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LES-12-00162-NRC

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

Louisiana Energy Services, LLC  
URENCO USA Facility  
NRC Docket No. 70-3103; License No. SNM-2010

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

- Reference:
1. LES-12-00139-NRC, Supplemental Environmental Report in Support of License Amendment Request Associated with Capacity Expansion of URENCO USA Facility, dated September 10, 2012
  2. Report on Public and Occupational Health Impact Evaluation to Support the Supplemental Environmental Report, October 2012
  3. LES-11-00180-NRC, Updated Decommissioning Funding Plan Cost Estimate (License Condition 16.c), dated December 19, 2011
  4. LES-12-00048-NRC, Response to Second Request for Additional Information on Updated Decommissioning Funding Plan Estimate, dated April 4, 2012
  5. UUSA Presentation to NRC, "Environmental Analysis of Potential Expansion of URENCO USA Production Capacity," on April 5, 2012
  6. UUSA Presentation to NRC, "Meeting to Discuss Construction During Pending LAR Review," August 9, 2012
  7. NRC Correspondence, IN-12-0001-NRC, License Amendment Request (LAR-11-02) for the National Enrichment Facility for Replacement of IROFS-41 and Changes to IROFS-27e (TAC No. L33180) and Amendment 50 to License SNM-2010, December 30, 2011.
  8. Revised Settlement Agreement between LES and the State of New Mexico (NMED and NMAG), dated June 16, 2009
  9. NEF-09-00103-NRC, Request for Amendment to Materials License SNM-2010 to Change License Conditions 21, 22 and 23 (LAR-09-21), dated July 10, 2009
  10. NUREG-1790, Environmental Impact Statement for the Proposed National Enrichment Facility in Lea County, New Mexico, June 2005
  11. LES Correspondence, LES-11-00129-NRC, Submittal of License Amendment Request for Replacement of IROFS41 and Changes to IROFS27e (LAR-11-02), September 19, 2011 (SUNSI)
  12. NUREG-1748, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs (NUREG-1748), August 2003

Pursuant to 10 CFR 70.34, Louisiana Energy Services, LLC (dba "UUSA") herewith submits a License Amendment Request (LAR-12-10) to expand the production capacity of the URENCO USA (UUSA) Facility to 5 SBMs (10 MSWU), which entails changes to License Conditions 10.b, 10.e, 10.g, 16, 21, and 23 of Materials License SNM-2010, as delineated in Enclosure 1. This LAR is supported by the associated Supplemental Environmental Report (Supplemental ER),

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which UUSA submitted earlier this year (Ref. 1), together with other documents which provide technical support to the Supplemental ER (Ref. 2).

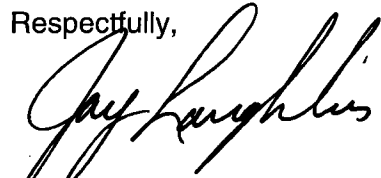
Enclosure 1 provides the background, proposed change, and basis for change of this LAR. Enclosure 2 contains the License Basis Document (LBD) page mark-ups consistent with the proposed license amendment. In addition to changes associated with the site expansion up through Phase V (SBM-1009), the Safety Analysis Report (SAR) mark-up includes an update to reflect Decommissioning Funding Estimates (approved by the NRC) up through Phase II (SBM-1003) (Refs. 3 and 4).

It is requested that portions of the LBD mark-ups in Enclosure 2 be withheld from the public in accordance with 10 CFR 2.390. These mark-ups are identified in the affidavit in Enclosure 3 which supports this withholding request. A copy of the redacted LBDs will be submitted under separate cover for docketing purposes.

UUSA plans to work closely with the NRC Staff to expedite the review of this license amendment request in addition to the associated Supplemental ER which is already under review; and welcomes the opportunity to interact with the NRC Staff, as needed, during the LAR review process.

Should the NRC have questions regarding this submittal, please contact Timothy Knowles, UUSA Licensing and Performance Assessment Manager, at 575.394.6212.

Respectfully,



Jay Laughlin  
Chief Nuclear Officer and Head of Technical Services

Enclosure:    1. URENCO USA LAR-12-10 Background, Proposed Change, Basis for Change  
                  2. Marked-up Pages of the License Basis Documents (SAR, ISA Summary, EP  
                      and FNMCP)  
                  3. Affidavit

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**ENCLOSURE 1****URENCO USA LAR-12-10  
Background, Proposed Change, Basis for Change****1.0 Background**

Currently (November 2012) the capacity at the UUSA Facility stands at approximately 2 MSWU, and will grow to approximately 3.7 MSWU when currently licensed Separations Building Modules (SBMs) 1001 and 1003 (Phase II) are fully operational. The initial Environmental Report (ER) evaluation was based on the UUSA Facility having three (3) SBMs, each with TC12s. To eliminate confusion, the supporting Supplemental ER (Ref. 1) was prepared to evaluate the environmental impacts associated with the change from the original design to that of one SBM with TC12 cascades and 4 SBMs each with TC21 cascades.

UUSA is submitting this License Amendment Request (LAR-12-10) to increase the production capacity of the UUSA Facility to 10 MSWU, which will entail changes to the following License Conditions of Materials License Number SNM-2010:

- License Conditions 10.b, 10.e, and 10.g: Revise the submittal date for the Safety Analysis Report (SAR), Fundamental Nuclear Material Control (FNMCP), and Emergency Plan (EP), respectively, to reflect this submittal for the LBD changes herein proposed
- License Condition 16: Add paragraphs similar to License Condition 16.c below (for SBM-1003) also for SBM-1005, SBM-1007 and SBM-1009, respectively:

“The licensee shall provide an updated Decommissioning Funding Plan cost estimate update and final copies of the proposed financial assurance instruments to NRC for review at least six months prior to introducing feed material in SBM 1003, and provide to NRC final executed copies of the reviewed financial assurance instruments at least 21 days prior to introducing feed material into SBM-1003. In this Decommissioning Funding Plan update, the licensee shall provide full funding for decontamination and decommissioning of SBM 1003 and all other plant areas where licensed material is used. The amount of the financial assurance instrument shall be updated to current year dollars and include any applicable changes to the decommissioning cost estimate.”

- License Condition 21: Change “15,727 cylinders” to “25,000 cylinders” (one place)
- License Condition 23: Change “15,727 cylinders of DUF<sub>6</sub> in 48Y cylinders” to “23,000 cylinders of DUF<sub>6</sub> in 48Y cylinders” (second paragraph, one place); and change “15,727” to “25,000” (third paragraph, two places)

[Note: This LAR does not propose any changes to the uranium quantities in License Conditions 8.A and 8.B, which is consistent with the facility expansion-related information presented earlier to the NRC (Refs. 5 and 6)]

## 2.0 Proposed Change

The proposed change in LAR-12-10 is to expand the UUSA Facility production capacity. This change would be implemented in three additional phases (III through V) which would include the following key items:

- Three new Separation Building Modules (SBM-1005\*, SBM-1007 and SBM-1009, respectively), and associated plant support systems (i.e., compressed air, centrifuge cooling water, and electrical distribution) (see Figure 4.12-2, Site Layout, of Ref. 1);
- One additional Cylinder Receipt and Dispatch Building (CRDB) to accommodate additional cylinder handling requirements;
- An increase in the Uranium Byproduct Cylinder (UBC) storage pad area (from 2.6 acres to 23 acres) to accommodate a storage capacity increase from 15,727 up to 25,000\*\* DUF<sub>6</sub> cylinders with triple stacking;
- Two additional UBC Basins to manage storm water run-off; and
- An increase in the capacity of the utility substation to accommodate additional 115kV/13kV transformers

The design has not been finalized beyond Phase III (SBM-1005); however, UUSA expects SBM-1007 (Phase IV) and SBM-1009 (Phase V) to be similar in cascade design to SBM-1003 (Phase II) and similar in construction to SBM-1005. The Facility expansion is expected to require eight (8) additional years of construction (until approximately 2020); and only the previously disturbed site surface area will be utilized during the build-out.

The cascade design for one assay in SBM-1005 is planned to be different from other cascades, and the difference is not within the scope of this LAR. The design is currently being finalized. The design of cascades in assay 1005 includes the ability to use depleted UF<sub>6</sub> as feed material. The ability to accept tails cylinders as feed material introduces a new criticality accident sequence and associated Items Relied on for Safety (IROFS). Re-feeding tails material represents a net decrease in the amount feed material used and the amount of tails material stored at the site per SWU of capacity. There is a small increase in chemical consequences following a postulated seismic event. The small increase is due to additional tails-off stations in the tails re-feed stations in the tails re-feed assay. The release from additional stations has already been included in the seismic analysis submitted in LAR 11-02 (Ref. 7) The tails re-feed design, accident sequence, and new IROFS will be described in detail in a separate License Amendment Request. It is noted that the overall impact of the above accident sequence from an environmental standpoint is enveloped by the Supplemental ER. The separate LAR addressing the tails re-feed design for the SBM-1005 assay will be submitted promptly following the completed design (currently targeted for the early December 2012).

## 3.0 Basis for Change

The basis for the UUSA Facility production capacity change is to satisfy the need for more reliable and economical domestic enriched uranium. As noted in Ref. 1: Congress has characterized uranium enrichment as a “strategically important domestic industry of vital national interest,” “essential to the national security and energy security of the United States,” and “necessary to avoid dependence on imports.” National security and defense interests require assurance that “the nuclear industry in the United States does not become unduly dependent on foreign sources of uranium or uranium enrichment services.” Domestic-produced

\*SBM-1005 is already approved (building only) and incorporated into the LBDs, based on UUSA's authorization.

\*\*Consistent with the Ref. 8 Revised Agreement with the State of New Mexico; and as earlier predicted in the Ref.9 LAR.

enriched uranium may also further non-proliferation goals. Under U.S. Section 123 Agreements for Peaceful Cooperation, which further non-proliferation, there are generally restrictions on indigenous enrichment and processing plants. This means Section 123 Agreement partners must rely on imported enriched uranium to fuel their reactors, ideally from U.S. sources. The capacity expansion at the UUSA Facility is a prerequisite to increasing exports to further these non-proliferation goals.

#### 4.0 Technical Overview/Radiological Impacts

The major safety considerations for the facility capacity expansion herein proposed are the associated chemical and radiological impacts. These impacts are summarized below and addressed in detail within the Supplemental ER (Ref. 1):

*Routine Gaseous and Liquid Effluent:* ER Table 4.12-12, Annual Total Effective Dose Equivalent (All Sources), indicates that the projected site boundary radiation dose from both liquid and gaseous effluent sources at current facility capacity is  $9.7\text{E-}03$  mrem/yr, a small fraction of the most restrictive applicable limit (i.e., 25 mrem/yr to the whole body, 40 CFR 190). The following calculation packages were reviewed and the data then updated by newer modeling and calculation exercises or extrapolated to project effluent dose rates at the facility capacity increase up to 10 MSWU. The projected site boundary dose from both liquid and gaseous effluents for 10 MSWU is  $3.45\text{E-}02$  mrem/yr which remains a small fraction of the limit. The reviews are summarized as follows:

- *Calculation of Potential Doses due to Effluent Discharges from the NEF (UUSA Facility) New Mexico Site:* Projected annual dose from effluent discharges are well within the annual limit of 25 mrem, i.e.  $3.45\text{E-}2$  mrem/yr for 10 MSWU. This calculation is based on current site capacity. ER Table 12-12, Annual Total Effective Dose Equivalent (All Sources), shows the annual dose at the site boundary, nearest business, and nearest resident for both fixed sources and gaseous and liquid effluents. Calculations may be revisited regarding the number of cylinders stored on the UBC pad and the amount of liquid sent to the retention basin based on actual weather patterns.
- *Calculation of Potential for Radioactivity Concentration from UBC Storage Pad:* The projected annual runoff concentration was calculated at 32 pCi/l for 10 MSWU, which is well below the 300 pCi/l allowable limit specified in the summary section of this calculation.

*Pathway Assessment:* The direct radiation exposure and three primary effluent exposure pathways presented in Appendix C of the EIS (Ref. 10) (i.e., direct radiation due to deposited radioactivity on the ground surface (ground plane exposure), inhalation of airborne radioactivity in a passing effluent plume, and ingestion of food that was contaminated by plant effluent radioactivity), remain unchanged with the proposed facility capacity expansion.

*Direct Radiation Impacts:* ER Table 4.12-12, Annual Total Effective Dose Equivalent (All Sources), indicates that projected site boundary radiation dose is dominated by direct exposure from the fixed sources (i.e., containers on the storage pads). The previously estimated 19 mrem/yr is a significant fraction of the most restrictive applicable limit (i.e., 25 mrem/yr to the whole body, 40 CFR 190). The following calculation package was reviewed to assess dose

rates from the cylinder inventory of 25,000 at the expanded facility capacity. The review is summarized as follows:

- *Radiation Dose Calculation of the Site Boundary due to UBC Storage Pad Expansion:* All radiation transport calculations of 25,000 storage cylinders were performed with the general purpose three-dimensional continuous energy Monte Carlo code MCNP5. Conceptual UBC pad configurations were assumed based on the required area for 25,000 cylinders, triple stack arrangement and maximizing the distance from the edge of pad to the fence line. This calculation refines previous calculation inputs and utilizes empirical TLD data to evaluate photon and neutron dose on the UBC pad. This information was subsequently utilized to evaluate conservative assumptions in the model. This calculation demonstrates that an expansion of the capacity of the UBC storage pad to host 25,000 48Y cylinders in a triple stacked arrangement is acceptable, and will not require additional mitigation because adequate distances are maintained from the pad edge to the site boundary. The results demonstrate that a minimum distance of approximately 1,000 feet from the UBC storage pad to the north side site boundary and a minimum distance of approximately 500 feet from the UBC storage pad to the east/west side site boundary is required to meet the dose rate limit of 25 mrem/yr governed by 40 CFR 190. Actual distances from the proposed UBC Storage Pad location to the site boundary exceed these values.

Mitigation Measures: Measures to mitigate public and occupational radiation exposure include filtration of gaseous effluents, collection and disposal of impacted wastes, and standard ALARA measures (i.e., time, distance and shielding) for control of direct exposure. Mitigation measures are not affected by the facility capacity expansion. The quantities of materials/resources needed to implement mitigation measures will be adjusted as necessary to ensure adequate quantities of items such as filter media and collection capacity and adequate personnel resources for additional sample collection, surveys, etc.

Occupational Exposure: EIS Table 4.12-14, Estimated NEF (UUSA) Occupational (Individual) Exposures, summarizes the annual dose equivalent rates and projected dose impact for different areas and compounds of the site. The maximum annual exposure to an individual is attributed to the category of 'Typical Cylinder Handler', and estimated at 300 mrem/yr for current site capacity. The following calculation is specific to the CRDB and was reviewed for the impact of the proposed capacity increase:

- *Calculation of Dose Equivalent Contribution from UF<sub>6</sub> Storage Inside the Cylinder Receipt and Dispatch Building (CRDB):* This calculation indicates the projected annual dose equivalent for UF<sub>6</sub> storage inside the CRDB at the current facility capacity is 157 mrem (typical cylinder handler). The previous calculation utilizes a methodology that includes unnecessary conservatism of the uncertainty treatment. For purposes of this assessment of potential impact and comparison to standards, the projected annual dose equivalent for the expanded capacity by simple scaling is 377 mrem. This annual dose equivalent is considered conservative based on current methodologies, and is well below the

annual limit of the NRC's permitted maximum occupational exposure of 5 rem/yr.

*Environmental Effects of Accidents:* All HF release scenarios with the exception of those caused by seismic and some fire cases are controlled through design features or by administrative procedural control measures. No additional accident scenarios are postulated due to the capacity expansion. The following evaluation was reviewed for the impact of increased facility capacity:

- *NEF (UUSA Facility) Dose versus Distance Evaluation for Accidents Resulting in Loss of UF<sub>6</sub> Containment.* For both the seismic event and fire, the distances to the nearest business and nearest resident are greater than the maximum distance depicted on the chart. Similarly for the fire scenario, the probability of fire will be proportionally greater when operating at the expanded capacity. However, the dose consequences would be the same on a per event basis. For purposes of this assessment, the TEDEs for the seismic event would be proportionally greater at all locations: boundary, business and resident. The dose at 1.17 miles due to a seismic event are predicted by simple scaling (the inventory of material impacted by a seismic event is proportional to the facility capacity expansion) to increase from a range of 1.5-15 mrem at current site capacity to 5 - 50 mrem for the expanded capacity.

For accidents, as in the initial evaluations conducted prior to construction (initial EIS) the most severe accident impact for the expanded capacity continues to be the release of UF<sub>6</sub> caused by the rupture of an overfilled and/or overheated cylinder, which could result in a collective population dose of 12,000 person-rem and seven latent cancer fatalities. The design of the proposed UUSA capacity expansion continues to include certain features such as passive engineered controls, active controls and administrative controls (Items Relied on for Safety) to significantly reduce the likelihood of this event.

*Related LAR-11-02 Supporting Analyses:* Comprehensive consequence analyses for an expanded facility up to approximately 10 MSWU were completed in support of, and summarized in, LAR-11-02 (Ref. 11) as approved by the NRC. The calculations that comprised these analyses (including updates since the approval of the LAR) for impacts to Facility Workers, Construction Workers On-Site, the Public, and Environment, are the following:

- Calculation of Off-Site & Construction Worker Consequences for Seismic Events (for 3.7 MSWU and approximately 10 MSWU)
- Seismic Release Consequence Calculation for Facility Workers in SBM-1001 through SBM-1009 and the CAB; and
- Source Term Determination for Bounding External Consequence Calculations (for approximately 10 MSWU)

The above calculations demonstrated that the public and environment mitigated consequences, as well as those to facility workers and construction workers on-site, for any hazards from the UUSA Facility due to a design basis seismic event are in the low consequence category and



meet the performance requirements of 10 CFR 70.61. These calculations also bound the tornado, tornado missile, roof snow load, and local intense precipitation events. Thus, these calculations confirmed the adequacy of the specified Items Relied On For Safety (IROFS) to meet the performance requirements of 10 CFR 70.61 for such an expanded facility.

**Nuclear Criticality Safety.** Expansion of the facility to 10 MSWU does not introduce any new accident sequences or hazards associated with Nuclear Criticality Safety (NCS). With the exception of the tails re-feed assay in SBM-1005. The additional capacity in SBMs 1005, 1007 and 1009 is similar to existing design. The modular nature of the design limits interact between components and existing NCS analyses and evaluations continue to apply to the new capacity.

The additional CRDB is also similar to the existing CRDB cylinder lay down area and poses no new criticality concerns. Increasing the capacity of the UBC Storage Pad poses no NCS risk because the material is natural or depleted. The same is true for additional UBC basins. Finally, the proposed change to the switchyard poses no NCS concerns.

The NCS concerns associated with the tails re-feed assay in SBM-1005 are being addressed in a separate LAR. Any unanticipated differences arising in the final as-built design of future SBMs will be addressed in the change management process. Because there are no other differences anticipated, the scope of changes proposed in this LAR requires no new NCS analyses, evaluations, or review.

## 5.0 Safety Significance Determination

Increasing the facility production capacity as herein proposed results in the public dose remaining within the NRC allowable limits.

Occupational exposures will remain well below the annual limit of 5 rem/year per person. All public radiological exposures due to effluents are significantly below the 10 CFR Part 20 regulatory limit of 100 millirem and the 40 CFR Part 190 regulatory limit of 25 millirem for uranium fuel cycle facilities. UUSA analyses demonstrate that an expansion of the capacity of the UBC storage pad to accommodate 25,000 48Y cylinders in a triple stacked arrangement is feasible and will not require additional mitigation.

The facility capacity increase covered by this LAR would not introduce any additional accident scenarios beyond those previously evaluated for the facility. The most severe accident impact for 10 MSWU continues to be the previously analyzed release of UF<sub>6</sub> caused by the rupture of an overfilled and/or overheated cylinder. The design of the proposed UUSA capacity expansion includes the same controls presently implemented to reduce the likelihood of this event. As the most severe accident is unchanged, and increases to exposure from seismic and fire accident scenarios meet 70.61 performance requirements (as described in Section 4.0 above), the NUREG 1748 (Ref. 12) significance level remains at 'Small to Moderate Impact'\* due to accidents for a facility capacity of 10 MSWU. Furthermore, the scope of changes proposed in this LAR requires no new NCS analyses, evaluations, or review.

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\***Small Impact:** The environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource; **Moderate Impact:** The environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

## **6.0 Environmental Considerations**

Pursuant to 10 CFR 50.60(a), and in support of this LAR, UUSA earlier submitted its Supplemental ER (Ref. 1), Section 4.15 of which addresses the appropriate environmental considerations for the change being requested in this LAR. The Supplemental ER concludes that the potential environmental impacts associated with the facility capacity expansion are small, and are outweighed by the substantial socioeconomic benefits associated with additional plant construction and operation.

## **7.0 Conclusions**

This LAR proposes changes to Materials License Number SNM-2010 which would authorize UUSA to proceed with a facility capacity expansion up to 10 MSWU through 2020. The safety analyses presented herein, as supported by the Supplemental ER and the technical supporting documents thereto, confirm that the facility expansion will be implemented in a safe and acceptable manner in that radiological impacts to both operators and the public are well within regulatory limits and performance requirements of 10 CFR 70.61 continue to be met.

**ENCLOSURE 3**

**Affidavit**

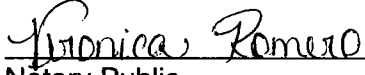
I, Jay Laughlin, Chief Nuclear Officer (CNO) and Head of Technical Services of Louisiana Energy Services, LLC (LES) at the URENCO USA Facility, make the following representations that to the best of my knowledge and belief:

1. LES wishes to have withheld from public disclosure a portion of the mark-ups (Sections/Figures/Tables) of the Safety Analysis Report (SAR), ISA Summary, Emergency Plan (EP) and Fundamental Nuclear Material Control Plan (FNMCP) in Enclosure 2 of this document, LES-12-00162-NRC. Identification of these portions of the LBD mark-ups to be withheld is being provided under separate cover together with a redacted copy of the LBDs.
2. The information contained in the document cited in 1 above for which exemption from public disclosure is requested is proprietary information related to commercial and financial aspects of the URENCO USA Facility, including the business strategy of LES. LES requests that this information be exempt from disclosure pursuant to the provisions in 10 CFR Part 2.390(a)(4).
3. Public disclosure of the information in the above enclosure to this submittal has the potential to result in substantial harm to the competitive position of LES, provide valuable business information to competitors of LES which they could duplicate without having to expend their own resources to develop, and reduce or foreclose the availability of profit opportunities.
4. The information sought to be withheld is not available in public sources, to the best of LES' knowledge and belief.
5. The information stated in this affidavit has been submitted in accordance with the applicable parts of 10 CFR 2.390 and the guidance contained in NUREG-1556, Vol. 20, Appendix C.4.

  
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Jay Laughlin  
CNO and Head of Technical Services  
Louisiana Energy Services, LLC  
URENCO USA Facility

11-9-12  
\_\_\_\_\_  
Date

I certify the above named person appeared before me and executed this document on this 9<sup>th</sup> day of November, 2012.

  
\_\_\_\_\_  
Notary Public  
My commission expires: 2-7-14



OFFICIAL SEAL  
**Verónica Romero**  
NOTARY PUBLIC  
STATE OF NEW MEXICO  
My Commission Expires 2-7-14