

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
REGION IV

Report No. 40-8027/79-01

License No. SUB-1010

Licensee: Kerr-McGee Nuclear Corporation  
Kerr-McGee Center  
Oklahoma City, Oklahoma 73125

Docket No. 40-8027

Facility: Sequoyah Uranium Hexafluoride Conversion Facility

Inspection at: Gore, Oklahoma

Inspection conducted: May 21-24, 1979

Inspector: C. L. Cain 6/19/79  
C. L. Cain, Radiation Specialist Date

Approved by: G. D. Brown 6/22/79  
G. D. Brown, Chief, Fuel Facility and Material Safety Branch Date

Inspection Summary

Inspection on May 21-24, 1979, (Report No. 40 08027/79-01)

Areas Inspected: Routine, unannounced inspection of uranium conversion facility operations and radiation program including organization and administration; facilities and equipment; internal exposure control; external exposure control; effluent and environmental monitoring; audits and training; emergency planning and fire protection; posting, labeling and reports; instrumentation; and independent measurements. The inspection involved twenty-three (23) hours on site by one inspector.

Results: Of the ten (10) areas inspected, no items of noncompliance or deviations were identified in nine (9) areas; one (1) apparent item of noncompliance was identified in one (1) area (infraction-improper use of half-mask respirator, ref. paragraph 5).

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## DETAILS

1. Persons Contacted

- \*J. W. Craig, Manager, Sequoyah Facility
- \*C. E. Grossclaude, Manager, Health Physics & Industrial Safety
- L. H. Harrison, Manager, Administration & Accounting

\*Members present at exit interview.

In addition the inspector interviewed one member of the plant operating force.

2. Licensee Action on Previous Inspection Findings

- A.. (Open) Noncompliance (40-8027/78-01): This item involved failure to use respiratory protective equipment in accord with Regulatory Guide 8.15. The inspector verified that all workers using such equipment had completed a fitting and training program and that workers who used half-mask respirators performed an irritant smoke test each time such equipment was donned. However, the inspector observed use of a half-mask respirator with head straps placed over the hard hat thus preventing straps from lying in their normal position next to the head as required by NUREG-0041.
- B. (Closed) Noncompliance (40-8027/78-01): This item involved failure to equip a high radiation area with entrance or access control devices. The inspector observed no areas posted as high radiation areas at the time of the inspection.
- C. (Closed) Noncompliance (40-8027/78-01): This item involved failure to establish procedures regarding 10 CFR 21 implementation. The inspector observed that such procedures had been adopted.
- D. (Closed) Noncompliance (40-8027/78-01): This item involved failure to control contamination levels and to administer annual tests to workers. The inspector verified that contamination levels were being maintained below the control level and that examinations had been administered to workers.
- E. (Closed) Noncompliance (40-8027/78-01): This item involved failure to obtain and analyze soil samples. The inspector verified that such samples had been obtained and analyzed.
- F. (Closed) Noncompliance (40-8027/78-01): This item involved failure to obtain and analyze reservoir bottom sediment samples. The inspector verified that such samples had been obtained and analyzed.

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### 3. Organization and Administration

Discussions with licensee management established the following corporate and facility organization on the dates of the inspection:

#### Corporate

P. M. Moore, President, Kerr-McGee Nuclear Corporation  
R. P. Luke, Vice President, Manufacturing & Marketing  
B. E. Brown, General Manager, Nuclear Manufacturing  
W. J. Shelley, Director, Regulation & Control  
G. J. Sinke, Coordinator, Radiation Health & Safety

#### Sequoyah Facility

J. W. Craig, Manager, Sequoyah Facility  
C. E. Grossclaude, Manager, Health Physics & Industrial Safety  
L. H. Harrison, Manager, Administration & Accounting

The licensee stated that Mr. J. W. Craig was appointed to his present position during December 1978 at which time Mr. B. E. Brown was relocated to the Kerr-McGee main office in Oklahoma City.

The licensee stated that the facility staff is comprised of 156 employees. The Health Physics and Industrial Safety organization includes one (1) manager, six (6) technicians, and one (1) clerk.

### 4. Facilities and Equipment

The inspector toured the plant on May 21, 1979, and the liquid effluent retention areas on May 23, 1979, to observe operations in progress and to verify that equipment and facilities were in accordance with applicable licensee requirements. The licensee stated that the plant process rate was approximately 7800 short tons per year, and that the plant operating schedule was twenty-four (24) hours per day, seven (7) days per week. The inspector observed that retention walls had been constructed around the process boildown tanks to contain any overflow such as that which occurred during December 1978 (Ref. IE Investigation Report 78-02 dated 1/10/79). Also evidenced was a major effort to decontaminate and paint many plant process areas. Under construction were facilities to process  $UF_4$  slurry. A tour of the waste ponding areas revealed that construction of Pond No. 3 was complete. The licensee stated that two million gallons of processed

raffinate from Pond No. 1 had been transferred to this new pond.

The inspector sought to determine if UF<sub>6</sub> cylinder valve packing nuts identified as potentially defective by DOE had been located and withdrawn from use. The licensee was in possession of a letter dated January 15, 1979, from Superior Valve Company which identified the questionable valves by date code and heat number. The licensee stated that the packing nuts on these valves had been replaced with ones of established good quality and that the removed nuts were being held for eventual destruction. The inspector observed that the questionable nuts were being stored in a holding area.

#### 5. Internal Exposure Control

The licensee's air sampling program is described in the License Application, Appendix A. Licensee records listed 45 air sampling locations in work locations within the plant. These samples are collected each 8-hour shift and analyzed radiometrically for total alpha emission. Each worker is required to tabulate his work time in each area. The MPC-hour exposure is then calculated on a seven-day exposure period.

A review of air sampling data revealed some areas in the plant where airborne radioactivity concentrations exceeded Part 20, Appendix B, Table I, limits. Exposure records indicated no evidence of overexposure to personnel. This was achieved by limiting occupancy and/or utilizing respiratory protection equipment. Daily Radiological Status Reports listing air sample results greater than 0.5 MPC were reviewed. These reports were noted to be distributed to various plant and corporate management personnel. Process engineering controls have been implemented to reduce airborne radioactivity concentrations, but concentrations were still recorded above those that would delimit an airborne radioactivity area. Process engineering controls added since the last inspection included the following:

- A. A refeed drum dumping and conveying system with an enclosure had been added to the sampling plant.
- B. A UO<sub>3</sub> screw conveyor had been replaced with a bucket elevator.
- C. Vacuum control had been improved on denitrators.
- D. Reduction filter bins had been routed through dust collectors.
- E. Improved packing rings had been installed on screw conveyors.

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- F. An enclosure had been installed around a drum dumper.
- G. An improvement to a UNH feed port on a denitrator has resulted in less leakage through a packing assembly.

Establishment of several other controls was observed to be in progress.

The licensee stated that a respiratory protection program continues to be utilized in accordance with Regulatory Guide 8.15. Internal exposure records were found to apply protection factors for those personnel wearing respirators. A polydisperse DOP man-test system with a fitting chamber is used in conjunction with the program. Records indicated that personnel had received medical examinations including lung dynamic tests as a part of the program. Copies of written examinations relating to respiratory protection were contained in employee record files. Comprehensive written procedures were found describing the program.

During the plant tour the inspector observed that an individual was wearing a half-mask respirator with head straps positioned over the hard hat helmet. The inspector stated that this item constituted noncompliance with 10 CFR 20.103 (c). This is a repeat item.

Discussion with the licensee and a review of pertinent records established that the bioassay program has been conducted as described in the application. The bi-monthly urinalysis schedule for plant workers is designed to monitor the controls implemented for routine worker exposure. The inspector noted some data in excess of 20 micrograms per liter action level and inquired as to the licensee's evaluation. The licensee stated that in each case the worker was restricted from further exposure until the next bioassay indicated normal levels.

Licensee records indicated that in vivo lung counting is performed by a vendor as described in the License Application, Appendix A. A review of current data revealed no result in excess of 10 CFR 20.103 (a) limits. The highest result was 10.3 mg natural uranium from counts performed during October 1978.

The inspector noted that the licensee documented and graphed alpha contamination survey data resulting from weekly measurements at 70 locations within controlled areas, 10 locations within uncontrolled areas, and 6 locations in unrestricted areas. The inspector observed that contamination levels within the plant were decreasing. The licensee stated that a major portion of the process areas had been cleaned with high pressure water and then painted. The licensee further stated that this project which had begun in February 1979

was approximately 70% complete. The inspector reviewed Hazardous Work Permits used to designate radiation safety practices for specific jobs in process areas.

6. External Exposure Control

Licensee records indicated that film badges are provided to all workers on a monthly exchange. External exposure data were reviewed and no exposures were noted in excess of 20.101 limits. The highest recorded annual dose for 1978 was 800 millirem.

The inspector confirmed that external radiation surveys have been made monthly at twenty-five (25) designated locations. No areas were classified as high radiation areas.

7. Effluent and Environmental Monitoring

The licensee's effluent and environmental monitoring program is described in license application references specified in License Condition 12. The licensee stated that verbal approval had been granted by NRC Licensing to lengthen the period between specified environmental samples. Neither the licensee nor the inspector is aware of any license amendment documenting such authorization. The licensee has been operating in accordance with the verbal authorization for several months. This item was left unresolved pending discussion with Licensing.

The liquid effluent stream from the plant is continuously sampled at the site boundary. Daily grab samples are analyzed for uranium, fluoride, nitrate, pH, and temperature. Monthly composites are analyzed for uranium, gross alpha, gross beta, nitrate, and fluoride. Quarterly analyses are performed for Ra-226 and Th-230. All radiological data were less than the applicable Part 20, Appendix B, Table II, values. A review of nonradiological parameters revealed no upward trending. Analyses for fluoride, uranium, and nitrate are performed at the Sequoyah Facility. Analyses for gross alpha, gross beta, radium, and thorium are performed at the Kerr-McGee Technical Center, Oklahoma City.

Surface water is collected and analyzed from the Arkansas, Illinois, and Salt Fork rivers and three nearby ponds as described in the license application. Ground water is collected from 42 monitor wells.

Treated raffinate continues to be used as fertilizer on test plots and increased nitrate levels have not been detected at monitor wells. The licensee stated that there had been three (3) on-site burials of wastes since the last inspection. The largest was 35,000 cubic feet of fluoride sludge.

Air sampling is performed at plant stacks, hatches, and vents; at four (4) locations within the boundary fence; and at five (5) locations off-site. Two boundary samples are analyzed for uranium, Th-230, and Ra-226. Data for these boundary samples were noted to be well below applicable MPC's for unrestricted areas.

The inspector verified that soil and vegetation samples had been obtained and analyzed in accordance with License Condition 12. Also reviewed were data pertaining to bottom sediment samples obtained by Oklahoma State University in accordance with License Condition 15. A final report on this initial sampling is still pending by the licensee.

8. Audits and Training

Reports of weekly, monthly, and quarterly audits were reviewed and found to be performed as required by Appendix A. Licensee training programs are detailed in appendices of the License Application. New employees receive comprehensive safety training and a training handbook at time of hire. A training program has also been established for contractor personnel. The licensee stated that female employees are instructed in the contents of Regulatory Guide 8.13 and that signatory verification of this instruction is required. The licensee further stated that plant employees have been given approximately three (3) hours of refresher training since the last inspection. The inspector reviewed written examinations given in conjunction with this training. The inspector interviewed one worker and determined that her understanding of radiation safety practices was sufficient to comply with 10 CFR 19.12.

9. Emergency Planning and Fire Protection

The licensee's emergency planning and fire protection programs are described in Appendix A. The fire protection program includes temperature activated foam spray heads in the SX building, sprinkler systems in cable trays, temperature activated nitrogen purge in the fluoride cell room, and manual fire extinguishers throughout the plant. The licensee stated the insurance underwriter had performed an inspection in recent months. The fire horn and emergency generator are tested monthly. Nine hose stations are supplied by a 150,000 gallon holding tank and are fed by diesel and electrical pumping equipment which is also checked monthly. Observation of approximately 10 portable extinguishers revealed that these were inspected monthly. The licensee stated that sprinklers had been recently installed in the chemical storage building behind the plant. Emergency teams on each shift have had instruction in the use of self-contained breathing apparatus and several individuals on

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each team have had first aid training. The licensee stated that simulated fire exercises had been performed by each shift crew. The licensee was found to have added a new procedure addressing reports of discharge of hazardous material.

10. Posting, Labeling and Reports

The inspector noted that incoming and outgoing shipping containers were labeled as LSA and radioactive. Forms NRC-741, completed upon receipt and transfer of source material, were reviewed; and compliance with 10 CFR 40.64 (a) was verified. The inventory report required by 40.64 (b) was reviewed. The inspector noted that the effluent monitoring report, required to be submitted to the NRC within 60 days after July 1, 1978, in accordance with 10 CFR 40.65, was not submitted until September 19, 1978. The inspector also noted that documents were posted as required by 10 CFR 19.11 and 10 CFR 21, and that shipping container certifications were available for each type of container used.

The inspector observed continuous fencing around the restricted area and access control at the main gate. The plant entrance was posted with information that all areas within the mill may contain radioactive material.

11. Instrumentation

The inspector observed that the inventory of portable survey instruments and laboratory counting instruments was sufficient to support radiation safety programs. Instrument calibration frequency, currency, and procedures were found to be as required.

12. Independent Measurements

A water sample was obtained from the combined effluent stream at the boundary fence. The sample will be analyzed for uranium, Ra-226, Th-230, gross alpha, and gross beta. Air samples were obtained in the process area near the denitrators on the second level and in the sampling plant on the first level. The analytical results of all samples from Idaho Health Services Laboratory will be later compared to the licensee's results of samples taken at the same location.

13. Unresolved Items

Unresolved items are matters about which more information is required in order to determine whether they are acceptable items, items of noncompliance, or deviations. One unresolved item was identified during the inspection. This item is discussed in paragraph 7.

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14. Exit Interview

The inspector met with licensee management (Ref. paragraph 1) at the conclusion of the inspection on May 24, 1979. The inspector summarized the purpose and scope of the inspection and summarized the findings.

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