LES-25-017-NRC

Attn: Document Control Desk
Director, Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

February, 06 2025

Louisiana Energy Services, LLC
NRC Docket No. 70-3103

Subject: Response to Request for Supplemental Information Regarding LAR 23-07

References:

1. LES-23-108-NRC UUSA License Amendment Request LAR 23-07, Revise SNM-2010 to Delete License Condition 14, dated 9/1/2023 (ML23244A191)
2. IN-23-090-NRC NRC RSI Regarding License Amendment Request 23-07 to Delete Licensing Condition 14, dated 11/28/2023 (ML23324A189)
3. LES-24-010-NRC Response to Request for Supplemental Information Regarding LAR 23-07, dated 1/25/2024

In Reference 1, Louisiana Energy Services (LES), dba Urenco USA (UUSA), requested a revision to SNM-2010 to delete the license condition 14. In Reference 2, NRC requested supplemental information in order to complete the NRCs acceptance review. Reference 3 provided the response to the RSI.

During a meeting with the NRC on 1/30/2025 and follow-up discussions, the NRC requested that some details in Reference 3 be corrected. Enclosed is that revision.

If you have any questions concerning this submittal, please contact Jim Rickman, Senior Licensing Specialist at 575.394.6558.

Respectfully,

Krystal Ramirez
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Date: 2025.02.06 12:17:46 -07'00'

Krystal Ramirez for Paul Lorskulsint
Head of Compliance

Enclosures:

1. Amended Environmental Considerations Section Revision 1

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ENCLOSURE 1
Amended Environmental Considerations Section Revision 1

4 Environmental Considerations

References:

1. NUREG-2116 Safety Evaluation Report for the International Isotopes Fluorine Products, Inc. Fluorine Extraction Process and Depleted Uranium Deconversion Plant in Lea County, New Mexico

2. NUREG-1790 Environmental Impact Statement for the Proposed National Enrichment Facility in Lea County, New Mexico, Volume 1

3. DOE/EIS-0359 Draft Environmental Impact Statement for Construction and Operation of a depleted uranium hexafluoride conversion facility at the Paducah Kentucky, Site.

4. DOE/EIS-0360 Final Environmental Impact Statement for Construction and Operation of a Depleted Uranium Hexafluoride Conversion Facility at the Portsmouth Ohio Site

5. NUREG-2113 Environmental Impact Statement for the Proposed Fluorine Extraction Process and Depleted Uranium Deconversion Plant in Lea County New Mexico

6. EPA Hydrogen Fluoride Study: Report to Congress, Section 112(N)(6), Clean Air Act as Amended: Final Report

7. EPA-550-K-03-001, EPA Chemical Emergency Preparedness and Prevention Advisory Hydrogen Fluoride

NRC Information Needed:

Because potential impacts associated with anhydrous HF were not analyzed in the EIS for the LES facility, removal of the license condition will require an environmental assessment of these potential impacts. The NRC staff needs additional information to complete its environmental review of the license amendment request (LAR). LES should provide an ER that addresses the impacts of using a deconversion facility that produces anhydrous HF. Specifically, the NRC needs the following information:

1. Describe the proposed action that would be made possible by the NRC's removal of the license condition, such as the shipment of depleted uranium hexafluoride (UF6) to a deconversion facility that produces anhydrous HF. Where possible, quantitative information should be included, such as the quantities and frequency of depleted UF6 shipments and a reasonable distance or range of distances.

2. Discuss how depleted uranium hexafluoride would be processed using a method that produces anhydrous HF and potential environmental impacts that would result from those activities, including impacts from anhydrous HF storage, transportation, and related accidents.

Urenco USA Response:

1. Should this license amendment be granted, it would allow Urenco USA to utilize the following facilities or others, that produce anhydrous hydrogen fluoride (AHF), to convert depleted uranium hexafluoride to uranium oxide for final disposal. Urenco USA anticipates the shipment of depleted uranium in industry standard 48Y cylinders.

    - International Isotopes Fluorine Extraction Process & Depleted Uranium Deconversion Plant to be located 15 miles West of Hobbs New Mexico

        - The facility will produce specialty fluoride gas products including anhydrous hydrogen fluoride (Reference 1). The plant will be capable of converting 3.3 million kg of depleted uranium hexafluoride per year (Ref 1 section 1.1.3).

        - If this facility is utilized at its maximum capacity, Urenco USA would ship approximately 275 cylinders annually to the facility. This is approximately 1 truck per day (one cylinder per truck).

        - UF6 cylinders would be transported north-northwest from the Urenco USA facility approximately 35 miles to the International Isotopes facility. Reference 2 section 3.13.1 describes the traffic on these roads and shows the typical traffic as about 5000 vehicles per day. The shipment of UF6 to the deconversion facility of one truck per day is not expected to be a significant increase.

        - At full capacity, the International Isotopes facility will produce .45 million kg of anhydrous hydrogen fluoride annually or approximately 450 metric tons annually (Ref 1 section 1.1.3). Assuming a single truck will carry 20 metric tons of AHF, the transportation of the AHF will result in 2 additional trucks on local roads per month.

        - The facility is authorized to store 99,200lbs of AHF (Reference 5 Table 2-1).

    - Department of Energy Depleted Hexafluoride Conversion Facility – Paducah KY

        - The facility is designed to convert 18,000 metric tons of depleted UF6 annually. The facility produces hydrogen fluoride(HF) which is either sold or converted to CaF2 for disposal (Reference 3).

        - At the facility's maximum capacity, Urenco USA would ship approximately 1500 cylinders annually to the facility. This is approximately 4 trucks per day.

        - UF6 cylinders would be transported from Urenco USA, on Interstate and state highways, approximately 1000 miles to the Paducah DOE facility. An increase of four trucks per day is not expected to be a significant increase on these highways.

        - The collective population risk of HF shipments from the Paducah facility is predicted to result in an addition of 1 traffic fatality. Emission and chemical

risks due to transportation are described in Reference 3, section 5.2.3.1 and Table 5.2-24.

- The DOE-Paducah facility has evaluated the need for mitigative actions for shipment of hydrogen fluoride in section 5.4 of Reference 3. In summary, standard and recommended industry practices ensure that there is minimal risk to the environment.

- Department of Energy Depleted Hexafluoride Conversion Facility – Portsmouth, OH
  - The facility is designed to convert 13,500 metric tons of depleted UF6 annually. It produces 70% aqueous HF but not anhydrous HF.
  - At the facility's rated capacity, Urenco USA would ship approximately 1000 cylinders annually to the facility. This is approximately 3 trucks per day.
  - UF6 cylinders would likely be transported from Urenco USA, on Interstate and state highways, 1400 miles to the Portsmouth DOE facility. An increase of three trucks per day is not expected to be a significant increase on these highways.
  - The collective population risk of aqueous HF shipments from the Portsmouth facility is predicted to result in an addition of 1 traffic fatality. Emission and chemical risks due to transportation are described in Reference 4, section 5.2.5.1.3 and Table 5.2-29.
  - The DOE-Portsmouth produces 70% aqueous hydrogen fluoride but not anhydrous fluoride. However, Reference 4 section 5.2.5.4 evaluated the safety of anhydrous HF transportation. In summary, over the period of 1971 to 2003, there were no fatal or serious injuries to the public or to transportation or emergency response personnel as a result of AHF releases during transportation.

Urenco USA currently receives UF6 cylinders containing natural uranium at an average rate of about 1 cylinder per day from suppliers. Natural UF6 has the same chemical hazard as depleted UF6. Full 48 cylinders are shipped to Urenco USA from the Cameco conversion facility (1800 miles) or from the Honeywell conversion facility (1000 miles). There have been no serious or fatal injuries associated with UF6 transport to/from Urenco USA since Urenco USA began operation in 2010.

Due to the logistics involved, it is unlikely that Urenco USA will ship more than an average of one cylinder per day (one truck per day), even if a facility could accept UF6 cylinders at a greater rate.

Since the hazard of natural uranium hexafluoride is similar to the shipment of depleted uranium hexafluoride, UUSA concludes that historical data demonstrates that depleted uranium hexafluoride shipment will be safe and will not have an adverse effect on traffic.

2. Uranium hexafluoride is converted to uranium oxide and anhydrous hydrogen fluoride as follows using the international isotopes facility;

The DUF6 cylinder is heated causing the UF6 to sublime and move into a reaction vessel. In the reaction vessel, the UF6 gas reacts with hydrogen to produce uranium tetrafluoride and hydrogen fluoride gas per the following:

$UF_6 + H_2 \longrightarrow UF_4 + 2HF$

The UF4, as a solid, settles in the bottom of the reaction chamber and is removed. The HF is removed from the vessel as a gas. The international Isotopes facility will further react the UF4 with silicon dioxide and boron trioxide to produce SiF_4, BF_4 and U_3O_8. Other chemical processes may be used to extract the fluorine from the UF4 and produce additional anhydrous HF.

At the DOE-Portsmouth facility, steam is added to the reaction chamber to react with the UF6. This results in the production of aqueous HF and U_3O_8.

HF is a colorless gas or fuming liquid. It is an inorganic acid with a very acrid odor and is corrosive. A significant enough release can form dense, white, vapor clouds. Both liquid and vapor can cause severe burns to all parts of the body. Exposure to skin, eyes and inhalation or ingestion can cause severe health consequences, including death. There is potential for HF exposure to workers and the public at facilities that produce HF. Due to the significant hazard posed by HF, the American Chemistry Council provides comprehensive guidelines for the design, construction and installation of equipment for the storage and transportation of HF.

The international Isotopes facility will utilize a scrubbing system to remove trace amounts of fluorine prior to discharge through a monitored stack. The quantity of HF released to the atmosphere is expected to be 0.031 lb/hr. This is well below the New Mexico limit of 0.167 lb/hr for fluoride emissions. (Reference 5 section 4.1.2.4.2.2). Urenco USA anticipates that other facilities that convert UF6 to AHF will have similar release rates.

AHF and aqueous HF are used in large quantities throughout the United States as a source of the fluorine atom for the manufacture of fluorine containing chemicals including refrigerants, plastics, pharmaceuticals and electrical components. It is also used to etch glass and metal. In a significant release of HF, a vapor cloud could form and be carried down wind. This could potentially affect the public at a considerable distance. A more detailed description of the environmental affects is contained in Reference 6. The EPA requires process hazard analysis for facilities that have significant quantities of HF.

The EPA regulations include specific requirements regarding the storage and handling of HF. These regulations, in addition to industry practices, provide adequate assurance that the risk to workers and the public is low. (Reference 6, Summary Findings and Recommendations and Reference 7). The risk to the environment of Urenco USA utilizing a facility that produces anhydrous HF is low.