

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Report No. 9990001/96-009

Docket No. 9990001

License No. General License (10 CFR 40.22)

Licensee: Chemalloy Company, Inc.
P.O. Box 350
Bryn Mawr, Pennsylvania

Facility Name: Chemalloy Company, Inc.

Inspection At: 1301 Conshohocken Road
Conshohocken, Pennsylvania

Inspection Conducted: September 16, 1996

Inspector: Penny Lanzisera 9-23-96
Penny Lanzisera date
Health Physicist

Approved By: John D. Kinneman 10/10/96
John D. Kinneman, Chief date
Nuclear Materials Safety Branch 2
Division of Nuclear Materials Safety

Inspection Summary: Special inspection conducted on September 16, 1996 to review the licensee's current inventory of zirconium oxide ores and to conduct a confirmatory survey of the facilities where the ore was previously used and stored (Inspection Report No. 9990001/96-009).

Areas Inspected: Announced, closeout inspection limited to a confirmatory survey of Building 4C and Warehouse A for residual thorium and uranium contamination. Approximately three thousand pounds of zirconium oxide ores remains stored in the warehouse. Both buildings were surveyed for surface contamination and exposure rate.

Results: No violations were identified. The licensee had previously identified and corrected a violation of 10 CFR 40.22, which limited the use and transfer of source material to less than 15 pounds under a general license.

DETAILS

1. Persons Contacted

- *A.C. Demos, President
- *Timothy Bergere, Counsel
- *George McCarter, Plant Manager
- *Luiz Spiezio, Maintenance Supervisor
- *Anthony LaMastra, Consultant

*Indicates those present at exit interview

2. Background

The Conshohocken plant of Chemalloy Company, Inc. is a manufacturing plant for raw material processing. Building 4C is used for fine grinding. Several products, including baddelyite, is ground to approximately 325 mesh and bagged in Building 4C. Baddelyite contains natural thorium and uranium and was typically received in drums and dumped into the hopper in Building 4C upon receipt. Normally two to three batches of approximately 40,000 pounds of baddelyite each were processed in a year. The bagged baddelyite is stored on pallets in the warehouse after processing.

The licensee's consultant stated that workers are required to wear dust respirators and Tyvek coveralls during grinding and bagging operations. The consultant also stated that the particle sizes ranged from 5 to 78 microns as estimated by Roy F. Weston Company, and therefore would not result in significant lung deposition.

On November 3, 1995, the licensee's consultant contacted the NRC to report that Chemalloy Company, Inc. possessed source material in excess of the 15 pound limit stated in 10 CFR 40.22. The consultant stated that the facility currently possessed about 80,000 pounds of zirconium oxide and zirconium silicate material containing in excess of 0.05 percent of thorium and uranium. Chemalloy had originally believed all their product to be less than 0.05 percent of thorium and uranium, however during a shipment of floor sweepings to a waste broker, the waste facility's alarms had gone off and as a result, the material was analyzed and found to contain as high as 0.09 percent of thorium and uranium. Chemalloy notified the NRC on November 9, 1995, that they would not acquire or grind additional material until a specific license was granted. On November 16, 1995, Chemalloy's consultant notified the NRC that Chemalloy would be transferring most of their baddelyite product to Cabot Corporation (NRC License Number SME 920) and would retain about 25,000 pounds. On January 4, 1996, Chemalloy's consultant notified the NRC that Chemalloy would be transferring an additional 14,000 pounds of essentially raw baddelyite to Muscle Shoals Minerals (Alabama License Number SM-868), leaving approximately 6,000 pounds of bagged product and the waste roll-off material that was returned by the waste broker. On May 13, 1996, an additional 3,000 pounds of baddelyite was shipped to Carpenter Technology Corporation.

On July 12, 1996, the consultant performed a radiological survey of the Chemalloy plant. The survey results were submitted to the NRC in a letter

dated August 3, 1996. Chemalloy committed in this letter to no longer purchase baddelyite in quantities that would require a specific license under 10 CFR Part 40. Chemalloy currently possesses 3,000 pounds of bagged baddelyite and the roll-off material that was returned by the waste broker.

3. Instruments Used in Survey

The following instruments were used during the NRC confirmatory inspection for radiation level surveys throughout the facilities: 1) Ludlum Model 16 meter with Ludlum 44-3 low energy gamma detector calibrated August 1996. The background radiation level detected was approximately 250 counts per minute. 2) Bicron microrem meter calibrated October 1996. The background radiation level detected was approximately 4 microrem per hour.

4. Survey for Surface Contamination

Surface contamination was monitored with the low-energy gamma detector and the Bicron survey meter. The survey included: 1) the current storage area in Warehouse A of the remaining baddelyite; 2) Building 4C; and 3) the roll-off container returned from the waste broker. Elevated readings were noted at the baddelyite storage location in Warehouse A (0.3 millirem per hour), the roll-off container (0.06 millirem per hour), near zirconium oxide dust filters in Building 4C (0.04 millirem per hour), and around bagged rutile stacked in Building 4C (0.04 millirem per hour). Rutile is a natural titanium ore that contains naturally occurring thorium and uranium in concentrations below the 0.05 percent limit for source material. All other readings were background levels.

5. Residual Material

Approximately 3,000 pounds of ground baddelyite is currently stored in Warehouse A. Also, the returned roll-off container with concentrations of 6.6 picocuries/gram is located at the facility.

6. Transfer of Baddelyite

Records of shipping papers are maintained by the licensee. These records were reviewed by the inspector. All baddelyite was properly transferred to other specifically licensed or generally licensed facilities.

7. Exit Interview

The results of the inspector's direct survey were discussed with the individuals indicated in Section 1 of this report at the conclusion of the inspection.