MAR 3 1 1983

ANNEX A

GUIDELINES FOR DECONTAMINATION OF FACILITIES AND EQUIPMENT PRIOR TO RELEASE FOR UNRESTRICTED USE OR TERMINATION OF LICENSES FOR BYPRODUCT, SOURCE, OR SPECIAL NUCLEAR MATERIAL

U. S. Nuclear Regulatory Commission
Division of Fuel Cycle and Material Safety
Washington, D.C. 20555

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The instructions in this guide, in conjunction with Table 1, specify the radionuclides and radiation exposure rate limits which should be used in decontamination and survey of surfaces or premises and equipment prior to abandonment or release for unrestricted use. The limits in Table 1 do not apply to premises, equipment, or scrap containing induced radioactivity for which the radiological considerations pertinent to their use may be different. The release of such facilities or items from regulatory control is considered on a case-by-case basis.

1. The licensee shall make a reasonable effort to eliminate residual contamination.

2. Radioactivity on equipment or surfaces shall not be covered by paint, plating, or other covering material unless contamination levels, as determined by a survey and documented, are below the limits specified in Table 1 prior to the application of the covering. A reasonable effort must be made to minimize the contamination prior to use of any covering.

3. The radioactivity on the interior surfaces of pipes, drain lines, or ductwork shall be determined by making measurements at all traps, and other appropriate access points, provided that contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement shall be presumed to be contaminated in excess of the limits.

4. Upon request, the Commission may authorize a licensee to relinquish possession or control of premises, equipment, or scrap having surfaces contaminated with materials in excess of the limits specified. This may include, but would not be limited to, special circumstances such as razing of buildings, transfer of premises to another organization continuing work with radioactive materials, or conversion of facilities to a long-term storage or standby status. Such requests must:

   a. Provide detailed, specific information describing the premises, equipment or scrap, radioactive contaminants, and the nature, extent, and degree of residual surface contamination.

   b. Provide a detailed health and safety analysis which reflects that the residual amounts of materials on surface areas, together with other considerations such as prospective use of the premises, equipment or scrap, are unlikely to result in an unreasonable risk to the health and safety of the public.

5. Prior to release of premises for unrestricted use, the licensee shall make a comprehensive radiation survey which establishes that contamination is within the limits specified in Table 1. A copy of the survey report shall be filed with the Division of Fuel Cycle and Material Safety, USNRC, Washington, D.C. 20555, and also the Administrator of the NRC Regional Office having jurisdiction. The report should be filed at least 30 days prior to the planned date of abandonment. The survey report shall:

   a. Identify the premises.

   b. Show that reasonable effort has been made to eliminate residual contamination.

   c. Describe the scope of the survey and general procedures followed.

   d. State the findings of the survey in units specified in the instruction.

   Following review of the report, the NRC will consider visiting the facilities to confirm the survey.

TABLE 1

ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDES[a]	AVERAGE[b c f]	MAXIMUM[b d f]	REMOVABLE[b e f]
U-nat, U-235, U-238, and associated decay products	5,000 dpm α/100 cm^2	15,000 dpm α/100 cm^2	1,000 dpm α/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm^2	3000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5000 dpm $\beta\gamma$/100 cm^2	15,000 dpm $\beta\gamma$/100 cm^2	1000 dpm $\beta\gamma$/100 cm^2

[a] Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c] Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

[d] The maximum contamination level applies to an area of not more than 100 cm^2.

[e] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

[f] The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

MAR 3 1 1983

Docket No. 70-925

License: Kerr-McGee Nuclear Corporation (K-M)
Facility: Cimarron Uranium Plant
Subject: Request for License Renewal, SNM-928

I. Background

K-M's Uranium Fuel Fabrication Plant (Cimarron Facility) located north of Crescent City, Oklahoma, was licensed for the fabrication of fuel elements for nuclear reactor fuel assemblies. In the fall of 1975, K-M decided to shut-down the Cimarron Plant and start decontamination of the facility and equipment. By NRC letter dated May 3, 1977, K-M's license was renewed for a 5-year term to authorize possession only of radioactive materials for the purpose of decontaminating the facility prior to requesting termination of the license. By letter dated March 29, 1982, the licensee filed an application for renewal of the license for the same purpose. In the application, K-M requested authorization to possess a maximum of 1.2 kg U-235 in the form of contaminated facilities and equipment.

On April 28, 1979, the license was amended to authorize the possession of 2000 kg of natural and depleted uranium. The material was previously authorized under K-M's Source Material License SMA-826. Materials License No. SMA-826 was then terminated.

On December 28, 1979, NRC authorized certain sections of the Cimarron Uranium Plant to be used for K-M's coal liquefaction development project, a nonnuclear activity. The area involved was decontaminated to below the NRC guidelines for unrestricted use; however, the area remains an authorized place of use under this license and subject to the conditions of the license.

Decontamination activities at the Cimarron Plant are being performed using incremental labor and a specific time schedule for completing decontamination

MAR 2 1 1983

has not been established. Accordingly, a license condition is being added to require K-M to complete the decontamination by April 30, 1987 (see License Condition No. 20).

II. Scope of Review

The review of K-M's application for renewal included a review of their license application dated March 29, 1982, a discussion with the Region III Inspector, and a review of their conduct of operations since the last renewal.

III. Discussion of Review

K-M's application demonstrates that they have the qualified technical staff to administer an effective radiological protection program during the decontamination and decommissioning activities. The following sections contain a description of K-M's organizational structure, the radiological safety program, and additional license conditions developed by FCUP staff.

A. Management Organization

The Cimarron Standby Operation Manager (SOM) has the responsibility for all decontamination and maintenance activities. The SOM has to approve the operating procedures, including the health and safety requirement. The SOM shall have a bachelor's degree with at least 2 years' experience in radiation and criticality safety.

The Health Physics Safety Supervisor reports to the SOM and is responsible for maintaining a radiation safety program for the protection of facility workers and the public.

K-M Corporation's Environment and Health Management Division, located at Oklahoma City, is responsible for establishing the K-M radiation protection program and for the general administration of the health and safety program at the Cimarron facility.

MAR 3 1 1983

K-M Corporation's Health Physicist conducts quarterly inspections and audits of the Cimarron decontamination operation. The results of these inspections are reported tc the SOM and top management of the Corporation.

B. Radiation Safety

1. Control of Personnel Exposure

a. External Exposure. All personnel who work with licensed material are provided with personal dosimeters for monitoring purposes. The workers' exposure will be evaluated on a monthly basis.

b. Internal Exposure. Protection of operating personnel from excessive internal exposure is provided by:

(1) Protective clothing - This minimizes direct contact with radioactive material.

(2) Monitoring the airborne radioactivity during the decontamination - The staff feels that this program needs to be better defined. Therefore, to further clarify the air monitoring program, the staff recommends that the following condition be added:

Condition 11. The airborne concentration of radioactivity in the workers' breathing zone shall be continuously monitored during the operation and analyzed for every shift or after each operation, whichever is shorter in time. If any air sample data indicates a measured level is greater than 1 MPC of the radionuclide as specified in Table 1, Column 1, Appendix B of 10 CFR 20, the Health and Safety Supervisor shall conduct an investigation of its cause and take corrective action.

MAR 3 1 1983

Furthermore, the permanently mounted air sampling equipment used to determine the concentration in the workers' breathing zone shall be evaluated for representativeness at least once every 6 months and whenever the licensed operation change is made.

(3) A bioassay program - The selection of bioassay techniques, sampling frequency, and action levels are based on Regulatory Guide 8.11, "Application of Bioassay for Uranium," dated June 1974; and

(4) Use respiratory protective equipment - The licensee requests authorization to use a protection factor for a type of respirator different from the one specified in 10 CFR 20.103. The staff feels the request is not justified and recommends the following license condition be added to the renewed license:

Condition 12. Notwithstanding the statements in Annex A of your application dated March 29, 1982, regarding respiratory protection, the licensee shall comply with the regulation specified in 10 CFR 20.103.

2. Control of Surface Contamination

All areas, where the decontamination work is done, will be surveyed to assure the surface contamination is within the specified limits. The following four additional conditions are recommended by the staff to enhance K-M's program for control of surface contamination.

Condition 13. Notwithstanding the statements in subsection 3.2.5 of page 3-5 in Appendix A of the application dated September 13, 1976, the licensee shall calibrate the radiation survey instruments at least every 6 months.

Condition 14. The licensee shall not allow an individual whose skin or personal clothing is found contaminated above background radiation level to exit a controlled area without prior approval of the Standby Operation Manager or Health Physics and Safety Supervisor.

Condition 15. Notwithstanding the statements in subsection 3.3.1, page 3-7, and Section 3.4 of page 3-14 in Appendix A of the application, release of facilities, equipment, and material from the plant to offsite for unrestricted use or from a controlled area to an uncontrolled area onsite shall be in accordance with the attached Annex A dated July 1982. Record of the contamination survey and final disposition of any equipment shall be kept for inspection by NRC.

Condition 16. The licensee shall conduct a routine surface radiological survey of the facility on a monthly basis. The surface contamination levels in the controlled areas shall be maintained below 5000 dpm/100 cm^2 (removable alpha).

3. Training

All personnel receive radiological safety training prior to starting work. A refresher meeting on safety topics is also given periodically to all personnel.

4. Management of Radioactive Effluents

a. Gaseous. Since the exhaust fans are not in operation while the Cimarron Plant is in standby, no significant amount of radioactivity is expected to be released through the gaseous effluents.

b. Liquids. Two sources of liquid waste are generated at the Cimarron facilities: the sanitary wastes from the laundry and restrooms, and the waste generated as a result of the decontamination operation.

Based on the 1982 records, it is estimated that 1.6×10^5 gallons of liquid waste containing 440 μC of uranium and 64 μC of plutonium was generated and stored onsite in the sanitary waste lagoons. Prior to the termination of this license, the sanitary waste lagoon shall be decontaminated to such a level so that it can be released for unrestricted use.

At the Cimarron Uranium Facility, there are three other dry ponds that are contaminated with uranium. None of these ponds have been used since 1975. K-M shall not be allowed to backfill the ponds before survey by NRC. Accordingly, the following condition is recommended:

Condition 17. After the residues have been removed, the settling ponds shall not be backfilled until they have been surveyed and released by the NRC. The aforementioned survey shall be requested and the final release authorized in writing.

c. Solids. The licensee did not describe the method for disposal of contaminated solid waste in the application. The staff, therefore, recommends the following condition:

Condition 18. The licensee shall dispose of the radioactive contaminated solid waste, that is generated by the licensed activities, at an NRC-approved burial site.

IV. Nuclear Safety

The following are the maximum possession limits of uranium under this license:

1. 1200 g of contained U-235 in uranium in any compound (any form except metal) enriched to no more than 5% U-235.

2. 100 g of contained U-235 in uranium in any form enriched to more than 5% U-235.

3. 2000 kg of natural or depleted uranium in any form.

No combination of the above can be made critical independent of the degree of water moderation or reflection.

The licensee has requested an exemption from the provisions of 10 CFR 70.24. Since no combination of the entire uranium inventory possessed by the licensee can be made critical independent of the degree of water moderation and reflection, good cause exists for granting an exemption from the requirements of 10 CFR 70.24. Granting such an exemption will not endanger life or property or the common defense and security and is in the public interest. It is recommended this exemption be granted as Condition 19.

Condition 19. The licensee is hereby exempt from the provisions of 10 CFR 70.24 insofar as this section applies to materials held under this license.

V. Region III Comment

On August 9, 1982, and March 9, 1983, the staff discussed the renewal with Mr. Charles Peck, Region III Facility Inspector. Mr. Peck foresaw no safety-related problems with renewing the license as proposed.

VI. Conclusion and Recommendation

Upon completion of the safety review of the licensee's application and discussions with the Region III Facility Inspector about the licensee's compliance records, the staff has concluded that K-M has the necessary technical staff to administer an effective radiological safety program. Conformance by K-M to their proposed conditions, as well as to those developed by the FCUF staff, should ensure a safe operation, a quick detection of unfavorable trends or effects and results in corrective actions being taken. Based on this analysis, it is concluded that the proposed renewal application is nonsubstantive and insignificant from the standoint of environmental impact.- Accordingly,

MAR 3 1 1983

pursuant to Subparagraph 51.5(d)(4) of 10 CFR 51, no environmental impact statement, negative declaration, or environmental impact appraisal need be prepared.

Based on the discussion above, it is recommended that the license be renewed for a 5-year period in accordance with the application and subject to the following conditions:

Condition 11. The airborne concentration of radioactivity in the workers' breathing zone shall be continuously monitored during the operation and analyzed for every shift or after each operation, whichever is shorter in time. If any air sample data indicates a measured level is greater than 1 MPC of the radionuclide as specified in Table 1, Column 1, Appendix B of 10 CFR 20, the Health and Safety Supervisor shall conduct an investigation of its cause and take corrective action. Furthermore, the permanently mounted air sampling equipment used to determine the concentration in the workers' breathing zone shall be evaluated for representativeness at least once every 6 months and whenever the licensed operation change is made.

Condition 12. Notwithstanding the statements in Annex A of your application dated March 29, 1982, regarding respiratory protection, the licensee shall comply with the regulation specified in 10 CFR 20.103.

Condition 13. Notwithstanding the statements in subsection 3.2.5 of page 3-5 in Appendix A of the application dated September 13, 1976, the licensee shall calibrate the radiation survey instruments at least every 6 months.

Condition 14. The licensee shall not allow an individual whose skin or personal clothing is found contaminated above background radiation level to exit a controlled area without prior approval of the Standby Operation Manager or Health Physics and Safety Supervisor.

Condition 15. Notwithstanding the statements in subsection 3.3.1, page 3-7, and Section 3.4 of page 3-14 in Appendix A of the application, release of facilities, equipment, and material from the plant to offsite for unrestricted use or from a controlled area to an uncontrolled area onsite shall be in accordance with the attached Annex A dated July 1982. Record of the contamination survey and final disposition of any equipment shall be kept for inspection by NRC.

Condition 16. The licensee shall conduct a routine surface radiological survey of the facility on a monthly basis. The surface contamination levels in the controlled areas shall be maintained below 5000 dpm/100 cm^2 (removable alpha).

Condition 17. After the residues have been removed, the settling ponds shall not be backfilled until they have been surveyed and released by the NRC. The aforementioned survey shall be requested and the final release authorized in writing.

Condition 18. The licensee shall dispose of the radioactive contaminated solid waste, that is generated by the licensed activities, at an NRC-approved burial site.

Condition 19. The licensee is hereby exempt from the provisions of 10 CFR 70.24 insofar as this section applies to materials held under this license.

MAR 3 1 1983

Condition 20. By March 31, 1987, the licensee shall (1) decontaminate the facilities and grounds to levels specified in Annex A so that they may be released for unrestricted use, and (2) submit a report that identifies all facilities where radioactive materials were used and stored, or disposed on the site. The report shall briefly describe operations conducted and radioactive materials used in the facilities and shall assess the results of the decontamination activities. The report shall provide the basis for unrestricted release of the facilities and the site, including a description of sampling and survey methods and instrumentation used, and shall include contamination survey data for the facilities and grounds.

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