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LES-14-00071-NRC

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

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

Subject: Redacted - Supplement to License Amendment Request for Capacity Expansion of URENCO USA Facility (LAR-12-10)

Reference:
1. LES-14-00061-NRC, Redacted - Supplement to License Amendment Request for Capacity Expansion of URENCO USA Facility (LAR-12-10)
2. LES-13-00077a-NRC, Redacted - Supplement to License Amendment Request for Capacity Expansion of URENCO USA Facility (LAR-12-10)
3. LES-12-00162-NRC, License Amendment Request for Capacity Expansion of URENCO USA Facility (LAR-12-10), dated November 9, 2012

UUSA is requesting the withdrawal of reference 1 from its docket, and that it is replaced in total with this submittal. This replacement is based on redaction of the 10 CFR 2.390 withholding markings that were inadvertently left on the previous submittal.

As discussed in the referenced submittal and pursuant to the requirements of 10 CFR 70.72(c) (1) (i), and in accordance with 10 CFR 70.34, URENCO USA (UUSA) herewith requests an amendment to Materials License SNM-2010. The changes herein proposed to the related License Basis Documents (LBDs) to incorporate re-feed of tails material and increased Uranium mass possession limits (natural, depleted and enriched). The changes proposed for the respective LBDs include the following:

1) Integrated Safety Analysis Summary (ISA Summary) - Add new Items Relied on For Safety (IROFS) required for a new accident sequence; and add changes to Section 4 to show the phased implementation of the new IROFS. Increased Material License possession limits for Uranium in ISA operating limits.

2) Safety Analysis Report (SAR) - Add Support Equipment within the boundary of the new Administrative Controls IROFS; and describe other equipment used for operator verifications.

3) Supplemental Environmental Report (Supplemental ER) – Revised mass possession required for production at 10 MSWU and for increased storage flexibility.

Additional details are provided in Enclosure 1 in the form of an Introduction (Purpose and Background), Proposed Changes, and Technical Basis for the Proposed Changes. Enclosure 2 provides the page changes to the LBDs; and revision bars and strikethroughs have been utilized to highlight the changes.

RAMS501

Should there be any questions regarding this request, please contact Timothy Knowles, UUSA Manager of Licensing and Performance Assessment, at 575.394.6212.

Respectfully,

Jay Laughlin,
Chief Nuclear Officer and Head of Operations

Enclosures:
1. Redacted - Supplement to License Amendment Request (LAR-12-10): Background, Proposed Changes, and Technical Analysis of Proposed Changes
2. Redacted - Page Changes to the Licensing Basis Documents

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ENCLOSURE 1

Description of Proposed Changes, Supplement to License Amendment Request (LAR-12-10) Background, Proposed Changes, Technical Analysis of Proposed Changes, Safety Significance

1 Introduction

1.1 Purpose

This supplement proposes to modify the Integrated Safety Analysis Summary (ISA) to add new Items Relied on For Safety (IROFS) required for a new accident sequence. The new criticality accident sequence is the result of Assay Unit 1005's ability to efficiently use high assay tails as feed material. Associated changes to the Safety Analysis Report (SAR) are required to add Support Equipment within the boundary of the new Administrative Controls IROFS and describe Other Equipment used for operator verifications. In addition, changes to Section 4 of the ISA Summary are provided to add the new accident sequence and IROFS in the phased operation tables.

This supplement proposes an increase in LES Material License Condition 8.a from mass limit of 136,120,000 to 251,000,000 kg for natural and depleted Uranium. This mass increase was an oversight in the original LAR 12-10 submittal and it corresponds to the mass of material analyzed for cylinders stored on the Uranium Byproduct Cylinder (UBC) Pad and CRDB as described in the supplemental Environmental Report

This supplement also proposes to increase LES Material License Condition 8.b. from a mass limit of 545,000 kg, to 2,180,000 kg for enriched Uranium. This increased mass limit is necessary to allow flexibility in the storage of material produced by UUSA.

1.2 Background

Separations Building Module (SBM) 1005 will have two Assay Units, Assay Unit 1005 and Assay Unit 1006, and will have a layout comparable to other TC-21 units (SBM 1003). Both Assay Units in SBM-1005, like other TC-21 Assay Units, can produce tails with a higher assay value (i.e., less depletion), approximately 0.4 weight percent ^{235}U, while using natural feed material. However, the design of both AU1005 and AU1006 will allow further flexibility by accommodating the efficient use of this high assay tails as feed material for the Assay Unit. The Assay Units use two separate modes of assay operation, natural feed, or tails feed, both of which will be able to produce enriched product at 4.95 weight percent ^{235}U. The discussion below is intended to cover AU1005 and AU1006.

Like the assays in SBM-1003, AU1005 and AU1006 will each consist of [redacted] TC-21 centrifuges. However, the number of tails stations will [redacted]

AU1005 and AU1006 will have two mode settings to optimize efficiency for whichever feed material is being used. [redacted]

[redacted]

IROFSC22 is a current administrative mass balance control, which is applied to operational cascades to prevent a critical mass of over enriched Uranium from accumulating due to an upset condition that would result in over enrichment. [redacted]

Flow rates will be analyzed for establishing the IROFSC22 periodicity. UUSA will evaluate and revise the required NCSA documenting IROFSC22 periodicity and if necessary, applicable Boundary Definition documents and implementing procedures prior to introducing Uranic material into re-feed cascades.

At the URENCO USA Facility (UUSA), 48Y cylinders are utilized for both Feed and Tails. [redacted] AU1005 and AU1006 will have the ability to produce tails at various depletion rates. [redacted]

UUSA has a need to increase product storage capacity due to the reduction in demand of enriched material and to meet the needs of our customers. Storage to this capacity however, is not possible with the current licensed possession mass limit. With an increased possession limit, UUSA plans to store this additional material using the established security measures, material control measures, and criticality programs and protocol. No additional processing of the enriched product is anticipated.

2 Proposed Changes

2.1 Summary of Proposed Change

The proposed changes require modifications to the ISA Summary and SAR to incorporate a new accident sequence and preventive IROFS.

Modification to Material License Condition 8a and 8b is also proposed. This is to correct an oversight within the initial LAR-12-10 in regards to condition 8a and the mass limit for depleted and natural uranium. The change to condition 8b is to allow storage of additional product (30B cylinders) on site. The ISA Summary, SAR, and the Supplemental Environmental Report (ER) also require modification to reflect the modifications to Materials License Condition 8a and 8b.

2.2 Modification to Integrated Safety Analysis Summary

2.2.1 ISA Summary Section 3.4.3.6 Operating Limits

Addition of revised Material License possession limit for Uranium (natural and depleted) from a mass limit of 136,120,000 to 251,000,000 kg.

Addition of revised Material License possession limit for Enriched UF6 from 545,000 kg to 2,180,000 kg.

2.2.2 ISA Summary Table 3.7-1, Accident Sequence and Risk Index

One new accident sequence, EC7-1, is created for a potential process deviation that could result in exceeding the performance requirements of 10 CFR 70.61.

2.2.3 ISA Summary Table 3.7-2, Accident Sequence Descriptions

One new accident sequence, EC7-1, is created for a potential process deviation that could result in exceeding the performance requirements of 10 CFR 70.61.

2.2.4 ISA Summary Table 3.8-1, Items Relied on For Safety (IROFS)

Two new IROFS are being added to prevent the new accident sequence mentioned above. IROFS53a is being added as a preventive administrative control to prevent a criticality for accident sequence EC7-1. IROFS53b is being added as a preventive administrative control to prevent a criticality for accident sequence EC7-1.

2.2.5 ISA Summary Table 4.1-1, Affected Accident Sequence Descriptions

This ISA Summary Table was modified to describe the phased implementation of the new IROFS and applicability of the new accident sequences. The new accident sequence and associated IROFS are not applicable in Production Phases 1, 2, or 3.

2.2.6 ISA Summary Table 4.1-3, Affected IROFS

This ISA Summary Table was modified to describe the phased implementation of the new IROFS and applicability of the new accident sequences. The new accident sequence and associated IROFS are not applicable in Production Phases 1, 2, or 3.

2.3 Modification to Safety Analysis Report

2.3.1 SAR Section 1.1.2, Facilities Description

Increased storage capacity of 30B cylinders may be partially accommodated by the Uranium Byproduct Cylinder Storage Pad.

2.3.2 SAR Table 3.4-1, Administrative Control IROFS Support Equipment

IROFS53a and IROFS53b are being added to the table to define the equipment that is within the boundary of the IROFS and the equipment utilized that is not.

2.4 Modification to Supplemental Environmental Report

2.4.1 Supplemental ER Section 1.4.4, License Amendments Associated with the Proposed Action

Addition of revised Material License possession limit for Uranium (natural and depleted) from a mass limit of 136,120,000 to 251,000,000 kg.

Addition of revised Material License possession limit for Enriched UF6 from 545,000 kg to 2,180,000 kg.

2.5 Modification to SNM-2010, LES Materials License

The proposed change is to revise the Material License for UUSA to change Materials License condition 8a from "136,120,000 kg" to "251,000,000 kg." (See § 1 for further discussion) The associated changes to the License Basis Documents are contained in Enclosure 2.

The proposed change is to revise the Material License for UUSA to change Materials License condition 8b from "545,000 kg" to "2,180,000 kg." (See § 1 for further discussion) The associated changes to the License Basis Documents are contained in Enclosure 2.

3 Technical Basis

3.1 Technical Analysis for Proposed Change

The proposed changes require modifications to the ISA Summary and SAR to incorporate the new accident sequence and associated preventive IROFS. A new accident sequence and new IROFS are necessary as a result of the increased flexibility of AU1005 and AU1006 to process tails for further enrichment.

Modification to Material License Condition 8a and 8b is also proposed. This is to correct an oversight within the initial LAR-12-10 in regards to condition 8a and the mass limit for depleted and natural uranium. The change to condition 8b is to allow storage of additional product (30B cylinders) on site. The ISA Summary, the SAR, and the Supplemental Environmental Report (ER) also require modification to reflect the modifications to Materials License Condition 8a and 8b.

3.2 Modification to Integrated Safety Analysis Summary

3.2.1 ISA Summary Section 3.4.3.6 Operating Limits

This section of the ISA Summary requires revision to reflect the increased possession limit for both Uranium (natural and depleted) and enriched Uranium. This increase in Uranium (natural and depleted) was an oversight in the original LAR 12-10 submittal and it corresponds to the mass of material analyzed for cylinders in the supplemental Environmental Report submitted with LAR 12-10. The increase in product storage requires no additional construction and would be accommodated within UUSA's existing security areas and procedures. No new accident sequences are introduced with the increase in product mass limit and thus no additional IROFS are needed.

3.2.2 ISA Summary Table 3.7-1, Accident Sequence and Risk Index

One new accident sequence, EC7-1, is created for a potential process deviation that could result in exceeding the performance requirements of 10 CFR 70.61. The unmitigated sequence results in a risk index of 9 and mitigated risk index of 3. The basis for the Initiating Event Index and Failure Index are provided in the Sections below.

3.2.3 ISA Summary Table 3.7-2, Accident Sequence Descriptions

Accident Sequence EC7-1 describes the unmitigated and mitigated cases for the potential accident of inadvertently placing higher assay tails (or natural feed) cylinder in a feed station or the improper setting of cascade flow rates [redacted]

There are no changes being made to the existing accident scenario EC3-1. EC3-1 is the present accident scenario resulting in a criticality as a result of an over enrichment event due to failing to control the enrichment process. IROFSC22 prevents a critical mass from accumulating. The

critical mass varies depending on enrichment. This scenario and this IROFS will be applicable to SBM1005. The new accident sequence (EC7-1) is only applicable to SBM1005.

3.2.4 ISA Summary Table 3.8-1, Items Relied on For Safety (IROFS)

IROFS53a is an administrative control to prevent criticality for accident sequence EC7-1. IROFS53a is a non-sole IROFS. The IROFS requires independent administrative verification of the cylinder contents prior to aligning the cylinder to the assay. The cylinders need not be homogenized. IROFS53a is implemented with a uranium assay measurement system. The specific assay measurement system can be determined by the licensee provided that it is independent from IROFS53b. [redacted]

IROFS53b is an administrative control to prevent criticality for accident sequence EC7-1. IROFS53b is a non-sole IROFS. The IROFS requires independent administrative verification of the cylinder contents prior to aligning the cylinder to the assay. The independent analysis will be performed utilizing a technique such as those described for IROFS53a and will be independent from the technique utilized in the performance of IROFS53a. [redacted] A Failure Probability Index Number (FPIN) of (-2) was selected for IROFS53b. This corresponds to an administrative IROFS for routine planned operations per NUREG-1520.

3.2.5 ISA Summary Table 4.1-1, Affected Accident Sequence Descriptions

This Section of the ISA Summary is being modified to include the new accident sequence.

3.2.6 ISA Summary Table 4.1-3 Affected IROFS

This Section of the ISA Summary is being modified to include the new IROFS.

3.3 Modification to Safety Analysis Report

3.3.1 SAR Section 1.1.2, Facilities Description

To accommodate the need for additional product storage at the UUSA facility, the UBC Storage Pad may be used. The pad would be used with appropriate security measures, material controls and criticality detection and alarm protocols, all of which are defined and controlled within UUSA procedures.

3.3.2 SAR Table 3.4-1, Administrative Control IROFS Support Equipment

IROFS53a and IROFS53b are being added to the table to define the equipment that is within the boundary of the IROFS and the equipment utilized that is not within the IROFS boundary. The types of equipment are Other Equipment and Support Equipment established in License Amendment Request LAR-10-04.

IROFS53a and IROFS53b both utilize Other Equipment. The operator's decision is based on determining the gross ^{235}U content of the 48Y cylinder. The instruments utilized will be selected by the licensee. Instruments include handheld gamma spectrometry, or mass spectrometry analysis obtained from cylinder samples but is not limited to those techniques. The instruments are standard commercial components; and are not included in the IROFS boundary. The specific instruments are not Support Equipment. If the gross ^{235}U content of the cylinder cannot be determined accurately, then the cylinder is not connected to the station.

IROFS53a and IROFS53b also utilize Operated Support Equipment. [redacted]

3.4 Modification to Supplemental Environmental Report

3.4.1 Supplemental ER Section 1.4.4, License Amendments Associated with the Proposed Action

Addition of revised Material License possession limit for Uranium (natural and depleted) from a mass limit of 136,120,000 to 251,000,000 kg. This increase was an oversight in the original LAR 12-10 submittal and it corresponds to the mass of material analyzed for cylinders stored on the UBC Pad in the supplemental Environmental Report submitted with the LAR.

Addition of revised Material License possession limit for Enriched UF6 from 545,000 kg to 2,180,000 kg. This increased possession limit will allow flexibility in storage of material from UUSA's current and future enriched Uranium production.

3.5 Modification to SNM-2010, LES Materials License

The proposed change is to revise the Material License for UUSA to change Materials License condition 8a from "136,120,000 kg" to "251,000,000 kg." (See § 1 for further discussion) The associated changes to the License Basis Documents are contained in Enclosure 2.

4 Safety Significance Determination

4.1 IROFS Boundaries

4.1.1 IROFS53a and IROFS53b

IROFS53a and IROFS53b both require the administrative verification of the ^{235}U enrichment of the cylinder contents that is in the feed station, by means of a uranium assay measurement system, prior to placing the station into production. The IROFS are performed prior to any AU1005 or AU1006 operation, regardless of how many cascades are online or in which Mode the cascades will be operating. [redacted]

4.1.1.1 IROFS Acceptance Criteria

The purpose of IROFS53a and IROFS53b is to ensure a natural feed cylinder or higher than expected tails cylinder is not introduced when a depleted feed cylinder is expected. The acceptance criterion for IROFS53a and IROFS53b shall be that any cylinder measurement showing an enrichment value greater than a calculated weight percent ^{235}U above that expected will result in that cylinder not being used [redacted] On acceptance, the determined cylinder assay will be validated against the cascade settings on AU1005 and AU1006 prior to opening the Feed Station's isolation valves.

[redacted]

4.1.1.2 Verification of Cylinder Assay Before Placing Cylinder into Production

IROFS53a and IROFS53b can be implemented by numerous methods such as external cylinder examination utilizing gamma spectrometry or by mass spectrometry. The determined cylinder assay will be verified against the cascade settings prior to opening the feed station isolation valves. If the acceptance criterion is not met, then the cylinder will not be placed in production; i.e., the feed station isolation valves will not be opened.

A larger uncertainty is expected if techniques such as external handheld gamma spectrometry are used instead of mass spectrometry. Regardless of which analysis method is used, the determined assay from both IROFS will be verified against the Assay Unit mode settings for the cascades prior to the cylinder being introduced as feed material.

4.1.2 IROFS Independence

In order to maintain independence of IROFS53a and IROFS53b, the individual performing IROFS53a must be different from the individual performing IROFS53b. This is necessary since the acceptance criteria of both IROFS require the recorded or determined feed cylinder assay to be verified against the cascade settings. The independence of the IROFS will be consistent with the requirements in Section 3.4.4 of the Safety Analysis Report. For independent sampling three of the following four criteria will be met:

1. Different methods/techniques are used for sample analysis.
2. Samples are obtained from different locations.
3. Samples are obtained at different times. The time period between collection of the different samples shall be sufficient to ensure results are meaningful and representative of the material sampled.
4. Samples are obtained by different personnel.

4.1.3 Cascade Setting Changes

In addition to the requirement for IROFS53a and IROFS53b being performed prior to a new feed cylinder being introduced into AU1005 or AU1006, the IROFS must also be performed when periodic adjustments are made to cascades in AU1005 and AU1006. These cascade setting changes are typically performed by the Cascade Performance Engineer; and prior to inputting new settings, the feed cylinder determinations made with IROFS53a and IROFS53b must be validated against the proposed cascade setting changes. As discussed in Section 4.1.2 above, a separate individual must perform each IROFS.

4.1.4 Other Considerations

The material at risk in the cascade is not being impacted and is the same as in SBM1003. As a result, there are no impacts to the effectiveness of IROFSC23. Further, the bases previously provided for a criticality occurring in a cascade is not being impacted as this change does not impact the ability of material to accumulate in a gaseous environment over time. There may be impacts to the periodicity of IROFSC22, as discussed above. These impacts, if any, will be addressed prior to commencing operation of SBM1005 in that UUSA will update its Nuclear Critical Safety Analysis NCS-CSA-015, and corresponding Boundary Definition Document and will be processed in the same manner prior to commencing operations of SBM1003.

4.2 Enriched Uranium Storage

4.2.1 30B Cylinder Storage

UUSA has a need to increase product storage capacity to facilitate supporting the needs of other facilities within the URENCO fleet, however this is not possible with the current licensed possession mass limit. With an increased possession limit, UUSA plans to store this additional material using the established security measures, material control measures, and criticality detection and alarm programs.

The increase in product storage requires no additional construction and would be accommodated within UUSA's security areas and in accordance with implementing procedures. No new accident sequences are introduced with the increase in product mass limit and thus no additional IROFS are needed.

Current occupational health analyses for storage of 48Y cylinders in the CRDBs and on the UBC pad are bounding for storage of 30B cylinders in the same areas.

4.3 Conclusion

IROFS53a and IROFS53b provide sufficient prevention to ensure a criticality does not occur and the performance requirements of 10 CFR 70.61 are met. Both IROFS are capable of ensuring that a naturally enriched feed cylinder or higher than expected tails cylinder is not utilized when the feed and product flow rates are set with the intention of utilizing depleted feed cylinders. The new accident sequence relies on multiple IROFS to achieve an acceptable risk index. The accident sequence is conservative in that it assumes a criticality will occur if an over-enrichment event occurs and assumes sufficient moderation is available. However, for moderator to be present, other failures would have to occur such as a leak within the product system to cause breakdown build-up in an otherwise safe-by-geometry component, or a failure of IROFS16a allowing moderator into the product cylinder prior to placing a 30B cylinder into production, or a failure of IROFS30a/b/c to verify the type of oil used in the process pumps.

The increase in enriched Uranium mass possession limit will allow additional storage of 30B cylinders produced at UUSA. The storage of UUSA produced cylinders, which contain enriched Uranium above the current Material Licensing limit in condition 8.b, will require a revision to the license limit 8b for enriched uranium.

5 Environmental Considerations

SBM1005 was added back into the UUSA Licensing Basis under Configuration Change (CC), CC-LS-2012-0009. This third SBM is discussed in the Safety Evaluation Report for the National Enrichment Facility, NUREG-1827, and Section 3.3.1.2.1. The CC addressed the inclusion of the building and its contents but did not address the operational implications of SBM1005. LAR-12-10, LES-12-00162-NRC and a supplemental Environmental Report (ER), LES-12-00139-NRC, were submitted to address the Environmental Impacts of construction and operation beyond SBM1003. Because design was not complete at the time, these submittals addressed construction and operation of AU1005 and 1006 in a non re-feed configuration. The environmental impact changes due to a re-feed configuration and the additional Enriched Uranium mass possession limit are discussed below and demonstrate that there are no additional environmental impacts associated with the changes proposed in this supplemental License Amendment Request.

The change to a re-feed design is accomplished with minor internal system design changes to the cascades. The feed and takeoff system's principles of operation will remain unchanged and will be of the same design as existing operational equipment. Thus, the equipment installed in SBM 1005 will be of the same design with only minor internal difference in the cascades. Because of this, the re-feed design will not alter the design of or the construction activities related to the SBM-1005 building. Furthermore, the manning and equipment at the facility for both construction activities and operational activities related to SBM-1005 will remain unchanged. The change will not require additional water resources nor will it result in the production of different or additional wastes and effluents than previous designs.

The increase in enriched Uranium mass possession limit will be accommodated with existing and planned areas already described in the supplemental ER and within the already disturbed areas. The increase in mass will be realized by UUSA retaining product at the facility.

The facility layout and disturbed footprint that is described and portrayed in the UUSA supplemental ER will remain the same for the changes included in this supplement to LAR 12-10. Taking this and the previous discussion into consideration the following environmental areas of consideration are categorically unaffected by these changes.

1. Land Use Impacts
2. Transportation impacts
3. Geology and Soil Impacts
4. Water Resource Impact
5. Ecological Resource Impacts
6. Air Quality Impacts
7. Noise Impacts
8. Historic and Cultural Impacts
9. Visual Scenic Resource Impacts
10. Socioeconomic Impacts
11. Environmental Justice
12. Waste Management Impacts

Public and Occupational Health Impacts are the only remaining environmental area of consideration to be discussed. The following paragraphs describe the impact of both the re-feed design change and the increase in product storage on both the public and occupational workers.

The change to a re-feed design will ultimately result in less tails material at the facility due to the use of low assay tails as feed material. This will therefore result in fewer tails cylinders being stored on the UBC pad. The analysis completed for 25,000 cylinders on the UBC, presented as part of the supplemental ER, is bounding for the change to a re-feed design, CALC-S-00141, Revision 1, Radiation Dose Calculation of the Site Boundary due to UBC Storage Pad Expansion. This existing evaluation therefore bounds site impacts due to re-feed operations.

Operationally, the rate of feed cylinder use, with the re-feed design, is higher than a non-re-feed design. The increased rate of feed will result in a small incremental increase in the exposure to operations personnel due to an increase in the number of feed cylinder connect and disconnect operations. Based on the additional number of cylinder operations, the UUSA Radiation Protection department estimates on average, an additional 18 mrem/year per person for a total of 88 mrem/year per person for operations personnel. The Logistic cylinder handlers would receive, on average, an additional 30 mrem/year per person for a total of 150 mrem/year per person. In both cases, this additional exposure still results in individual annual exposures that are well below the UUSA administrative limit of 500 mrem/year per person and significantly below the occupational dose limits for adults, 5 rem/year, cited in 10 CFR 20.1201.

The increase in product mass possession limit, and therefore the increase in the number of product cylinders stored at the facility, is bounded within the calculations for public dose at the site boundary. That is, the UBC Storage pad is analyzed to accommodate the storage of up to 25,000 cylinders. This number of cylinders will be controlled with UUSA tracking processes. The supporting bounding assumption is stated in the calculations supporting the data provided in the supplemental ER, CALC-S-00141, Revision 1, Radiation Dose Calculation of the Site Boundary due to UBC Storage Pad Expansion, Section 2.0, Assumption 1. Storage of additional material on the UBC Pad and within existing structures is bounded in calculations supporting the analysis for occupational doses at the facility, CALC-S-00143, Worker Dose Assessments for 10 MSWU Site Expansion Activities, Section 2, Assumptions 2.4 and 2.6.

The discussion above bounds the impacts of the proposed action to those impacts discussed in UUSA's supplemental ER and the RAI responses. In addition, the following paragraphs support the determination of a categorical exclusion per 10 CFR 51.22(c)11.

1. *10 CFR 51.22(c)(11)(i) No significant change in the types or significant increase in the amounts of any effluents that may be release offsite.* The proposed re-feed process utilizes the same chemical form of uranium hexafluoride as used in other UUSA Assay Units. Gaseous releases due to system operations and maintenance will be captured in the same filtration system (GEVS) and will be monitored by the same devices used in current operating cascades and those cascades proposed the UUSA site expansion LAR 12-10. Further, the cascade design difference is bounded to the cascade equipment and will not lead to increased or new paths of gaseous releases. The impacts of effluents related to SBM 1005 are unchanged and are bounded by Sections 4.6.2 and 4.12.4 of the UUSA supplemental ER, which accompanies LAR 12-10.

   The liquid effluents produced from process operations are not a direct result of the cascade operations, thus the change to a re-feed configuration has no impact to the rate of generation of liquid effluents. The liquid effluents due to maintenance of the operational Assay Unit will not deviate from those described and bounded by the proposed expansion impacts described in Sections 4.4.3 and 4.12.5 of the UUSA supplemental ER. Thus, there is no change in the types or amounts of any effluents that may be released offsite.

The increase in the enriched Uranium storage limit will not impact gaseous or liquid effluents as analyzed in the supplemental ER. This proposed increase allows the storage of additional 30B product cylinders at the UUSA facility.

2. *10 CFR 51.22(c)(11)(ii) There is no significant increase in individual or cumulative occupational radiation exposure.* Section 4.12.6 of the UUSA supplemental ER describes direct radiation impacts due to facility expansion; this includes AU1005 in a non-re-feed configuration. The supplemental ER describes direct radiation impacts from the storage of feed, product and UBCs (tails cylinders containing depleted Uranium Hexafluoride) within the CRDB and UBC Pad, with the UBC Storage Pad being the most significant portion of the total direct dose equivalent. The re-feed design efficiently uses tails as feed material thus reducing the cumulative output of tails cylinders to the UBC Storage Pad. Supplemental ER, Section 4.12.12 concludes that the cumulative radiological impacts would be small during the time of construction, operation, and decommissioning of the proposed expansion.

   As described previously, the re-feed design will result in a higher rate for feed cylinder usage. This results in an increase in the radiation exposure to Logistics and Operations personnel. The changes to both groups is incremental and does not present any challenge to meeting local administrative levels nor do they challenge Federal occupational exposure limits.

   The above changes are bounded by the supplemental ER and supporting analysis and thus there is no significant increase in individual and cumulative occupational radiation exposure.

3. *10 CFR 51.22(c)(11)(iii) There is no significant construction impact.* The Environmental Impact Statement (EIS) for NEF, NUREG-1790 includes the construction of SBM1005. Section 4.4.1 of the EIS, Land Use, concludes that construction of the proposed NEF would not substantially change the land use and therefore the impacts would be small. The change of the cascade design has no impact on the building construction or the number of personnel required for the completion of construction. That is, the SBM structure would be of the same construction regardless of the cascade being a re-feed design and would have no impact on construction. Thus, the construction of SBM1005 is addressed in UUSA's license basis and there is no incremental change in the construction impact.

   The increase in product storage requires no additional construction and would be accommodated with UUSA's existing structures and procedures.

4. *10 CFR 51.22(c)(11)(iv) There is no significant increase in the potential for or consequences from radiological accidents.* The re-feed configuration introduces a new accident sequence, which, if unmitigated, could result exceeding the performance criteria of 10 CFR 70.61. The two new IROFS described in this License Amendment Request have been evaluated by the UUSA ISA Team and provide administrative controls to prevent criticality. Thus, by imposing the proposed controls there is no significant increase in the potential for or consequences from radiological accidents.

   The increase in enriched Uranium possession results in a fractional increase in the total mass of Uranium currently allowed to be possessed by the Material License. The increase in enriched Uranium mass possession limit introduces no new accident sequences.

In conclusion, there are no significant additional impacts from the proposed action that are not already bounded by existing analysis and calculations performed by UUSA in support the of the proposed facility expansion or in response to RAIs.

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ENCLOSURE 2

Page Changes to the Licensing Basis Documents

Integrated Safety Analysis Summary, Safety Analysis Report and Supplemental Environmental Report

(Revision bars, strikethroughs and underlines were utilized)

[redacted]

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INTEGRATED SAFETY ANALYSIS SUMMARY

Supplement to LAR 12-10

LES, PO Box 1789, Eunice, New Mexico 88231, USA T: +1 575 394 4646 F: +1 575 394 4545 W: www.urenco.com

B. Product Take-off System

C. Tails Take-off System

D. Contingency Dump System

E. Centrifuge Cooling Water Distribution System

F. Compressed Air System

G. Electrical System

H. Plant Control System.

3.4.3.5 Design and Safety Features

The Cascade System is designed and constructed to provide safe operation for plant personnel as well as the general public. Release of UF_6 to the atmosphere is minimized by:

A. All process piping, valves and vessels in the Cascade System operate at sub-atmospheric pressure. B. If a centrifuge fails, (i.e., "crashes"), it is isolated to prevent contamination from entering other parts of the cascade. Current sensors are provided to detect crashes.

C. If a process upset occurs (pressure or temperature), the cascade is dumped to the Tails Take-off System. If the Tails Take-off System is unavailable, the gasses are evacuated to the Contingency Dump System.

D. The centrifuge outer casing is the primary barrier to the escape of UF_6. [redacted]

E. The floor mounting element (flomel) and the associated bolts for the centrifuges are designed to remain intact [redacted] to prevent the centrifuge casing from breaking away and damaging other centrifuges or injuring workers. The flomel consists of a concrete floor mounting element with threaded metal inserts for anchoring the centrifuge foot flange via bolts. The flomel in turn is securely cast in the concrete floor of the Cascade Hall.

3.4.3.6 Operating Limits

The LES Materials License possession limits are 251,000,000~~136,120,000~~ kg of natural or depleted UF_6 and 2,160,000~~545,000~~ kg of enriched UF_6 with a maxium product assay limit of 5 $^{w}/_{o}$ ^{235}U.

[redacted]

Table 3.7-1 Accident Sequence and Risk Index

Accident Identifier	Initiating Event Index	Preventive Safety Parameter 1 or IROFS 1 Failure Index	Preventive Safety Parameter 2 or IROFS 2 Failure Index	Mitigation IROFS Failure Index	Likelihood Index T Uncontrolled (U) / Controlled (C)	Likelihood Category	Conseq. Category (Type of Accident)	Risk Index (h=f x g) Uncontrolled (U) / Controlled (C)	Comments and Recommendations
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	
DS2-3	(IROFS19c) -1	N/A	N/A	N/A	-1 (U)	3	3 (CR)	9 (U)	IROFS Required
DS2-3	(IROFS19c) -1	(IROFS19a) -2	(IROFS19d) -2	N/A	-5 (C)	1	3 (CR)	3 (C)	Acceptable Risk
DS3-1	-2	N/A	N/A	N/A	-2 (U)	3	3 (CR)	9 (U)	IROFS Required
DS3-1	-2	(IROFS14a) -3	N/A	N/A	-5 (C)	1	3 (CR)	3 (C)	Acceptable Risk
DS3-2	-2	N/A	N/A	N/A	-2 (U)	3	3 (CR)	9 (U)	IROFS Required
DS3-2	-2	(IROFS14b) -3	N/A	N/A	-5 (C)	1	3 (CR)	3 (C)	Acceptable Risk
EC 4-1	-2	N/A	N/A	(IROFSC21) (Failure, -3)	-5 (C)	1	3 (T)	3 (C)	Acceptable Risk
EC3-1	-2	N/A	N/A	N/A	-2 (U)	3	3 (CR)	9 (U)	IROFS Required
EC3-1	-2	(IROFSC22) -3	N/A	N/A	-5 (C)	1	3 (CR)	3 (C)	Acceptable Risk
EC4-1	-2	N/A	N/A	N/A	-2 (U)	3	3 (T)	9(U)	IROFS Required
EC4-1	-2	N/A	N/A	(IROFSC21) (Success)	-2 (C)	3	1 (T)	3 (C)	Acceptable Risk
EC7-1	-2	N/A	N/A	N/A	-2 (U)	3	3 (CR)	9 (U)	IROFS Required
EC7-1	-2	(IROFS53a) -2	(IROFS53b) -2	N/A	-6 (C)	1	3 (CR)	3 (C)	Acceptable Risk
FR1-1	-2	N/A	N/A	N/A	-2 (U)	3	3 (CR)	9 (U)	IROFS Required
FR1-1	-2	(IROFS14a) -3	N/A	N/A	-5 (C)	1	3 (CR)	3 (C)	Acceptable Risk
FR1-2	-2	N/A	N/A	N/A	-2 (U)	3	3 (CR)	9 (U)	IROFS Required

Table 3.7-2 Accident Sequence Descriptions

Accident Identifier: EC7-1

The initial failure (initiating event) is failure of criticality enrichment control by failing to properly control the UF_6 enrichment process. For this sequence the Assay Unit's intended operating mode is Mode B. The initial failure (initiating event) is a higher enriched cylinder cylinder with a higher than desired assay value being installed into a feed station when one or more cascades in the Assay Unit are set to flow rates intended for Mode B operation. This failure is initiated by the improper use of a feed (natural) cylinder or higher than desired tails (depleted) cylinder resulting in an over enrichment or the improper setting of cascade flow rates. In addition, other failures are assumed to occur such as a leak must exist within the product system to cause a breakdown build-up in an otherwise safe-by-geometry component, or allow moderator into the product cylinder. The combination of these conditions is assumed to result in a criticality resulting in high consequences to the worker and public.

For the controlled accident sequence, the preventative measures are to: 1) determine with an independent uranium assay measurement system the assay of the feed cylinder (IROFS53a) and 2) determine with an independent uranium assay measurement system the assay of the feed cylinder the type of cylinder that is in the feed station (IROFS53b). If the acceptance criterion of IROFS53a and IROFS53b isare not met then the cylinder will not be entered into production such that no over enrichment can occur.

The frequency index number for the initiating event was determined to be (-2). The NUREG-1520 criteria of no failures of this type in this facility in 30 years applies. This failure frequency index was selected based on evidence from history of similarly designed URENCO European plants, which have a combined plant history of greater than 30 years, and have not had a failure of this type.

A failure probability index of (-2) was selected for IROFS53a. This corresponds to an administrative IROFS for routine planned operations per NUREG-1520. A failure probability index of (-2) was selected for IROFS53b. This corresponds to an administrative IROFS for routine planned operations per NUREG-1520.

This sequence only applies to SBM-1005, Assay Units capable of using high assay tails as feed.

[redacted]

3.8~~3.8~~3.7 Items Relied On For Safety (IROFS)~~Items Relied On For Safety (IROFS)General Types of~~

Table 3.8-1 Items Relied On For Safety (IROFS)

IROFS	Accident Sequence	Type of Accident	Type (1)	Class (2)	Description of Safety Function	FPIN (3)	FPIN Basis (4)
IROFS50h	OC1-1	Chemical	AC	B	Administratively control proximity of site preparations vehicles around the UBC Storage Pad to prevent a fire from an impact with UBCs resulting in a release of UF_6. This is implemented by establishing a second and independent temporary barrier of sufficient strength to alert the vehicle operator upon impact with the barrier. The barrier is placed at a minimum distance of 30 feet from the cylinders on the UBC Storage Pad to allow the vehicle operator sufficient distance to stop or alter course prior to reaching the cylinder on the UBC Storage Pad.	-2	3.8.3.50h
IROFS53a	EC7-1	Criticality	AC	B	Administratively and independently determine the cylinder contents that is in the feed station, and proper cascade settings, prior to placing the station into production in Assay Unit 1005, or prior to changing cascade settings. This is implemented by cylinder examination utilizating quantitative isotopic analysis. The measurement is taken after the cylinder is placed in the station it is to be connected to. If the acceptance criterion is not met then the cylinder will not be placed in production in Assay Unit 1005.	-2	N/A
IROFS53b	EC7-1	Criticality	AC	B	Administratively and independently determine the cylinder contents that is in the feed station, and proper cascade settings, prior to placing the station into production in Assay Unit 1005, or prior to changing cascade settings. This is implemented by cylinder examination utilizating quantitative isotopic analysis. The measurement is taken after the cylinder is placed in the station it is to be connected to. If the acceptance criterion is not met then the cylinder will not be placed in production in Assay Unit 1005.	-2	N/A

[redacted]

4.13.83.7 Accident Sequence / IROFS DifferencesItems Relied On For Safety (IROFS)General Types of

Table 4.1-1 (Table 3.7-2) Affected Accident Sequence Descriptions

Accident Sequence	Description and Applicable IROFS	Operational Phases						
		Production Phase 1a	Production Phase 1b	Production Phase 2a	Production Phase 2b	Production Phase 2c	Production Phase 3a	Production Phase 3b
EC7-1	This accident sequence is only applicable to ~~SBM-1005 and AU1005~~AU1005 in SBM-1005. • (IROFS53a) Administratively determine the cylinder contents that is in the feed station, and proper cascade settings, prior to placing the station into production in Assay Unit 1005, or prior to changing the cascade settings. • (IROFS53b) Administratively determine the cylinder contents that is in the feed station, and proper cascade settings, prior to placing the station into production in Assay Unit 1005, or prior to changing the cascade settings.	This sequence is not applicable as AU1005 is not on-line	This sequence is not applicable as AU1005 is not on-line	This sequence is not applicable as AU1005 is not on-line	This sequence is not applicable as AU1005 is not on-line	This sequence is not applicable as AU1005 is not on-line	This sequence is not applicable as AU1005 is not on-line	This sequence is not applicable as AU1005 is not on-line

[redacted]

4.13.83.7 Accident Sequence / IROFS DifferencesItems Relied On For Safety (IROFS)General Types of

Table 4.1-3 (Table 3.8-1) Affected IROFS

IROFS	Affected Accident Sequence	Description	Justification						
			Production Phase 1a	Production Phase 1b	Production Phase 2a	Production Phase 2b	Production Phase 2c	Production Phase 3a	Production Phase 3b
IROFS53a	EC7-1	Administratively determine the cylinder contents that is in the feed station, and proper cascade settings, prior to placing the station into production in Assay Unit 1005, or prior to changing cascade settings.	AU1005 is not online	AU1005 is not online	AU1005 is not online	AU1005 is not online	AU1005 is not online	AU1005 is not online	AU1005 is not online
IROFS53b	EC7-1	Administratively determine the cylinder contents that is in the feed station, and proper cascade settings, prior to placing the station into production in Assay Unit 1005, or prior to changing cascade settings.	AU1005 is not online	AU1005 is not online	AU1005 is not online	AU1005 is not online	AU1005 is not online	AU1005 is not online	AU1005 is not online
IROFSC21	MR3-1 MR3-2	Flow restriction to ensure in the event of a release that worker consequences of inhalation of uranic material and HF are low.	Applicable SBM100SBM-1001	Applicable SBM100SBM-1001	Applicable SBM100SBM-1001	Applicable SBM100SBM-1001	Applicable SBM100SBM-1001	Applicable SBM100SBM-1001 & SBM100SBM-1003	Applicable SBM100SBM-1001 & SBM100SBM-1003

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SAFETY ANALYSIS REPORT

Revision 33b

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- Mass spectrometry and chemical analysis
- Radiation monitoring
- Filtration and exhaust of gaseous effluent through Gaseous Effluent Vent Systems (GEVS)
- HVAC (supporting radiological and non-radiological portions of the CRDB)

Source material and SNM are used in the CRDB.

Uranium Byproduct Cylinder (UBC) Storage Pad

(See 12.2.1.4) The facility utilizes an area outside of the CRDB, the UBC Storage Pad, for storage of cylinders containing UF_6 that is depleted in ^{235}U. The UBC Storage Pad also provides buffered storage for full and empty feed cylinders. The cylinder contents are stored under vacuum in corrosion-resistant ANSI N14.1 Model 48Y cylinders. Additionally, the UBC Storage Pad provides buffered storage for full and for clean, empty Model 30B product cylinders.

The UBC storage area layout is designed for moving the cylinders with a transporter/mover (e.g., a semi-tractor trailer) and a crane. A transporter/mover moves the UBCs from the CRDB to the UBC Storage Pad entrance. A single girder mobile gantry crane removes the cylinders from the transporter/mover and places them in the UBC Storage Pad. The mobile gantry crane is designed to double stack the cylinders in the storage area.

Source material is used in this area.

Central Utilities Building

(See 12.2.1.5) The Central Utilities Building (CUB) is shown on Figure 1.1-18, Central Utilities Building First Floor. The Central Utilities Building houses two diesel generators, which provide the site with standby power. The rooms housing the diesel generators are constructed independent of each other with adequate provisions made for maintenance, equipment removal and equipment replacement. The building also contains Electrical Rooms/Areas, an Air Compressor Area, and Centrifuge Cooling Water System.

Utilities Service Module

The Utilities Service Module houses two diesel generators, which provide SBM-1005 with standby power. The rooms housing the diesel generators are constructed independent of each other with adequate provisions made for maintenance, equipment removal and equipment replacement. The building also contains Electrical Rooms/Areas, an Air Compressor Area, and Centrifuge Cooling Water System.

1.1.3 Process Descriptions

This section provides a description of the various processes analyzed as part of the Integrated Safety Analysis. A brief overview of the entire enrichment process is provided followed by an overview of each major process system.

3.64.33.6 Chapter 3 Tables

Table 3.4-1 Administrative Control IROFS Support Equipment						
IROFS	**Monitoring Support Equipment**	**Other Equipment**	**Equipment Attributes**	**Operated Support Equipment**	**Other Equipment**	**Equipment Attributes**
	Scale System including local digital readout from weighing system at the product stations ***(Notes 2 and 3)**		and reliable indication			
IROFS45	None	None	None	None	None	None
IROFS46	None	None	None	None	None	None
IROFS50a	None	None	None	None	Barriers	Visible and substantial
IROFS50b	None	None	None	None	Barriers	Visible and substantial
IROFS50c	None	None	None	None	Barriers	Visible and substantial
IROFS50d	None	None	None	None	Barriers	Visible
IROFS50e	None	None	None	None	None	None
IROFS50f	None	None	None	None	Barriers	Visible and substantial
IROFS50g	None	None	None	None	Barriers	Visible
IROFS50h	None	None	None	None	Barriers	Visible and substantial
IROFS53a	None	Instrument for determining cylinder content assay	Accurate and reliable indication	Select isolation valves ***(Note 2)**	None	Valve Position
IROFS53b	None	Instrument for determining cylinder content assay	Accurate and reliable indication	Select isolation valves ***(Note 2)**	None	Valve Position

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SUPPLEMENTAL ENVIRONMENTAL REPORT FOR FACILITY EXPANSION REQUEST

Supplement to LAR 12-10

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The increase in production capacity to 10 MSWU will not require modification of License Conditions 68A or 6B that which establishes the mass limits for Natural (Feed) and Depleted (Uranium Byproduct) Uranium. and Product enriched up to 5% by weight. License Condition 86A establishes the mass limits for Natural (Feed) and Depleted (Uranium Byproduct) Uranium at 136,120,000 kg. The estimated Natural (Feed) and Depleted (Uranium Byproduct) Uranium mass at the 10 MSWU capacity will be 251,000,000 kg below this License Condition 6A limit. For the reason of increased facility storage capacity, which is not related to production at 10 MSWU, Tthe mass limit for Product enriched up to 5% by weight in License Condition 68B ofis 545,000 kg, will increase 2,100,000 kg. and the maximum estimated Product mass onsite for the 10 MSWU facility will be well below this License Condition 6B limit.

License Condition 21 currently limits DUF_6 cylinder storage to 15,727 48Y cylinders or the equivalent amount of Uranium stored in other NRC accepted and DOT certified types of DUF_6 cylinders. The license amendment request (LAR) will request that this limit be changed to 25,000 cylinders consistent with the revised agreement with New Mexico.

License Condition 23 currently requires financial assurance for off-site disposal of 15,727 DUF_6 cylinders. The LAR will request that this limit be changed to 25,000 DUF_6 cylinders.

1.4.5 Pre-Construction Activities

UUSA also plans to perform a number of activities prior to the facility capacity expansion that do not come within the definition of construction under 10 CFR 70.4 and are not subject to NRC's regulatory authority (FR, 2011). Under the NRC's definition, construction does not include, inter alia:

> (3) Preparation of the site for construction of the facility, including clearing of the site, grading, installation of drainage, erosion and other environmental mitigation measures, and construction of temporary roads and borrow areas;
>
> (4) Erection of fences and other access control measures that are not related to the safe use of, or security of, radiological materials subject to this part;
>
> (5) Excavation;
>
> (6) Erection of support buildings (*e.g.,* construction equipment storage sheds, warehouse and shop facilities, utilities, concrete mixing plants, docking and unloading facilities, and office buildings) for use in connection with the construction of the facility;
>
> (7) Building of service facilities (*e.g.,* paved roads, parking lots, railroad spurs, exterior utility and lighting systems, potable water systems, sanitary sewerage treatment facilities, and transmission lines);
>
> (8) Procurement or fabrication of components or portions of the proposed facility occurring at other than the final, in-place location at the facility.

10 CFR 70.4, Construction (3)-(8). Construction also does not include "[t]aking any other action that has no reasonable nexus to: (i) Radiological health and safety, or (ii) Common defense and security." 10 CFR 70.4, Construction (9).