

**SAFETY EVALUATION REPORT
WESTINGHOUSE ELECTRIC COMPANY, LLC APPLICATION
FOR TEMPORARY POSSESSION OF CERTAIN HEMATITE ASH**

DOCKET: 70-1151

LICENSEE: WESTINGHOUSE ELECTRIC COMPANY, LLC

SUBJECT: SAFETY EVALUATION REPORT: REQUEST TO TEMPORARILY POSSESS A LIMITED QUANTITY OF HEMATITE ASH ABOVE LICENSE LIMITS (EPID L-2022-LLA-0177)

1.0 BACKGROUND

By cover letter dated December 2, 2022, Westinghouse Electric Company, LLC (Westinghouse or WEC) submitted a license amendment request to temporarily possess and store a limited quantity of Hematite ash in excess of its current possession limit of 5.0 weight percent (wt.%) uranium-235 (²³⁵U). (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22336A174). The request was for possession and storage of the material only and did not include any material processing.

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 the Hematite site. During that process, as described in NRC Event Notification Number 56199, CFFF employees discovered that some bags from the Hematite site had labels stating the ash contents were above or statistically had the potential to be above the 5 wt.% ²³⁵U limit in SNM-1107. In total, 9 drums containing ash potentially above the 5 wt.% ²³⁵U threshold were identified and segregated from the remaining Hematite drums and are currently stored in an intermodal transport container suspended off the ground on a flatbed trailer. At the time of decommissioning commencement, the Hematite site was a Category III fuel facility (Docket No. 70-36, License SNM-33) licensed to possess only up to 5 wt.% ²³⁵U, so it is unlikely the incinerated ash would contain material with enrichments in excess of 5.0 wt.% ²³⁵U.

The purpose of this review is to determine whether the proposed activities will be conducted such that adequate protection for the health and safety of workers and the public against criticality hazards is reasonably assured, and whether the proposed activities will be conducted such that subcriticality is assured under normal and all credible abnormal conditions.

2.0 REGULATORY REQUIREMENTS

The NRC staff conducted its review of the licensee's request to ensure that the statements and commitments described in the submittal are consistent with the applicable requirements of 10 CFR Part 70, including:

- §70.22, "Contents of applications;"
- §70.24, "Criticality accident requirements;"
- §70.61, "Performance requirements;" and

- §70.62, “Safety program and integrated safety analysis.”

The NRC regulatory guidance for an acceptable material control and accounting (MC&A) program applicable to Category III fuel fabrication facilities is NUREG-1065, “Acceptable Standard Format and Content for the Fundamental Nuclear Material Control (FNMC) Plan Required for Low-Enriched Uranium Facilities.” The NUREG is divided into separate chapters for each of the program areas listed with associated commitments and acceptance criteria for each program area. Additionally, the NRC staff’s criticality safety review was conducted in accordance with the applicable acceptance criteria in Chapter 5, “Nuclear Criticality Safety,” of NUREG-1520, Rev. 2, as well as applicable portions of NUREG/CR-6698, “Guide for Validation of Nuclear Criticality Safety Calculational Methodology.”

3.0 MATERIAL CONTROL AND ACCOUNTING

As specified in 10 CFR 70.22(b), each licensee authorized to possess and use special nuclear material (SNM) in a quantity exceeding one effective kilogram must provide a full description of its program for MC&A of such SNM to show how compliance with applicable requirements of 10 CFR part 74, “Material Control and Accounting of Special Nuclear Material,” will be accomplished. Regulations in 10 CFR part 74 subpart B, “General Reporting and Recordkeeping Requirements,” and in 10 CFR 74.31, “Nuclear Material Control and Accounting for Special Nuclear Material of Low Strategic Significance,” apply to the establishment of an MC&A program for Category III fuel fabrication facilities. The requirements in 10 CFR 74.31 cover the specific MC&A program capabilities needed to establish an acceptable MC&A program. Category III fuel fabrication facilities are required to have a fundamental nuclear material control plan (FNMCP) describing how the performance objectives in 10 CFR 74.31(a), the system capabilities of 10 CFR 74.31(c), and the recordkeeping requirements of 10 CFR 74.31(d) will be met.

NRC STAFF EVALUATION

The NRC staff reviewed the December 2022 application for specific MC&A impacts of the temporary storage of the drums of incinerator ash referenced in the submittal. The licensee provided a summary of the material included in the request, a safety basis for the storage of the material, and copies of the nuclear material transaction reports associated with the material. The staff reviewed the currently approved FNMCP, Revision 44, dated July 9, 2019, which is required by 10 CFR 70.22(b). The FNMCP describes the licensee’s MC&A program and includes the practices in use for all the SNM possessed under the license, including the procedures for incinerator ash. Chapter 2 provides a general overview of the MC&A system, covering receipts, shipments, statistics, inventory, and records and reports. Chapter 4 describes the various measurement systems and measurement control practices for all the SNM in receipts, on inventory, and in shipments. Chapter 5 describes procedures and practices for the physical inventory of nuclear material. Chapter 6 discusses the item control program, including nuclear material receipt and entry into the item control program, in-plant handling features, shipment and removal from the item control program, and records. Chapter 7 addresses shipper-receiver evaluations. Chapter 9 describes the recordkeeping system.

Based on its review of the FNMCP, the NRC staff finds that the requirements of 10 CFR 74.31(a), 10 CFR 74.31(c), and 10 CFR 74.31(d) are met.

4.0 CRITICALITY SAFETY

The requested amendment involves the storage of a limited quantity of Hematite ash in excess of the licensee's current possession limit of 5.0 wt.% ²³⁵U. Nine 55-gallon drums containing incinerator ash in excess of 5 wt.% ²³⁵U were shipped from the Hematite site to WEC's CFFF facility in 2003. Although the average enrichment of the material contained in each drum is less than 5 wt.% ²³⁵U, each drum contains two or more items (i.e., bags), some of which contain material in excess of 5.0 wt.% ²³⁵U or have the potential to exceed 5.0 wt.% ²³⁵U when accounting for statistical uncertainty. The individual item enrichment and ²³⁵U mass, as well as the average drum enrichment and total drum ²³⁵U mass are described in table 5.3.1

Table 5.3.1 – Drum Contents

Drum Identifier	Item wt.% ²³⁵ U	Item Mass (g ²³⁵ U)	Total Mass (g ²³⁵ U)	Enrichment Average (wt.% ²³⁵ U)
HO29	5.17	37	262	4.222
	4.1	192		
	4.084	33		
H033	5.028	37	170	4.526
	4.48	81		
	4.291	52		
H058	5.02	42	334	4.373
	4.4	203		
	4.108	4		
	4.07	85		
H104	5.01	43	250	4.326
	4.46	86		
	4.09	3		
	4.04	117		
H032	5.00	105	253	4.73
	4.58	90		
	4.521	58		
H096	5.00	252	308	4.809
	4.1	56		
H022	4.999	25	153	4.498
	4.58	70		
	4.52	22		
	4.06	36		
H023	4.96	61	315	4.443
	4.41	128		
	4.26	125		
H068	4.957	23	314	4.128
	4.15	45		
	4.06	246		

The individual item enrichment ranges from 4.04 to 5.17 wt.% ²³⁵U, with the total drum enrichment ranging from 4.128 to 4.809 wt.% ²³⁵U. The individual item mass ranges from 3 to 252 grams ²³⁵U, with total drum mass ranging from 153 to 334 grams ²³⁵U. The maximum quantity in any drum does not exceed 334 grams ²³⁵U. The total ²³⁵U mass of all nine drums is approximately 2.36 kilograms.

In the December 2022 application, WEC stated that the nine drums were currently stored in an intermodal container suspended off the ground on a flatbed trailer with 24-inch edge-to-edge spacing. WEC further stated that the drums will be maintained in their current configuration until WEC submits a plan to the NRC for movement, sampling, testing, and if necessary, down-

blending of the ash to within current SNM-1107 license limits. WEC stated that the current configuration of the drums is bound by an existing nuclear criticality safety evaluation, CSE-16-F, "Criticality Safety Evaluation (CSE) for Floor Storage of Special Nuclear Material," which demonstrates that the drums do not present any credible criticality hazard.

The NRC staff reviewed CSE-16-F. The normal conditions considered in the CSE involve the temporary storage and staging of materials typically removed from processes in the chemical area. The CSE considers 5-gallon pails, 1.5-gallon pails, cream cans, vacuum cleaners, ventilation filter media, and 55-gallon drums. Although the material present in the containers may be of various material composition and form, the CSE assumes that all material is uranium dioxide (UO_2) as it has the highest possible uranium density of all compounds used at the CFFF and therefore bounds all other forms in terms of reactivity. Sources of moderation considered include water, oil, and polypropylene.

The licensee's analysis for normal conditions considered a triangular pitch array with the internal contents of each drum consisting of an optimally-moderated UO_2 /polypropylene mixture. No spacing requirement is imposed for drums containing less than 500g ^{235}U ; therefore, the triangular pitch was modeled as closely packed (i.e., no edge-to-edge spacing). The Hematite drums are administratively limited to less than 500g ^{235}U and are not allowed to be stacked; therefore, stacking was considered an abnormal condition.

The licensee's analysis identified and considered several credible abnormal conditions, including but not limited to, the stacking of drums containing less than 500g ^{235}U onto the array and the placement of a separate drum containing more than 500g ^{235}U near the array. Conservative assumptions on reflection and moderation conditions were used to bound any credible upsets involving potential interstitial or interspersed moderation, including the assumption that the contents of each drum contained an optimally-moderated sphere of a UO_2 /polypropylene mixture surrounded by water to fill the remaining contents of each drum. The licensee concluded in its analysis that drums containing less than 500g ^{235}U , such as the drums containing Hematite ash, do not present any credible criticality concerns.

The calculations performed as part of CSE-16-F assumed a maximum enrichment of 5.0 wt.% ^{235}U , which is inconsistent with the licensee's request to store material enriched up to 5.5 wt.%. In the December 2022 application, WEC stated that "[i]t is recognized that the safety basis for the floor storage drums has been performed with a maximum enrichment of 5.0 wt.% [^{235}U]. However, the calculations are modeled as an optimally-moderated Uranium Dioxide (UO_2) and polypropylene homogenous mixture, which is a very conservative representation of incinerator ash.... 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.% [^{235}U]." In the CSE, the licensee assumes an optimally-moderated sphere of a UO_2 /polypropylene mixture surrounded by water to fill the remaining contents of each drum. This is a conservative representation of incinerator ash and likely bounds any additional reactivity caused by the higher enrichment (i.e., 5.5 wt.% vs 5.0 wt.% ^{235}U). Additionally, although the contents of certain individual items are in excess of 5.0 wt.% ^{235}U , the average content of each drum is below 5.0 wt.%. This further reinforces that the licensee's existing analysis that 5.0 wt.% ^{235}U is bounding. However, the staff performed an independent confirmatory analysis to confirm the licensee's conclusions.

NRC Staff Confirmatory Analysis

The staff performed an independent confirmatory analysis using the SCALE 6.0/KENO-VI Monte Carlo N-Particle application with various continuous energy cross-section libraries. The normal conditions considered included an array of nine 55-gallon drums in both a 3x3 cuboid and triangular configuration. Each drum was assumed to contain an optimally-moderated sphere of a UO₂/water mixture with a ²³⁵U mass of 500g at 5.5 wt.% ²³⁵U, surrounded by a water reflector to fill the remaining contents of the drum. This approach is highly conservative as it accounts for both homogeneous and heterogeneous effects. Additionally, this approach is considered to be bounding to other potential sources of moderation (e.g., oil, polypropylene) given that such moderating material would not be present in a sufficient quantity to impact reactivity more significantly than that of an optimally-moderated UO₂/water mixture surrounded by water. Conservative reflection conditions on the boundary of the array were also considered. A single drum in isolation was not considered as 500g ²³⁵U is less than a minimum critical mass, even for a fully-reflected spherical geometry containing an optimally-moderated uranium metal/water mixture at 100 wt.% ²³⁵U. Additionally, 500g ²³⁵U is less than the single parameter limit for any form of uranium (UO₂, uranyl fluoride (UO₂F₂), uranyl nitrate (UO₂(NO₃)₂), uranium (U-) metal, etc.) at any level of moderation and at any level of enrichment per ANSI/ANS-8.1, "Nuclear Criticality Safety in Operations with Fissionable Material Outside Reactors," as endorsed in NRC Regulatory Guide (RG)-3.71, "Nuclear Criticality Safety Standards for Fuels and Material Facilities."

The staff identified three general process upsets to bound the credible abnormal conditions of the storage of the Hematite drums:

- moderation/reflection of drums;
- placement of container with more than 500 grams ²³⁵U near array (i.e., loss of spacing); and
- stacking of drums.

Moderation/Reflection of Drums. The moderation contents of each drum is not specifically controlled by the licensee; therefore, the NRC staff assumed the contents of each drum under normal conditions to contain an optimally-moderated sphere of a UO₂/water mixture with an assumed ²³⁵U mass of 500g at 5.5 wt.% ²³⁵U surrounded by a water reflector to fill the remaining contents of the drum. This approach is highly conservative as it accounts for both homogeneous and heterogeneous effects and bounds any potential process upsets involving the introduction of interstitial moderation (i.e., moderation inside the drums). The staff's analysis concluded that a reflected 3x3 array, as well as a triangular array, of closely packed 55-gallon drums, each containing 500g ²³⁵U at 5.5 wt.% ²³⁵U in an interstitially-moderated UO₂/water mixture, was adequately subcritical ($k_{\text{calc}} + 2\sigma_{\text{calc}} < 0.95$ for normal conditions). Therefore, the staff determined that the drums containing Hematite ash would be adequately subcritical under normal conditions and in the event of a moderation upset that resulted in the introduction of interstitial moderation.

The NRC staff does not consider a condition in which full interspersed moderation (i.e., moderation between drums) is introduced to be a credible upset condition. This is further strengthened by the licensee's commitment to store the Hematite drums on an intermodal container suspended off the ground on a flatbed trailer. However, the staff considered the presence of interspersed moderation up to a height of 24 inches. The staff's analysis concluded

that a fully reflected 3x3 array, as well as a triangular array, of closely packed 55-gallon drums, each containing 500g ²³⁵U at 5.5 wt.% ²³⁵U in an interstitially-moderated UO₂/water mixture under the conditions of 24 inches of interspersed moderation, was adequately subcritical ($k_{\text{calc}} + 2\sigma_{\text{calc}} < 0.98$ for upset conditions). Therefore, the staff determined that the drums containing Hematite ash would be adequately subcritical in the event of a moderation upset that resulted in the introduction of interspersed moderation.

Given the NRC staff's conclusion that there are no credible upsets involving the introduction of interstitial or interspersed moderation that could result in criticality, the staff determined that there is no credible criticality concern related to moderation upsets.

Loss of Spacing. Per the licensee's nuclear criticality safety evaluation (NCSE), CSE-16-F, "Criticality Safety Evaluation (CSE) for Floor Storage of Special Nuclear Material," spacing is not necessary for drums containing less than 500g ²³⁵U and spacing of at least 12 inches is necessary for drums containing more than 500g ²³⁵U. Drums with necessary spacing (i.e., drums containing more than 500g ²³⁵U) are subject to an administrative mass limit of 798g ²³⁵U. Although the licensee's procedure states that such drums to be spaced at least 12 inches from all other fissionable material, it is possible that the 12-inch spacing limit would be violated and that a drum containing more than 500g ²³⁵U would be placed near the nine drums containing Hematite ash given that containers are stored on the floor without physical barriers limiting the proximity of one container to another.

The NRC staff's analysis considered a configuration in which a drum containing 798g ²³⁵U at 5.0 wt.% in a moderated UO₂/water mixture is placed in contact (i.e., no edge-to-edge spacing) with the array of Hematite drums. The enrichment of the added 798g ²³⁵U drum was assumed to be 5.0 wt.% ²³⁵U as it would not contain Hematite ash and would be subject to the licensee's current possession limit of 5.0 wt.% ²³⁵U. The staff's analysis concluded that a reflected 3x3 array, as well as a triangular array, of closely packed 55-gallon drums, each containing 500g ²³⁵U at 5.5 wt.% ²³⁵U in an interstitially-moderated UO₂/water mixture, was adequately subcritical ($k_{\text{calc}} + 2\sigma_{\text{calc}} < 0.98$ for upset conditions) despite the presence of an additional drum containing 798g ²³⁵U. Therefore, the staff determined that the drums containing Hematite ash would be adequately subcritical in the event of a single-spacing upset involving a drum containing more than 500g ²³⁵U. This is further strengthened by the licensee's commitment to store the Hematite drums on an intermodal container suspended off the ground on a flatbed trailer and the licensee's administrative restrictions on the spacing of drums containing more than 500g ²³⁵U.

The NRC staff also considered multiple spacing upsets involving drums containing 798g ²³⁵U at 5.0 wt.% ²³⁵U. The staff's analysis considered multiple drums, each containing 798g ²³⁵U at 5.0 wt.% in a moderated UO₂/water mixture, placed in contact (i.e., no edge-to-edge spacing) with the array of Hematite drums and in contact with one another along the perimeter of the array. The staff's analysis concluded that it would take more than the nine 55-gallon drums containing 798g ²³⁵U would be required to violate the licensee's upper subcritical limit for upset conditions of 0.98. Given the many spacing upsets required for criticality to be possible, the staff determined that no credible criticality concern exists for spacing upsets involving 55-gallon drums containing greater than 500g ²³⁵U. Furthermore, the licensee has committed to store the Hematite drums on an intermodal container suspended off the ground on a flatbed trailer. This serves as a physical barrier between the Hematite drums and all other fissionable material, and this makes the likelihood of introducing not just one, but many, 798g ²³⁵U drums in close proximity to the Hematite drums even more unlikely.

Stacking of Drums. The licensee imposes an administrative control to prevent the stacking of 55-gallon drums; however, it is credible for this to occur. The NRC staff considered eight of the nine drums containing Hematite ash in a rhombohedral array, with the ninth drum stacked on top of the array positioned to maximize interaction. An over-massed drum, such as those discussed in the above Loss of Spacing upset condition, was not considered for stacking as it would represent both a violation of spacing requirements as well as a violation of stacking restrictions. Additionally, given the licensee's commitment to store the Hematite drums on an intermodal container suspended off the ground on a flatbed trailer, it is extremely unlikely that an over-massed drum would be not only introduced to the Hematite drum array, but also stacked. The staff's analysis concluded that a rhombohedral array consisting of eight closely packed 55-gallon drums, each containing 500g ^{235}U at 5.5 wt.% ^{235}U in an interstitially-moderated UO_2/water mixture, was adequately subcritical ($k_{\text{calc}} + 2\sigma_{\text{calc}} < 0.98$ for upset conditions) despite the presence of a stacked drum consisting of the same internal conditions. Therefore, the staff determined that the drums containing Hematite ash would be adequately subcritical in the event of a single stacking upset.

The NRC staff also considered a configuration in which four Hematite drums in a rhombohedral array were stacked on top of five Hematite drums in a rhombohedral array to represent multiple stacking upsets and the worst-case stacking scenario involving Hematite drums. The staff's analysis concluded that such a configuration of closely packed 55-gallon drums, each containing 500g ^{235}U at 5.5 wt.% ^{235}U in an interstitially-moderated UO_2/water mixture, was adequately subcritical ($k_{\text{calc}} + 2\sigma_{\text{calc}} < 0.98$ for upset conditions). Therefore, the staff determined that the drums containing Hematite ash would be adequately subcritical in the event of multiple stacking upsets. Given that this configuration represents the worst-case stacking scenario involving Hematite drums, the staff determined that no credible criticality concern exists for stacking upsets.

Confirmatory Analysis Conclusions

The NRC staff's analysis concluded that there are no credible criticality concerns associated with the storage of the Hematite drums. However, in order, to reinforce the staff's conclusions, the following temporary license conditions will be added for a period of up to six months until the Hematite ash campaign is complete:

License Condition S-19:

"The licensee shall not alter the current storage configuration or location of the nine 55-gallon drums containing Hematite ash in excess of 5.0 wt.% ^{235}U for a period of six months, or upon completion of the Hematite ash campaign, as described in the NRC's license amendment approval letter dated 5 May 2023."

License Condition S-20:

"The licensee shall maintain at least 12 inches edge-to-edge spacing between the nine 55-gallon drums containing Hematite ash in excess of 5.0 wt.% ^{235}U and all other fissionable material for a period of six months, or upon completion of the Hematite ash campaign, as described in the NRC's license amendment approval letter dated 5 May 2023."

These license conditions ensure that restrictions on stacking and spacing are maintained, a physical barrier between the Hematite drums and all other fissionable material is maintained, and that the Hematite drums will be stored in a location that is covered by the licensee's criticality accident alarm system (CAAS).

NRC STAFF EVALUATION

The NRC staff determined additional information was needed to complete the review. On February 10, 2023 (ML23045A203), the staff sent a request for additional information (RAI) to the licensee. By cover letter dated February 16, 2023 (ML23047A457), the licensee provided a response to the RAI. In the response, the licensee provided details of the historical data regarding the material when it was received and clarified the basis for the values assigned to the material. Additionally, the licensee indicated that the material is being controlled in accordance with the FNMCP and associated site procedures. The additional information provided in Westinghouse's February response was sufficient for staff to find the temporary license amendment to have reasonable assurance of adequate protection of public health and safety and the environment.

Based on the review discussed in this report, the NRC staff concludes that the licensee's request provides reasonable assurance of subcriticality under normal and all credible abnormal conditions, provides reasonable assurance of adequate protection against the risk of criticality accidents, and otherwise satisfies the applicable requirements of 10 CFR part 70. Two license conditions are included to ensure that restrictions on stacking and spacing are maintained, a physical barrier between the Hematite drums and all other fissionable material is maintained, and that the Hematite drums will be stored in a location that is covered by the licensee's CAAS.

5.0 ENVIRONMENTAL REVIEW

The amendment changes a requirement with respect to a materials license issued under 10 CFR Part 70 and identified in 10 CFR 51.60(b)(1) and are considered administrative, organizational, or procedural in nature. The NRC staff determined that the changes addressed by this amendment will not result in any significant change in effluents released offsite or any significant increase in individual, or cumulative occupational radiation exposure. Additionally, the amendment will not result in any construction impacts or any significant increase in the potential for consequences from radiological accidents. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(11). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

Based on the review of the submittal, the FNMCP, and the RAI response, the NRC staff has determined that the temporary license condition for storage of the subject drums will not result in any significant impact from a safeguards perspective. The licensee's MC&A program as described in the approved FNMCP will continue to provide reasonable assurance that loss, theft, or diversion of SNM will be detected and protected against. The NRC staff finds that the licensee continues to meet the applicable MC&A requirements in 10 CFR Part 74, the 10 CFR 70.23(a)(6) requirement for approving applications has been met, and therefore approves the temporary license amendment to possess and store this specified material for a period up to six months based upon the licensee's commitments detailed in the submittals:

- The request is limited to the storage of the nine drums of incinerator ash referenced in the submittal;
- The nine drums are controlled in accordance with the FNMCP and associated site procedures; and
- The nine drums will remain segregated from other material and be maintained in their current configuration until the licensee submits a plan to the NRC for movement and processing of the material.

Based on the review discussed in this report, the NRC staff concluded that the licensee's request provides reasonable assurance of subcriticality under normal and all credible abnormal conditions, provides reasonable assurance of adequate protection against the risk of criticality accidents, and otherwise satisfies the applicable requirements of 10 CFR Part 70. Two temporary license conditions (S-19 and S-20) are added to ensure that restrictions on stacking and spacing are maintained, a physical barrier between the Hematite drums and all other fissionable material is maintained, and that the Hematite drums will be stored in a location that is covered by the licensee's criticality accident alarm system.

PRINCIPAL CONTRIBUTORS

JTobin, DFM

SAni, DFM

JMunson, DFM

Westinghouse License Amendment Hematite Ash Part 1 DATE May 5, 2023

DISTRIBUTION:

SAni, NMSS/DFM/MCAB

JMunson, NMSS/DFM/NARAB

TVukovinsky, R-II/DFFI/PB2

ADAMS Accession No.: ML23094A157; ML23094A159

* via email

OFFICE	NMSS/DFM/FFLB	NSIR/DSO/SOSB	OGC/NLO	NMSS/DFM /CTCFB
NAME	JTobin <i>JT</i>	JCurry <i>JC</i>	CKreuzberger <i>CK</i>	JPlotter <i>JP</i>
DATE	Apr 5, 2023	Apr 5, 2023	Apr 24, 2023	Apr 25, 2023
OFFICE	NMSS/DFM/MCAB	NRR*		
NAME	JRubenstone <i>JR</i>	SLav <i>SL</i>		
DATE	Apr 24, 2023	May 5, 2023		

OFFICIAL RECORD COPY