

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 030-28641
License No.: 42-23539-01AF
Report No.: 030-28641/96-17
Licensee: Department of the Air Force
Facility: Altus Air Force Base (AFB)
Location: HQ AFMOA/SGPR
8901 18th Street
Brooks AFB, Texas
Dates: November 20-21, 1996
Inspector: Jeffrey Cruz
Radiation Specialist
Approved By: Linda L. Howell, Chief
Nuclear Materials Inspection and
Fuel Cycle/Decommissioning Branch

ATTACHMENTS:

Attachment 1: Partial List of Persons Contacted
List of Inspection Procedures Used
List of Items Opened, Closed, and Discussed
List of Acronyms
Attachment 2: Photographs

EXECUTIVE SUMMARY

Department of the Air Force: Altus AFB
NRC Inspection Report 030-28641/96-17

This inspection included a review of the activities first reported to the NRC on August 22, 1996, involving depleted uranium contained in aircraft counterweights. The inspection included a review of administrative aspects of the licensee's radiation safety program, and interviews of licensee personnel.

Physical Processing of Uranium Contained in Counterweights Installed in Aircraft

- A violation of 10 CFR 40.13(c)(5)(iv) was identified. The violation involved the unauthorized physical processing of uranium counterweights other than repair or restoration of any plating or other covering. During the dismantling of two C-141 aircraft, Altus AFB personnel cut the depleted uranium contained in the tail section elevators. Follow-up surveys and dose assessments indicated no significant personnel exposures or contamination resulted from the cutting.

Transfer of Processed Uranium

- The licensee inadvertently transferred physically processed DU counterweights contained in the tail section elevator of a C-141 aircraft to a civilian scrap dealer (Section 3).

Report Details

1 Organization and Scope of the Licensee Program

The United States Air Force Radioisotope Committee (RIC) is responsible for the oversight of use of radioactive materials at AFB installations with the exception of nuclear weapons materials, certain radioactive parts of nuclear weapons systems, nuclear reactor systems, and parts and fuel controlled under Section 91b of the Atomic Energy Act. The RIC is authorized by Materials License 42-23539-01AF to issue radioactive material permits to USAF medical and industrial users of byproduct material.

Altus AFB possessed four USAF permits for assorted licensed activities conducted on the base. No permit was issued for the possession of depleted uranium counterweights contained in aircraft since they are categorized by 10 CFR Part 40 as unimportant quantities of source material; and therefore, exempt from licensing.

2 Physical Processing of Uranium Contained in Counterweights Installed in Aircraft

2.1 Inspection Scope

This portion of the inspection included interviews with licensee personnel and a review of licensee records.

2.2 Observations and Findings

The primary mission of the Altus AFB installation is the flight training of Air Force personnel and day-to-day maintenance of necessary aircraft. In early spring of 1996, Altus AFB was requested to convert two unflyable C-141 aircraft into training equipment. The conversion process involved the removal of the wings and tail sections from the planes so that only the fuselages would be utilized. Major structural alterations of aircraft is not usually conducted at Altus AFB, and the above request for conversion had, to the best of knowledge of Altus AFB personnel interviewed, never previously been accomplished at Altus AFB.

A non-commissioned officer (NCO1) who had previously been assigned to a Combat Logistics Support Squadron (CLSS) was designated to supervise the removal of the aircraft wings and tail section. While a member of the CLSS, NCO1 had participated in the conversion of active aircraft to museum pieces and also participated in the removal and re-installation of complete C-141 tail sections. Since he had been in the Air Force for 16 years and had spent 11 years in the CLSS, NCO1 was considered to have the most experience in major aircraft structural maintenance.

After supervising the removal of the complete wing and tail section assemblies, NCO1 contacted a number of different organizations regarding the disposal of the components (See Section 3). He was advised that the assemblies would have to be

reduced into pieces that would fit onto the bed of a flat-bed truck, approximately 8-foot by 8-foot pieces. NCO1 then referenced an Air Force Technical Order (TO), TO 1C-141B-4-2, an illustrated structural manual, to determine the most efficient manner to cut the assemblies. This TO did not identify the counterweights located on the ailerons and tail section elevators as being constructed from depleted uranium (DU).

Prior to commencing the cutting process, NCO1 contacted the Altus AFB Base Radiation Protection Officer's (RPO) office to make arrangements for the safe removal and storage of the DU counterweights located in the ailerons of the wings. Although the TO did not identify the DU in the ailerons, NCO1, through previous experience, was aware of its presence in the wings; however, he was unaware of the DU located in the tail assemblies. Air Force personnel then rented circular saws from a local civilian equipment rental company and upon removal of the aileron counterweights, NCO1 and his assigned crew began cutting both the wing and tail assemblies into the prescribed sizes for disposal. The cutting of the wing and tail assemblies by Altus AFB personnel was completed on June 25, 1996. The cutting of the DU in the tail section elevators resulted in 12 total cuts to the DU, exposing 24 surfaces of unplated and uncovered DU. Each surface area measured approximately 1 square inch. After cleaning the rented equipment with damp rags, the circular saws were returned to the rental company without radiological surveys being performed. At the time of the return of the equipment, Altus AFB personnel were unaware of the fact that the DU located in the tail section elevators had been cut.

On August 19, 1996, while transferring the aileron counterweights from the temporary storage location to a storage area in the Altus AFB sheet metal shop, a second non-commissioned officer (NCO2) who had participated in the cutting was asked by Air Force personnel in the shop if they had also removed the DU from the tail section. NCO2 responded that he was unaware of any further DU in the aircraft, and that they had not removed any DU from the tail section. NCO2 then began referencing more TO's, and on the morning of August 20, 1996, located a TO which demonstrated that DU was also located in the tail section of the C-141 aircraft. This TO, TO 1C-141B-3, is titled as a structural repair manual and was not referenced prior to cutting since the cutting team was dismantling the aircraft and not conducting repairs.

NCO1 and NCO2 then returned to the pile of cut aircraft components and attempted to locate the tail sections to remove the DU. NCO1 and NCO2 were unable to locate two pieces of the tail sections which they believed had been transferred to a civilian scrap dealer. The pieces missing were two elevator endpieces, one from each tail section assembly. NCO1 and NCO2 then informed the Base RPO's office that some DU had possibly left Altus AFB, and that they would be travelling to a scrap yard in Joplin, Missouri, to retrieve the endpieces. NCO1 had determined that the scrap dealer contracted to remove the cut assemblies had sold his load to the scrap yard. The Base RPO, in turn, reported the incident to the on-call

representative of the RIC. Upon arrival at the scrap yard, NCO1 located a single piece of the tail section (see Photo 1) and informed the Altus AFB RPO that one endpiece had been located and that they would continue to try to find the second piece.

On the morning of August 20, 1996, the RIC informed the NRC of the event, and the Altus AFB RPO informed the states of Missouri and Oklahoma. On the afternoon of August 21, 1996, the Tinker AFB RPO and two technicians travelled to the scrap yard to help in the location of the second piece.

Also on the afternoon of August 21, 1996, the scrap dealer returned to Altus AFB to haul more scrap from the pile. The dealer was accompanied by a member of the Altus AFB recycling organization and had previously hauled a load of scrap from the pile on August 13, 1996. On this occasion the scrap dealer possessed a circular saw and further cut a number of pieces of the scrap material to make them easier to handle. No restrictions had been placed on the material which the dealer could cut or remove. In fact, until the NRC inspector brought it to the attention of the Base RPO, he had not been aware that the dealer had returned to Altus AFB on August 21, 1996, for a second load, nor was he aware that the dealer had further cut the pieces of scrap.

The team from Tinker AFB found no indication that the second missing piece was located at the Missouri scrap yard and advised NCO1 and NCO2 to return the piece they had located and to continue to try to locate the second piece at Altus AFB. On August 23, 1996, NCO1 located the "missing" piece at Altus AFB. Altus AFB personnel laid out the two tail sections to ensure that all the pieces had been located (see Photo 2). The inspection of the tail section pieces indicated that the scrap dealer did not remove any more DU and, though the opportunity existed, the dealer did not cut any sections of DU.

Following a dose reconstruction of the incident, the USAF determined the worst-case approximation of worker external dose to be 1.0 millirem for each member of the cutting team. Bioassays, performed on August 26, 1996, of five members of the cutting team revealed no evidence of DU intake resulting from the cutting. Radiological surveys of the runway on which the aircraft were cut did not identify DU contamination.

10 CFR 40.13(c)(5)(iv) states, in relevant part, that any person is exempt from the regulation in this part and from the requirements for a license set forth in Section 62 of the Act to the extent that such person receives, possesses, uses, or transfers uranium contained in counterweights installed in aircraft, rockets, projectiles, and missiles, or stored or handled in connection with installation or removal of such counterweights, provided, that the exemption contained in this paragraph shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of any such counterweights other than repair or restoration of any plating or other covering.

The cutting of depleted uranium counterweights contained in the tail section elevators of C-141 aircraft by Altus AFB personnel was identified as a violation of 10 CFR 40.13(c)(5)(iv) (030-28641/9617-01).

2.3 Conclusions

A violation of 10 CFR 40.13(c)(5)(iv) was identified. The violation involved the physical processing of uranium counterweights contained in aircraft components. From May 13, 1996, to June 25, 1996, Altus AFB personnel utilized circular saws to cut depleted uranium counterweights contained in the tail section elevators of C-141 aircraft. Follow-up surveys and dose assessments indicated no significant personnel exposures or contamination resulted from the incident.

3 **Transfer of Processed Uranium**

3.1 Inspection Scope

This portion of the inspection included interviews with licensee personnel and a review of licensee records.

3.2 Observations and Findings

In April of 1996, NCO1 contacted the Altus AFB Defense Reutilization and Marketing Office (DRMO) to make arrangements for the disposition of the removed C-141 aircraft wing and tail section assemblies. NCO1 was informed that a project that large would actually need to be overseen by the DRMO located at the Ft. Sill, Oklahoma, United States Army installation. NCO1 contacted the Ft. Sill DRMO and was informed that it would be necessary to reduce the size of the scrap pieces to approximately 8-foot by 8-foot pieces so that the pieces could be transported by flat-bed truck. DRMO representatives from Ft. Sill inspected and photographed the cut wing and tail section assemblies. At this time the DRMO representatives informed NCO1 that the disposal of the assemblies would require the placement of an advertisement in the DRMO monthly catalog and that the process would probably take two months to complete. DRMO representatives suggested that NCO1 contact the Altus AFB recycling center to attempt to process the assemblies as scrap metal. It was thought that this method would be quicker, and this method would also allow the proceeds from sale of the assemblies to remain at Altus AFB.

An agreement had been established in January of 1996, between Ft. Sill DRMO and Altus AFB which allowed Altus AFB to directly sell recyclable materials. The Altus AFB RPO later determined in September of 1996 that aircraft and aircraft components are classified as special military equipment and are excluded from the recycling program.

On August 13, 1996, a civilian scrap dealer took possession of several pieces of material from the cut assemblies. Included in this load was a tail section elevator

endpiece containing DU counterweights weighing approximately 30 pounds. The endpiece had been cut from the tail section assembly by Air Force personnel, who, in doing so, had cut the DU. The cut resulted in approximately 1 square inch of unplated and uncovered DU surface being exposed on the endpiece. The scrap dealer then sold this load, including the endpiece containing DU, to a scrap yard located in Joplin, Missouri. On August 20, 1996, Altus AFB personnel discovered that the DU in the endpiece had been transferred. The end piece was retrieved on August 22, 1996.

During the first week of September 1996, the Altus AFB RPO contacted the scrap dealer who had removed the depleted uranium. The RPO informed the scrap dealer that his vehicle had transported radioactive material from Altus AFB to Joplin, Missouri. The scrap dealer was asked by the RPO if Air Force personnel could perform a contamination survey of his vehicle. The scrap dealer, based in Diamond, Missouri, said that he would be willing to allow a survey and that he, the scrap dealer, would notify the Base RPO's office when he would next be in the Altus area.

Through interviews of Altus AFB recycling center personnel, the inspector determined that the dealer had actually been at Altus AFB on four occasions between September 20, 1996, and November 19, 1996; however, as of the date of this inspection, no radiological surveys had been conducted on the civilian-owned vehicle by the Air Force since the dealer had not contacted the Base RPO's office.

3.3 Conclusions

The licensee inadvertently transferred physically processed DU counterweights contained in the tail section elevator of a C-141 aircraft to a civilian scrap dealer.

Exit Meeting Summary

The inspector presented the inspection results to the representatives of the licensee at the conclusion of the inspection on November 21, 1996. Licensee representatives acknowledged the findings as presented.

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee

Lieutenant Colonel Joseph J. Donnelly (per telephone)
Lieutenant Colonel Joan C. Hansen
Lieutenant Colonel Rebecca A. Russell
Major David M. Loftus
Major Mitch Hicks (per telephone)
Captain Jon Widman
Lieutenant Colby Adams
Lieutenant Bradley Schulte
Master Sergeant Joseph E. German, Jr.
Staff Sergeant Carlos Moellering
Senior Airman Thomas W. Morton

INSPECTION PROCEDURES USED

87100	Licensed Materials Programs
83822	Radiation Protection
87103	Inspection of Incidents at Nuclear Materials Facilities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened:

030-28641/9617-01	VIO	The violation involved a failure to possess and transfer depleted uranium contained in counterweights installed in aircraft in accordance with the exemption granted in 10 CFR 40.13(c)(5).
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Closed: None

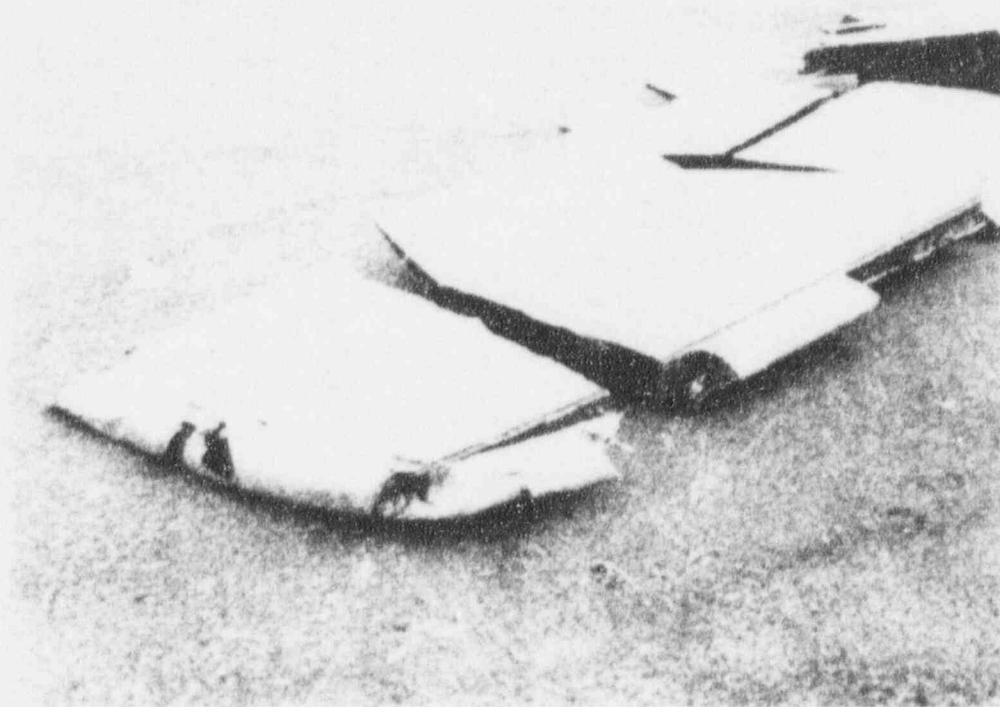
Discussed: None

LIST OF ACRONYMS USED

AFB	Air Force Base
CLSS	Combat Logistics Support Squadron
CFR	Code of Federal Regulations
DRMO	Defense Reutilization and Marketing Organization
NRC	Nuclear Regulatory Commission
DU	Depleted Uranium
RIC	Radioisotope Committee
RPO	Radiation Protection Officer
TO	Technical Order
VIO	Violation

ATTACHMENT 2

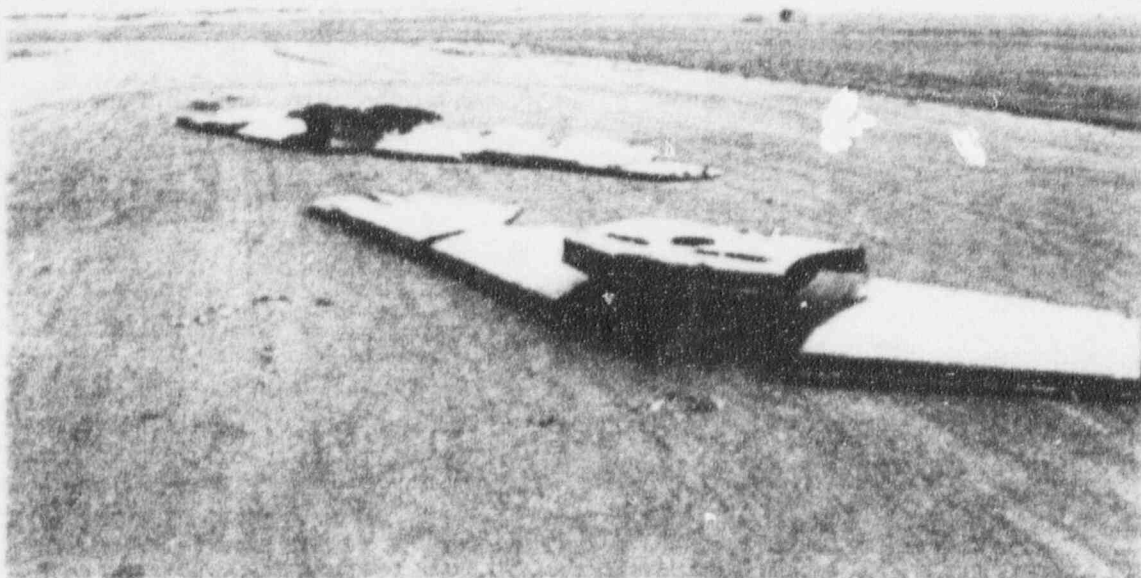
Photographs



Photograph 1: Tail Section Endpiece Containing Depleted Uranium Counterweights Inadvertently Transferred to a Civilian Scrap Dealer



Photograph 2: Close up of Retrieved Tail Section Endpiece Containing Depleted Uranium Counterweights



Photograph 3: Cut Tail Section Assemblies