August 5, 2004

MEMORANDUM TO: Mark Satorius, Director
Division of Nuclear Materials Safety
Region IV

FROM: Scott C. Flanders, Deputy Director **/RA/**
Environmental and Performance
Assessment Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

SUBJECT: TECHNICAL REVIEW OF CODE OF FEDERAL REGULATIONS (10 CFR) PART 20.2002 REQUEST BY U.S. DEPARTMENT OF THE AIR FORCE

On June 30, 2004, you requested that the Office of Nuclear Material Safety and Safeguards review the U.S. Department of Air Force's June 23, 2004, *Code of Federal Regulations* (10 CFR) Part 20.2002 request. My staff has reviewed the 10 CFR Part 20.2002 request and finds it acceptable.

The licensee's analysis conservatively assumed the inventory of depleted uranium in each of the four tanks was the maximum number of penetrators (i.e., forty rounds) that potentially hit the tanks. The licensee analyzed the dose to a transport driver, loader, burial worker, and long-term impacts to a residence. While the licensee did not analyze the groundwater impacts from the disposal, staff reviewed previous analyses in support of NUREG-1640 that showed that the groundwater pathway is not a controlling factor for depleted uranium. Each of the conservative analyses result in dose estimates of less than 0.01 mSv (1 mrem) total dose.

If you have any questions, please contact Christepher McKenney of my staff at 301-415-6663.

Docket: 030-28641

Attachment: As stated

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TECHNICAL REVIEW OF U.S. DEPARTMENT OF AIR FORCE 10 CFR PART 20.2002 DISPOSAL REQUEST FOR TANKS CONTAINING DEPLETED URANIUM PENETRATORS

BACKGROUND

The U.S. Department of Air Force submitted a request to dispose of four M-47 tanks from the 98th Range Wing at Nellis Air Force Base Nevada to US Ecology's Hazardous Waste Treatment and Disposal Facility in Idaho, under 10 CFR 20.2002. These four tanks have been used as target practice for A-10 aircraft and have been contaminated by depleted uranium from the 30mm rounds, each containing 300 grams of depleted uranium, fired by the aircraft. Based on records, each tank has less than forty of these rounds within it. Because of the kinetic energy released when a vehicle is hit by a depleted uranium round, some of the depleted uranium from the round will bond with the metal surrounding the entry point and the interior of the chamber.

TECHNICAL EVALUATION

For the analysis, the licensee conservatively assumed that each of the four tanks contained forty rounds. The licensee analyzed the dose to a transport driver, loader, burial worker, and long-term impacts to a residence. While the licensee did not analyze the groundwater impacts from the disposal, staff reviewed previous analyses in support of NUREG-1640 that showed that the groundwater pathway is not a controlling factor for depleted uranium. Each of the conservative analyses result in dose estimates of less than 0.01 mSv (1 mrem) total dose.

For the truck driver scenario, the licensee used empirical dose rate information from a depleted uranium projectile. They ignored any benefits of shielding due to the cab or tank armor and calculated the dose rate to a truck driver assuming that twenty rounds were within 3 meters (~10 feet) of the driver of the truck. They assumed that the same driver transported all four tanks on separate 16-hour trips. The total dose calculated for this very conservative estimate was 0.0024 mSv (0.24 mrem).

For loading, unloading, and burying the tanks, a similar analysis was calculated, however, the exposure time was 2 hours per tank. The only relevant exposure pathway is external as there is no removable contamination on the exterior of the tanks and they will be sealed before shipping. While no removable contamination is assumed, the scenario remains conservative because of the assumption that twenty rounds are near the exposed person. This scenario resulted in a conservative dose estimate of 0.0006 mSv (0.060 mrem).

The third scenario analyzed by the licensee was the long-term impacts from the tanks. The licensee conservatively assumed that the mass of depleted uranium in the tank would mix instantly with a volume of soil equivalent to the displacement volume of the tank. The analysis did not assume any cover was present and assumed that a house was built over the disposal area. The pathways of exposure were external, inhalation, and radon. External exposure is the dominant pathway. The result of this very conservative and unlikely scenario was a peak annual dose of 0.009 mSv (0.9 mrem).

Attachment

CONCLUSIONS

The staff recommends that the U.S. Department of Air Force request to dispose of four M-47 tanks from the 98th Range Wing at Nellis Air Force Base Nevada to US Ecology's Hazardous Waste Treatment and Disposal Facility in Idaho, under 10 CFR 20.2002, be approved. For the analysis, the licensee conservatively assumed that each of the four tanks contained forty depleted uranium rounds. The licensee analyzed the dose to the transport driver, loader, burial worker, and long-term impacts to a residence. While the licensee did not analyze the groundwater impacts from the disposal, staff reviewed previous analyses in support of NUREG-1640 that showed that the groundwater pathway is not a controlling factor for depleted uranium. Each of the conservative analyses result in dose estimates of less than 0.01 mSv (1 mrem) total dose.