



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
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March 26, 2003

Lt. Col. Kali Mather  
Department of the Air Force  
USAF Radioisotope Committee  
HQ AFMOA/SGZR  
110 Luke Ave, Suite 405  
Bolling AFB, DC 20322-7050

SUBJECT: NRC INSPECTION REPORT 030-28641/2003-02

Dear Lt. Col. Mather:

This refers to the inspection conducted on March 3-6, 2003, at Kirtland Air Force Base, New Mexico. The inspection was limited to a review of decommissioning activities authorized under Master Materials License 42-23539-01AF and Air Force Permit No. NM-03110-01/07AFP. An exit briefing was conducted with the Kirtland Air Force Base staff at the completion of the onsite inspection. The enclosed report presents the results of this inspection. Overall, the inspection found that decommissioning activities were being performed in accordance with procedural and regulatory requirements.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Mr. Anthony Gaines at (817) 860-8252 or the undersigned at (817) 860-8186.

Sincerely,

*/RA/*

Charles L. Cain, Chief  
Nuclear Materials Licensing Branch

Docket No.: 030-28641  
License No.: 42-23539-01AF

Enclosure:  
NRC Inspection Report  
030-28641/2003-02

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U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket No. 030-28641

License No. 42-23539-01AF

Air Force Permit No. NM-03110-01/07AFP

Report No. 030-28641/2003-02

Licensee: Department of the Air Force

Facility: Installation Restoration Program Site OT-10  
Training Sites TS5, TS6, TS7, and TS8

Location: Kirtland Air Force Base  
Albuquerque, New Mexico

Dates: March 3-6, 2003

Inspector: Robert Evans, P.E., C.H.P., Senior Health Physicist  
Fuel Cycle and Decommissioning Branch

Accompanied By: Julia S. McAnallen, Nuclear Safety Intern  
Special Projects and Inspection Branch  
Division of Fuel Cycle Safety and Safeguards  
Office of Nuclear Material Safety and Safeguards

Approved By: D. Blair Spitzberg, Ph.D., Chief  
Fuel Cycle and Decommissioning Branch

Attachment: Supplemental Information

## **EXECUTIVE SUMMARY**

Department of the Air Force  
NRC Inspection Report 030-28641/2003-02

The purpose of this inspection was to review the Air Force Permittee's mobilization for reclamation of four former training sites. The areas reviewed included site status, organizational structure, radiation protection program, worker training, reclamation activities, transportation and waste disposal activities, and followup of open safety evaluation report issues. Overall, the Permittee had established a program that was in compliance with decommissioning plan requirements, and the program was adequate for the reclamation work to be performed.

### **Decommissioning Inspection Procedure for Materials Licensees**

- The Permittee had sufficient staff to implement the work, including ample staff for the health and safety program (Section 1.a).
- A radiation protection program had been established with adequate equipment and procedures necessary to implement the health and safety program as stipulated in the decommissioning plan (Section 1.b).
- The training program was in compliance with the decommissioning plan and requirements of 10 CFR 19.12, "Instruction to Workers" (Section 1.c).
- Reclamation was being conducted in accordance with the decommissioning plan and the Permittee's implementing procedures (Section 1.d).
- Transportation and waste activities were being conducted in accordance with decommissioning plan, implementing procedures, and 10 CFR Part 20, Appendix G, requirements (Section 1.e).
- Selected open issues, identified in Section 14.6 of the NRC's Safety Evaluation Report were reviewed during the inspection. All issues remained open at the end of the onsite inspection and will be reviewed by the NRC at a later date (Section 1.f).

## Report Details

### **Summary of Facility Status**

From 1961 through 1990, four sites seeded with thorium sludge were used by the Air Force for training of radiological response personnel. The four training sites were designated as TS5, TS6, TS7, and TS8. During August 2002, the Air Force submitted a revised decommissioning plan (DP) to the NRC for the reclamation of these four sites. NRC subsequently reviewed and approved the DP. NRC Materials License 42-23539-01AF was amended on January 6, 2003, to incorporate the revised DP into License Condition 20.P.

During the beginning of the onsite inspection, the Air Force Permittee was mobilizing its contractor work force. At the end of the onsite inspection, the Permittee was actively decommissioning training site TS5. The Permittee planned to complete the remediation of all four training sites by October 2003.

### **1 Decommissioning Inspection Procedure for Materials Licenses (87104)**

#### 1.1 Inspection Scope

This inspection was performed to determine whether decommissioning activities were being conducted in accordance with NRC requirements and the NRC-approved DP.

#### 1.2 Observations and Findings

##### a. Organizational Structure

The reclamation work was being conducted by a contract workforce of about 25 individuals. MWH Americas, the prime contractor, was providing project management oversight. A subcontractor, MKM Engineers, provided the operators and heavy equipment for site reclamation. MKM Engineers would also serve as waste brokers and was responsible for shipment of the radioactive wastes for permanent disposal. A second subcontractor, ERG, would implement the site radiation protection program and conduct selected radiological surveys. Following a review of the work scope, the inspector concluded that the Permittee had sufficient workers to conduct decommissioning, including implementation of the health and safety program.

Section 4.1.1 of the DP states that all contractor-performed activities will be monitored by the Air Force to assure compliance with the DP and health and safety plans. During the onsite inspection, the inspector discussed with the Permittee its plans to monitor the reclamation work being performed on behalf of the Permittee. The Permittee planned to conduct both routine site visits and at least one formal audit during reclamation.

The inspector confirmed that the Permittee had established a list of records and files to be maintained for the decommissioning project. The list included project work plans, work permits, contract administration records, correspondence, daily records, health and safety records (to be kept in a locked file), quality control documents, cost and schedule records, and invoices. Included in these records were documents specifically required to be maintained by Section 4.8, "Records," of the DP.

b. Radiation Protection Program

The DP requires that general work area monitoring be conducted to assess potential radiation exposures to workers. Personnel monitoring consisted of both external and internal exposure monitoring. The Permittee issued optically stimulated dosimeters to workers for external exposure monitoring, and the Permittee planned to use air samplers to monitor for internal exposures. In accordance with DP commitments, the Permittee planned to exchange and analyze the dosimeters on a quarterly basis during decommissioning.

Internal exposure monitoring consisted of air sampling. The Permittee used an intermediate volume air sampler to obtain grab samples of the work environment. Lapel air samplers were also being issued to selected workers to supplement the general work area air sampling data. The inspector noted that the Permittee's air sampling program had been implemented in accordance with DP requirements. Initial air sample results were not available at the conclusion of the onsite inspection.

Bioassays are collected at the discretion of the site radiation safety officer. As a precaution, initial whole body counts were conducted on all site workers, with three exceptions. All workers submitted baseline urine samples. Future bioassay samples will be conducted at the discretion of the site radiation safety officer based on work conditions or in response to incidents.

The DP states that radon monitoring would be performed prior to beginning work and periodically thereafter. Just prior to commencement of work, the Permittee conducted radon progeny sampling. The sample results were essentially zero, although the site radiation safety officer acknowledged that the samples had been collected on a windy day. The site radiation safety officer stated that radon progeny sampling would be conducted weekly to fulfill the DP commitment of periodic monitoring. The results of future weekly samples would be used to ascertain whether additional work controls will be necessary to protect workers from radon progeny exposures.

The inspector observed the Permittee's radiological survey instruments being used to implement the radiation protection program. The inspector noted that all instruments in use had been calibration checked. The DP states that the response of survey instruments will be compared periodically to check sources to confirm constancy. The Permittee had appropriate check sources available for use in instrument response checks.

The Permittee created a contamination reduction zone between the restricted area and the project support zone. An exercise was performed during the inspection to verify adequacy of contamination reduction zone procedures and processes. Several procedures were updated to implement lessons learned by the Permittee's staff observing and participating in the exercise. Procedure updates included re-zoning the contamination reduction area to better accommodate employees entering and exiting the radiologically restricted area as well as updating the process of donning and doffing personal protective equipment.

The DP states that facilities within the support zone will be monitored for surface contamination. The inspector noted that the Permittee had developed a program to ensure that facilities, including lunchrooms, offices, and the contamination reduction zone, will be routinely surveyed for contamination. The Permittee planned to conduct these surveys at least weekly in accordance with the DP. The Permittee had the procedures and equipment available during the inspection to conduct these weekly contamination surveys.

The Permittee established and implemented an environmental monitoring program that included use of four sampling stations, three site perimeter stations and one background station. Air filters will be routinely exchanged and counted for gross alpha activity. These sample results will then be compared to the most restrictive action level (thorium-232). The first set of sample results were not available for review at the end of the onsite inspection.

The Permittee used radiation work permits to help control worker health and safety. The Permittee issued three radiation work permits for work in training site TS5. The inspector reviewed the permits and noted that all three provided sufficient personal protective equipment requirements. Workers were required to sign the respective radiation work permit to ensure their understanding of work requirements. Based on observation of workers entering and exiting the radiologically restricted area, the inspector noted that each worker had complied with the personal protective equipment requirements of the radiation work permits.

Section 4.1.5 of the DP lists the standard operating procedure requirements. The inspector briefly reviewed site procedures and noted that most were generic in nature. Site specific information such as acceptance criteria were not always included in these generic procedures. As an example, the intermodal container survey form did not include the acceptance criteria for free release of the container. The inspector discussed these acceptance criteria limits with selected site personnel who did not always know what the DP-specific release limits were. The Permittee stated it would reconsider several procedures and processes and may update applicable procedures as appropriate to include the site-specific acceptance criteria.

c. Worker Training

The Permittee's radiological safety training was reviewed for compliance with Section 4.2 of the DP. All personnel working in potentially contaminated areas were required to undergo formal radiological safety training. In addition, documentation of training completion was required in the form of a written examination for each employee. The training program was determined to meet all requirements of the DP. Records of all employees' radiological safety training were included in their respective personnel files.

Respirator training was also reviewed. Respirator use training was given on March 3, 2003, for all applicable workers and was documented on a sign-in sheet for the course. Furthermore, fit tests were observed during the onsite inspection for several employees. The employees were given an irritant smoke test to ensure that respirator seals were leak tight.

The Permittee conducted a drill on March 4, 2003, to ensure adequate response to an injured and potentially contaminated worker. The drill was performed in conjunction with a local hospital to coordinate the response to a potentially contaminated and injured worker. The Permittee used a scenario where the worker was in a life-threatening situation and was transported to the emergency room while still wearing potentially contaminated clothing.

Several lessons were learned from the drill. The exact location of the emergency room exit at the local hospital was determined, the fastest entry/exit point to hospital from the Kirtland Air Force Base was identified, and additional equipment necessary for the emergency vehicle was recognized. The emergency plan was updated as a result of the drill.

d. Reclamation Activities

The Permittee began reclamation of training site TS5 on March 5, 2003. The reclamation of TS5 was expected to continue until April 2003. The decommissioning included excavation and packaging of contaminated soils, vegetation, and surface debris (if any) because there were no buildings located within TS5 that required remediation. The construction work consisted of scraping the ground surface in nominal 6-inch lifts, transferring the potentially contaminated soils to an intermodal container, and packaging of the intermodal for shipment.

During reclamation of TS5, the Permittee conducted investigative surveys to ensure removal of contaminated soils. The investigative surveys consisted of measurement of local gamma radiation levels. Any survey measurement above the action level (13,000 counts per minute for TS5) indicated that additional reclamation was necessary. The Permittee also planned to collect soil samples for onsite analysis to supplement the investigative surveys. The combination of in-situ gamma radiation levels and onsite analysis of soil samples would be used to guide excavation work.

Training site TS6 was scheduled to undergo reclamation during May 2003. This training site included a discrete area referred to as corrective action unit SS-69, a 50-foot by 50-foot area that previously contained drums of thorium oxide sludge and waste fuels. During a 1997 Air Force investigation, elevated concentrations of petroleum hydrocarbon and radioactive compounds were identified in area SS-69. Reclamation of the non-radioactive wastes occurred during 1998 by the Air Force under its Resource Conservation and Recovery Act Part B Permit. At the time of this inspection, area SS-69 still contained residual radioactive contamination. After removal of the thorium contaminated soils, the Air Force will pursue a "No Further Action" proposal for this corrective action unit.

e. Transportation/Waste Disposal Activities

During site reclamation, the Permittee and its waste broker planned to package and ship the wastes to a commercial low-level waste facility in Utah for permanent disposal. Intermodal containers would be loaded at the site, shipped by truck to a local rail yard, and then shipped by rail to the disposal facility. The Permittee planned to use about



240 intermodal containers for the project, and the total number of shipments was expected to be about 1200 shipments.

The waste material would be shipped as low specific activity material. The intermodal containers satisfied U.S. Department of Transportation (DOT) requirements as industrial packages IP-1. The intermodals will be transported to the rail yard by dedicated trucks. The waste broker planned to use four primary drivers but also provided training to six backup/alternate drivers. The training included function specific training stipulated by 49 CFR 172.704.

The wastes were being manifested and shipped by an NRC-licensed waste broker, MKM Engineers. The inspector confirmed that the waste broker had established a program for sampling the waste material as it was being loaded, surveying the intermodals for compliance with DOT's radiological limits, and preparing shipping papers and manifests based on waste sample results. The inspector conducted a review of the shipping papers developed for the first fully loaded intermodal. The papers were in agreement with requirements established in 10 CFR Part 20, Appendix G, "Requirements for Transfers of Low-Level Radioactive Waste Intended For Disposal at Licensed Land Disposal Facilities and Manifests."

f. Followup of Open Issues Identified in Safety Evaluation Report

Section 14.6 of the Safety Evaluation Report dated January 6, 2003, provided a list of open issues identified during the NRC's review of the DP. Several of the issues were reviewed with the Permittee during the onsite inspection. Most had not been completed at the conclusion of the onsite inspection and will be reviewed by the NRC at a later date.

One issue that was reviewed involved the determination of background concentrations of uranium-238. The licensee initially determined the thorium-230 concentration as being 0.93 pCi/g yet assumed that the uranium-238 concentration would be similar. The DP states that the actual background concentration of uranium-238 will be determined during project mobilization. During the inspection, the site radiation safety officer stated that soil samples had been collected from the reference land area located adjacent to training site TS7. These samples will be submitted to an offsite laboratory in the near future for chemical separation analysis. The chemical separation analysis would be used to determine the uranium isotopic content of the samples. These sample results would then be used to establish the uranium-238 background concentration.

1.3 Conclusions

Overall, the Permittee had established a program that was in compliance with the DP requirements, and the program was adequate for the reclamation work to be performed. The Permittee had sufficient staff to implement the work, including ample staff for the health and safety program. A radiation protection program had been established with adequate equipment and procedures necessary to implement the health and safety program as stipulated in the DP. The training program was in compliance with the DP and requirements of 10 CFR 19.12, "Instruction to Workers." Reclamation was being conducted in accordance with the DP and the Permittee's implementing procedures.

Transportation and waste activities were being conducted in accordance with DP, implementing procedures, and 10 CFR Part 20, Appendix G, requirements. Selected open issues, identified in Section 14.6 of the NRC's Safety Evaluation Report, were reviewed during the inspection. All issues remained open at the end of the onsite inspection and will be reviewed by the NRC at a later date.

## **2 Exit Meeting Summary**

The inspection results were presented to representatives of the licensee at the conclusion of the onsite inspection on March 6, 2003. Licensee representatives acknowledged the findings as presented. The representatives did not identify any information reviewed by the NRC inspector as being proprietary information.

**ATTACHMENT**

**SUPPLEMENTAL INFORMATION**

**PARTIAL LIST OF PERSONS CONTACTED**

Department of the Air Force, Kirtland Air Force Base

S. Calvert, Supervisory Industrial Hygienist  
C. Lanz, Chief, Restoration Section  
J. Poland, Director, Environmental Management  
J. Sillerud, Project Manager  
J. Volza, Alternate Base Radiation Safety Officer  
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K. Baker, Site Radiation Safety Officer, ERG  
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J. Cehn, Radiation Safety Officer, MKM Engineers  
J. Johnson, Project Manager, MWH Americas  
S. Neralla, Senior Project Manager, MKM Engineers  
N. Wrubel, Environmental Scientist, MWH Americas

**ITEMS OPENED, CLOSED AND DISCUSSED**

Opened

None.

Closed

None.

Discussed

None.

**LIST OF ACRONYMS USED**

DP	Decommissioning Plan
DOT	U.S. Department of Transportation
pCi/g	picocuries per gram
TS	training site