UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

May 5, 2009

Department of the Army
Corpus Christi Army Depot
ATTN: AMSAM-CC-ES-SE
Eduardo Perez
Radiation Safety Officer
308 Crecy Street, Stop 23
Corpus Christi, Texas 78419-5260

SUBJECT: NRC INSPECTION REPORT 040-08177/09-001

Dear Mr. Perez:

This refers to the inspection conducted on April 9-10, 2009, at the Corpus Christi Army Depot in Corpus Christi, Texas. This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspection included the examination of selected procedures and representative records, observations of activities, and interviews with personnel. The enclosed report presents the results of this inspection.

By letter received December 3, 2007, the Corpus Christi Army Depot informed the NRC that it intended to terminate its source material license. In response to the Army's request to terminate the license, a confirmatory inspection was conducted by the NRC. The inspection included confirmatory radiological surveys to independently assess if the facility meets the NRC's criteria for unrestricted release. While conducting the confirmatory surveys, the inspector identified an area with elevated contamination levels which may require additional remediation before the license can be terminated. Alternatively, you may be able to demonstrate through calculation or analysis that remediation is not necessary to meet the NRC-approved release criteria. As discussed with you at the conclusion of the onsite inspection, you are expected to address this issue in your final status survey report. Resolution of this specific issue is necessary before the NRC can move forward with its process for terminating the license.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response to this letter, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC's Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact Mr. Robert Evans, Senior Health Physicist, at (817) 860-8234 or the undersigned at (817) 860-8197.

Sincerely,

/RA Jacqueline D. Cook For/

Jack E. Whitten, Chief
Nuclear Materials Safety Branch B

Docket: 040-08177
License: STB-1168

Enclosure:
NRC Inspection Report 040-08177/09-001

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket:	040-08177
License:	STB-1168
Report:	040-08177/09-001
Licensee:	Department of the Army
Facility:	Corpus Christi Army Depot
Location:	Corpus Christi, Texas 78419
Dates:	April 9-10, 2009
Inspector:	Robert J. Evans, PE, CHP, Senior Health Physicist Nuclear Materials Safety Branch B
Accompanied By:	Hope A. Alvarez, Field Inspector Radioactive Materials Inspection Group Environmental and Consumer Safety Section Texas Department of State Health Services
Approved By:	Jack E. Whitten, Chief Nuclear Materials Safety Branch B
Attachment:	Supplemental Inspection Information

ENCLOSURE

EXECUTIVE SUMMARY

Corpus Christi Army Depot
NRC Inspection Report 040-08177/09-001

This inspection was a non-routine, announced inspection of decommissioning activities being conducted at the Corpus Christi Army Depot. In summary, no violations of NRC requirements were identified.

Decommissioning Inspection Procedure for Materials Licensees

- A site tour was conducted, and only generally licensed material was identified at the site. The generally licensed material included thorium alloy parts from obsolete engines. The licensee had permanently discontinued processing of thorium alloys (Section 1.2.a).

- A confirmatory survey was conducted in areas identified in the site historical assessment. Residual radioactive contamination, in concentrations greater than the NRC-approved derived concentration guideline level, was identified in the welding shop of Building 8. This location will require additional assessment by the licensee (Section 1.2.b).

- Elevated beta particulate measurements were identified at the Building 8 machine shop, Building 258 shop floor, and Building 132 table. These results were inconclusive, in part, because the areas did not exhibit elevated alpha particulate contamination and because two of three areas were used for storage of generally licensed thorium alloys that potentially interfered with the NRC inspector's confirmatory survey results (Section 1.2.b).

Report Details

Summary of Plant Status

License STB-1168 was originally issued to the Department of the Army on August 20, 1973. The license authorized the possession of thorium in the form of magnesium and nickel alloys. The authorized uses specified in the source material license included the maintenance and repair of these alloys. Later amendments issued by the NRC authorized the possession of thorium compounds in optical glass.

By letter received December 3, 2007, the licensee notified the NRC of its plans to terminate the license. In response to the licensee's request, the NRC downgraded the license during January 2008 to possession and storage only. The licensee subsequently submitted the Corpus Christi Army Depot (CCAD) Radiological Survey Plan (Plan) to the NRC by letter dated September 27, 2008. This Plan provided the details for the proposed final status survey of the facility. The Plan also provided the acceptance criteria for release of the facility for unrestricted use. The NRC approved the CCAD Plan by license amendment dated November 7, 2008.

According to information provided by the radiation safety officer during the inspection, a contractor began conducting the final status survey at CCAD during early-November 2008. The work was completed during late-December 2008. However, the contractor conducted additional onsite work during the March-April 2009 time frame. This additional work included reassessment of the original background measurements. The licensee plans to submit the results of the final status survey to the NRC in the near future.

1 Decommissioning Inspection Procedure for Materials Licensees (87104)

1.1 Inspection Scope

The purpose of the inspection was to determine if decontamination activities had been conducted in accordance with NRC requirements and in a manner that was protective of the health and safety of the workers and the general public.

1.2 Observations and Findings

a. Site Tour

The inspector toured all areas where the licensee had previously possessed and chemically, physically, or metallurgically processed the alloys containing thorium. These areas had been remediated and a final survey of the impacted areas had been conducted by the licensee. The areas identified as being impacted in the site historical assessment included Buildings 8, 340, 1825, and various storage areas. No processing of thorium alloys was observed in any location, although generally licensed magnesium-thorium alloy material was identified in two locations, Buildings 258 and 132.

The NRC inspector noted that a number of obsolete engines containing thorium alloys were being stored at Building 258. At the time of the site tour, roughly 150 engines had been received, and CCAD was expected to receive about 150 more engines. Upon receipt, mechanics drained the oil from the engines. The engines were then stored in their shipping containers behind Building 258. According to the radiation safety officer, the final disassembly of the engines, the removal of the thorium alloy parts, and the

disposal of the thorium will be conducted by another agency located at CCAD. The licensee also possessed some radioactive material in waste storage Building 132. The stored material included some magnesium-thorium alloy engine parts.

Possession of magnesium-thorium alloy is allowed by 10 CFR 40.13(c)(4) without a specific license. Unimportant quantities of source material that are covered by this regulation include any finished product or part fabricated of, or containing magnesium-thorium alloys, provided that the thorium content of the alloy does not exceed 4 percent by weight. This regulation specifically prohibits the chemical, physical, or metallurgical treatment or processing of any such product or part while under a general license. Based on information provided by the licensee, the obsolete engines have alloys that contain between 1.8 to 3.3-percent thorium, depending on the specific type of alloy. Accordingly, the licensee can possess the magnesium-thorium parts without a specific license as long as chemical, physical, or metallurgical treatment or processing is not conducted during engine disassembly.

b. Confirmatory Survey

The confirmatory survey consisted of measurement of ambient gamma exposure rates, scans of building surfaces, and fixed point measurements of surfaces. The gamma exposure rates were measured using a Ludlum Model 19 microRoentgen meter (NRC No. 015518, calibration due date 10/30/09). The inspector measured the alpha and beta particulate contamination on surfaces using an Eberline Model E600 survey meter (NRC No. 063473, calibration due date 01/03/10) coupled to an Eberline SHP380AB alpha-beta probe.

As part of the confirmatory survey, the inspector conducted background measurements on various material types including concrete and tile floors, cinderblock and sheetrock walls, and sheet metal. The inspector collected the background measurements in non-impacted areas of Buildings 8 and 258. The inspector then calculated a minimum detectable activity for each material type.

The inspector conducted confirmatory surveys in the impacted areas of Buildings 8, 132, 258, 339, 340, and 1825. Surface scans of selected areas were conducted to locate areas of elevated radioactive particulate activity. The scans conducted by the NRC inspector were not recorded but were used to locate surface areas for fixed point measurements. A total of 64 fixed point measurements were collected and documented. Each fixed point measurement was a 1-minute count of total alpha and total beta particulate contamination. In addition, the ambient gamma exposure rate was measured in each area.

The ambient gamma exposure rates were measured, in part, because elevated exposure rates may be indicative of gross thorium contamination. With a background of approximately 5 microRoentgens per hour (µR/hr), the general area exposure rates ranged from background to a maximum of 13 µR/hr. The elevated measurements were attributed to naturally occurring radioactive material that was present in floors and walls including cinderblocks. Based on these ambient gamma exposure rate measurements, no area with gross thorium contamination was identified.

As noted above, the licensee continued to possess generally licensed radioactive material in two buildings. Thorium material in these two buildings exhibited elevated

exposure rates. The magnesium-thorium alloy parts measured about 1-2 millirems per hour on contact. As described below, these radioactive components had an impact on several fixed point measurements collected in areas near the radioactive material.

The inspector conducted fixed point measurements of building surfaces in the impacted areas. A total of 64 measurements were collected. Most measurements were collected by the NRC inspector in Building 8, the location where most of the specifically licensed activities were conducted with thorium alloys. The measurements taken by the NRC inspector consisted of total alpha and total beta particulate activity. The alpha particulate measurements ranged from background to 1,162 disintegrations per minute per 100 square centimeters (dpm/100 cm^2). The beta particulate measurements ranged from background to 3,829 dpm/100 cm^2.

Section 4.1 of the NRC-approved CCAD Radiological Survey Plan provides the derived concentration guideline levels (DCGLs) for release of the facility for unrestricted use. The total alpha radioactivity DCGL is 612 dpm/100 cm^2, while the total beta radioactivity DCGL is 306 dpm/100 cm^2. The inspector compared the fixed-point sample results to the DCGLs. Four alpha particulate measurements exceeded the total alpha radioactivity DCGL, while 11 beta particulate measurements exceeded the total beta radioactivity DCGL:

- Three alpha measurements and four beta measurements exceeded the respective DCGLs in the Building 8 'mag booth.' The highest alpha measurement was 1,162 dpm/100 cm^2, while the highest beta measurement was 1,721 dpm/100 cm^2. This area is located within the welding shop and was the area where welding of thorium alloys had previously occurred.

- One alpha measurement and two beta measurements exceeded the respective DCGLs in the Building 8 'touchup booth.' The highest alpha measurement was 774 dpm/100 cm^2, while the highest beta measurement was 3,829 dpm/100 cm^2. This area is also located within the welding shop and is adjacent to the 'mag booth.'

- Three beta measurements exceeded the DCGL in Building 8 on the machine shop floor. The measurements ranged from 961-992 dpm/100 cm^2. Because the alpha measurements were generally low in this area, the inspector concluded that the elevated beta measurements were probably indicative of naturally occurring radioactive material emanating from the concrete and tile flooring.

- One beta measurement exceeded the DCGL on the shop floor in Building 258. This measurement was 2,821 dpm/100 cm^2. The corresponding alpha particulate measurement did not exceed the DCGL. Generally licensed radioactive material was being stored in this area, and the inspector concluded that the elevated beta sample measurement may have been impacted by radiation originating from generally licensed thorium alloys.

- One beta measurement exceeded the DCGL on a table in Building 132. This sample result was 3,519 dpm/100 cm^2. The corresponding alpha measurement did not exceed the DCGL. The licensee was storing generally licensed thorium

alloys at this location, and the radiation originating from the generally licensed thorium alloys may have impacted the inspector's measurements.

Based on a review of the sample results, the inspector concluded that additional remediation, or the application of a DCGL area factor, may be required in the two Building 8 welding shop areas before the source material license can be terminated. The survey results from the other areas (Building 8 machine shop, Building 258, and Building 132) were inconclusive and may not have been indicative of thorium contamination on these surfaces.

1.3 Conclusions

A site tour was conducted, and only generally licensed material was identified at the site. The generally licensed material included thorium alloy parts from obsolete engines. The licensee had permanently discontinued processing of thorium alloys.

A confirmatory survey was conducted in areas identified in the site historical assessment. Residual radioactive contamination, in concentrations greater than the NRC-approved DCGL, was identified in the welding shop of Building 8. This location will require additional assessment by the licensee before the source material license can be terminated.

Elevated beta particulate measurements were identified at the Building 8 machine shop, Building 258 shop floor, and Building 132 table. These results were inconclusive, in part, because the areas did not exhibit elevated alpha particulate contamination and because two of three areas were used for storage of generally licensed thorium alloys that potentially interfered with the NRC inspector's confirmatory survey results.

2 Exit Meeting Summary

The inspector presented the results of the inspection to the radiation safety officer on April 10, 2009. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspector.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

E. Perez	Radiation Safety Officer

INSPECTION PROCEDURE USED

87104 Decommissioning Inspection Procedure for Materials Licensees

ITEMS OPENED AND CLOSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS AND ABBREVIATIONS

CCAD	Corpus Christi Army Depot
CFR	*Code of Federal Regulations*
DCGL	derived concentration guideline level
dpm/100 cm^2	disintegrations per minute per 100-square centimeters
µR/hr	microRoentgens per hour

ATTACHMENT