

November 9, 2004

NEF#04-047

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

Louisiana Energy Services, L. P.
National Enrichment Facility
NRC Docket No. 70-3103

Subject: Integrated Safety Analysis Summary Update Related to Vehicle Fires

- References:**
1. Letter NEF#03-003 dated December 12, 2003, from E. J. Ferland (Louisiana Energy Services, L. P.) to Directors, Office of Nuclear Material Safety and Safeguards and the Division of Facilities and Security (NRC) regarding "Applications for a Material License Under 10 CFR 70, Domestic licensing of special nuclear material, 10 CFR 40, Domestic licensing of source material, and 10 CFR 30, Rules of general applicability to domestic licensing of byproduct material, and for a Facility Clearance Under 10 CFR 95, Facility security clearance and safeguarding of national security information and restricted data"
 2. Letter NEF#04-002 dated February 27, 2004, from R. M. Krich (Louisiana Energy Services, L. P.) to Director, Office of Nuclear Material Safety and Safeguards (NRC) regarding "Revision 1 to Applications for a Material License Under 10 CFR 70, "Domestic licensing of special nuclear material," 10 CFR 40, "Domestic licensing of source material," and 10 CFR 30, "Rules of general applicability to domestic licensing of byproduct material"
 3. Letter NEF#04-029 dated July 30, 2004, from R. M. Krich (Louisiana Energy Services, L. P.) to Director, Office of Nuclear Material Safety and Safeguards (NRC) regarding "Revision to Applications for a Material License Under 10 CFR 70, "Domestic licensing of special nuclear material," 10 CFR 40, "Domestic licensing of source material," and 10 CFR 30, "Rules of general applicability to domestic licensing of byproduct material"

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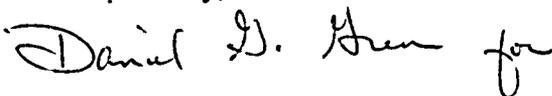
4. Letter NEF#04-037 dated September 30, 2004, from R. M. Krich (Louisiana Energy Services, L. P.) to Director, Office of Nuclear Material Safety and Safeguards (NRC) regarding "Revision to Applications for a Material License Under 10 CFR 70, "Domestic licensing of special nuclear material," 10 CFR 40, "Domestic licensing of source material," and 10 CFR 30, "Rules of general applicability to domestic licensing of byproduct material"
5. Letter NEF#04-036 dated September 14, 2004, from R. M. Krich (Louisiana Energy Services, L. P.) to Director, Office of Nuclear Material Safety and Safeguards (NRC) regarding "Clarifying Information Related to Vehicle Fires"

By letter dated December 12, 2003 (Reference 1), E. J. Ferland of Louisiana Energy Services (LES), L. P., submitted to the NRC applications for the licenses necessary to authorize construction and operation of a gas centrifuge uranium enrichment facility. Revision 1 to these applications was submitted to the NRC by letter dated February 27, 2004 (Reference 2). Subsequent revisions (i.e., revision 2 and revision 3) to these applications were submitted to the NRC by letters dated July 30, 2004 (Reference 3) and September 30, 2004 (Reference 4), respectively.

Clarifying information related to the analysis of vehicle fires at the National Enrichment Facility was provided to the NRC by letter dated September 14, 2004 (Reference 5). In an October 25, 2004, telephone call between LES and NRC representatives, the NRC requested that updated Integrated Safety Analysis (ISA) Summary pages for the analysis of vehicle fires described in the Reference 5 letter be provided. These updated ISA Summary pages are included in the Enclosure, "Updated Integrated Safety Analysis Summary Pages for Vehicle Fires." These updated pages will be formally incorporated into the ISA Summary in a future revision.

If you have any questions or need additional information, please contact me at 630-657-2813.

Respectfully,



R. M. Krich
Vice President – Licensing, Safety, and Nuclear Engineering

Enclosure:

Updated Integrated Safety Analysis Summary Pages for Vehicle Fires

cc: T.C. Johnson, NRC Project Manager

ENCLOSURE

Updated Integrated Safety Analysis Summary Pages for Vehicle Fires

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)
IROFS36g	FF44-1	Chemical	AC	A	<p>Administratively limit onsite vegetation fire sources to ensure integrity of important targets.</p> <p>This is implemented by requiring clear cutting of vegetation onsite proximate to buildings and cylinders containing uranic material.</p>	-3	3.8.3.36g
IROFS36h	FF5-2	Chemical	AC	A	<p>Administratively limit fire exposure to feed cylinders, product cylinders, and UBCs containing ≥ 0.1 kg of UF_6 due to a semi-tractor trailer fire during the receipt and shipping process.</p> <p>This is implemented by ensuring that all received feed cylinder/protective assemblies are unloaded from the semi-tractor trailer to the loading dock prior to removal of the required DOT protective assemblies, that all outgoing product cylinders are loaded into their required DOT overpacks prior to placement on the semi-tractor trailer, and that all outgoing UBCs have their required DOT protective assemblies installed prior to placement on the semi-tractor trailer.</p>	-3	3.8.3.36h
IROFS37	FF25-2	Chemical	AEC	A	<p>Automatic hardwired, fail-safe, trip of the Ventilated Room HVAC and isolation from TSB GEVS on smoke detection and Ventilated Room design leakage limited to ensure offsite exposure from building out flow maintains consequences to the public low.</p>	-2	N/A

Table 3.7-3 External Events And Fire Accident Sequences 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	Consequence 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)	
FF1-1	-2	IROFS35-3	N/A	N/A	-5 (C)	1	3 (T)	3 (C)	Acceptable Risk
FF1-2	-2	N/A	N/A	N/A	-2 (U)	3	3 (T)	9 (U)	IROFS Required
FF1-2	-2	IROFS36a-3	N/A	N/A	-5 (C)	1	3 (T)	3 (C)	Acceptable Risk
FF5-1	-2	N/A	N/A	N/A	-2 (U)	3	3 (T)	9 (U)	IROFS Required
FF5-1	-2	IROFS36b-3	N/A	N/A	-5 (C)	1	3 (T)	3 (C)	Acceptable Risk
FF5-2	-2	N/A	N/A	N/A	-2 (U)	3	3 (T)	9 (U)	IROFS Required
FF5-2	-2	IROFS36h-3	N/A	N/A	-5 (C)	1	3 (T)	3 (C)	Acceptable Risk
FF6-1	-2	N/A	N/A	N/A	-2 (U)	3	3 (T)	9 (U)	IROFS Required
FF6-1	-2	IROFS35-3	N/A	N/A	-5 (C)	1	3 (T)	3 (C)	Acceptable Risk
FF6-2	-2	N/A	N/A	N/A	-2 (U)	3	3 (T)	9 (U)	IROFS Required
FF6-2	-2	IROFS36a-3	N/A	N/A	-5 (C)	1	3 (T)	3 (C)	Acceptable Risk
FF7-1	-2	N/A	N/A	N/A	-2 (U)	3	3 (T)	9 (U)	IROFS Required
FF7-1	-2	IROFS36c-3	N/A	N/A	-5 (C)	1	3 (T)	3 (C)	Acceptable Risk
FF8-1	-2	N/A	N/A	N/A	-2 (U)	3	3 (T)	9 (U)	IROFS Required
FF8-1	-2	IROFS35-3	N/A	N/A	-5 (C)	1	3 (T)	3 (C)	Acceptable Risk
FF8-2	-2	N/A	N/A	N/A	-2 (U)	3	3 (T)	9 (U)	IROFS Required
FF8-2	-2	IROFS36a-3	N/A	N/A	-5 (C)	1	3 (T)	3 (C)	Acceptable Risk
FF11-1	-2	N/A	N/A	N/A	-2 (U)	3	3 (T)	9 (U)	IROFS Required
FF11-1	-2	IROFS35-3	N/A	N/A	-5 (C)	1	3 (T)	3 (C)	Acceptable Risk

Type of Accident – T for Chemical
CR for Criticality

Table 3.8-2 Sole Items Relied On For Safety (IROFS)

IROFS Identifier	Accident Sequence	Type of Accident	Type of IROFS	Title
IROFS35	FF1-1 FF6-1 FF8-1 FF11-1 FF15-1 FF21-1 FF23-1 FF24-1 FF38-1	Chemical	PEC	Automatic closure of fire-rated barrier opening protectives (e.g., doors, dampers, penetration seals) to ensure the integrity of area fire barriers prevents fires from propagating into areas containing uranic material.
IROFS36a	FF1-2 FF6-2 FF8-2 FF11-2 FF16-1 FF16-2 FF38-2	Chemical	AC	Administratively limit transient combustible loading in areas containing uranic material to ensure integrity of uranic material components/containers and limit the quantity of uranic material at risk to ensure consequences to the public are low.
IROFS36b	FF5-1	Chemical	AC	Administratively limit storage of UF ₆ cylinders in the CRDB to ensure ≥ 1 m (3 ft) setback from the edge of the loading dock.
IROFS36c	FF7-1 FF42-1	Chemical	AC	Administratively limit onsite UF ₆ cylinder transporters/movers to ensure only use of electric drive or diesel powered with a fuel capacity of less than 280 L (74 gal).
IROFS36d	FF21-2 FF23-2 FF25-1 FF25-2	Chemical	AC	Administratively limit transient combustible loading in areas containing uranic material to ensure integrity of uranic material components/containers and limit the quantity of uranic material at risk to ensure consequences to the public are low.
IROFS36e	FF43-1	Chemical	AC	Administratively limit transient combustible loading on the UBC Storage Pad to ensure cylinder integrity.
IROFS36f	FF43-2	Chemical	AC	Administratively limit designated routes for bulk fueling vehicles onsite to ensure UBC cylinder integrity.
IROFS36g	FF44-1	Chemical	AC	Administratively limit onsite vegetation fire sources to ensure integrity of important targets.
IROFS36h	FF5-2	Chemical	AC	Administratively limit fire exposure to feed cylinders, product cylinders and UBCs containing ≥ 0.1 kg of UF ₆ due to a semi-tractor trailer fire during the receipt and shipping process.

Table 3.7-4 External Events and Fire Accident Descriptions

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Accident Identifier: FF5-2 (CRDB Truck Bay)

The frequency index number for the initiating event was determined to be (-2). The NUREG-1520 criteria – no failures of this type in this facility in 30 yrs – applies. (See FF1-1 for justification.)

The uranium inventory is UF₆ contained in 48Y and/or 30B cylinders located on the semi-tractor trailers during receipt of incoming feed cylinders, shipment of outgoing product cylinders, or shipment of outgoing UBCs while on the semi-tractor trailer or being transported to/from the loading dock!

The uncontrolled event is a fire involving the transient combustibles and fuel load of a truck located in the truck bay that could result in a release of the UF₆ inventory (failure of IROFS36h: administratively limit fire exposure to feed cylinders, product cylinders, and UBCs containing ≥ 0.1 kg of UF₆ due to a semi-tractor trailer fire during the receipt and shipping process). This event was assumed to have a high consequence!

For the controlled event, a fire considering expected in-situ and transient combustibles would be a low consequence event. The UF₆ inventory was discounted as not being released during a fire due to insufficient combustibles being present to cause failure of the cylinders. In order to prevent cylinder exposure to a semi-tractor trailer fire in the drive through bay, preventive measures are to receive UF₆ feed cylinders in their U.S. Department of Transportation (DOT) required protective assemblies and to offload the cylinder/protective assemblies to the loading dock! Outgoing product cylinders will be placed into their DOT required overpacks on the loading dock or in the CRDB prior to the cylinder/overpacks being placed on the semi-tractor trailer. Similarly, the DOT required protective assemblies would be installed on outgoing UBCs on the loading dock or in the CRDB prior to the cylinder/protective assemblies being placed on the semi-tractor trailer!

A theoretical truck fire in the CRDB loading bay was analyzed and shown to not pose a threat of rupturing cylinders in the building or on the loading dock applying a minimum of 1 meter (3 feet) spatial separation. This theoretical truck fire aggregated the cumulative combustible load of the vehicle (i.e., 500 liters (132 gallons) of diesel fuel and 744 liters (196 gallons) of fuel equivalent to other content) into a pool fire of 5 meters (16 feet) in diameter. The duration of this fire was calculated to be approximately 22 minutes. This fire severity is less than that required by 10 CFR 71.73(c)(4) for qualification of the cylinder thermal overpack/protective assemblies (i.e., full engulfment of the cylinder in an 800°C (1475°F) hydrocarbon fire for 30 minutes). Additionally, there are conservative assumptions in the analysis that make exposure from this theoretical fire more severe than would be expected to realistically occur (e.g., the bulk fuel load of the tractor is actually spatially separated from the trailer, holding the cylinders, three-fifths of the fuel load cannot physically "pool," and cylinders would not be "engulfed"). As a result, the cylinder handling practices, including use of cylinder overpack/thermal protective assemblies, of IROFS36h will ensure that cylinders containing UF₆ on a semi-tractor trailer will be protected from a theoretical truck fire!

The failure probability index for administrative controls/procedures of IROFS36h was determined to be (-3). The NUREG-1520 criteria – a routine administrative IROFS - applies. The IROFS justification for enhanced administrative control is discussed in Section 3.8.3!

Type of Accident – T for Chemical

CR for Criticality

- (1) Routine landscaping upkeep results in potential fire loading margins to cylinder and building wall fire ratings of such magnitude as to make this event highly unlikely.
- (2) Routine (at least daily) visual inspection by security personnel provides enhanced monitoring.

3.8.3.36h IROFS36h Basis for Enhanced FPIN

The enhanced (i.e., Index of "-3") administrative control to limit fire exposure to feed cylinders, product cylinders, and UBCs containing ≥ 0.1 kg of UF_6 due to a semi-tractor trailer fire during the receipt and shipping process, is based on the following factors:

- (1) Routine (at least daily) visual inspection to verify appropriate cylinder load/unload practices, including installation of required U.S. Department of Transportation (DOT) cylinder overpacks/protective assemblies.
- (2) Additional verification, through manifest/shipping inspection of receipt/delivery vehicles at CRDB entry and departure, that incoming and outgoing cylinders have the required DOT protective assemblies properly installed or are in the required DOT overpacks.

3.8.4 References

CFR, 2003a. Title 10, Code of Federal Regulations, Section 70.4, Definitions, 2003.

CFR, 2003b. Title 10, Code of Federal Regulations, Section 70.61, Performance Requirements, 2003.

IEEE, 1983. Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations, IEEE-323, Institute of Electrical and Electronics Engineers, 1983.

NRC, 1999. Setpoints for Safety-Related Instrumentation, Regulatory Guide 1.105, U.S. Nuclear Regulatory Commission, Revision 3, December 1999.

NRC, 2002. Human-System Interface Design Review Guidelines, NUREG-0700, U.S. Nuclear Regulatory Commission, Revision 2, May 2002.

NRC, 2003. Regulatory Guide 1.180, Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems, Revision 1, October 2003.

NRC, 2004. Human Factors Engineering Program Review Model, NUREG-0711, U.S. Nuclear Regulatory Commission, Revision 2, February 2004.