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Your ref:

Our ref: LTR-RAC-22-62

December 2, 2022

SUBJECT: Request for Temporary License Amendment for Storage of Hematite Ash
(Docket No. 70-1151, License SNM-1107)

In accordance with 10 CFR 70.34, Westinghouse Electric Company, LLC (Westinghouse) requests NRC approval to possess ash from the Hematite site labeled as containing as high as 5.17 wt% U235. Our request is limited to the possession of 9 containers of Hematite ash with contents up to 5.5 wt% U-235 under a temporary license condition with a requested duration not to exceed six months after issuance of the amendment. Enclosure 1 provides specific drum and residue identification numbers for the material associated with this request, along with the NRC Form 741 Nuclear Material Transaction Report identification numbers associated with the shipments.

In the first quarter of 2003, Westinghouse was in the process of decommissioning the Westinghouse Hematite site in Hematite, MO. Ash from the incinerator for uranium recovery was sent to the Columbia Fuel Fabrication Facility (CFFF) for processing. The ash has been in storage since that time and CFFF recently began a campaign to process all the ash from Hematite. During that process, as described in NRC Event Notification Number 56199, CFFF employees discovered some bags from the Hematite site have labels that state the ash contents are above or statistically have the potential to be above the 5 wt% U235 limit in our current license. In total, 9 drums containing ash that are potentially above the 5 wt% threshold have been segregated from the remaining Hematite drums and are being stored in an intermodal transport container suspended off the ground on a flatbed trailer.

The historic NRC Form 741 records indicate that samples of the ash were sent to CFFF for testing to perform a shipper/receiver comparison of the uranium content of the shipment. Later on, corrected NRC Form 741 records show the U235 content of the intermodal transport container shipments were reduced, indicating that CFFF found the U235 content of the ash to be lower than indicated by Hematite and Hematite accepted the CFFF test results as resolution to the shipper/receiver difference. The original NRC Form 741 reports are included in Enclosure 3, and the corrected NRC Form 741 reports are included in Enclosure 4. It is also worth noting that

at the time of decommissioning commencement, Hematite was a Category III fuel facility (Docket No. 70-36, License SNM-33) licensed to possess only up to 5 wt% U235, so it is unlikely the incinerated ash would contain elevated levels of U235.

A nuclear criticality safety (NCS) technical justification of the existing safety basis for the current storage condition of the Hematite Ash is provided in Enclosure 2. Also, the storage of the 9 drums of Hematite Ash falls within the existing safety basis for environmental protection, fire safety, chemical safety and radiological safety, as documented in Integrated Safety Analysis (ISA) 16, *Storage of Uranium Bearing Materials*. Accordingly, there is no undue risk to public health and safety from approval of a temporary license condition for storage of the subject Hematite Ash Material because the condition is bound by the existing safety basis.

The requested amendment does not decrease the effectiveness of the CFFF Fundamental Nuclear Material Control Plan and will not impact security operations at the facility. As a result, storage of the subject material will not be inimical to the common defense and security.

Pursuant to 10 CFR 51.22(b), no environmental assessment or environmental impact statement need be prepared in connection with approval of this request. The amendment request is categorically excluded under 10 CFR 51.22(c)(11) because the requested license amendment involves no significant change in the types or significant increase in the amounts of any effluents that may be released offsite; no significant increase in individual or cumulative public or occupational radiation exposure; no significant construction impact; and no significant increase in the potential for or consequences from radiological accidents. There are no extraordinary circumstances present that would preclude reliance on this categorical exclusion.

Please contact me at (803) 647-1957 should you have questions or need additional information.


[Patrick Donnelly \(Dec 2, 2022 13:46 EST\)](#)

Patrick Donnelly
Regulatory Affairs Manager
Westinghouse Columbia Fuel Fabrication Facility
Docket 70-1151, License SNM-1107

cc:
NRC, Ms. Jennifer Tobin
NRC, Mr. Thomas Vukovinsky

Enclosure 1: Summary of Material Included in Request
Enclosure 2: NCS Technical Justification – Safety Basis for Storage of Hematite Ash Suspected >5 wt% U235
Enclosure 3: Original NRC Form 741 Reports for Hematite Ash Material
Enclosure 4: Corrected NRC Form 741 Reports for Hematite Ash Material

Enclosure 1

Summary of Material Included in Request

(1 Page)

WESTINGHOUSE NON-PROPRIETARY CLASS 3

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Transaction	Drum	Residue ID	%U235
ZWQ-YLM-184	H029	R0042330	5.170
ZWQ-YLM-184	H033	R0042123	5.028
ZWQ-YLM-184	H058	R0042072	5.020
ZWQ-YLM-184	H104	R0042137	5.010
ZWQ-YLM-190	H032	R0041910	5.000
ZWQ-YLM-190	H096	R0042640	5.000
ZWQ-YLM-184	H022	R0041911	4.999
ZWQ-YLM-184	H023	R0042070	4.960
ZWQ-YLM-184	H068	R0042315	4.957

Enclosure 2

**Nuclear Criticality Safety (NCS) Technical Justification - Safety
Basis for Storage of Hematite Ash Suspected >5 wt% U235**

(3 Pages)

Nuclear Criticality Safety (NCS) Technical Justification - Safety Basis for Storage of Hematite Ash Suspected >5 wt% U235

There are nine drums containing incinerator ash that were shipped to CFFF from the Hematite site in early 2003 that have records indicating some of the contents may include ash with a uranium enrichment that exceeds or is statistically possible to exceed 5 wt% U235. The drums contain individual bags of ash, between two and four bags each. The tables below list the contents of each bag of ash, the cumulative contents of each drum and the average enrichment of each drum based on the shipping documentation. Although the labeled enrichment of each bag varies from 4.04 wt% up to 5.170 wt%, the average drum enrichment does not exceed 4.809 wt%. The maximum U235 quantity in any drum does not exceed 334 grams U235.

CFFF has an existing safety basis for the storage of low uranium density materials in 55-gallon drums. This drum storage is typically referred to as “floor storage” at CFFF and consists of arrays of drums loaded up to 500 grams U235, without spacing, in non-stacked planar arrays where needed in the facility. Calculations were performed for these drum arrays to show that under normal and upset conditions, the k-effective will remain below license limits. The safety basis is documented in ISA-16, *Storage of Uranium Bearing Materials* and CSE-16-F, *Criticality Safety Evaluation (CSE) for Floor Storage of Special Nuclear Material*.

It is recognized that the safety basis for the floor storage drums has been performed with a maximum enrichment of 5.0 wt% U-235. However, the calculations are modeled as an optimally moderated Uranium Dioxide (UO₂) and polypropylene homogenous mixture, which is a very conservative representation of incinerator ash. Incinerator ash is typically extremely dry and poorly moderated due to the capability of the incinerator to destroy the hydrogenous material. Further, the models are also considered to bound the ash drums from an enrichment standpoint because the average enrichment of the ash drums is less than 5.0 wt% U235. The fissile mass is also obviously conservatively bounded, as the maximum fissile mass in any of the nine drums is approximately two-thirds of the mass limit for the drum arrays. The nine drums are currently stored in an intermodal container suspended off the ground on a flatbed trailer with 24-inch edge-to-edge spacing (out of an abundance of conservatism), but the safety basis for the drum storage arrays requires no spacing for drums with a fissile mass below 500 grams U235.

The drums are currently stored, and will remain, within coverage of the CFFF Criticality Accident Alarm System. The drums will be maintained in their current configuration until Westinghouse submits a plan to the NRC for movement, sampling, testing and if necessary, down blending the ash to within the current SNM-1107 license limits.

Drum Content Summary

Drums with Contents Labeled >5%

Drum	Residue ID	Tare	Net	%U	Grams U	%U235	Grams U235	Drum Grams U	Drum Grams U235	Drum Avg %U235
H029	R0042330	1,050	13,880	5.172	718	5.17	37			
H029	R0042062	1,050	19,215	24.365	4682	4.1	192			
H029	R0041758	1,050	6,765	11.935	807	4.084	33	6207	262	4.222
H033	R0042123	650	4,580	16.067	736	5.028	37			
H033	R0042728	650	13,320	13.5	1798	4.48	81			
H033	R0042302	650	14,590	8.379	1222	4.291	52	3757	170	4.526
H058	R0042072	650	5,520	14.987	827	5.02	42			
H058	R0042378	650	16,855	27.43	4623	4.4	203			
H058	R0042124	650	2,115	4.974	105	4.108	4			
H058	R0042795	650	11,490	18.2	2091	4.07	85	7647	334	4.373
H104	R0042137	650	12,430	6.974	867	5.01	43			
H104	R0031070	650	6,595	29.315	1933	4.46	86			
H104	R0033960	650	905	8.862	80	4.09	3			
H104	R0003191	650	16,565	17.536	2905	4.04	117	5785	250	4.326
H032	R0041910	650	14,685	14.238	2091	5	105			
H032	R0042131	650	12,655	15.485	1960	4.58	90			
H032	R0042119	650	7,735	16.649	1288	4.521	58	5338	253	4.73
H096	R0042640	650	16,820	30.02	5049	5	252			
H096	R0042276	650	17,990	7.55	1358	4.1	56	6408	308	4.809

Continued on the next page.

Drums with Contents Potentially >5%

Drum	Residue ID	Tare	Net	%U	Grams U	%U235	Grams U235	Drum Grams U	Drum Grams U235	Drum Avg %U235
H022	R0041911	1050	6,760	7.347	497	4.999	25			
H022	R0042196	1050	11,395	13.375	1524	4.58	70			
H022	R0042296	1050	8,550	5.76	492	4.52	22			
H022	R0042290	1050	9,900	8.88	879	4.06	36	3392	153	4.498
H023	R0042070	1,050	6,195	19.839	1229	4.96	61			
H023	R0042192	1,050	18,770	15.475	2905	4.41	128			
H023	R0042627	1,050	12,445	23.67	2946	4.26	125	7079	315	4.443
H068	R0042315	650	9,335	5.03	470	4.957	23			
H068	R0042033	650	11,450	9.51	1089	4.15	45			
H068	R0042806	650	18,475	32.78	6056	4.06	246	7615	314	4.128