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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAR 30 1993

MEMORANDUM FOR: Michael F. Weber, Section Leader
Regulatory Issues Section
Decommissioning and Regulatory
Issues Branch

FROM: Dominick A. Orlando, Project Manager
Regulatory Issues Section
Decommissioning and Regulatory
Issues Branch

SUBJECT: CURTIS BAY DEPOT INSPECTION

On March 12, 1993, I accompanied Nuclear Regulatory Commission Region I inspector Eric Reber on a routine, unannounced inspection of the Curtis Bay Depot in Curtis Bay, Maryland (License No. STC-133). The Curtis Bay Depot was last inspected by Region I in July 1985. A representative of the State of Maryland, Department of the Environment, Mr. Charles Flynn, also observed and participated in the inspection. Within the scope of the inspection, no violations were observed. Mr. Reber and I began the inspection at approximately 10:00 a.m. and completed the inspection at approximately 4:00 p.m.

The Curtis Bay Depot is one of 11 NRC-licensed facilities operated by the Defense Logistics Agency (DLA) under License No. STC-133. These facilities store and process strategic materials, including thorium nitrate, for the U.S. Government. The purpose of this inspection was to evaluate the status of the licensee's compliance with NRC regulations and the facility's license conditions. I accompanied the Region I inspector to gain insight into the Depot's storage and management of the current inventory (approximately 5.1 million pounds) of thorium nitrate, as I may be questioned on this issue during the remediation of the Anne Arundel County property adjacent to the depot. The Anne Arundel County property was formerly owned by the Depot and was released for unrestricted use by NRC in 1978. In February 1993, after an NRC sponsored survey of the site identified spotty residual contamination in the soil and buildings, DLA committed to remediate the property in accordance with current radiological criteria for decommissioning.

The inspection consisted of interviews with Mr. William Fritz, the Depot Manager and other personnel, a visual inspection of the thorium nitrate storage facilities and an empty warehouse that had been used to store monazite sand and a review of the facility's radiation safety program and selected records. We also obtained several exposure rate measurements in and around the thorium nitrate storage facility and the empty warehouse.

The only licensed material at the site is 5,193,606 pounds of thorium nitrate (see Enclosure 1) which is stored in approximately 19,000 steel and plastic drums and some residual contamination in one building that resulted from monazite sand storage. Mr. Fritz stated that to the best of his knowledge, all the thorium nitrate is in granular form. This has not been visually confirmed by Mr. Fritz.

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There are three lots of thorium nitrate at the facility. One lot, consisting of approximately 1900 drums, is of French origin. The second lot is of Indian origin and consists of approximately 760 drums. The third, and largest lot, is of domestic origin and consists of approximately 16,600 drums. Most of the thorium nitrate (appx. 16,000 drums) is triple packed in a plastic bags within a plastic drum that is packed in a DOT approved 55-gallon steel drum. The remainder of the thorium nitrate is stored in plastic bags within steel drums (appx. 2,600 drums) or in plastic bags within two plastic drums (appx. 750 drums). Mr. Fritz indicated that the 2,600 drums would be placed in 85-gallon steel overpacks prior to any transport off-site. The drums are stacked on flat or box pallets in 3 or 4 tiers and the floors beneath the pallets are covered with a paper and plastic liner. Visual inspection of these drums revealed some superficial corrosion; however, no leakage was observed. As these drums have been in storage at the Depot since 1962, with only minimal corrosion taking place to this point, it seems unlikely that leaking of the thorium nitrate from the drums will be a problem.

All thorium nitrate is stored in three buildings at the facility. These buildings are of terra cotta tile construction and are almost completely enclosed in an 8-foot high fence. The fence line is broken in a few places by large piles of various ores or strategic materials. The fence line and buildings are posted with the appropriate radiation warning signs and the fence and buildings are normally padlocked. Mr. Fritz indicated that these buildings have had their roofs replaced within the last 10 years. The interior of the buildings appeared to be dry and in good condition and the drums showed no evidence of leakage. External exposure rates at the buildings averaged 4-5 mR/hr. Internal exposure rates were not determined as the exposure rate inside the buildings exceeded the scale of the microR meter (in excess of 5 mR/hr). Exposure rates at the fence line, which is 150 feet from the buildings, ranged from 100 μR/hr to 190 μR/hr.

The facility performs several types of internal audits. Every 6 months the thorium nitrate drums are inspected visually. No wipe tests are performed during this inspection. We suggested that a representative sample of drums be wipe tested during these audits. Mr. Fritz agreed with our suggestion. Every 3 years the Army Environmental Health Agency (AEHA) performs an audit of the facility. Exposure rate measurements and wipes are taken during this audit (see Enclosure 2). The last AEHA audit was performed 3-4 months ago. An annual audit is also performed by the in-house Quality Assurance (QA) staff. Exposure rate measurements are taken during this audit. However, the drums are not wipe tested.

Two environmental audits of the facility have been performed in the last year. The first consisted of gamma exposure rate and airborne radon measurements at the fence line. This audit was completed in December 1992 and the results of the measurements were not yet available. In June 1992, in response to a request from the QA group at the Depot, an Environmental Assessment was performed (see Enclosure 3).

In general the audits indicate that the thorium is being managed in a safe manner and in compliance with applicable NRC requirements and license conditions. The most recent QA audit indicated that the inspector felt that

the steel drums exhibited a significant amount of exterior rusting. Mr. Fritz indicated that he did not agree with the audit and that the container integrity had not been compromised. We suggested that when Mr. Fritz contests the findings of an audit he should document not only his contrary views but the result of any deliberations on the issue.

Mr. Fritz indicated that since 1985 only 150 drums of thorium nitrate had been shipped from the Depot (to Teledyne Wah Chang in Huntsville, AL). The Depot is investigating the disposal of much of the thorium nitrate at one of the existing low-level waste disposal facilities. No date was available for beginning disposal operations.

Mr. Fritz stated that training in radiation safety is given to all workers, including contractors, who enter the restricted area inside the fence surrounding the throium nitrate storage buildings. All individuals that enter the restricted area wear film badges and a record of the dose received is offered to all individuals (a contractor employee that was inside the fence stated that he had received radiation safety training. He was also wearing a film badge). Training is provided to DLA employees through monthly safety meetings. Mr. Fritz has also started a program whereby all employees will view a video tape with radiation safety instructions.

Film badges are provided by Siemens. Approximately thirteen maintainance and QA employees have permanent badges. Approximately ten visitor badges are also available. Review of selected film badge records from 1985 to the present indicated no overexposures. The greatest dose received by any worker during these years was to an individual working in the QA department. His maximum dose was 680 mR in 1986.

We also inspected Building 731, which had been used in the past to store monazite sand. This building is not within the previously discussed fence line, although it is within the Depot fence. This building is of terra cotta tile and concrete slab construction. The roof of this building is in fair condition, although there is an appx. 4 square foot hole in one spot where the roof meets the wall. Mr. Fritz indicated that some residual contamination (uranium) existed in the walls and floors of this building. This building has not been released for unrestricted use. We observed a single drum of monazite sand and 4 drums that were being used to store floor sweepings in the building. Although the drums were properly secured and stored, we suggested that they be relocated to one of the thorium storage buildings. This would confine all the licensed material at the Depot except the residual monazite sand contamination to one location. Mr. Fritz agreed with this suggestion. The Depot is currently evaluating cost and logistics of decontaminating this building.

During the exit interview with Mr. Fritz, Eric and I discussed the past releases of other buildings at the site. Mr. Fritz indicated he would investigate with Kevin Reilly the DLA Radiation Safety Officer, the possibility of re-evaluating these building using current NRC unrestricted use criteria before any demolition of the buildings occurred. Eric indicated that the Depot should coordinate this with Region I, to ensure that no questions

concerning the demolition are raised in the future.

While at the Depot I noticed that one of the L-line buildings on the Anne Arundel County property is now beginning to collapse. In addition, a gate has been installed on the access road leading onto the Anne Arundel County property from Ordnance Road.

If you have any questions, please contact me.

/s/

Dominick A. Orlando, Project Manager
Regulatory Issues Section
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