

Release NRC

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August 31, 1978

License No. SUB-1010

Kerr-McGee Nuclear Corporation
ATTN: Mr. W. J. Shelley, Director
Regulation and Control
Kerr-McGee Building
Oklahoma City, Oklahoma 73102

Gentlemen:

This refers to the inspection conducted by Messrs. R. J. Everett and C. L. Cain of this office on August 10-11, 1978, of the activities authorized by NRC Source Material License No. SUB-1010, and to the discussion of our findings held by Messrs. Everett and Cain with Messrs. B. E. Brown and C. E. Grossclaude on August 11, 1978.

The inspection was an examination of the activities conducted under the license as they relate to radiation safety and compliance with the Commission's rules and regulations, and the conditions of the license. The inspection consisted of selective examinations of procedures and representative records, interviews of personnel, independent measurements and observations by the inspector.

The inspectors also reviewed the action you had taken with respect to two (2) items of noncompliance observed during our previous inspection, which was conducted June 15-17, 1977. They verified that the corrective action with respect to these items was implemented as stated in your reply of July 20, 1977, to our letter dated July 6, 1977.

Based on the results of this inspection, it appears that certain of your activities were not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith.

This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within twenty (20) days of your receipt of this notice, a written statement or explanation in reply including (1) corrective actions which have been taken by you and the results achieved; (2) corrective actions which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved.

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OFFICE	RIV	CLC	YB	WV	
SURNAME	RJEverett/dt	CLCain	GDBrown	WEVetter	
DATE	8/28/78	8/29/78	8/ /78	8/30/78	

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August 31, 1978

In accordance with Section 2.790 of the NRC "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you believe to be proprietary, it is necessary that you make a written application within twenty (20) days to this office to withhold such information from public disclosure. Any such application must include a full statement of the reasons it is claimed that the information is proprietary. It should be prepared so that proprietary information identified is contained in a separate part of the document, since the application, excluding this separate part, will also be placed in the Public Document Room. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

Should you have any questions concerning this letter, please let me know.

Sincerely,

Glen D. Brown, Chief
Fuel Facility and Material
Safety Branch

Enclosures:

1. Notice of Violation
2. IE Inspection Report No. 40-8027/78-01

bcc w/encl to Reproduction Unit for Distribution 8/31/78

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IE FILES
NMSS:FC&MS
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bcc w/encl held for 20 days
CENTRAL FILES
PDR:HQ
LOCAL PDR
NSIC

License No. SUB-1010

Notice of Violation

Based on the results of the NRC inspection conducted on August 10-11, 1978, certain activities appear to be in noncompliance with NRC regulations and the conditions of your License No. SUB-1010 as indicated below:

1. Contrary to 10 CFR 20.103(c), use of respiratory protective equipment was not in accord with Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection" in that;
 - a. At the time of the inspection, twelve workers had not completed a respirator fitting and training program prior to the use of respiratory equipment, as required by Section C of Regulatory Guide 8.15.
 - b. Half-mask respirators are not being tested for fit with irritant smoke, prior to use, each time such equipment is donned as required by Table 1, Footnote f, of Regulatory Guide 8.15.
 - c. Half-mask respirators are used with head straps over the hard hat which prevents straps from lying in their normal position next to the head as required by Section 13.5 of NUREG-0041, which is referenced in Section C.8.n of Regulatory Guide 8.15.

This is an infraction.

2. Contrary to 10 CFR 20.203(c)(2), the ash receiver enclosure, a high radiation area in the fluorination area, was not equipped with entrance or access control devices or maintained locked when access was not required.

This is an infraction.

3. Contrary to 10 CFR 21.21(a), appropriate procedures have not been adopted that would provide for the evaluation and reporting of defects in basic components as defined in Section 21.3 of 10 CFR 21.

This is an infraction.

4. License Condition 9 requires that licensed activities be conducted in accordance with statements, representations, procedures and conditions stated in the License Application, Appendix A, and Section 2.0 of Appendix B.

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Contrary to this requirement:

- a. During the period October 1977 to August 1978, surface contamination levels in the operating areas of the plant exceeded and remained above the control value of 2,000 dpm/100 cm² smearable activity as specified in Section 3.4.3 of Appendix A.
- b. Annual oral or written tests have not been given to mill workers to determine their understanding of radiation protection and uranium loss prevention as specified in Section 2.0 of Appendix B.

This is an infraction.

5. License Condition 12 requires, in part, that soil samples be collected at 6000 foot distances from the plant in the cardinal compass directions and analyzed for uranium and fluoride. Contrary to this requirement:

Soil samples have not been collected at 6000 foot distances from the plant in the cardinal compass directions, since the renewed license was issued.

This is an infraction.

6. License Condition 15 requires that samples of bottom sediments be obtained at meaningful upstream and downstream points of the plant outfall into the Robert S. Kerr reservoir and analyzed as a means of evaluating the effect of the liquid plant effluent on aquatic biota.

Contrary to this requirement:

Bottom sediment samples have not been obtained and analyzed, since the renewed license was issued.

This is an infraction.

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

Report No. 40-8027/78-01

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: August 10-11, 1978

Inspectors: C. L. Cain
C. L. Cain, Radiation Specialist

8/29/78
Date

R. J. Everett
R. J. Everett, Radiation Specialist

8/30/78
Date

Approved by: G. D. Brown
G. D. Brown, Chief, Fuel Facility and Material
Safety Branch

8/30/78
Date

Inspection Summary

Inspection on August 10 and 11, 1978 (Report No. 40-08027/78-01)

Areas Inspected: Routine, unannounced inspection of uranium conversion facility operations and radiation protection program including organization and administration; facilities and equipment; internal exposure control; external exposure control; environmental monitoring; audits and training; emergency planning and fire protection; posting, labeling, and reports; and independent measurements. The inspection involved sixteen (16) hours on site by two inspectors.

Results: Of the nine (9) areas inspected, no items of noncompliance or deviations were identified in four (4) areas; six (6) apparent items of noncompliance were identified in five (5) areas (infraction - deficiencies in respiratory protection program, see paragraph 5; infraction - failure to provide proper access control to a high radiation area, see paragraph 6;

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infraction - failure to obtain soil samples, see paragraph 7; infraction - failure to obtain bottom sediment samples, see paragraph 7; infraction - failure to perform personnel testing and to control contamination, paragraphs 5 and 8; infraction - failure to establish procedures to report defects, paragraph 10).

DETAILS

1. Persons Contacted

- *B. E. Brown, General Manager, Nuclear Manufacturing
- *C. E. Grossclaude, Manager, Health Physics & Industrial Safety
- L. H. Harrison, Manager, Administration & Accounting

*Members present at exit interview.

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

2. License Action on Previous Inspection Findings

- a. (Closed) Noncompliance (40-8027/77-01): This item involved failure to conduct monthly audits of health physics programs by facility management required by License Condition 8 of SUB-1010. This license condition was modified in the renewed license issued October 1977.
- b. (Closed) Noncompliance (40-8027/77-01): This item involved failure to post radiation areas. The inspectors verified proper posting of radiation areas during the plant tour.
- c. (Closed) Unresolved Item (77-01/1): This item involved the use of a compliance certificate issued to Union Carbide (AEC-ORO 6273-48/AF) as authority to ship type B quantities of UF₆ in a container described as ORO-651, Model 48x. The licensee has now received compliance certificate #6273, issued by the NRC on July 29, 1977, and now fully complies with 10 CFR 71.12.

3. Organization and Administration

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

Corporate

Morgan Moore, President, Kerr-McGee Nuclear Corporation
R. P. Luke, Vice President, Manufacturing & Marketing
G. J. Sinke, Corporate Health & Safety Coordinator
W. J. Shelley, Director, Nuclear Regulation & Control

Sequoyah Facility

B. E. Brown, General Manager, Nuclear Manufacturing
C. E. Grossclaude, Manager, Health Physics & Industrial Safety
J. W. Craig, Manager, Conversion Engineering
L. H. Harrison, Manager, Administration & Accounting

The licensee stated that the facility staff is comprised of about 148 employees, which includes about 78 in production, 40 in maintenance and 30 salaried workers.

4. Facilities and Equipment

The inspectors toured the plant and the liquid effluent retention areas on August 10, 1978, to observe operations in progress and verify that equipment and facilities were in accordance with applicable license requirements. The licensee stated that the plant capacity had been doubled to 10,000 tons per year commencing April 1978, as authorized by a renewed license dated October 1977. The licensee stated that the plant operating schedule was twenty-four (24) hours per day, seven (7) days per week. During the plant tour the inspectors verified that corrective action had been maintained regarding the posting of radiation areas, an item of noncompliance from the June 15, 1977, inspection. The plant was observed to be operating and housekeeping was noted as being poor. The licensee stated that this condition was due in large degree to the recent plant modifications necessary to increase production capacity.

A tour of the waste ponding areas revealed that a pit had been dug for burial of fluoride sludge at the south side of the exclusion area. The licensee indicated that an additional liquid effluent retention pond was being planned for construction south of the exclusion area fence.

5. Internal Exposure Control

The licensee's air sampling program is described in the License Application, Appendix A. Licensee records listed 46 air sampling locations in work locations within the plant. These samples are collected each 8-hour shift and analyzed radiometrically for total alpha emission after a 4-hour delay. 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. The licensee stated that air sampling in the solvent extraction building had been terminated, since results obtained over many years of operation had shown air activities in this area to be less than 25% of 10 CFR 20, Appendix B, Table I, limits.

A review of air sampling data revealed many 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 had been implemented to reduce airborne radioactivity concentrations, but concentrations were still recorded above those that would delimit an airborne radioactivity area. A rotary valve had been installed on the re-drum hopper in the sampling plant and additional ventilation had been installed. The licensee stated that several other measures had been studied, but none of these had yet been implemented. The inspectors were unable to clearly determine whether the licensee's efforts to provide engineering and process controls were sufficient to comply with 10 CFR 20.103(b)(1). The item was left unresolved pending discussion with NRC Licensing.

The licensee stated that a respiratory protection program has been established 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 has been used in conjunction with the program. Records indicated that personnel had received medical examinations including lung dynamics 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, inspectors observed that half-mask respirators were worn with head straps over hard hat helmets and that irritant smoke testing was not performed, prior to use, each time respirators were donned. The licensee also indicated that twelve (12) workers, who received allowance for respirator use, had not completed the respirator fitting and testing program. The inspectors stated that these items constituted noncompliance with 10 CFR 20.103(c).

The licensee's bioassay program is described in Section 3.4.2., Appendix A of the application. The inspectors' discussions with the licensee and a review of pertinent records established that the program being conducted was 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 inspectors 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. The licensee stated further that

some of the high samples may have been contaminated. The inspectors noted that the bioassay laboratory did not, in two instances, report levels in excess of the action level in a timely manner, sufficient to allow resampling to confirm the result from an acute exposure standpoint. However, once the licensee was informed, samples were collected and these samples yielded normal values. The licensee stated that acute exposures should be readily identified so that more frequent sampling can be conducted, and discussions would be held with the bioassay laboratory in order to expedite the reporting of data.

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 inspectors noted that the licensee documented alpha contamination survey data for approximately 100 points within the plant. Surveys were documented as being performed weekly. Section 3.4.3 of Appendix A specifies that operating areas will be cleaned so as to remain below 2,000 dpm/100 cm² smearable activity. Surveys of the operating areas were noted to exceed this limit during the period October 1977 to August 1978. The inspectors stated that failure to maintain contamination levels below this limit constituted noncompliance with License Condition 9.

6. External Exposure Control

Licensee records indicated that film badges are provided to all workers on a monthly exchange. External exposure data was reviewed and no exposures were noted in excess of 20.101 limits.

The inspectors confirmed that external radiation surveys have been made monthly at nineteen (19) designated locations. Measurements as high as 1100 mR/hr (contact) in the ash receiver enclosure were noted. The whole body dose rate within this area was higher than 100 mR/hr, and the area was appropriately posted as a high radiation area.

The licensee stated that the area was not equipped with entrance or access control devices or maintained locked when access was not required. The inspectors stated that failure to provide control devices or control access constituted noncompliance with 10 CFR 20.203(c)(2).

7. Environmental Monitoring

The licensee's environmental monitoring program is described in license application references specified in License Condition 12.

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 four (4) settling basin monitor wells, one (1) residence well, and thirty-nine (39) raffinate pond monitor wells. Concentrations were found to be below applicable MPC's for unrestricted areas.

The licensee stated that submerged combustion burning had been suspended at the raffinate ponds and that the raffinate was no longer used to fertilize test plots, since increased nitrate levels had been detected at a monitor well. The licensee also stated that there had been no burials of wastes since the last inspection.

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. Samples are analyzed for gross alpha and fluoride. 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. These data are used by the licensee to determine release quantities to unrestricted areas for compliance with 10 CFR 40.65. The method entails ratioing of gross alpha concentrations between the stacks and the boundary samplers in order to determine total discharge of uranium, Ra-226, and Th-230 at the stacks. Although License Condition 14 seemed to imply that principal radionuclide analyses at the stacks should be performed to verify the licensee's method, this condition was not clearly stated; therefore, the item was left unresolved pending discussion with NRC Licensing.

Engineering data was reviewed in order to confirm that the plant building underwent ten (10) air changes per hour as required by License Condition 12.

License Condition 12 requires that soil and vegetation samples be collected at 1000 foot and 6000 foot distances from the plant in the cardinal compass point directions and that they be analyzed for uranium and fluoride.

The inspector stated that contrary to this requirement soil samples had not been obtained at the 6000 foot distances, since the renewed license had been issued. The inspectors stated that failure to obtain such samples constituted noncompliance with License Condition 12.

License Condition 15 requires obtaining and analyzing samples of bottom sediments at meaningful upstream and downstream points of the plant outfall into the Robert S. Kerr reservoir, as a means of evaluating the effect of the liquid plant effluent on aquatic biota. The licensee stated that this sampling program had not been initiated since the renewed license was issued. The inspectors responded that failure to obtain such samples constituted noncompliance with License Condition 15.

8. Audits and Training

Reports of weekly, monthly, and quarterly audits were reviewed and found to be performed as required by Appendix A. Documented minutes of safety meetings were also reviewed. Licensee training activities are detailed in appendices of the License Application. New employees receive two hours of safety training and a safety handbook at time of hire. A second training session of two hours duration is provided within several weeks of hire. 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. Section 2.0 of Appendix B states that workers will be tested annually to determine their understanding of radiation protection and uranium loss prevention. The licensee stated that such testing had not been performed. The licensee was informed by the inspectors that failure to administer such testing constituted noncompliance with License Condition 9. The inspectors interviewed one worker and determined that her understanding of the radiological hazards was sufficient to comply with 10 CFR 19.12.

9. Emergency Planning & 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's insurance underwriter inspection was last performed during the second quarter of 1978. 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 manual extinguishers revealed that these were inspected monthly. Emergency teams on each shift have had instruction in the use of self-contained breathing apparatus. Several individuals on each team have had first aid training. The licensee stated that there had been neither simulated fire exercises nor fire drills since the the last inspection. The licensee was found to have several documented procedures pertaining to fire response and to systems operations and inspection.

10. Posting, Labeling and Reports

The inspectors 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 inspectors noted that documents were posted as required by 10 CFR 19.11, but that no regulations or procedures were posted relating to Part 21. The licensee stated that there were no procedures relating to the reporting of defects. The inspectors stated that failure to establish such procedures constituted noncompliance with 10 CFR 21.21(a).

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

11. Independent Measurements

A water sample was obtained from the combined effluent stream at the boundary fence. The sample will be analyzed for uranium, gross alpha, gross beta, Ra-226, and Th-230. The analytical results from Idaho Health Services Laboratory will be later compared to the licensee's results of samples taken at the same location.

12. 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. Two unresolved items were identified during the inspection. These items are discussed in paragraphs 5 and 7.

13. Exit Interview

The inspectors met with licensee management (See paragraph 1) at the conclusion of the inspection on August 11, 1978. The inspectors summarized the purpose and scope of the inspection and summarized the findings.