

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection No. 040-07102/99-01
Docket No. 040-07102
License No. SMB-743
Licensee: Shieldalloy Metallurgical Corporation
Location: West Boulevard
P.O. Box 768
Newfield, New Jersey 08344
Inspection Dates: August 19, 1999 and September 9, 1999

Inspector:

Marie Miller

Marie Miller
Senior Health Physicist

10-27-99

date

Observers:

Amanda Strzelec, NRC Summer Intern
Nancy Stanley, NJ Department of Environmental Protection
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Division of Nuclear Materials Safety

October 27, 1999

date

EXECUTIVE SUMMARY

Shieldalloy Metallurgical Corporation NRC Inspection Report No. 040-07102/99-01

An announced safety inspection was conducted at the Shieldalloy facility in Newfield, New Jersey on August 19 and September 9, 1999. The inspection included a review of the licensee's organization and scope of licensed activities; facilities and equipment; radiation surveys; and decommissioning activities. Four soil samples were also taken and analyzed by NRC Region I.

One violation of NRC requirements was identified regarding the failure to notify the NRC in writing within 60 days after a decision was made to permanently cease a principal licensed activity in a separate building in accordance with 10 CFR 40.42 (d).

The current emphasis at the facility was directed to demolition and remediation activities. The licensee had implemented their revised radiation safety procedures with respect to the release of contaminated equipment and soils. While licensed material was being stored and controlled in designated areas, the potential for off-site residual contamination from past storage activities was discussed. This area of concern is being evaluated as part of the NRC licensing process.

REPORT DETAILS

I. Organization and Scope of the Program

a. Inspection Scope

The inspection included a review of organizational changes and scope of licensed activities conducted since the last inspection.

b. Observations and Findings

The licensee's radiation safety officer, assistant radiation safety officer, and senior corporate official at the site remained the same, since the inspection conducted in July 1998. However, the chair of the radiation safety committee (RSC) was nearing retirement and a replacement had not been named. On September 22, 1999, the licensee informed NRC by telephone that Mr. Nigel Morrison, Vice-President and General Manager of the plant had been named the new chair for the RSC.

The licensee reported that there was no processing of pyrochlore since February 1998. Pyrochlore contains greater than 0.05 percent by weight of thorium and uranium and is therefore "source material" as defined in 10 CFR Part 40. There were no receipts of licensed materials for processing or for re-distribution. The inspector reviewed the inventory records and noted that as of August 11, 1999, the licensee was at 96.8 percent and 87.6 percent of its thorium and uranium possession limits, respectively.

The licensee stated that although they had planned to transfer baghouse dust containing less than 0.05 percent source material to an exempt person in accordance with 10 CFR 40.51 (b) (3) and 40.13 (a), they presently were unsuccessful in finding a cement manufacturer. By NRC letter dated February 9, 1999 to the licensee, the NRC provided its conclusion that the total effective dose equivalent to an individual member of the public or worker from the transfer of the baghouse dust to a cement manufacturer would not be expected to exceed 100 mrem/year. Therefore, the NRC staff had no objection to the transfer of this material to a cement manufacturer.

The licensee also indicated they would be submitting by October 20, 1999, in accordance with its licensee condition, a decommissioning funding plan with onsite disposal as the primary method of remediation. Removal, demolition and remediation activities were in progress during this inspection and are discussed in Section IV of this report. (A copy of this report was received on October 20, 1999.)

c. Conclusions

The current emphasis at the facility with respect to radiological activities was directed at demolition and remediation activities. The licensee's inventory of radioactive materials were within its licensed possession limits.

II. Facilities and Equipment

a. Inspection Scope

The inspection included a tour of the facilities used for licensed material, including the Source Material Storage Yard.

b. Observations and Findings

Licensed material was located in Building D111 and the adjacent Flex-Kleen filtration building. Crushed ferrocolumbium slag (also known by trade-name CANAL) had been removed from Warehouse B, and returned to the Source Material Storage Yard (SMSY). Warehouse A no longer contained licensed material, and had been removed from the license, since the last inspection. The SMSY was used to store all of the manufacturing byproduct, which contains most of the uranium and thorium; baghouse dust, which the licensee plans to transfer as unlicensed material; baghouse dust filter bags, which are considered contaminated with licensed material; and soil with low levels of thorium and uranium contamination from recent remediation activities.

The inspectors observed that these areas were conspicuously posted with the appropriate caution signs as required by 10 CFR 20.1902. Quarterly reports prepared for review by the licensee's Radiation Safety Committee documented routine radiological exposure and contamination surveys.

As documented in the last inspection, the NRC has expressed concern regarding the potential for contamination adjacent to the northern boundary of the licensee's property near the ferrocolumbium slag piles in the SMSY. The inspector discussed with the licensee's Radiation Safety Officer the NRC off-site sampling locations that were stated as being unknown in the licensee's letter dated August 13, 1999. The inspector identified the approximate offsite sampling locations, which were immediately adjacent to the fence-line. In addition, the inspector noted that the licensee stated that they had identified several ferrovandium slag chips (unimportant quantities of source material) east of the SMSY, outside the licensee's fence-line during their re-forestation project. The inspector noted there was no observable evidence of run-off from the current storage piles. However, surveys just outside the fence-line to demonstrate the lack of migration had not been conducted.

c. Conclusions

Licensed material was being stored and controlled in designated areas. The potential for off-site residual contamination from past storage activities will be evaluated as part of the licensing process. (These areas of concern were the subject of the October 15, 1999 letter from T. Sherr, NRC to D. Smith, Shieldalloy Metallurgical Corporation.)

III. Radiation Surveys

a. Inspection Scope

The licensee's radiation survey procedures for the release of materials and the results of selected surveys were reviewed.

b. Observations and Findings

The inspector reviewed the licensee's Radiation Safety Procedure No. RSP-008, "Instrumentation and Surveillance" and RSP-009, "Contamination Control," which provided specifications for instrumentation and criteria for soil screening and release of equipment and building debris from demolition. The inspector noted that the procedures specified appropriate instrumentation and scanning rates. Further, the criterion (600 disintegrations-alpha per minute per 100 square centimeters, and 10 picocuries per gram of soil) were in accordance with the licensee's commitments to NRC documented in their letter dated March 19, 1997.

The inspector reviewed selected surveys of materials released from the decommissioning of the American Air Filtration building. Release surveys were performed by the licensee's consultant who was qualified to use a gas flow proportional counter and alpha scintillation detector. The survey package for the dismantlement of the AAF had not been completed. Further, a final status survey of the cleared land areas had not been completed at the time of the inspection.

c. Conclusions

The licensee had implemented their revised radiation safety procedures with respect to release of contaminated equipment and soils. The final release surveys for the AAF building will be reviewed during a subsequent inspection.

IV. Decommissioning Activities

a. Inspection Scope

The inspection included a tour of the facility, independent measurements, and a discussion of current decommissioning activities. The inspection also included a review of the licensee's plans to revise their Decommissioning Funding Plan.

b. Observations and Findings

The licensee stated they intended to submit a decommissioning plan that would use in-situ disposal, and their plan to provide a financial assurance mechanism, in accordance with their license commitment of October 20, 1999. The inspector noted that a request

for a restricted release would require a dose assessment from all radiological sources that would remain at the site.

With respect to current decommissioning and remediation activities, the licensee's Radiation Safety Officer described the excavation and site remediation programs with regard to licensed and non-licensed activities that had been conducted since the last inspection. Because some of these activities were adjacent to areas authorized for NRC licensed activities, the inspector requested a status of these programs. In addition, four soil samples were taken from these areas to confirm that the soil did not contain source materials greater or equal to 0.05 percent.

The soil samples were analyzed on a Princeton Gamma-Tech high purity intrinsic germanium detector coupled to a Nuclear Data Accu-Spec multi-channel analyzer. The samples were dried and counted for 10,000 seconds. This gamma analysis infers concentrations of thorium and uranium through progeny isotopes as follows: Thorium-232 (based on the presence of Actinium-228), Thorium-228 (based on Lead-212), Uranium-238 (based on Palladium-234m). The soil sample results were as follows:

SOIL RESULTS FROM NON-LICENSED FACILITY AREAS (pCi/g)				
Location	Ac-228	Pb-212	Pa-234m	U-235
West pile from Haul Road(1)	11.07 ± 0.10	10.15 ± 0.04	3.1 ± 1.2	< 0.23
East pile from Haul Road (2)	1.10 ± 0.03	0.972 ± 0.009	1.2 ± 0.4	< 0.06
Re-forestation area-east (3)	0.62 ± 0.02	0.578 ± 0.008	1.1 ± 0.4	0.04 ± 0.02
Re-forestation area-center (4)	0.37 ± 0.02	0.357 ± 0.007	<1.0	0.06 ± 0.02

Except for the sample from the west pile from Haul Road, all results appear consistent with background levels of thorium and uranium. The results from sample one, although elevated, contains less than 0.05 percent of source materials.

As was discussed by the licensee on August 18, 1999 during a telephone conversation initiated by the NRC for inspection planning purposes, the American Air Filter baghouse and adjacent silo had been dismantled during the period of May 17 through June 17, 1999. During the inspection on August 19, 1999, the inspector observed that only the concrete pad remained in-place, and that the filter bags containing residual contamination in excess of the contamination limits were placed on-site in the licensed SMSY. On September 9, 1999, the inspector observed preparations for scanning the remaining concrete pad and land areas. The scanning activity was being performed by

the licensee's consultant with a qualified health physicist using a gas-flow proportional counter for contamination measurements and a scintillation detector for scanning.

The licensee had not provided written notification to the NRC that the AAF system was to be dismantled. The licensee stated they had mistakenly believed that a written notification was only required if a decommissioning plan was required to be submitted for NRC approval. The inspector discussed with the RSO the specific requirements for Timeliness in Decommissioning of Material Facilities, which were detailed in NRC Administrative Letter 96-05, Revision 1, dated July 14, 1998. The RSO acknowledged that a notification should have been made.

Another active remediation program at the licensee's facility involved an area of approximately 3 acres east of the licensee's SMSY that had stored ferrovanadium slag piles, which contained unimportant quantities of source material. This area is being reclaimed as part of the Natural Resource Restoration Plan, which was developed in accordance with the terms of the United States and New Jersey Department of Environmental Protection Settlement Agreement pursuant to the emergence from Chapter 11 Bankruptcy. The licensee stated that elevated levels of non-licensable radioactive material (i.e., less than 0.05 percent of source materials) were identified, so the licensee excavated soil up to three feet and placed this material at the edge of the SMSY. The inspector observed the licensee's in-process remediation survey on September 9, 1999 and discussed the basis of the number and location of the soil samples that were being collected. Two samples taken by the NRC from the remediated area confirm that levels were consistent with background. However, because this area is adjacent to the licensed storage yard, and the licensee proposes an in-situ disposal for its decommissioning plan, a review of the licensee's final status survey would be required. The licensee stated that this information would be provided prior to re-forestation of the area.

A third project, completed since the last inspection, was the excavation of Haul Road. The licensee had submitted their survey report for Haul Road to the State of New Jersey, because the contaminated soils from the roadway indicated the elevated radiation levels were not attributable to NRC licensable materials. The inspector noted the excavated soils that were removed during the remediation of Haul Road had been placed in the SMSY. The inspector took two samples of this soil, and confirmed that the concentrations were considered unimportant quantities of source materials.

c. Conclusions

The results from the four soil samples taken from the two non-licensed remediated areas were consistent with the licensee's surveys conducted of the same areas.

With respect to the demolition of the AAF baghouse and silo, 10 CFR 40.42 (d) requires, in part, that the licensee provide notification to the NRC in writing within 60 days if (among other occurrences) the licensee decides to permanently cease principal activities in any separate building or outdoor area that contains residual radioactivity such that the

building or outdoor area is unsuitable for release in accordance with NRC requirements. Failure to provide written notification within 60 days of the decision to permanently cease principle activities with respect to the AAF baghouse and silo is a violation of 10 CFR 40.42(d).

V. Exit Meeting

The inspector provided a synopsis of the inspection findings to the Radiation Safety Officer on September 9, 1999. The inspector summarized the soil sample results with the Radiation Safety Officer by telephone on October 16, 1999.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

*David Smith, Radiation Safety Officer and Director of Environmental Services
 James Valenti, Assistant Radiation Safety Officer
 Allan Duff, Integrated Environmental Management, Inc. (IEM), Licensee Consultant
 Brian Kelly, Senior Health Physicist, IEM

State of New Jersey Department of Environmental Protection Observers

Nancy Stanley, Bureau of Environmental Radiation
 Jenny Goodman, Bureau of Environmental Radiation

* indicates presence at exit meeting