KERR-McGEE CHEMICAL CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

F. D. LYONS
VICE PRESIDENT
CHEMICAL MANUFACTURING

October 8, 1976

Mr. William L. Fisher, Acting Chief
Fuel Facility and Materials Safety Branch
Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Re: License No. STA-583

Dear Mr. Fisher:

This refers to the several items of noncompliance noted in your letter of September 17, 1976. Corrective action has been taken as described below:

Infractions

1. The individual who was overexposed was immediately reassigned to work areas which would reduce his exposure to well within the cumulative limit when the plant was notified of the exposure. The individual's exposures for the next two subsequent quarters were 1.0 rem and zero rem.

   There is one repackaging operation where a possibility of overexposure exists. To prevent further overexposure, the time of exposure to this source will be limited. This was effected October 5, 1976.

2. A report of the personnel overexposure cited above has been sent to the USNRC on October 8, 1976. To prevent a recurrence of failing to report such an incident, copies of exposure reports are being sent to Corporate headquarters for review as of October 1, 1976.

   A report of excessive levels of airborne radiation was not sent to the USNRC because this matter was not recognized until brought to our attention by the inspections referred to in your letter. This matter will be corrected as indicated in 3 below.

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3. The evaluation of airborne concentrations will be made as part of the Health Physics plan developed by Eberline Instrument Corporation. This plan will be submitted on October 8, 1976 for your approval.

Deficiencies

1. Airborne radioactivity area warning signs will be posted and the area restricted to authorized personnel wearing suitable protective clothing and/or respiratory equipment as part of the plan developed under 3 above.

2. The individual was notified verbally immediately when the exposure report was received. The individual has now been notified in writing. Recurrence of such an omission will be prevented in the future through Corporate review of exposure reports.

We trust this action meets with your approval.

Very truly yours,

F. D. Lyons

F. D. LYONS
Vice President

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DRAFT REGULATORY REPORT

Licensee and Address: Kerr McGee Chemical Corp.
Oklahoma City, Oklahoma

Facility: Rare Earth Plant — Type of Licensee: Source Material

Location: West Chicago, Ill — Type of Inspection: Announced, Routine

Date(s) of Inspection: July 8, 9, 16 & 19, 1976

Date(s) of Previous Inspection: July 1973

License No.	Amend. No. & Date	Report No.	Category	Priority
STA-583	Renewal, Aug. 2, 1974	7601	I	II

Principal Inspector: W.H. Schultz — Other Accompanying Personnel: C.T. Lenegan

Accompanying Inspector(s): C.T. Oberg

Reviewed By: C.T. Lenegan
Title: Chief, VMRPS

Findings: 591 or Ltr: ltr. Compliance: Yes ____ No 4 — No. of Violations: 5

Recommended Reinspection Date: ____ — No. of Safety Items: 0

Proprietary Information: None

Licensee Participants: Mr. R.P. MacLean, Mgr. of Production and Mr. E. Jugwiak

Management Summary:

Individual(s) (including title) with whom inspection was summarized:
Mr. R. J. Vreeland, Sr. Proj. Engr.; Mr. R.P. MacLean, Mgr. of Production, and Mr. M. Troutman, Consultant, Mgr. Midwest Facility, Eberline Inst. Co.

Violations & Safety Items Noted:

Regulation	Brief Statement of Problem	Paragraph of Report Where Discussed
20.101	Overexposure to whole body	¶ 28
20.405(a)	No 30 day report of overexposure	¶ 20 & 28
20.201(b)	Inadequate evaluation of airborne concentrations	¶ 20
20.203(d)(2)	No airborne radioactivity area warning signs posted	¶ 25
20.409(b)	No notification of exposure to radiation	¶ 28

13. Inspection Summary (Including violations and safety items, and status of previously reported violations and safety items, etc.)

Items of noncompliance identified during this inspection are briefly outlined in the preceeding paragraph.

14. Summary of Licensed Program (Kind of program, number of people, rate of use or quantities on hand, places and frequency of use, type, quantity and use as authorized, etc.)

A renewal license was issued to this licensee for the West Chicago facility for the purpose of storage and distribution of various thorium and rare eath compounds. All processing at this plant was terminated as of December 31, 1973.

The plant has been undergoing decommissioning; equipment dismantling and performance of decontamination/cleanup operations for release for unrestricted use. At the time of this inspection, the Thorium Extraction Plant building (Bldg. 9) was undergoing rigorous decontamination by pneumatic chipping and removal of contaminated concrete flooring concomitant with a continuous water wash to reduce dust and flush residue. One and one-half floors of three in the building have been completed since about May, 1976.

15. Organization and Administration (Management organization, RSO, authorities and responsibilities, authorized users, qualifications, supervision, etc.)

Kerr-McGee chemical Corp., Headquarter Offices in Oklahoma City, Oklahoma, is the holder of the license. Messrs. F. D. Lyons, Vice President of the Chemical Manufacturing Division, and R. J. Vreeland, Sr. Project Engr. of the HQ office are cognizant individuals for ths West Chicago facility. Mr. MacLean is Mgr. of Production on site at the West Chicago facility.

Administrative control and review of personnel and the operations has not been direct. Management assigned a local individual the responsibility for decommissioning and has subcontracted the decontamination/cleanup operations to a construction contractor.

Instructions to perform the decommissioning and decontamination/cleanup were issued from HQ to Mr. MacLean. Verbal directions were issued at the facility.

16. Facilities (Use facilities, storage facilities, control of access, control devices and alarms, etc.)

The Kerr-McGee, West Chicago facilities consist of two major locations; the processing plant complex and a large waste storage area. Both of these areas are fenced and have locked gates to inhibit access.

Within the past six months, the licensee has permitted use by other persons of up to three buildings in the plant area. The construction contractor performing the decontamination/cleanup is using a truck garage type of building (Bldg. 20) and grounds for storage of vehicles. A three-car garage (Bldg. 11) was used for a period of time by another party.

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17. Equipment (Devices utilizing licensed material, monitoring instrumentation, special equipment as glove boxes, hoods, handling tools, respirators, etc.)

Special handling equipment and devices used during processing are no longer in use. Electric and gas utilities have been shut off and/or disconnected in buildings not in use.

Instrumentation available consists of portable PAC-3 type alpha and GM type beta-gamma, laboratory survey meters; a Nuclear Chicago Co. Model 470, gas flow proportional detector and Model 8703 scaler counting system, and two locally fabricated air particulate sampling units capable of sampling up to 35,000 ml of air/min. The beta-gamma survey instruments do not have end window type detectors. Licensee uses four Eberline standard check sources for response verification and calibration. The activity levels of these sources are recorded as 370, 3480, 31510 and 301170 counts per minute. The B-Y survey instruments do not have the end window type detectors necessary to make surface measurements through a total absorber thickness of 7 mg/cm^2 or less as specified in guidelines for decontamination for unrestricted use.

18. Radiological Safety Procedures (Written operating and emergency procedures, availability of procedures, license and regs., training, Form NRC-3, etc.)

NRC-3 (AEC-3)

was posted and license and regs. were available.

Contractor personnel performing the decontamination operations were provided masks by their employer. The masks were purchased from local hardware suppliers and were those used by painters when spraying paint. Masks have not been approved nor was there any thought of having them approved for the decontamination application.

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16. Facilities (Use facilities, storage facilities, control of access, control devices and alarms, etc.) (Continued from Item 4)

In the waste storage area, a ladder was positioned against the fence indicative of possible access to the area.

The plant area security is more appropriately controlled because of the presence of personnel during the normal work day plus a security guard during some of the off hours. Because of the use of some of the buildings by persons other than the licensee, access to the facility is not fully controlled.

19. Personnel Monitoring and Exposure to External Radiation (Type of monitoring, range of exposures, supplier, period worn, exposure history, etc.) Film badge service is provided on a monthly exchange basis by Landauer Co.

All employees of licensee plus five contractor personnel are issued whole body film badges. The latter individuals have been performing decontamination and cleanup operations since about November, 1975, and are required to wear their badges during working hours.

Contractor personnel performing decontamination and cleanup operations have received maximum exposures of 300 mrem to the skin and 220 mrem whole body. Most of their readings have been minimal.

20. Exposure of Employees to Airborne Radioactive Materials (Method of evaluation, type of samples, radioisotopes, records, bioassay, etc.)

Airborne particulate contamination measurements were made two times and the concentration levels were calculated by the licensee rep.

One set of airborne particulate activity samples taken and calculated by licensee rep. on June 13, 1976, gave a concentration level of 1×10^{-7} uCi/ml. The licensee rep. stated that this value was a factor of two high because of an error in his calculations. The error was verified by the inspectors. The corrected airborne concentration level was 5×10^{-8} uCi/ml, in excess of regulatory limits (6×10^{-11} uCi/ml for nat. Th). The results of the second

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21. Effluents to Unrestricted Areas (Types, source, measurements, flow rates, applicable MPC, analytical procedures, environmental samples, etc.)

Licensee has made no evaluation of water effluents from the decontamination operation.

set of airborne survey samples could not be located by the licensee Rep.

When questioned as to the meaning of the calculated results in terms of action point or MPC, licensee rep. stated that he had not been told what these were.

No action was initiated on the evidence of apparent high activity concentration results (greater than MPC_a for ^{h}-Th) determined from these measurements.

These facts constitute an inadequate evaluation of airborne concentrations by licensee in noncompliance with 10 CFR 20.201(b). The airborne activity level was recorded but contrary to 10 CFR 20.405(a) a report was not submitted to the USNRC as required.

Licensee has not established a bioassay program.

22. Disposals (Methods, typical quantities, etc.)

Waste material from the plant area decontamination oeprations is loaded into steel waste bins of about a cubic yard in volume. These are subsequently transferred to the waste storage area and dumped. During the inspection, ~~eight to~~ 12 of these containers were awaiting disposal of their contents.

23. Miscellaneous Surveys, Evaluations and Records (External radiation levels, contamination levels, leak tests, etc.)

Licensee has performed and evaluated direct reading & removable contamination surveys in the plant area. Direct reading measurements have been taken in buildings prior to and during decontamination to attain limits of 5,000 dpm α/100 cm² and 0.2 mr/hr β-γ, the licensee goal for acceptable surface decontamination levels. Direct readings have also been taken in and around the waste storage area to determine its effect on the environment. Fixed and removable surface contamination surveys have been made in buildings within the plant area where licensee rep. has determined that decontamination and cleanup have been achieved. These data and evaluations have been submitted in a "Preliminary Report" requesting release of four buildings for unrestricted use (April 20, 1976).

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24. Special License Conditions

See Section 14 of this report.

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23. Miscellaneous Surveys, Evaluations and Records (External radiation levels, contamination levels, leak tests, etc.) (Continued from p. 6)

Since the start of the decontamination and cleanup program, two airborne particulate contamination survey samples were made by licensee during June, 1976, in Bldg. 9 while decontamination work was in progress. The survey samples were each taken in duplicate. The results of the measurement data from the duplicates were averaged and a concentration value was calculated. (See P 20)

25. Posting and Labelling

Radioactive airborne contamination warning signs were not posted in Building 9 during the decontamination and cleanup operations. This constitutes noncompliance with 10 CFR 20.203(d)(2). All other posting throughout the facility appeared to be as required by NRC Regulations. However, many of the signs posted were faded and weathered. Licensee had on hand and was installing several large, new signs.

26. Independent Measurements (Type, results, comparison to licensee results, etc.)

Independent measurements in the form of radioactive surface contamination (fixed and removable, alpha and beta-gamma) surveys were made by NRC, Region III personnel as requested by ~~[illegible]~~ AITS Track No. HO1317F3. The results of these measurements are presented in a report which has been transmitted to HQ on August 12, 1976.

USNRC, Region III personnel also made beta-gamma direct reading survey measurements in and around the waste storage area. Within the area, sections of the thorium processing residue pile gave readings as high as 80 mr/hr; dried, rain wash areas measured about 40 mr/hr, and the sides of the residue pile read about 20 mr/hr. At the perimeter fence line and up to several feet out from the fence, ground level measurements varied from about 0.5 mr/hr to 6 mr/hr. Comparable levels were obtained at waist

Continued in ¶ 29, par 8

27. Operations Observed

Decontamination/cleanup operations being performed in Building 9 as discussed in Section 14 , were observed on two occasions. The techniques employed appeared to be appropriate for the task.

28. Incidents, Overexposures, Theft or Loss, Equipment Malfunction (Those not described elsewhere should be reported here.)

No incidents of theft or loss of source material were identified by licensee rep. during the inspection.

During the second quarter, 1975, period of May 15 to June 14, 1975, one licensee employee received a dose to the whole body of 1400 mrem while repackaging processed thorium into smaller units. This constitutes noncompliance with 10 CFR 20.101. The licensee rep. made no written notification of this overexposure to the USNRC within the required 30 days in noncompliance with 10 CFR 20.405(a). No internal evaluation was made nor was a memo of the overexposure made to licensee file. No written notification was made to the employee of his overexposure which constitutes noncompliance with 10 CFR 20.409(b). Subsequent to this, the same employee received a 1000 mrem exposure to the whole body during the third quarter, between July 15 and August 14, 1975. The individual was taken off his assigned task and has received no further exposure. His previous exposure history was:

Continued in P 29

29. Other Information or Continuation from Previous Paragraphs

P26 Con't. (Independent Measurements)

height, dependent upon the distance from the processing residue pile and/or condition of the retaining banks around the pile.

The ground radiation levels outside the fence were apparently the result of contamination spread by the effects of meteorlogical conditions on the thorium processing residue pile.

Beta-gamma, direct reading measurements were also made at ground level and of stored equipment in the South end of the plant property. Ground level measurements were as high as 6 mr/hr. Some of the piping stored in this area gave radiation levels measuring significantly above background.

Airborne particulate contamination concentrations were obtained by Region III personnel employing high velocity, Staplex Samplers in Building 9 during decontamination/cleanup operations. The sampling was performed in duplicate at a rate of 20 cu ft./min. for a period of 40 minutes. The results of the duplicate samplings were within a factor of two of one another. The alpha activity level of the highest was evaluated to obtain an air concentration level of 2.4×10^{-10} uCi nat. Th/ml, a factor of four above the limits in Part 20.

Beta-gamma direct readings of some of the decontamination/cleanup waste in Bldg. 9 waste bins were as high as 8 mr/hr. These bins were awaiting transfer to the waste storage area and were not covered.

P28 Con't (Incidents, Overexposures, etc)

12/15/74 to 1/14/75	-	40 mrem
2/15/75 to 3/14/75	-	290 mrem
3/15/75 to 3/14/75	-	0 mrem
4/15/75 to 5/14/75	-	20 mrem

(Contue P5A

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On July 20, 1976, USNRC, Region III, personnel contacted Mr. R. J. Vreeland by telephone to advise him of the findings of this inspection, and that Region III personnel considered that the Health Physics/Management controls of the decontamination and cleanup operations at the West Chicago facility are inadequate. Region III personnel recommended to Mr. Vreeland that the operations cease until improved and acceptable procedures can be established, and requested that he, Mr. Vreeland, meet with personnel at the USNRC, Region III offices, Glen Ellyn, Illinois on July 22, 1976, to review the status and determine the necessary steps to be taken to correct and improve the existing conditions. Mr. Vreeland stated that operations at the West Chicago facility would cease immediately and that he would be available on July 22, 1976, for the meeting.