



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

RELATED TO AMENDMENT NO. 6 TO MATERIALS LICENSE NO. SNM-1999

KERR-McGEE CORPORATION

CUSHING REFINERY SITE

DOCKET NO. 70-3073

1.0 INTRODUCTION

By license amendment application dated October 20, 1995, the licensee, Kerr-McGee Corporation, has requested changes to the license for its Cushing facility at Cushing, Oklahoma. This Amendment No. 6 to the license responds to licensee's request on the organization supporting the decommissioning of the Cushing site, the approval requirements of radiation safety procedures, the commitments of the bioassay and air sampling program implemented under the radiation safety program, and other miscellaneous items addressed in the license application. Notice of consideration of this amendment request and opportunity for hearing was published in the Federal Register (61 FR 38788) on July 25, 1996. No hearing was requested. This license amendment request was revised by the licensee by letters dated February 9, 1996, and February 15, 1996.

2.0 BACKGROUND

On April 6, 1993, U.S. Nuclear Regulatory Commission issued Materials License SNM-1999 authorizing possession of contaminated soil, sludge, sediment, trash, building rubble, and any other contaminated material, at the licensee's Cushing site. In this Amendment No. 6, license conditions 11.C, 11.F, and 11.K are revised, license condition 11.D is added, and several conditions in the license application are changed.

3.0 EVALUATION

In the evaluation, topics considered are the organization, the approval of radiation safety procedures, the bioassay and air sampling programs, and miscellaneous items addressed in the license application.

3.1 Organization

The licensee requests that its organization be changed as shown on a chart it submitted as amended on January 15, 1996, and February 9, 1996. The corporate restructuring brings all site remediation activities of the licensee under the management of a single group, the Safety and Environmental Affairs Division. The Vice President of Assessment and Remediation Department oversees all NRC and Agreement State

decommissioning activities within the company. This person has experience in environmental assessment and uranium mining operations. The Project Leader has no previous experience in radiation protection, but has completed a course in HAZWOPER. This individual has the responsibility for the Cushing site. NRC staff recognizes that Mr. Terence Moore is still designated as the Radiation Safety Officer (RSO) for the Cushing site, and that Mr. Jeff Lux is designated as the contact person for all written correspondence pertaining to the license.

### 3.2 Approval of Radiation Safety Procedures

The licensee uses a Special Work Permit program to control remediation activities at the Cushing site. The radiation safety program consists of the radiation safety plan, which outlines the main elements of the radiation safety program, and referenced radiation safety procedures, which implement the radiation safety program. License condition 11.F requires, "All radiation protection program procedures shall, at a minimum, be approved by the Radiation Safety Officer and either the Vice President, Environmental Operations, or the Vice President, Environmental & Health Management."

The licensee requests to either delete approval requirements for the radiation safety plan and procedures or require approval of the radiation safety procedures by the RSO only and not by management. NRC staff agrees with the licensee that the radiation safety procedures are technical in nature, and the licensee's managers do not need to approve these procedures to ensure radiological safety. However, NRC staff continues to believe that revisions to the radiation safety plan should be reviewed by the appropriate level of the licensee's managers. Therefore, NRC staff recommends revising license condition 11.F as follows, "All radiation protection program procedures or revisions to these procedures shall be approved by the Radiation Safety Officer. All revisions to the radiation safety plan shall be approved by the Radiation Safety Officer, Site Manager, Project Manager, and Project Leader." This license condition will continue to ensure that revisions to the radiation safety program receive appropriate Kerr-McGee management review. With this stipulation, the Amendment No. 6 request is acceptable, because the radiation safety plan and procedures are approved by those who are responsible for their compliance.

### 3.3. Bioassay and Air Sampling Programs

Inhalation of resuspended airborne radioactivity is the primary pathway for internal occupational exposure during remediation and disposal activities at the Cushing site. The bioassay program is intended to supplement the air sampling program that monitors and controls the inhalation of airborne materials. The licensee requests to be relieved from its commitments to: (1) collect daily lapel and area air samples, (2) provide 50 percent of all workers with lapel air samplers when working in radioactive materials areas, and (3) provide bi-monthly urinalysis and bi-annual in-vivo lung count.

The licensee used a contractor to assess the Cushing air sampling and bioassay programs. This internal assessment study was based on an analysis, which covers a 13-month period taken between January 1, 1994, and January 31, 1995, of lapel air samples and urinalysis. The contractor concluded that urinalysis was an inappropriate method to detect low levels of thorium, and that lapel air sampling was the best method to detect low levels of thorium. In addition, the licensee noted that based on the requirements of 10 CFR Part 20, in-vitro bioassay testing is not required for expected inhalation intake less than 200 derived air concentration-hours (DAC-hrs). The licensee said that according to the resulting lapel air sample data from its internal assessment study, it found that site inhalation intakes were well below the Part 20 monitoring threshold of 200 DAC-hrs. Based on this finding, the licensee proposes to revise its air sampling and internal monitoring programs. In general, the licensee requests to replace the commitments with a performance-based air sampling program and to set prescriptive bioassay monitoring thresholds similar to Part 20 but lower to account for uncertainties.

The licensee's proposal to replace the lapel air samplers commitments would be replaced with a air sampling program comprised of the following elements:

- 1) The lapel air samplers would be issued when required by a special work permit or at the direction of the health physics personnel. Lapel air samplers would be issued when there is a reasonable probability that personnel may be exposed to airborne radioactive material. Lapel air samplers may be issued at a minimum of one per work crew, or a maximum of one per individual, depending on the work scope and the potential for worker exposure.
- 2) Downwind area air sampling would be performed when work activities are being performed that would cause the potential of producing airborne radioactivity, such as earthmoving.

The licensee stated that lapel air samplers can provide the sensitivity needed for thorium and uranium isotopes. In an inspection conducted on September 25-26, 1995, the NRC inspector examined a detailed study of the licensee's internal exposure assessment capabilities. The inspector noted that Cushing's lapel air sample analysis was capable of detecting Th-232 at  $1.6 \times 10^{-15}$   $\mu\text{Ci/cc}$ . Part 20, Appendix B, derived air concentration value for Th-232 is  $5.0 \times 10^{-13}$   $\mu\text{Ci/cc}$ . Thus, the Cushing lapel air samplers have a level of sensitivity necessary to measure the licensee's proposed thresholds of 40 DAC-hrs.

Next, the licensee requests that the urinalysis and lung count commitment be replaced by data based on worker exposure. The licensee stated that urine sampling and analysis for uranium isotopes would be performed for all workers in a work crew, if either area air sample(s) or lapel air sample(s) indicate an inhalation intake of greater than 40 DAC-hrs or greater than 100 DAC-hrs/yr accumulated exposure for any one worker. In addition, the licensee proposes to perform fecal

analysis for thorium, if thorium inhalation is suspected and either area air sample(s) or lapel air sample(s) indicate chronic or acute exposures in excess of 100 DAC-hrs. NRC staff reviewed the resulting lapel air sample data from the licensee's internal assessment study and agrees with the licensee that site inhalation intakes during this period were below the Part 20 monitoring threshold of 200 DAC-hrs for bioassay testing.

NRC staff concludes that the licensee's request to replace its commitments to: (1) collect daily lapel and area air samples; (2) provide 50 percent of all workers with lapel air samplers, when working in radioactive materials areas; and (3) provide bi-monthly urinalysis and bi-annual in-vivo lung count, with revised air sampling and bioassay programs is acceptable. However, NRC staff recommends that the revised programs be included in the Cushing license as a license condition.

### 3.4. Miscellaneous Items Addressed in the License Application

The licensee requested three additional amendments to its license application. The requests are: (1) NRC recognizes stipulated times of training programs are not appropriate as criteria for judging the adequacy of a radiation safety training program; (2) all film badges for both workers and visitors to be submitted on a quarterly basis; and (3) all radiation monitoring instruments to be calibrated either by the manufacturer or at the Cushing facility.

Sections 8.1 and 8.2 of the license application stipulate prescribed numbers of hours for various training programs that the licensee believes is an unnecessary stipulation. NRC staff addressed the issue regarding this issue in a letter dated November 14, 1995, and agreed that the content of training courses, not the number of hours devoted to each course, is the germane issue. NRC staff then requested alternate designations for the two training courses. The licensee responded in a letter dated February 15, 1996, in which it will utilize Initial Radworker Training for initial training and Annual Radworker Requalification for annual updates. The licensee also gives a commitment to cover all of the topics listed in 10 CFR 19.12 in each course.

Film badges are used to monitor external occupational exposure. Radiation workers are required to wear film badges at all times while on the Cushing site, and all individuals entering a radioactive materials area are required to wear film badges. Section 10.1 of the license application states that film badges for workers are processed on a monthly basis and for others are processed on a quarterly basis. The licensee requests all film badges be submitted on a quarterly basis for both workers and visitors. NRC staff acknowledges the modification for film badge submittal in the radiation safety program, as appropriate, based on the data submitted by the licensee. The air sampling program shows that the majority of the samples are below detectable limits. Quarterly submission of film badges is a common practice in industry and



does not endanger the health or safety of workers or visitors at the Cushing site.

Section 10.4 of the license application states that portable alpha and gamma radiation monitoring instruments are calibrated at the Cimarron Corporation's Crescent, Oklahoma facility. NRC staff acknowledges the modification for location of instrument calibration as acceptable, because the change in calibration location does not affect the measurement and detection capability of the instruments.

#### 4.0 STATE CONSULTATION

The Oklahoma State official was notified of the proposed issuance of Amendment No. 6. The State official had no comments.

#### 5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner; (2) such activities will be conducted in compliance with the Commission regulations; and (3) the issuance of Amendment No. 6 will not be inimical to the common defense and security or to public health and safety.

Principal Contributor: S. nu

Date: February 12, 1997

**ENCLOSURE 3**