

~~M/S #1~~



**KERR-McGEE CORPORATION**

KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

ENVIRONMENT AND HEALTH MANAGEMENT DIVISION

January 27, 1993

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Mr. Jack Whitten  
U. S. Nuclear Regulatory Commission  
Region IV  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011

FEB 2 1993

Re: Kerr-McGee Corporation  
Technical Center  
License No. SUB-986; Docket No. 040-08006

Dear Mr. Whitten:

In accordance with our telephone conversations, the following changes related to the re-licensing actions for the above referenced Technical Center License is hereby provided.

If you have any questions please contact me at your earliest convenience.

Sincerely,

J. C. Stauter, Vice President  
Environmental Services

JCS:rlr

Enclosure

xc: E. J. Johnson

0/4

Information in this record was deleted in accordance with the Freedom of Information Act. Exemptions 6 FOIA/PA 2010-2248

463398

**Kerr-McGee Corporation - Technical Center  
Nuclear Materials License  
SUB-986**

1. **Kerr-McGee Corporation**
2. **Kerr-McGee Center**  
123 Robert S. Kerr Avenue  
Oklahoma City, Oklahoma 73125
3. **License number: SUB-986**
4. **Expiration date: December 31, 1990**
5. **Docket or Reference No.: 040-08006**
6.
  - A. **Uranium (natural)**
  - B. **Thorium (natural)**
  - C. **Uranium (depleted in U-235)**
7.
  - A. **Any**
  - B. **Any**
  - C. **Any**
8.
  - A. **250 kilograms**
  - B. **150 kilograms**
  - C. **25 kilograms**
9. **Authorized Use:**
  - A. **Research and development as defined in 30.4(q) of 10 CFR Part 30.  
Calibration of instruments.**
  - B. **Purification and concentration process development studies.**
  - C. **Research and development as defined in 30.4(q) of 10 CFR Part 30.  
Calibration of instruments.**
10. **CONDITIONS:**

Licensed material shall be used only at Kerr-McGee Corporation, Technical Center, 3301 N.W. 150 Street, Oklahoma City, Oklahoma.
11. **Licensed material shall be used by, or under the supervision of Garet E. Van De Steeg and Elizabeth J. Johnson (Jo). All work with licensed material shall be done in accordance with the facility Radiation Safety Program and the oversight of the Radiation Safety Officer (RSO).**

Application for Material License Renewal

12. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
  - A. Application dated August 29, 1984
  - B. Letter dated October 28, 1985
  - C. Letter dated July 22, 1986
  - D. Letter dated January 27, 1993

Application for Material License Renewal

Renewal of License No. SUB-986

- 2: Kerr-McGee Corporation  
Kerr-McGee Center  
123 Robert S. Kerr  
Oklahoma City, OK 73125
- Item 3: Kerr-McGee Corporation  
Technical Center  
3301 N.W. 150th Street  
Oklahoma City, OK 73134
- Item 4: John C. Stauter  
Vice President - Environmental Services  
(405) 270-2623
- Item 5: See current License SUB-986, Nos. 6, 7, and 8.
- Item 6: See current License SUB-986, No. 9.
- Item 7: Individuals Responsible for Radiation Safety Program and Their Training and Experience

Elizabeth J. Johnson (Jo) - Radiation Safety Officer

Education B.S. in Microbiology (b)(6) Oklahoma State University, B.S. in Industrial Safety (b)(6) University of Central Oklahoma. Successfully completed the Radiation Safety Specialist Training Program conducted by Oklahoma State University (1991). Certificate of completion attached. The course consisted of 32 hours of classroom instruction and a four-hour comprehensive examination.

Experience Industrial experience at Kerr-McGee for 9 years including one year as a lab technician for the Advanced Coal Liquefaction Program and four years as a lab technician for the Analytical Chemistry section. Served one year as the Assistant Safety Director for the Kerr-McGee Technical Center and three years as Safety Director for the Technical Center. Currently serves as Safety Director for the Kerr-McGee Technology and Engineering Division which encompasses the Technical Center.

Responsibility As Radiation Safety Officer, Ms. Johnson is responsible for the management, training and oversight requirements of the facility Radiation Safety Program and all work with radioactive materials encompassed by such.

Item 8: Training Program

1. Activities

Source Materials License SUB-986 applies to activities at the Kerr-McGee Technical Center, the research and development facility for the corporation. As a research and laboratory facility, only relatively small amounts of source material are in use at any given time. All activities are carried out

## Application for Material License Renewal

such that no laboratory activity exceeds the criteria in 10 CFR 20-105, "Permissible Levels of Radiation in Unrestricted Areas, or 10 CFR 20.106, "Radioactivity in Effluents to Unrestricted Areas. Areas where radioactive materials are used or stored are posted with Caution Radioactive Materials signs, as prescribed in 10 CFR 20.203(e)(2). The contents of individual containers or packages of radioactive materials are clearly labeled.

### 2. Training

Employees who work with radioactive materials or routinely work in an area where those materials are used shall receive instruction in accordance with the requirements of 10 CFR 19.12, "Instructions to Workers." As part of their instruction, these employees will be provided a copy of Regulatory Guide 8.29, "Instructions Concerning Risks from Occupational Exposure. Female employees will also receive a copy of Regulatory Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure.

Almost all of the laboratory personnel have science degrees and completed course work on the nature of radioactivity. In addition: (1) Use of radioactive materials in designated laboratories minimizes the potential for low-level contamination. (2) Workers are instructed individually as to the materials being handled. General hazards are discussed; particular emphasis is put on inhalation and ingestion as the most significant sources of potential exposure.

#### Training Program Objectives

- Minimize personnel exposure to ionizing radiation.
- Prevent exposure of non-involved personnel.
- Prevent the spread of radioactive contamination.
- Maintain radiation levels as low as reasonably achievable.

#### Training Includes Discussion of the Following Topics:

##### A. Radiation Fundamentals

- Radiation Types
  - Alpha
  - Beta
  - Gamma
  - Neutron
- Units
  - Roentgen (R)
  - Rad, Gray
  - Rem, Sievert
  - Counts per minute (cpm)
  - Disintegrations per minute
  - per 100 cm<sup>2</sup> (dpm/100cm<sup>2</sup>)
  - Curie (Ci), Becquerel (Bq)
- Biological Effects
  - Effects of Acute Dose
  - Effects of Chronic Dose

## Application for Material License Renewal

- Working with Radioactive Materials
    - Protective Clothing
    - No smoking, eating, drinking in controlled areas
  - Protective Strategies and Devices
    - Containment
    - Decontamination Methods
  - Monitoring for Radiation Exposure
    - Film Badge
    - TLD
    - Dosimeters
    - Exposure Records
  - Personnel Monitoring for Contamination
    - Survey following work with Radioactive Material
    - Bioassay
  - Facility Procedures
    - Standard Operating Procedures
    - Storage of Radioactive Material
    - Waste Disposal
    - Reporting Unsafe Conditions or Acts
    - Emergencies
    - Posting and Labeling
  - Radiation Zones
    - Radiation Symbol and Colors
    - Controlled Area
    - Airborne Radioactivity Area
    - Contamination Control Area
  - Regulation Review
    - Part 19
    - Part 20
    - License Conditions and Requirements
- B. The training course outlined above is presented biannually and is coordinated by the facility RSO. An intensive one-day format is used. Actual instruction is five to six hours with teaching done by the RSO or other individuals qualified and knowledgeable of the precautions and handling of radioactive materials.
- C. Each participant in the training program is required to take a written examination. A copy of a sample test is attached as Exhibit 1.
- D. Participation is recorded on an attendance sheet signed by each employee.

**Item 9:** Facilities and Equipment

## Application for Material License Renewal

Figure 1 is a floor plan of the laboratory building. Laboratory Room E30 is used for chemical work involving the use of radiotracers. The use of radioisotopes is authorized under our Byproduct License 35-12636-06.

Laboratory Room E8 has previously been used for uranium work. Room C23 currently houses the counting equipment. The pilot plant area and other locations may contain small quantities of ores or compounds or source material at one time or another for analysis or research and development work.

Most laboratory rooms and areas are equipped with fume hoods. Glove box equipment is also available. Containment, ventilation controls and safe operating procedures preclude the need for wearing respiratory protective equipment while handling source materials, except under emergency conditions such as an accidental spill or fire.

Figure 1 maps the locations where general safety and emergency equipment is located within the laboratory. Personnel are trained to properly use this equipment when needed. An inspection and maintenance program effectively keeps this equipment in readiness.

### Item 10: Radiation Safety Program

The instrument calibration test pits are surveyed by visual inspection to determine proper safeguarding and posting. The condition of the containment and associated earthwork and structures are also evaluated. This inspection is conducted annually. The values of low dose rates above and near the test pits are known. The handling of more than sample amounts of uranium at one time is unusual. Should the need for handling larger quantities of uranium occur (such as blending new mixtures for the test pits), the appropriate health physics procedures will be followed.

In case of an accident resulting in a spill of source material, the affected area will be placed in a shut-down and controlled access mode until decontamination procedures are accomplished and surveys conducted proving the area suitable for reuse. Physicians knowledgeable in the fields of Health Physics and Nuclear Medicine located in Oklahoma City are available to render service in the event of an emergency.

The Kerr-McGee Technical Center has a well organized safety program with strong corporate support. The program includes active participation of all employees, supplemented by persons with special safety and industrial hygiene skills, safety committee, and a trained emergency Squad. Employees are trained on how to sound the emergency alert, how to protect themselves, evacuate and assemble in a safe location. The Emergency Squad is especially trained in rescue and first aid. A staff of skilled health physicists and health technicians (and their equipment) from Kerr-McGee Corporation's nuclear facility nearby can be called upon for assistance.

The Kerr-McGee Technical Center maintains a radiation safety program which is designed to monitor the adequacy of the containment and control provisions for radiological safety purposes.

### Item 10.1 Personnel Monitoring Devices

An established personal dosimeter program is in place. Film badges are issued to individuals who work routinely with significant sources of ionizing radiation. The badges are processed at monthly

## Application for Material License Renewal

intervals by R.S. Landauer Company.

### Item 10.2 Bioassays

Bioassay procedures are not considered as a routine monitoring tool because of the very limited opportunity for any significant internal exposure to occur. In the unlikely event of an accidental exposure, bioassay and medical management programs will be instituted. Bioassays will be performed by the collection of urine samples when indicated by the investigation of a reported spill or the results of air samples which are greater than or equal to the MPC value given in 10 CFR 20, Appendix B, Table I, Col. 1.

#### A. Urinalysis

An employee submitting a urine sample which analyzes above 100 ugU/1 will be placed on immediate work restriction (non-uranium work). Resampling is done daily with voidings given at home prior to coming to work. A resample with results 20 ugU/1, releases the employee from work restriction.

An employee submitting a sample  $> 20$  ugU/1 but  $< 100$  ugU/1 is placed on daily resample schedule until a sample result is  $< 20$  ugU/1. The employee is placed on work restriction if the first resample is  $> 20$  ugU/1. He is released from work restriction whenever a subsequent daily resample analyzes  $< 20$  ugU/1.

### Item 10.3 Surveys and Monitoring

Areas in the facility where radioactive materials are used are surveyed on a bimonthly basis using an alpha survey meter and a beta-gamma survey meter.

- A. Alpha action levels for bench tops, hoods and floors are 200 dpm/100 cm<sup>2</sup> smearable and 1,000 dpm/100 cm<sup>2</sup> fixed.

The beta/gamma action level is 2 mR/hr measured at 18 inches from the surface of interest.

- B. Where source material is being used, an alpha survey meter is dedicated for personnel contamination surveys and daily area monitoring by the worker(s) involved. This type of monitoring ensures decontamination and cleanup on a timely basis. Individuals who work with radioactive materials are supplied with film badges or TLDs which are processed monthly.
- C. Storage areas are surveyed on a bimonthly basis as part of the routine facility survey. There are no disposal sites at the facility.
- D. Effluent Monitoring: Effluents from the facility are as low as reasonably achievable. Gaseous or particulate effluents are of a fugitive nature. When the possibility exists of such effluents, air monitoring is undertaken to monitor the amount of material lost in this fashion. In earlier studies involving uranium ore handling, air monitoring showed values below that specified for an unrestricted area. Duct systems are not surveyed.

Operations involving gaseous materials will be monitored for fugitive emissions. Operations

## Application for Material License Renewal

involving solutions are carried out over catch pans which are monitored and cleaned as required. Operations involving fine particulates are monitored if there is reasonable likelihood of fugitive emissions.

- E. Monitoring for airborne activity is carried out when there is a reasonable likelihood that such contamination could exist (i.e., when operations involve materials that could lead to airborne activity).
- F. Air samples will be obtained from work areas when the potential for airborne contamination exists. Samples will be collected from the work area so as to be representative of the airborne concentrations to which the workers are exposed. Samples will be analyzed radiometrically and the activity per unit volume of air determined. The appropriate maximum permissible concentration given in 10 CFR 20, Appendix B, Table I will be used to compute the MPC-hour exposures per quarter.
- G. Where there is potential for release of airborne radioactive material, the effluent air will be sampled through a collector for counting.

Some very low concentrations of liquid radioactive waste may be discharged to the sanitary sewer. Such discharges comply with 10 CFR 20.303. This stream is monitored to comply with the wastewater discharge permit issued by Oklahoma City.

### Item 10.4 Radiation Detection Instruments and Calibration

Survey and monitoring instruments include an Eberline E-120 beta-gamma instrument (0-50 mr/hr, 30 mg/cm<sup>2</sup> window), and a Ludlum 12 alpha survey meter. These instruments are tested for proper function with a check source prior to use and are calibrated semi-annually and after repairs. The calibration is performed by health physics personnel at the Kerr-McGee Cimarron Facility, License No. 35-12636-02, using calibration sources traceable to the National Bureau of Standards.

Survey meter calibration records are retained indefinitely. No records have ever been discarded. Such records will be retained for a minimum of two years.

### Item 10.5 Radiation Safety Procedures

An outline of the existing radiation safety program as provided below in accordance with the information specified in Item 10.5 or Revision 2 of Regulatory Guide 10.4. The program is included in the facility safety manual which is reviewed and updated periodically.

- A. Radiological Safety at the Technical Center
  - (1) Need for program
  - (2) Protection principles
  - (3) Legal basis and regulatory requirements

## Application for Material License Renewal

### B. Organization of Radiation Safety

The Technical Center's Manager of Support Services is ultimately responsible for the radiological safety of employees at the Technical Center. The routine responsibility for assuring that safety is maintained during the use of radioactive materials is done by the Radiation Safety Officer.

The duties of the Radiation Safety Officer are:

- 1) To insure that employees handling radioactive material have all necessary administrative and technical instructions concerning radiation hazards and safe working practices. This includes 10 CFR 19 briefing.
- 2) Radioactive material is nominally under the control of the Radiation Safety Officer, and an inventory shall be maintained of such material. In order to maintain this inventory, purchase orders for radioactive materials will be reviewed by the Radiation Safety Officer.
- 3) Personnel monitoring and area monitoring programs will be the responsibility of the Radiation Safety Officer.
- 4) Licensed activities and compliance with applicable requirements shall be the responsibility of the Radiation Safety Officer. The RSO, besides having the latitude to discuss all matters with the NRC, coordinates formal license related activities (e.g. renewal, amendment) with the Corporate Vice-President of Environmental Services to insure that upper management is fully informed.
- 5) Review of arrangements for safe disposal of radioactive waste will be a responsibility of the Radiation Safety Officer.

### C. Radiation Monitoring Programs

- (1) Basis and need
- (2) Personal dosimeters
- (3) Area Monitoring

### D. Personnel Monitoring

- (1) Detailed procedures for badge issue and processing

### E. Area Monitoring

- (1) Detailed procedures and action levels
- (2) Calibration requirements
- (3) Air monitoring
- (4) Sealed source testing

Application for Material License Renewal

(5) X-Ray equipment

F. General Procedures

- (1) Procedure for highly radioactive samples
- (2) Personal protective measures
- (3) Contaminated equipment or materials
- (4) Waste disposal
- (5) References

**Item 11:** Source material waste is generated only periodically and in small amounts. It is disposed of by using procedures compatible with 10 CFR 20.303 and by disposal at an approved burial site.

FEB 2 1993

*Alabama State University*



*This is certified*

*to Johnson*

*who successfully completed the*

**RADIATION SAFETY SPECIALIST TRAINING PROGRAM**

*conducted by Alabama State University and a committee thereof hereby  
awards this diploma to *James P. Johnson* Alabama this 15th day of March*

*1966*



*James P. Johnson*

James P. Johnson  
Alabama Power

*Stan M. Dunham*

Stan M. Dunham  
Coordinator  
ASU Extension

ASU EXT



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TEXAS 76011-8064

OCT 27 1992

In Reply Refer To:  
License Nos: 35-12636-06  
                  SUB-986  
Docket Nos: 030-08401  
                  040-08006  
Control Nos: 463652  
                  463651

Kerr-McGee Corporation  
ATTN: J. C. Stauter  
Kerr-McGee Center  
123 Robert S. Kerr Avenue  
Oklahoma City, Oklahoma 73125

Gentlemen:

We have reviewed your decommissioning financial assurance submittal dated July 25, 1990, and your subsequent submittals dated August 30, 1991, and June 19, 1992, in response to our deficiency letters dated July 10, 1991, and May 13, 1992, respectively. Within the scope of our review, no further deficiencies were identified. If additional information is required, we will contact you.

Sincerely,

E. J. Callan, Director  
Division of Radiation Safety  
and Safeguards

10/27/92

2971 + +  
9302108464 920917  
PDR ADDCK 03008401  
C PDR

MLAO