

April 7, 2004

MEMORANDUM TO: Joseph G. Giitter, Chief
Special Projects Branch
Division of Fuel Cycle Safety
And Safeguards

THRU: Brian W. Smith, Chief **/RA/**
Gas Centrifuge Facility Licensing Section
Special Projects Branch, FCSS

FROM: William M. Troskoski **/RA/**
Senior Chemical Engineer
Mixed Oxide Facility Licensing Section
Special Projects Branch, FCSS

SUBJECT: MARCH 16-18, 2004, IN-OFFICE REVIEW SUMMARY: LOUISIANA
ENERGY SERVICES' INTEGRATED SAFETY ANALYSIS IN-OFFICE
REVIEW

On March 16-18, 2004, U.S. Nuclear Regulatory Commission (NRC) staff met with Louisiana Energy Services (LES), Framatome, and Urenco staff to discuss the classified portions of the Integrated Safety Analysis documentation for the LES gas centrifuge uranium enrichment plant project proposed to be located in Eunice, New Mexico. FCSS staff also toured the Urenco facility at Almelo, The Netherlands, and conducted discussions with plant staff concerning process operations, event history, and ISA related topics. I am attaching the in-office review summary for your use. This summary contains no proprietary or classified information.

Docket: 70-3103

Attachments: 1. LES Meeting Summary
2. Meeting Agenda
3. Urenco Presentations:

cc: W. Szymanski/DOE C. Claiborne/Jal D. Holmberg/Lea County W. Floyd/NM
R. Krich/Exelon M. Newman/Hobbs J. Brown/Eunice R. Ratliff/Texas
J. Curtiss/W&S T. Harris/Lovington M. Marriotte/NIRS J. Clift/ Hartsville
P. Miner/USEC B. Richman/Tatum CO'Claire/Ohio L. Chaney/CNIC
J. Ferland/LES G. Hackler/Andrews Derrith Watchman-Moore/NM

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OFC	SPB		SPB		SPB		FCSS	
NAME	WTroskoski:dw		LGross		BSmith		RPierson	
DATE	4/ 06 /04		4/ 06 /04		4/ 06 /04		4/ 07 /04	

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Summary of In-Office Review of
Louisiana Energy Services Integrated Safety Analysis

Dates: March 16-18, 2004

Place: Urenco Gas Centrifuge Uranium Enrichment Facility
Almelo, The Netherlands

Attendees:

H. Felsher/NRC	B. Dekker/Urenco
R. Pierson/NRC	P. de Jong/Urenco
B. Smith/NRC	H. Voschezand/Urenco
W. Troskoski/NRC	M. Kennedy/Framatome ANP
	A. Pilkington/RM Consultants
	R. Krich, LES

Purpose:

The purpose of this in-office review was to review and discuss the classified documentation related to the Louisiana Energy Services (LES) Integrated Safety Analysis (ISA) for its gas centrifuge uranium enrichment plant proposed to be located in Eunice, New, Mexico, and to tour the gas centrifuge uranium enrichment facility.

Discussion:

The proposed LES National Enrichment Facility (NEF) is based on Urenco technology. A significant portion of the ISA was developed through a validation process of the Urenco HAZOPs. This portion of the HAZOP and supporting ISA documentation is considered to be sensitive classified information by the nations hosting the existing Urenco facilities. The NRC staff has previously reviewed the non-classified ISA material at the Framatome offices in Marlborough, Massachusetts, on March 9-10, 2004 (see trip report dated March 25, 2004).

During the site visit, the staff toured the facility control rooms and process areas, and observed the equipment and components that are proposed to be used at the NEF. The NRC staff conducted discussions with the plant personnel concerning the operational and maintenance requirements and experience. The staff also received presentations concerning:

1. Uranium Hexafluoride Processing
2. Equipment Operating Experience
3. Waste Treatment
4. Radiation Protection and Regulatory Compliance
5. Approach to Criticality [Safety] in the NEF Project
6. Water Consumption

The uranium hexafluoride presentation covered feed, enriched and depleted uranium process streams, and uranium cylinder receipt, dispatch, and storage activities. Plant operating history

Attachment 1

reviewed included the decommissioning activities for the SP-1 section of the plant down to “green-fields” specifications and general production activities.

LES bases a significant portion of the ISA risk evaluation upon the operating history of the Urenco facilities. The equipment operating experience presentation covered the 30-years of operating experience related to the equipment and components proposed to be used by LES at the NEF. Urenco officials informed the staff that none of the described accident sequences of concern have ever occurred. It was pointed out that the SP-5 design proposed to be used by LES is the product of many upgrades as a result of lessons-learned and operational improvements. Specific topics covered included: heater control failure; cylinder overfill; uranic releases due to equipment failure; wrong cylinder connections (prevention of connecting a product cylinder to a feed station); criticality in product pumps, cylinders, and storage; saturated carbon traps; and, criticality in the gaseous effluent ventilation system.

Urenco officials discussed several operational events and conditions related to the accident sequences developed by LES. One operating event that was discussed included blockage of a cylinder valve in an SP-4 autoclave. The corrective actions that were subsequently applied to the SP-5 design (and to be implemented by LES) improves on the pressure or temperature control and the addition of several independent hardware and software controls. Two events involving a slight overfill of tails cylinders occurred due to a failed load cell. As a result, another type of load cell was installed and an hourly total mass check control was added. There has been no significant uranium hexafluoride or uranic material releases. No material has been found in the SP-5 gaseous effluent ventilation system. There has been no significant accumulations of uranium in any of the pumping systems. No moderation control problems have occurred in any of the product, donor or receiver cylinders. There has also not been any significant accumulations of uranium mass in the chemical traps, waste treatment and collection tanks, or oil storage.

The information provided concerning radiation protection and waste treatment demonstrated exposure and release levels were low and well within NRC requirements. It was noted that the individuals with the highest exposures were involved with cylinder handling and transport activities.

The criticality safety approach covered the preferred hierarchy of safety design (passive engineered controls, active engineered controls, followed by administrative controls), the double contingency principle, and interactions (Monk8A). Safe geometries are conservatively based on 6 weight percent of U-235. Specific components and systems reviewed included 30-inch product cylinders, the product vent subsystem pump/trap sets, product pumps, the citric acid decontamination tank, and material movement rules.

Based on 3MSWU/year, the estimated water consumption for the Almelo plant would be about 15 million gallons annually. This estimate is based on water consumption for the year 2003, which was an extremely warm summer.

Urenco officials also provided the responses to the following staff questions:

- Is there anything required to safely shutdown the plant (i.e., vacuum, offsite power)?
No, various systems are provided for investment protection only.

- Is cooling water required for safety? No, it is for investment protection only.
- What has been the operating experience with fires? There have been several minor smoldering electrical events, but no offsite assistance has ever been required.
- When will the IROFS packages be ready? An A/E firm is expected to be selected by about June 2004 and the packages are expected to be developed by the end of the year.

The staff found the site visit to be helpful in understanding the technology, plant system operations, and the bases for the accident sequences and process risk assessments contained in the LES application. Valuable safety insights were gained and the potential risks associated with the Urenco technology-based gas centrifuge uranium enrichment plants are better understood.