DEPARTMENT OF THE ARMY
UNITED STATES ARMY TANK - AUTOMOTIVE AND ARMAMENTS COMMAND
ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER
PICATINNY ARSENAL, NEW JERSEY 07806-5000

27 May 1997

System Safety Group
Quality Evaluation and Safety Team
Product Assurance Directorate

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Re: Reply to a Notice of Violation
Docket No. 040-06377
License No. SUB-348

Dear Sir or Madam,

In regard to the referenced violation(s) the following information is submitted in accordance with the format prescribed in your letter dated April 2, 1997, which discussed the findings from NRC Inspection No. 040-06377/97-001. It is our understanding that this response is considered timely based on the agreement reached between Mr. Richard Fliszar, ARDEC Radiation Protection Officer, and personnel from your Region I Office that is documented in our April 27, 1997 correspondence (encl 1).

This Center was cited for violating 10 CFR 20.1801 & 1802 for failure to secure from unauthorized removal and failure to maintain constant surveillance when not in a controlled area 3.2 pounds of depleted uranium contained in 400 rounds of 7.62 mm armor piercing experimental ammunition. The result was an improper transfer of 1468 grams of depleted uranium in munitions resulting in the ultimate loss of 367 grams of licensed material.

This Center had received these 400 experimental rounds in 1984 from another Army installation for storage awaiting disposal by another installation. They were held in storage with other ammunition until 1994 when a representative for the U.S. Department of Justice, who also happened to be a National Guardsman stationed at a National Guard Heliport located on the grounds of Picatinny Arsenal, formally requested the issue of excess small arms ammunition for use in training by that Agency. As a result thousands of rounds of small arms ammunition were turned over to that individual. Unknowingly included in that issue were the 400 rounds of experimental 7.62mm depleted uranium ammunition (each round contained 3.67 grams of depleted uranium in the form of a saboted penetrator). Subsequent to issue, the Dept. of Justice representative improperly diverted a large portion of the small arms ammunition to local police departments for their use. This diversion happened to include the 400 rounds of radioactive

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ammunition (the representative had not requested nor was he initially aware he had received radioactive material). Within days after the initial issue from Picatinny Arsenal the police departments fired 100 of the depleted uranium containing rounds at a Basic Service Rifle Course sponsored by the Roxbury, NJ Police Department. The firings occurred at the outdoor Roxbury Police Firing Range located on the grounds of Hercules Inc., Kenvil, N.J. (see encl 2). More detailed information concerning the circumstances and details surrounding these events are contained in the NRC Region I Inspection Report No. 040-06377/97-001, dated April 1, 1997. Though not indicated in the April 2, 1997 correspondence from your Agency a risk assessment pertaining to the spent 100 rounds is included with this submission as enclosure 3 in response to the verbal request for such made by both Mr. John Kinneman and Ms. Betsy Ullrich of your NRC Region I Office.

The primary cause of the infraction was the ammunition handler's failure to recognize that the ammunition was radioactive and notify the Radiation Protection Officer to coordinate the transfer in accordance with current SOP AR-0000-L-002. This occurred for several reasons.

a. There is no radioactive 7.62 mm ammunition in the Army inventory as field issue. Since this was supposed to be an issue of standard small arms munitions the ammunition handler would not expect this ammunition to be radioactive.

b. The Ammunition Locator Card, kept in central ammunition files, was marked "Radioactive" but the marking was written in the same color as other writing on the card and was not highlighted. It is not known whether the Magazine Card, kept with the ammo, had a radioactive marking on it. It was discarded when the ammunition was issued.

c. The wooden overpack in which the ammunition had been received had no radioactive markings on it, as is permitted for excepted radioactive material shipments in accordance with Department of Transportation regulations.

A secondary cause for the violation was the failure of the radioactive material inventory system to include this ammunition so it was not identified as missing during routine physical inventories. The reason for this was due to a loss of continuity in the health physics staff in 1987 when all but one member of the staff retired or was transferred to other jobs, coupled with the fact that the radioactive material inventory at the time was ineffectively assembled, and apparently did not include reference to the existence of these rounds. In addition, in establishing a more complete radioactive material inventory in 1987 the present office staff erred in demonstrating a lack of insight to also examine all available prior incoming/outgoing radioactive material shipment files.

The following corrective actions to the violation(s) have been taken:

a. Recover and control:

(1) The remaining 300 rounds of 7.62mm depleted uranium ammunition have been recovered and placed in safe secure storage. They are now listed in the radioactive material inventory and subject to semiannual physical inventories per license conditions.

(2) All radioactive ammunition has been consolidated into a minimum number of designated magazines.

(3) Both the M14 rifle alleged to have fired the 100 7.62mm depleted uranium rounds as well as the Roxbury Police Firing Range backstop and metal target stands (hold paper targets) have been surveyed by ARDEC health physicists. No radioactive contamination was found on the rifle, the metal target stands nor the surface of the earthen backstop that the rounds are alleged to have been fired into. In addition, no penetrators were detected below the surface of the backstop. Several false positive readings during the survey (readings possibly slightly above background) were flagged with the dirt from those spots dug up, spread out on plastic sheeting and resurveyed. Had any penetrators or oxidized remains been discovered they would have been collected and brought back to ARDEC to hold for radioactive waste disposal. The fact that no penetrators were discovered was not surprising given the mass and size of the penetrators and the anticipated depth to which it is believed they may have burrowed and possibly scattered upon entry into the dirt backstop. In addition to meter readings (ie. GM pancake probe reading at end of muzzle) on the M14 rifle swipes were run through the barrel to survey for the presence of loose contamination. The swipes were analyzed on ARDEC's laboratory scale gas flow proportional counter. The metal target stands were surveyed with a GM pancake probe, as was the soil that had been dug up and spread out on the plastic sheeting. The survey of the dirt backstop itself had been performed with a number of different survey meters with the primary meter of use being a FIDLER probe (ie. field instrument for the detection of low energy photon radiation) which has a sodium iodide crystal. Although several other different type survey meters were also used in the survey (ex.. micro-R meter), it was assured that the FIDLER was used over the entire surface of interest. As stated earlier, a risk assessment that addresses the 100 depleted uranium rounds remaining in the dirt backstop is contained in enclosure 3 of this submission. Based on the mass of uranium lost, the amount of soil in which the penetrators were deposited, the slopping of the dirt backstop limiting surface water percolation, and the expected minimal diffusion rate and mass of any oxidized DU through the soil at any given time, there will not be any impact to the environment or to human safety of any significance.

b. Prevent recurrence:

(1) All ammunition handlers were provided refresher training specific to the issues at hand on February 12, 1997 by the ARDEC health physics staff. In this training the ammo handlers were specifically reminded not to issue or ship radioactive ammunition without the coordination and authorization of the ARDEC Radiation Protection Officer. Refresher training that addresses these points will be provided annually to all ammunition handlers, including those who are not radiation workers, to assure continued awareness of the system and responsibilities of those workers.

(2) The radioactive material inventory has been fully reconstructed including that for radioactive ammunition. A search of all existing incoming/outgoing radioactive material shipment records (dating back to 1977) located in the Radiation Protection Office files

was performed to determine if there were any other atypical radioactive ammunition not accounted for. No additional such material was found.

(3) A similar search of all available Ammunition Locator Cards (both historical as well as present ammunition on hand) was performed by the ammunition handlers to determine if there is or was any other atypical radioactive ammunition in the ammunition storage area. No such additional material was found.

c. Enhance radioactive ammunition identification: It is not necessary to place radioactive markings or labels on ammunition containers that hold radioactive munitions while in storage provided that one of the exemptions listed in 10 CFR 20. 1905 is met. To that end compliance with 10 CFR 20. 1905 (e) has been enhanced by the following actions that have been taken since the February 12, 1997 NRC inspection of the incident. These procedures/systems were implemented to improve identification of radioactive ammunition and in turn further assure prevention of unwarrented issue of this type ammunition again in the future.

(1) Yellow and magenta colored stickers containing the ionizing radiation propeller blade symbol are now applied to the Ammunition Locator Cards and Magazine Cards for all radioactive ammunition to alert ammunition handlers that these items are radioactive.

(2) The ammunition inventory computer database maintained by the ammunition handlers has been updated to provide an additional field whose sole purpose is to flag radioactive ammunition. This will be examined whenever ammunition is to be issued.

The POC for any further questions is Mr. Richard Fliszar, ARDEC Radiation Protection Officer, at (201) 724-3126/3742. Please note that this location will have a new area code as of June 1, 1997, which will be (973).

Sincerely,

James E. Elliott
TACOM-ARDEC System Safety Officer

Enclosures

Copies Furnished:

U.S. NRC - Region I (Mr. John Kinneman / Ms. Betsy Ullrich), King of Prussia, Pa.
AMSTA-AR-PSS (Mr. O.T. Perry, IRCC Chairman)
AMCSF-P (Mr. John Manfre)
AMSTA-CS-CZ (Ms. Karen McGuire)
NJ Dept. of Environmental Protection, Radiation Protection Program, Radioactive Material Section (Att. Mr. John Feeney), 25 Artic Parkway, Trenton, NJ 08625-0415