APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 40-8681/83-01 License: SUA-1358

Licensee: Energy Fuels Nuclear Inc.
P. O. Box 787
Blanding, Utah 84511

Docket: 40-8681

Facility: White Mesa Mill

Inspection At: Blanding, Utah

Inspection Conducted: May 11-12, 1983

Inspector: C L Cain 6/6/83
C. L. Cain, Radiation Specialist Date

Approved By: R.J. Everett 6/7/83
R. J. Everett, Chief, Materials Radiation Protection Section Date

Inspection Summary

Inspection conducted on May 11-12, 1983 (Report: 40-8681/83-01)

Areas Inspected

Routine, announced inspection of uranium milling operations and radiation safety program including organization, management, and training; internal exposure control; external exposure and contamination control; facilities and equipment; environmental monitoring and tailings management; and independent measurements. The scope of the inspection was limited since the mill had discontinued ore processing on February 3, 1983. The inspection involved 11 hours onsite by one NRC inspector.

Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

*D. K. Sparling, Manager of Uranium Processing
*D. E. Smith, Environmental and Safety Supervisor
*L. K. Perkins, Radiation Safety Officer (RSO)
*D. C. Bradford, Radiation Safety Technician
*G. A. Jones, Industrial Safety Specialist
*S. Palmer, Maintenance Supervisor
*G. Pangburn, NRC Uranium Recovery Field Office

*Denotes those present at the exit briefing.

2. Licensee Action on Previous Inspection Findings

(Closed) Violation (40-8681/82-01): Overexposure of one individual to airborne soluble uranium and failure to perform evaluations in regard to the weekly limit for soluble uranium and the 40-hour control measure for other radionuclides. The inspector found that the required evaluations had been performed since the last inspection and that all other commitments, such as increased sampling efforts, had also been implemented.

(Closed) Violation (40-8681/82-01): Failure to report overexposure to NRC and individual exposed. No reportable exposures have occurred since the last inspection.

(Closed) Violation (40-8681/82-01): Failure to post airborne radioactivity areas. The inspector reviewed documentation indicating areas that had been so posted since the last inspection.

(Closed) Violation (40-8681/82-01): Failure to use source material in accordance with license application. The inspector noted that licensee commitments had been implemented including calibration of air samplers, investigation of unusual exposures, and provision of adequate personnel contamination monitoring equipment.

(Closed) Violation (40-8681/82-01): Failure to perform surveys for fixed contamination on items released to unrestricted areas. The inspector reviewed survey records and confirmed that such surveys had been performed since the last inspection.

(Closed) Violation (40-8681/82-01): Failure to perform surveys for fixed contamination in controlled areas of the mill. The inspector reviewed survey records and confirmed that such surveys had been performed since the last inspection.

(Closed) Violation (40-8681/82-01): Failure to maintain required lower limits of detection for environmental sample analysis. The inspector confirmed that appropriate limits have been maintained since the last inspection.

(Closed) Violation (40-8681/82-01): Failure to submit annual source material inventory reports. The inspector confirmed that such reports had been prepared for 1981 and 1982.

(Closed) Violation (40-8681/82-02): Failure to include required elements in semiannual ALARA reports. The inspector determined that the subsequent report, in draft form at the time of the inspection, contained all required elements.

(Closed) Open Item (40-8681/82-01/01): Failure to follow up on unidentified radionuclide findings in in vivo lung counts. The licensee presented documentation describing the results of supplemental counting.

(Closed) Open Item (40-8681/82-01/02): Failure to maintain strong, tight shipping containers by use of larger closure bolts. The inspector confirmed that the licensee had begun use of the larger 5/8-inch bolts.

3. Organization, Management, and Training

Ore feed at the mill had been discontinued as of February 3, 1983, and only solvent extraction circuitry was in operation at the time of the inspection. Tailings solutions from Cells 1 and 2 were being recycled through the mill and returned to Cell 3. The licensee stated that this effort would continue through the remainder of the year, at which time the mill would be placed in full stand-by mode. Occassional use of product drying and packaging apparatus is expected during the recycle phase.

Several organizational changes had occurred in the safety department since the last inspection during November 1982. L. K. Perkins, previously Assistant RSO, had been appointed RSO as of January 17, 1983. He reported to the newly appointed Environmental and Safety Supervisor, D. E. Smith, who had previously held the title of Environmental Specialist. The corporate position of Manager of Regulatory Compliance had been eliminated and this function had been assigned to Harold R. Roberts at the Denver office of the licensee.

The licensee stated that the current mill staff was 38, down from 148, at the time of the previous inspection, and that there had been no major modifications to mill circuitry since the last inspection.

The inspector reviewed the radiation safety procedures manual and found the contents to be adequately comprehensive as reported for the last inspection. The radiation work permit system appeared to be operating effectively and was otherwise in conformance with the license application.

The inspector reviewed various licensee internal audit reports and found them to be similar to those reported during the previous inspection. The semiannual ALARA report due in February 1983 had not yet been submitted. The licensee stated that the delay was due to changes required in the report as a result of the NRC Notice of Violation issued February 22, 1983. The licensee further stated that an independent consultant was no longer being retained to assist in the report preparation.

The mill radiation safety training program was found to have been sustained in a fashion similar to that noted during the previous inspection. The inspector deemed the program to be adequate, especially in light of the current reduced level of operation.

4. Internal Exposure Control

a. General

The licensee demonstrated a number of program changes that had been made since the last inspection. The inspector noted that increased monitoring and improved recordkeeping fully responded to the program deficiencies previously identified.

b. Inplant Air Sampling

Since the last inspection the licensee had added sampling points within the yellowcake dryer and packaging enclosures and had increased the frequency of all samples in yellowcake areas from monthly to weekly. In addition, the yellowcake precipitation operator and the packaging operator have each been required to wear lapel samplers for one shift per week. Sampling equipment, procedures, and analytical methods remained the same as previously reported. Sample results were noted to have been reported from the lab in a timely fashion and sample analytical intercomparisons had been performed with an independent laboratory.

The inspector also reviewed data associated with the monitoring of Th-230, Ra-226, and Rn-222 progeny. Semiannual radium and thorium data had been reported by vendor and had been converted to appropriate regulatory units of measurement by the licensee. These data were noted to be substantially below their respective maximum permissible concentrations (MPC's). Monthly radon progeny samples, analyzed by the licensee using the modified Kusnetz method, were noted to have been as high as 75 percent of the MPC in the grinding area. In these cases, as well as similar cases for other radionuclides, licensee records indicated that the area had been posted as an airborne radioactivity area.

The licensee also presented records demonstrating that air sampling equipment had been calibrated monthly by the licensee using a vendor-calibrated flowmeter. The licensee stated that air sampling had not been performed in the sampling plant since the last inspection because this facility had not been used.

c. Exposure Determination

The inspector found that airborne radionuclide exposure records had been carefully maintained since the last inspection and that no worker had been exposed above regulatory limits during that interval. The licensee had also modified records systems to assess worker

exposure in regard to the 40-hour control measure. Several investigation reports were on file pertaining to workers who had exceeded the control measure or who had abnormally high exposures to soluble uranium. Some of these made reference to workers who had been exposed to radon progeny in excess of 0.08 WLM per month.

For radionuclides other than soluble uranium, the licensee was using a computer program to calculate worker status in regard to maximum permissible exposure each month. Worker occupancy times were derived from time cards except for soluble uranium where a time study had been performed.

d. Respiratory Protection

Although the licensee had previously notified NRC of its intent to initiate use of a full respiratory protection program starting December 20, 1982, the licensee stated that protection factors had never been applied to exposure calculations and that no use was anticipated as long as the mill was shut down. However, the inspector briefly reviewed the program and found no violations in regard to 10 CFR 20.103(c)(d)(e) and (f).

e. Bioassay

The inspector reviewed the urine bioassay program and found that there had been no program changes since the last inspection. All program elements complied with draft Regulatory Guide 8.22 as reported for the previous inspection.

Although no routine in vivo measurements were due or had been performed since the last inspection, several workers had been counted at the University of Utah in response to the inspector's earlier concern regarding unidentified isotopes reported by the vendor. Records of these latest counts indicated insoluble uranium to be less than 6 nanocuries for each person, and no other radionuclides were identified.

5. External Exposure and Contamination Control

The inspector reviewed records of worker external dosimetry and results of area dosimeters and instrument surveys. Program elements and data were similar to previous findings.

In addition to surveys for fixed alpha contamination on items released to unrestricted areas and for various areas within the mill, the licensee had instituted surveys for removable contamination as well. All data were observed to be below license limits, and instrumentation was found to have been properly calibrated.

The licensee stated that all mill workers were still required to undergo an alpha survey prior to leaving the mill restricted area. The

inspector performed a sensitivity test on the equipment in use and found the alarm set point to be adjusted to 70 percent of the release limit of 1,000 dpm/100 cm^2.

6. Facilities and Equipment

The inspector toured the mill and noted most facilities to be in shutdown mode. The licensee pointed out that the product scales had been relocated within the packaging enclosure in order to decrease exposure to the packaging operator. Regulatory warning signs were conspicuous within the mill and on perimeter fences.

The inspector noted that employee notices required by 10 CFR 19.11 and 21.6 were posted and that the licensee had submitted annual source material inventory reports for 1981 and 1982 as required by 10 CFR 40.64(b). The licensee stated that there had been no changes to the fire protection program since the last inspection.

The inspector toured the product storage compound and noted that most of the drums now included the larger 5/8-inch closure bolts. The licensee stated that all drums would include this feature in the future. All drums were observed to be properly marked as "Radioactive - LSA."

7. Environmental Monitoring and Tailings Management

The inspector observed sprinklers to be operating on the tailings cells and that there was minimal blowing of tailings and ore dust. A review of records indicated that freeboard limits for each of the three tailings cells had not been exceeded. Also reviewed were records of daily impoundment inspections performed by the licensee.

The inspector reviewed the fourth quarter 1982 effluent and environmental monitoring report in the regional office prior to the site inspection and reviewed at the site 1983 data that had been accumulated so far. The licensee had completed data reporting under the special 40 CFR 190 assessment as of October 1, 1982. All data appeared to be complete and comparable with those previously reported. Quoted lower limits of detection were within license guidelines.

8. Independent Measurements

The inspector performed exposure rate surveys throughout the mill and found the readings to be typical of a mill environment. Air samples were not obtained since the mill was not operating.

9. Exit Interview

The inspector met with licensee personnel referenced in Section 1 on May 12, 1983, and summarized the purpose, scope, and findings of the inspection.