

ENCLOSURE

U. S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket No.: 40-8681

License No.: SUA-1358

Report No.: 40-8681/97-01

Licensee: Energy Fuels Nuclear, Inc.

Facility: White Mesa Mill

Location: Blanding, Utah

Inspection Dates: January 14-16, 1997

Inspector: M. Linda McLean, Senior Health Physicist

Approved By: Charles L. Cain, Acting Division Director  
Division of Nuclear Materials Safety

Attachment: Supplemental Information

## EXECUTIVE SUMMARY

### White Mesa Mill Facility NRC Inspection Report 40-8681/97-01

This inspection included a review of site status, management organization and controls, site operations, and the licensee's radiation protection, and environmental monitoring programs.

#### Management Organization and Controls

- The site's organization and management controls met the requirements of the license. The site staffing was appropriate for the amount of work in progress at the facility (Section 2).

#### Operations Review

- Site activities appeared to have been conducted in accordance with applicable license and regulatory requirements (Section 3).
- The procedures were found to contain the required limits and controls specified in 10 CFR Part 20 and in the license, and appeared appropriate for the type of work being performed at the facility (Section 3).

#### Radiation Protection

- The licensee had implemented a radiation protection program that met requirements of 10 CFR Part 20 and the conditions of the license with one exception. A non-cited violation was identified involving the licensee's failure to provide the 1995 dose report to workers required by 10 CFR Part 19 (Section 4).
- Occupational doses appeared consistent with the level of activity in progress at the site (Section 4).

#### Environmental Monitoring

- The licensee's implementation of its environmental monitoring program appeared effective and met applicable regulatory requirements and the conditions of the license (Section 5).

#### Followup

- Violation 40-8681/96-01: failure to notify the NRC of a mill circuit change was closed (Section 6).

## Report Details

### **1 Site Status**

The Energy Fuels Nuclear, Inc.'s (EFN) uranium processing facility (White Mesa Uranium Mill) was not in operation during this inspection. Site activities included routine maintenance and environmental and radiation surveillances required by their license. Operations were planned to start up in May 1997, in order to process the alternate feed material approved by license Amendment 43. The mill completed the last ore run in February 1996, and the calcium fluoride alternate feed run in August 1996. About 12 thousand drums of calcium fluoride were processed from May through August. Approximately 728 thousand pounds of  $U_3O_8$  had been produced during 1996.

In the mill standby mode, 24 full-time employees worked at the site. Approximately 98 full time workers were employed during full mill operation.

### **2 Management Organization and Controls (88005)**

#### **a. Inspection Scope**

The organizational structure was reviewed to ensure that the licensee had established an organization with defined responsibilities and functions.

#### **b. Observations and Findings**

The licensee stated that EFN holdings are being purchased by International Uranium Holdings Corporation (IUC), a Canadian company. The licensee has submitted a request to the NRC to transfer the license to IUC. No organizational changes were planned that would differ from that described in the license. At the time of the inspection, EFN was operating under Amendment 43 of NRC License SUA-1358. The license has an expiration date of September 23, 1991, and is considered under timely renewal. Amendment 43 authorized the licensee to receive and process alternate source material (potassium hydroxide).

At the conclusion of the ore mill run in February 1996, the mill manager and the mill superintendent retired. The former maintenance superintendent was moved into the mill manager position. In addition, a new radiation safety officer (RSO) started in May 1996. The former RSO resigned in April 1996. Other staff changes included the resignation of the environmental coordinator. This position has not been replaced. The environmental technician had taken over the responsibilities of that position. None of these changes were in nonconformance with license requirements.

License Condition 30 specifies the required education, training, and experience for the RSO position. The inspector reviewed the qualifications of the new RSO and found them to satisfy the license condition.

c. Conclusions

The licensee's organization and management controls met the requirements of the license. The site staffing was appropriate for the amount of work in progress at the facility.

3 **Operations (88020)**

a. Scope

The inspector reviewed licensee operations to determine compliance with applicable requirements specified in the license.

b. Observations and Findings

Mill operations were in standby during the inspection. In addition, the weather conditions prevented an extensive tour of the mill site (nearly 30-inches of snow had fallen in the area in 2 days). Nonetheless, a limited tour of the mill site was conducted. The tour included the solvent extraction building, the central control room, and the processing facility, which included the two operating dryers and the yellowcake packaging area. The housekeeping in the plant was observed to be very good. Areas were being kept clean and orderly. No evidence of leaking valves or tanks was observed.

License Condition 56 authorizes EFN to receive and process alternate source material from Allied Signal Corporation (Allied). The White Mesa Mill received from Allied 12 thousand barrels of uranium bearing calcium fluoride (containing 2-3 percent natural uranium), a byproduct of the uranium conversion process. This material was processed May through August 1996. Approximately 250 drums of the calcium fluoride were not processed. The licensee planned to process this material this summer following the run of the alternate feed potassium hydroxide authorized by License Condition 59.

Several of the licensee's standard operating procedures (SOPs) were reviewed by the inspector. Pursuant to License Condition 29, an annual review of procedures is required. Records showed that the new RSO had reviewed the SOPs. The inspector reviewed the SOPs that had been established for the calcium fluoride alternate feed process. The SOPs included precautions for radiation safety as well as chemical safety (hydrogen fluoride was a significant chemical concern during production). Employees were required to read the procedures prior to production. The training was documented by signature of those involved in the process.

c. Conclusions

Site activities appeared to have been conducted in accordance with applicable license and regulatory requirements.

The procedures were found to contain the required limits and controls specified in 10 CFR Part 20 and in the license, and appeared appropriate for the type of work being performed at the facility.

4 **Radiation Protection (83622)**

4.1 Inspection Scope

The purpose of this portion of the inspection effort was to determine if the licensee's radiation safety program was in compliance with requirements established in the license and 10 CFR Part 20 regulations.

4.2 Observations and Findings

a. Employee Exposures

To ensure that personnel had been properly monitored for potential exposures to radioactive materials, the licensee's internal and external monitoring programs were reviewed. The licensee's personnel monitoring program consisted of issuance of thermoluminescent dosimeters (TLDs), sampling for airborne natural uranium and radon, and obtaining urine bioassay samples from site workers.

The licensee reported that during 1995, the highest total effective dose equivalent was 1.09 rem including 0.709 rem deep dose equivalent. The highest committed effective dose equivalent for 1995 was reported as 0.68 rem. Occupational doses appeared consistent with the level of activity at the site. Employees were issued TLDs quarterly. The fourth quarter 1996 dosimetry results had not been received from the vendor at the time of this inspection; therefore, the 1996 total effective dose equivalent data had not been calculated.

The RSO stated that the licensee had not notified during 1996 each worker of their dose received during 1995 as shown in records maintained by the licensee pursuant to the provisions of 10 CFR 20.2106. This was identified as a violation of 10 CFR 19.13 (40-8681/9701-01). The RSO identified the violation during a program audit conducted during November 1996 and stated that he had not completed collecting the data necessary to provide the reports. Although this failure constitutes a violation of 10 CFR 19.13, it is being treated as a non-cited violation since it satisfies the conditions of Section IV of the NRC Enforcement Policy as a licensee-identified violation.

b. Annual ALARA Audit

In compliance with License Condition 33, the licensee submitted the 1995 annual ALARA report by letter dated March 29, 1996. The report contained all of the required information and complied with the requirements of the license. The 1996 annual ALARA audit was conducted on November 4-5, 1996, by EFN's environmental manager and an individual from another uranium recovery site. The preliminary report was reviewed by the inspector. Corrective actions for items identified during the audit were in-progress at the time of the inspection.

c. Employee Training

A review of records relating to personnel training was performed. The inspector reviewed training records of several employees. In compliance with 10 CFR Part 19, the licensee had provided radiation safety training to all radiation workers. The inspector reviewed the agenda and found that it covered the topics specified in 10 CFR Part 19. In addition, each employee was furnished with EFN's "White Mesa Mill Safety Rules" booklet. This document provided the employee with information relating to radiation safety and industrial safety. The RSO planned to receive offsite training, required by License Condition 30 every two years, during 1997.

d. Radiation Surveys/Radiation Work Permits (RWP's)

The radiation safety program activities included weekly, monthly, and quarterly inspections. License Condition 32 requires that the RSO and mill foreman, or qualified designees, perform weekly inspections of all mill areas to observe general radiation control practices. In addition, the license requires that at a minimum the RSO conduct one weekly inspection per month during mill standby and two weekly inspections per month during production. It was noted during the licensee's internal ALARA audit conducted in November 1996, that the RSO had conducted the required weekly inspections but had not signed the inspection reports. Since the ALARA audit, the RSO has documented his participation in the weekly inspections.

In addition to the weekly inspections and pursuant to License Condition 32, the RSO is to prepare a monthly radiation safety report, which includes a review of these inspections and a summary of all monitoring and exposure data for the month for submission to facility management. The inspector reviewed the fourth quarter 1996 monthly reports and noted that prompt corrective action was taken for items found during the inspections. The reports were found to include appropriate topics and concerns for the activities in progress and complied with the requirements of the license.

A review of records relating to equipment releases was performed. The inspector found them to be in compliance with License Condition 14.

License Condition 31 requires the use of RWPs for work not covered by standard operating procedures in restricted areas or areas where the potential for exposure to radioactive materials exists. Approximately 85 RWPs were issued in 1996. The inspector reviewed a representative sample of the RWPs issued since the last inspection and concluded that the RWPs adequately addressed the safety hazards involved with the activities.

e. Bioassay Program

The bioassay program was reviewed to determine compliance with License Condition 38 and 10 CFR Part 20. The licensee used an action level of 15 micrograms per liter ( $\mu\text{g/l}$ ) uranium in urine samples. In 1996 one urine sample result was reported at a concentration of 24  $\mu\text{g/l}$ . The licensee conducted an investigation and followup urinalysis on the individual in accordance with the requirements in the license and guidance provided in Regulatory Guide 8.22, "Bioassay At Uranium Mills." The licensee concluded that the urine sample had been inadvertently contaminated and that there had been no uranium intake. The inspector concluded that the licensee was in compliance with Subpart C of 10 CFR Part 20.

f. Radioactive Waste Management

License Condition 55 authorizes the licensee to dispose of byproduct material generated at licensed in situ leach facilities. The disposal is limited to 5,000 cubic yards from a single source, and is to be placed in Cell 3. Two in situ leach facilities shipped material to the White Mesa mill site for disposal during 1996. Total volume of waste received from the two generators in 1996 was approximately 96 and 425 cubic yards respectively. It was noted that one generator had disposed of approximately 4,608 cubic yards of material since 1994, close to the maximum limit authorized for a single source. The material consisted mostly of PVC, scrap metal, and dirt. In addition, License Condition 42 authorizes the disposal of material and equipment generated at the mill site. The material consisted mostly of office waste and mill generated waste. Approximately 10 acres within Cell 2 was used as the disposal location.

4.3 Conclusions

The licensee had implemented a radiation protection program that met the requirements established in 10 CFR Part 20 and the license with one exception. A non-cited violation was identified involving the licensee's failure to provide the 1995 dose report to workers pursuant to 10 CFR Part 19. Occupational doses appeared consistent with the level of activity in progress at the site.



**5 Environmental Protection (88045)**

a. Inspection Scope

The environmental monitoring program at the site was reviewed to assess the effectiveness of the licensee's program and to evaluate the effects, if any, of the site's activities on the local environment.

b. Observations and Findings

The licensee is required by License Condition 26 to conduct daily, weekly, and monthly tailings retention system and liner inspections. The environmental technician has been conducting the inspections required by the license condition. One weekly inspection was missed during 1996 (the week of December 22-28, 1996), due to the holiday schedule. It was identified and noted by the licensee.

License Condition 17 requires that the licensee conduct an annual survey of land use (private residences, grazing areas, private and public potable water and agricultural wells, and non-residential structures and uses) in the area within five miles of any portion of the restricted area boundary. In addition, the licensee is to submit a report of this survey to the NRC indicating any differences in land use from that described in the last report. EFN submitted the report by letter dated August 27, 1996. The following are the five land changes discussed in the report:

- (1) A National Guard Armory was in use on a full time basis;
- (2) Construction began on a new hospital located about 4.25 miles north of the mill;
- (3) A new lumber yard was constructed approximately 4.5 miles north of the mill;
- (4) Two new residences were being built four miles north and one mile east of the mill. Both of the residences are in areas which will require wells; and
- (5) Six modular homes were being located on the edge of the town of Blanding which is included within the 5 mile radius. City water will be supplied to the six homes.

License Condition 18 requires that results of effluent and environmental monitoring must be reported to the NRC on a semiannual basis pursuant to 10 CFR 40.65. The semiannual effluent report for the first half of 1996, dated August 29, 1996, was reviewed. (The report for the second half of 1996 was not available at the time of the inspection.)



The program in place at the site at the time of the inspection consisted of airborne particulate, direct radiation, ground water, surface water, soil, and vegetation sampling. The licensee had obtained the required samples at the specified frequency and reported the sample results to the NRC in a timely manner. Five sample stations were used by the licensee, including one located at the nearest residence and one background control station. Each sample station consisted of an air particulate monitor and a TLD. The licensee sampled for natural uranium, thorium-230, radium-226 (Ra-226), and lead-210 (Pb-210) particulates. The results indicated that all concentrations were less than the limits established in 10 CFR 20, Appendix B.

TLDs were used to measure the ambient gamma radiation levels at the five sample stations. Three stations were located within the property boundary, one station was located at the nearest residence, and the background station was located southwest of the mill site. During the first half of 1996, the highest measurement (5.98 millirems with background subtracted) was obtained at the east tailings area. The measurement at the nearest resident station was less than background.

Vegetation samples were taken three times (spring, late spring, and fall) during 1996 at three locations around the mill site periphery. The licensee reported that the Ra-226 and Pb-210 concentrations at each sampling location remained constant.

c. Conclusions

The licensee's implementation of its environmental monitoring program appeared effective and met applicable regulatory requirements and the conditions of the license.

**6 Followup (92702)**

**6.1 (Closed) Violation 40-8681/9601: failure to Notify the NRC of a Mill Circuit Change.**

The previous NRC inspection identified a violation involving the failure to notify the NRC of a change in the mill circuit. License Condition 13 requires that any changes in the mill circuit as illustrated and described in Plate 3.1-1 of the August 1991 renewal application, and revised by amendment request of November 22, 1994, for the addition of the second dryer, require approval by the NRC. The licensee failed to notify the NRC of the yellowcake hopper line disconnection which constituted a change in the licensee's mill circuit. The failure to notify the NRC of a change in the mill circuit was identified as a violation of License Condition 13.

During the tour of the mill site, the inspector verified that the yellowcake hopper line had been reconnected. In addition, the licensee's corrective actions to prevent recurrence in other areas appeared to be effective.

Exit Meeting Summary

The inspector presented the inspection results to the site representatives of the licensee at the conclusion of the inspection on January 16, 1997. Licensee representatives acknowledged the findings as presented.

## Attachment

### PARTIAL LIST OF PERSONS CONTACTED

#### Licensee

William N. Deal, Mill Manager  
Michelle R. Rehmann, Environmental Manager  
Ron E. Berg, Radiation Safety Officer  
Shannon Clark, Environmental Technician  
Wayne Palmer, Radiation Technician

### INSPECTION PROCEDURES USED

IP 88005: Management Organization and Controls  
IP 88020: Operations Review  
IP 83822: Radiation Protection  
IP 88035: Radioactive Waste Management  
IP 88045: Environmental Protection  
IP 92702: Followup

### ITEMS OPENED, CLOSED AND DISCUSSED

#### Opened:

40-8681/9701-01    NCV    Failure to provide the 1995 dose report to workers; a violation of 10 CFR 19.13

#### Closed:

40-8681/96-01    VIO    Failure to notify the NRC of a change in the mill circuit.

40-8681/9701-01    NCV    Failure to provide the 1995 dose report to workers; a violation of 10 CFR 19.13

#### Discussed:

None

### LIST OF ACRONYMS USED

EFN	Energy Fuels Nuclear
IUC	International Uranium Corporation
RSO	radiation safety officer
RWP	radiation work permit
SOP	standard operating procedures
TLD	thermoluminescent dosimeter