LES-18-063-NRC

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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: Safety Analysis Report (SAR) Update

In accordance with Materials License SNM-2010, Condition 30, Louisiana Energy Services (LES), dba URENCO USA (UUSA) herewith submits the Safety Analysis Report (SAR) changes made under UUSA's authority.

Enclosure 1 contains the marked up pages to the Safety Analysis Report for revision 43. A description of each change is provided in the revision history. Revision bars, strikethroughs and underlines were utilized.

Should there be any questions regarding this submittal, please contact Wyatt Padgett, UUSA Licensing and Performance Assessment Manager, at 575-394-5257.

Respectfully,

Stephen Cowne
Chief Nuclear Officer and Compliance Manager

Enclosure: 1) Marked up pages of the Safety Analysis Report.

NMSS20

CC: via email (without attachments)

Mike G. Raddatz, Senior Project Manager
U.S. Nuclear Regulatory Commission
Michael.Raddatz@nrc.gov

Marvin Sykes, Chief - Fuel Facility Branch 1
U.S. Nuclear Regulatory Commission
Marvin.Sykes@nrc.gov

Jacob Zimmerman, Branch Chief - Enrichment and Conversion Branch
U. S. Nuclear Regulatory Commission
Jacob.Zimmerman@nrc.gov

Enclosure 1
Marked up pages of the Safety Analysis Report
(revision bars, strikethroughs and underlines utilized)

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SAFETY ANALYSIS REPORT

Revision 43~~42a~~

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

Summary of Changes		
Issue / Date	**Change**	**Description of Change**
43	LBDCR 17-0006	MFDT Enriched Operations CC-RW-2015-0003 70.72 – 2017-0025
	LBDCR-17-0012	Replaces carbon/aluminum oxide mixed bed Type 'A' trap on the feed sampling pump/trap sets with a Type 'A' trap filled with sodium fluoride and aluminum oxide. MOD-17-0152 70.72 – 2017-0076
	LBDCR-17-0022	Modification of the SRC audit frequency based on NRC Approval of SRC Audit Frequency (IN-12-0081-NRC) CC-LS-2015-0001; 70.72 – 2015-0285
	LBDCR 18-001	Removal of fluorinated carbon from a chemical trap under an inert atmosphere for sampling purposes CC-RW-2017-0003 70.72 – 2018-0015

2.2.3 Safety Review Committee

The facility maintains a Safety Review Committee (SRC) to assist with the safe operation of the facility. The SRC reports to the Chief Nuclear Officer and provides technical and administrative review and audit of operations that could impact plant worker, public safety and environmental impacts. The scope of activities reviewed and audited by the SRC shall, as a minimum, include the following:

- Radiation protection
- Nuclear criticality safety
- Hazardous chemical safety
- Industrial safety including fire protection
- Environmental protection
- ALARA policy implementation
- Changes in facility design or operations.

LBDCR-17-0022

The SRC shall ensure construction and operational ~~conduct at least one facility~~ audits ~~per year~~ for the above areas are conducted according to the frequencies specified in Section 11.5.2. SRC review of audits completed by the QA Department can be credited for meeting SRC review and auditing requirements.

The Safety Review Committee shall be composed of at least five members, including the Chairman. Members of the SRC may be from the LES corporate office or technical staff. The five members shall include experts on operations and all safety disciplines (criticality, radiological, chemical, industrial). The Chairman, members and alternate members of the Safety Review Committee shall be formally appointed by the Chief Nuclear Officer, shall have an academic degree in an engineering or physical science field; and, in addition, shall have a minimum of five years of technical experience, of which a minimum of three years shall relate directly to one or more of the safety disciplines (criticality, radiological, chemical, industrial).

The Safety Review Committee shall meet at least once per calendar quarter.

Review meetings shall be held within 30 days of any incident that is reportable to the NRC. These meetings may be combined with regular meetings. Following a reportable incident, the SRC shall review the incident's causes, the responses, and both specific and generic corrective actions to ensure resolution of the problem is implemented.

A written report of each SRC meeting and audit shall be forwarded to the Chief Nuclear Officer and appropriate Managers within 30 days and be retained in accordance with the records management system.

2.2.4 Personnel Qualification Requirements

The minimum qualification requirements for the facility functions that are directly responsible for its safe operation shall be as outlined below consistent with NUREG-1520. This includes the Chief Nuclear Officer , Operations Manager, Compliance Manager, Shift Managers, and managers for various safety and environmental disciplines. "Responsible nuclear experience" for these positions shall include (a) responsibility for and contributions towards support of

3.6 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
~~IROFS15~~	~~None~~	~~Instrument for determining item contains no enriched uranic material~~	~~Accurate and reliable indication~~	~~None~~	~~None~~	~~None~~
IROFS16a	None	Instrument for viewing cylinder internal	None LBDCR 17-0006	None	None	None
	Pressure transducer and local digital display ***(Note 2)**	None	Accurate and reliable indication	None	None	None
IROFS16e	Weighing Scale System including local digital readout from weighing system at the cylinder stations *(Notes 2 & 3)	None	Accurate and reliable indication	None	None	None
	Pressure transducer and local digital display *(Note2)	None	Accurate and reliable indication	None	None	None
IROFS16f	Weighing Scale System including local digital readout from weighing system at the cylinder stations *(Notes 2 & 3)	None	Accurate reliable indication	None	None	None
IROFS16f	Pressure transducer and local digital display *(Note 2)	None	Accurate reliable indication	None	None	None

IROFS	Monitoring Support Equipment	Other Equipment	Equipment Attributes	Operated Support Equipment	Other Equipment	Equipment Attributes
		enrichment level (wt.% ^{235}U), independent of IROFS55b			Slab Tanks)	liquid sample
IROFS55b	N/A LBDCR 17-0006	Instrument(s) for determining uranium enrichment level (wt. % ^{235}U), independent of IROFS55a	Accurate and reliable indication	N/A	Circulation pumps (for Slab Tanks)	Supports withdrawal of representative sample
IROFS56a	None	Instrument for determining gross ^{235}U content independent of IROFS56b	Accurate and reliable indication	None	None	None
IROFS56b	None	Instrument for determining gross ^{235}U content independent of IROFS56a	Accurate and reliable indication	None	None	None
IROFS57a	None	Instrument for determining gross ^{235}U content independent of IROFS57b	Accurate and reliable indication	None	Circulation pumps (for MFDT baths)	Supports withdrawal of representative sample
IROFS57b	None	Instrument for determining gross ^{235}U content independent of IROFS57a	Accurate and reliable indication	None	Circulation pumps (for MFDT baths)	Supports withdrawal of representative sample
IROFS58a	None	Instrument for determining gross ^{235}U content	Accurate and reliable indication	None	None	None
IROFS58b	None	None	None	None	Storage Array	Provides adequate

3.6 Chapter 3 Tables

IROFS	Monitoring Support Equipment	Other Equipment	Equipment Attributes	Operated Support Equipment	Other Equipment	Equipment Attributes
						spacing
IROFS60	None LBDCR 18-001	Oxygen Sensor	Accurate and reliable indication of displacement of O_2 by inert gas	None	Glove Bag	Provides enclosure for inert gas
	None	None	None	None	Inert Gas	Provides non-reactive environment
IROFS61	None	None	None	None	Inert Gas	Provides non-reactive environment
	None	None	None	None	Mobile Rigs	Provides method of purge
IROFSC22	1) Weigh Scale System including local digital readout from weighing system at cylinder station ***(Notes 2 and 3)**	None	1) Accurate and reliable indication	Select independent isolation valves ***(Note 2)**	None	Valve closure
	2) vent system cold trap load cells ***(Notes 2 and 3)**		2) Accurate and reliable indication			
	N/A	Instrument for determining cylinder content assay	3) Accurate and reliable indication	N/A	Verify CASCAL settings document	Accurate and reliable

***(Note 1** Deleted

***(Note 2) Support** Equipment meets the requirements for QA Level 2AC.

***(Note 3)** An exception to License Condition 20 has been approved by the NRC for this equipment.

6.2.1.2.2 Chemical Traps - Activated Carbon, Aluminum Oxide, and Sodium Fluoride

Adsorption is the attraction of gas molecules to the surface of an activated solid. There are two classifications of adsorption: physical and chemical. At ordinary temperatures, adsorption is usually caused by molecular forces rather than by the formation of chemical bonds. In this type of adsorption, called physical adsorption, very little heat is evolved. If a chemical reaction takes place between the gas and the solid surface, the process is known as chemisorption. In chemisorption the reaction between surface and gas molecules occurs in a stoichiometric manner, and heat is liberated during the reaction.

Chemisorption is used in the removal of UF_6, HF and trace amounts of F_2 from gaseous effluent streams. It is also used to remove oil mist from vacuum pumps operating upstream of gaseous effluent vent systems. Adsorbent materials are placed on stationary beds in chemical traps downstream of the various cold traps. These materials capture HF and the trace amounts of UF_6 that escape desublimation during feed purification or during venting of residual UF_6 contained in hoses and/or piping that is bled down before disconnection.

The chemical traps are placed in series downstream of the cold traps in the exhaust streams to the GEVS and may include one or more of a series of three different types of chemical traps; activated carbon ~~or NaF~~ traps, sodium fluoride (NaF) traps aluminum oxide (Al_2O_3) traps, and mixed-bed traps, which contain ~~both~~ activated carbon and Al_2O_3 or NaF and Al_eO_3 in the same housing. The activated carbon or NaF captures small amounts of UF_6 that escape desublimation. Since chemisorption is a pressure sensitive process, HF is not fully adsorbed on carbon at low pressures. In addition, F_2 passes through NaF. This necessitates a second type of trap containing a charge of Al_2O_3 to remove HF and/or ~~trace amounts of~~ F_2 from the gaseous effluent stream at normal system operating pressure. One or more of a series of these traps is used depending on the process system being served. Additionally, an oil trap (also containing Al_2O_3) is present on the inlet of the vacuum pumps to prevent pump oil from migrating back into the UF_6 cold traps.

Chemisorption of UF_6 on activated carbon evolves considerable thermal energy. This is not normally a problem in the chemical traps downstream of the cold traps because very little UF_6 escapes desublimation. If multiple equipment failures and/or operator errors occur, significant quantities of UF_6 could enter the chemical traps containing activated carbon. This could cause significant overheating leading to release. ~~Failures associated with the carbon traps were evaluated in the Integrated Safety Analysis.~~

Activated carbon cannot be used in the Contingency Dump System because the relatively high UF_6 flow rates during this non-routine operation could lead to severe overheating. A chemical trap containing sodium fluoride (NaF) is installed in the contingency dump flow path to trap UF_6. NaF is used because the heat of UF_6 chemisorption on NaF is significantly lower than the heat of UF_6 chemisorption on activated carbon. Failures associated with the NaF traps were evaluated in the integrated safety analysis.

LBDCR-17-0012

There are no specific concerns with heat of adsorption of ~~either~~ UF_6, F_2, or HF with Al_2O_3. Although the heat of absorption of HF on NaF and F_2 on Al_2O_3 are relatively large, the quantity of HF or F_2 present at a pump/trap set is relatively small. Failures associated with the sodium fluoride and aluminum oxide traps were evaluated in the Integrated Safety Analysis.

6.6 Chapter 6 Tables

Table 6.1-5 Physical Properties of UF_6

Property	Value
Sublimation Point at 1.01 bar abs (14.7 psia)	56.6°C (133.8°F)
Triple Point	1.52 bar abs (22 psia) 64.1°C (147.3°F)
Density Solid @ 20°C (68°F) Liquid @ 64.1°C (147.3°F) Liquid @ 93°C (200°F) Liquid @ 113°C (235°F) Liquid @ 121°C (250°F)	 5.1 g/cc (317.8 lb/ft^3) 3.6 g/cc (227.7 lb/ft^3) 3.5 g/cc (215.6 lb/ft^3) 3.3 g/cc (207.1 lb/ft^3) 3.3 g/cc (203.3 lb/ft^3)
Heat of Sublimation @ 64.1°C (147.3°F)	135,373 J/kg (58.2 BTU/lb)
Heat of Fusion @ 64.1°C (147.3°F)	54,661 J/kg (23.5 BTU/lb)
Heat of Vaporization @ 64.1°C (147.3°F)	81,643 J/kg (35.1 BTU/lb)
Specific Heat Solid @ 27°C (81°F) Liquid @ 72°C (162°F)	 477 J/kg/°K (0.114 BTU/lb/°F) 544 J/kg/°K (0.130 BTU/lb/°F)
Critical Pressure	46.10 bar abs (668.8 psia)
Critical Temperature	230.2°C (446.4°F)

LBDCR-17-0012

Table 6.2-1 Properties of Chemical Adsorbents

Adsorbent (solid)/ Adsorbate (gas)	Heat of Adsorption	Capacity of Adsorption by weight
Activated Carbon/UF_6	293 kJ/kg (126 BTU/lb)	1:1
Activated Carbon/HF	negligible	negligible at low pressure
Aluminum Oxide/UF_6	negligible	0.2:1
Aluminum Oxide/HF	negligible	0.2:1
Aluminum Oxide/F_2	7824 kJ/kg Al_2O_3 (3364 BTU/lb Al_2O_3)	0.12:1
Sodium Fluoride~~Activated NaF~~/UF_6	186 kJ/kg (80 BTU/lb)	1.0-1.5:1
Sodium Fluoride~~Activated NaF~~/HF	4,052 kJ/kg (1,742 BTU/lb)	1:0.5
Sodium Fluoride/F_2	Negligible	Negligible