference Bias Curve Basis)	14-42
14-9	Minimum Critical and Safe Reflected Parameters for Heterogeneous UO <sub>2</sub> – Water Systems, Pellet Diameter 0.40 inches	14-43

License No. SNM-33

Revision 2

Page: iii

Date: 2/22/06

Docket No. 70-36

#### **LIST OF TABLES** (continued)

Table No.		<u>Page</u>
14-10	Critical and Subcritical (0.95) Parameters for Clad, 10.41 g/cc, 0.40" OD (UO <sub>2</sub> Pellet Columns in Water;	14-44
14-11	Reference Bias Curve Basis) Critical and Subcritical (0.95) Parameters for Clad, 10.41 g/cc	14-45
1-4-11	0.3224" OD (UO <sub>2</sub> Pellet Columns in Water; Reference Bias Curve Basis)	14-40
14-12	Mass, Volume, and Cylinder Diameter Limits versus Enrichment	14-46
14-13	Summary of Data on Randomly Stacked (0.4 inch diameter) UO <sub>2</sub> Pellets in 2x5x10" Pellet Plan Having Volume of 1422 cc	14-47
14-14a	Summary of Lattice Parameters for 23 Critical Experiments	14-48
14-14b	Summary of Lattice Parameters for 23 Critical Experiments	14-49
14-15	Lattice Multiplication Factors	14-50
14-16	KENO IV Results for Noted Gap Widths	14-51
14-17	Calculation of Methodology Standard Deviation	14-52

License No. SNM-33

Revision 2

Docket No. 70-36

Page: iv

Date: 2/22/06

## **LIST OF FIGURES**

Figure No.		<u>Page</u>
Chapter 14 -	NUCLEAR CRITICALITY SAFETY	
14-1	Reflected and Optimally Moderated, Critical Parameters versus Enrichment	14-53
14-2	Critical Masses of U(93.5) Metal Spheres in Various Reflectors, Uranium Density = 18.8 g/cc (form LA-10860-MS)	14-54
14-3	Reflected Critical Slab Thickness versus Water-to Oxide Ratio for 0.40" OD U(5)O <sub>2</sub> Pellets Uniformly Distributed in Water	14-55
14-4	Reflected Critical Surface Density versus Water-to Oxide Ratio for 0.40" OD U(5)O <sub>2</sub> Pellets Uniformly Distributed in Water	14-56
14-5	Reflected Critical Radius versus Water-to Oxide Ratio for 0.40" OD U(5)O <sub>2</sub> Pellets Uniformly Distributed in Water	14-57
14-6	Reflected Critical Spherical Volume versus Water-to Oxide Ratio for 0.40" OD U(5)O <sub>2</sub> Pellets Uniformly Distributed in Water	14-58
14-7	Reflected Critical Spherical Mass versus Water-to Oxide Ratio for 0.40" OD U(5)O <sub>2</sub> Pellets Uniformly Distributed in Water	14-59
14-8	Reflected Critical Mass versus Water-to Oxide Ratio for U(5)O <sub>2</sub> Pellets of Different Diameters	14-60
14-9	Comparison Between CE and DP-1014 Calculated Reflected and Optimally Moderated Critical Mass versus U(5)O <sub>2</sub> Pellet Diameter	14-61
14-10	Comparison of Minimum Critical Reflected Heterogeneous Slab Thickness versus Enrichment	14-62
14-11	Minimum Critical Reflected Surface Density versus Enrichment for Heterogeneous UO <sub>2</sub> Slab	14-63
14-12	Minimum Critical Reflected Cylinder Diameter versus Enrichment for Heterogeneous UO <sub>2</sub> – Water Mixture	14-64
14-13	Minimum Critical Reflected Spherical Volume versus Enrichment for Heterogeneous UO <sub>2</sub> – Water Mixture	14-65
14-14	Minimum Critical Reflected Spherical Mass versus Enrichment for Heterogeneous UO <sub>2</sub> – Water Mixture	14-66
14-15	Minimum Subcritical Reflected Slab Thickness and Cylinder Radius versus Water-to Oxide Ratio for Zircaloy Clad, U(5)O <sub>2</sub> Pellet Columns in Water	14-67
14-16	KENO K <sub>eff</sub> Including Uncertainty and Bias, versus Kilograms Uranium Per Liter for Mass limited Containers	14-68
14-17	KENO K <sub>eff</sub> Including Uncertainty and Bias, versus ts/tc and KgU/L for Cylinder Diameter and Volume Limited Unit Containers	14-69
14-18	Infinite Multiplication Factor versus Pellet Diameter for Several Water-to-UO <sub>2</sub> Volume Ratios	14-70

License No. SNM-33

Revision 2

Page: v

Date: 2/22/06

Docket No. 70-36

# LIST OF FIGURES (continued)

Fic	<u>gure No.</u>		<u>Page</u>
	14-19	K∞ versus 0.400 inch Diameter UO2 Pellet Density at Various14-7	71
		H2O-to-UO2 Volume Ratios	14-20
	Loci of N	Minima in Reflected Minimum Critical Mass and	14-72
		Geometric Parameters with Enrichment and Bulk Density	
	14-21	Reflected Subcritical (Safe) Slab Thickness versus	14-73
		Water-to-Oxide Ratio for Unclad U(5)O <sub>2</sub> of Various Outer	
		Diameters	
	14-22	K <sub>eff</sub> versus Water Density and Planar Separation in 4 Inch Thick Infinite slab Array of Pellet Trays	14-74
	14-23	K <sub>eff</sub> versus H <sub>2</sub> O/UO <sub>2</sub> , 23 Experiments	14-75
	14-24	K <sub>eff</sub> versus Pellet O.D.	14-76
	14-25	K <sub>eff</sub> versus Enrichment	14-77
	14-26	Experimental Setup for Experiments of Reference 29	14-78
	14-27	Keff versus Average Energy Group of Neutrons Causing Fission	14-79

Docket No. 70-36

Page: vi

Date: 2/22/06