



DEPARTMENT OF THE NAVY  
OFFICE OF THE CHIEF OF NAVAL OPERATIONS  
2000 NAVY PENTAGON  
WASHINGTON, D.C. 20350-2000

IN REPLY REFER TO

5104  
N455/OU595823  
30 Oct 00

Division of Industrial and Medical Nuclear Safety  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
One White Flint North  
Washington, DC 20555-0001

Gentlemen:

SUBJECT: RESPONSE TO 10CFR2.206 PETITION FOR FORMAL HEARING

This letter responds to your September 8, 2000 correspondence to the Naval Radiation Safety Committee (NRSC), regarding a petition from Douglas L. Rokke, Ph.D., requesting a "...formal NRC hearing to consider the revocation of the master DU (depleted uranium) license for the U.S. Department of Defense and all services, implementation of substantial fines and consideration of personal criminal liability."

Under the provisions of Section 2.206 of Title 10 of the Code of Federal Regulations, the Nuclear Regulatory Commission (NRC) has determined that sufficient justification has been presented by Dr. Rokke to support his request that Navy provide evidence for sustained use of depleted uranium under the Navy's Master Materials License. Dr. Rokke identified three areas of concern in his request for a Formal Hearing. These concerns are the willful and deliberate use of depleted uranium on the Live Impact Area of Vieques of Puerto Rico, the exposure of U.S. citizens on Vieques to ionizing radiation arising from the depleted uranium, and the failure to conduct depleted uranium training within the Navy.

The enclosures provided directly support Navy's position that the expenditure of depleted uranium rounds on Vieques was due solely to human error. They also demonstrate clearly that the radiation effects from the DU is considered negligible. Finally, the enclosures show that Navy has provided appropriate personnel training for depleted uranium munitions.

Sincerely,

A handwritten signature in black ink, appearing to read "L. Baucum".

L. BAUCOM  
Rear Admiral, U.S. Navy

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In response to the three general areas of concern raised in the request for a Formal Hearing, the enclosures are considered germane.

1. The willful and deliberate use of depleted uranium on the Live Impact Area of Vieques, Puerto Rico: Enclosures (1), (2), (5), (6), (12).
2. The exposure of U.S. citizens on Vieques to ionizing radiation arising from the depleted uranium (bioeffects): Enclosures (3), (4), (9), (11), (19), (20).
3. The failure to conduct depleted uranium training within the Navy: Enclosures (8), (13), (14), (15).
4. General background information pertaining to the event, corrective actions, and recovery responses: Enclosures (1), (2), (7), (10), (16), (17), (18), (21), (22).

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**Enclosure (1), Document Title and Date:** Improper Expenditure of Depleted Uranium Munitions, dated April 1, 1999.

**Executive Summary:** The attached letter was submitted to the NRC Region II, in compliance with 10 CFR 30.50 as an initial 30-day report of the event. The letter discussed initial actions taken by the NRSC to recover depleted uranium penetrators on the Live Impact Area, Vieques, Puerto Rico.

**Enclosure (2), Document Title and Date:** Improper Expenditure of Depleted Uranium Munitions, dated June 1, 1999.

**Executive Summary:** Follow on letter to NRC Region II, detailing actions taken by the NRSC, 60 days post incident. The letter references a Marine Corps message that was released to all Marine Corps activities controlling and using munitions. The Marine Corps message notified activities of revision to applicable Navy/Marine Corps instructions regarding use code restrictions for DU munitions; the development of a command self-inspection checklist for munitions compliance; and the inclusion of DU specific items in Marine Corps Ordnance Occupational Training Courses.

**Enclosure (3), Document Title and Date:** Letter from Dr. Shirley Ann Jackson, Ph.D., Chairman of the U.S. Nuclear Regulatory Commission to The Honorable Adlah "Foncie" Donastorg, Jr., Chairman, Committee on Planning and Environmental Protection, Legislature of the Virgin Islands, St. Thomas, U.S. Virgin Islands, dated June 29, 1999 (copies to The Honorable Pedro Rosello, Governor of Puerto Rico and to The Honorable Carlos Romero-Barcelo, Resident Commissioner of Puerto Rico).

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**Executive Summary:** "The NRC staff has assessed the consequences of the incident and has determined that the DU contamination does not pose an immediate safety concern. DU is comparable in radioactivity to naturally occurring uranium. Because the radioactivity is relatively low, occasional direct exposure to DU does not pose a significant radiological hazard. Although health effects may occur from excessive ingestion or inhalation of DU, an individual on the range is unlikely to receive such an intake. The NRC staff believes that the public health is not endangered by the DU remaining on the firing range from the February 19, 1999, incident."

**Enclosure (4), Document Title and Date:** Letter to NRC with Depleted Uranium (DU) Dose Assessment Calculations and Summarized Health Effects, dated July 22, 1999.

**Executive Summary:** Assessment of dose calculations associated with exposure to DU accompanied by excerpts from the RAND Corporation Report entitled "A Review of Scientific Literature as it Pertains to Gulf War Illnesses, Volume 7, Depleted Uranium (May 1999)." The assessment included multiple radiation field measurements taken from a DU penetrator and compared the values to calculated estimates for exposure times required to meet or exceed general public Federal Code of Regulations exposure limits.

**Enclosure (5), Document Title and Date:** Unauthorized Use of Depleted Uranium (DU) on Vieques Naval Range, Puerto Rico, dated August 19, 1999.

**Executive Summary:** Level FOUR Notice of Violation (NOV) issued to USS KEARSARGE (LHD-3) as a result of issuing 25 mm depleted uranium munitions to Marine Expeditionary Unit TWENTY-SIX. NOV signed by Chairman, Naval Radiation Safety Committee and forwarded via chain of command.

**Enclosure (6), Document Title and Date:** Unauthorized Use of Depleted Uranium (DU) on Vieques Naval Range, Puerto Rico, dated August 19, 1999.

**Executive Summary:** Level FOUR Notice of Violation (NOV) issued to Marine Expeditionary Unit TWENTY-SIX as a result of receiving and firing 25 mm depleted uranium munitions on the Live Impact Area, Vieques, Puerto Rico. NOV signed by Chairman, Naval Radiation Safety Committee and forwarded via chain of command.

**Enclosure (7), Document Title and Date:** Survey Work Plan for Depleted Uranium (DU) Penetrators, Vieques Naval Target Range, Live Impact Area, Vieques, Puerto Rico, dated December 10, 1999.

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**Executive Summary:** Submission of the proposed depleted uranium recovery plan for the Live Impact Area, Vieques. Discussion of site description, previous recovery effects, radiological contamination and health effects, site preparation, radiological survey equipment, quality assurance plans, calibration of detectors, and gamma scintillation equipment (both NAVTRACK and backpack mounted).

**Enclosure (8), Document Title and Date:** Depleted Uranium Weaponry Handling, dated December 21, 1999.

**Executive Summary:** Confirmation of training for Close-In-Weapons-System (CIWS) weapons workers. The following quotation is taken from the Close-In Weapons System, MK 15 MODS 11 Thru 14 PHALANX Block 1 Baselines 1 and 2, and Block 1A: "The MK-15 CIWS currently uses a 20mm DU round, the MK 149 cartridge, which contains a subcaliber heavy metal penetrator of DU. The residual radiation level of DU, primarily alpha particles, is so low that it presents no hazards to personnel. The only personnel hazard from DU is its toxicity, that is, the possibility of heavy metal poisoning if any DU is ingested or absorbed into the body. In its unfired state, the DU penetrator is encased in a plastic sabot that effectively protects operating personnel from contact with the heavy metal. However, if a cartridge should become damaged and expose the DU during handling, or if debris from targets that have sustained hits is recovered by shipboard personnel, possible heavy metal poisoning may result. Loose DU penetrators and target debris should be handled only with heavy gloves. Special care should be exercised if any part of the object being handled contains jagged metal that can easily tear through gloves and other clothing to damage the skin. Hands should be washed thoroughly after any handling operation, and any cuts or bruises obtained during the operation should be reported immediately to a medical officer." This training is provided to all CIWS weapons workers and has been since 1 April 1987. It is reviewed annually by the Fleet Combat Training Center for applicability.

**Enclosure (9), Document Title and Date:** Letter From NRC to Dr. Carmen Feliciano de Melecio, MD, Secretary of Health, Commonwealth of Puerto Rico, San Juan, PR., dated February 1, 2000.

**Executive Summary:** NRC Region II sent a letter to Dr. Carmen Feliciano de Melecio, MD, Secretary of Health, Commonwealth of Puerto Rico, in response to her request for information regarding the health effects associated with depleted uranium exposure. The NRC responded: "The results of the Navy's assessment of the dose to a member of the public (including the protestors) from the depleted uranium showed it is unlikely to be more than 100 millirem in a year, which is the NRC's limit

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members of the public from licensed activities. We have reviewed this assessment and agree with its conclusions. We believe that the Navy's actions to date have been appropriate and that public health is not at risk from the radiation exposures. We also believe that it is in the best interest of public health and safety that the remaining depleted uranium to be removed as soon as it can be done safely.

**Enclosure (10), Document Title and Date:** Review of Survey Work Plan for Depleted Uranium (DU) Penetrators, dated March 21, 2000.

**Executive Summary:** Review of the proposed Survey Work Plan submitted by the NRSC via the Radiological Affairs Support Office (RASO). The NRC's conclusion was that the Survey Work Plan was adequate to recover the depleted uranium penetrators but did not address free release criteria for the range. Additional comments were forwarded for consideration by RASO. NRC concludes that the Survey Work Plan as proposed was adequate to identify, locate, and recover the DU penetrators.

**Enclosure (11), Document Title and Date:** Letter from Department of Veteran's Affairs to Naval Dosimetry Center, dated March 3, 2000.

**Executive Summary:** Establishment of a working relationship between the Naval Dosimetry Center and the Department of Veterans Affairs for the performance of urine bioassays for depleted uranium.

**Enclosure (12), Document Title and Date:** NRC Inspection Report No. 45-23645-01NA/001, dated April 19, 2000.

**Executive Summary:** Report of inspection conducted by the NRC, Region II, during 22-23 March 2000 of NRSC actions in response to the inadvertent expenditure of DU penetrators on Vieques. The inspection involved a detailed examination of the Navy and Marine Corps Litigation Investigation. The inspection reports a description of the incident, assessment of causes of the incident, forwards observations and findings, and draws conclusions. The inspection discusses the NRSC's response to the incident, corrective actions implemented and planned to prevent similar occurrences. In particular, it was reported to the NRC that Navy/Marine Corps had changed the Ammunition Use Code from "B" (restrictions applied) to "N" (wartime reserve). Additionally, a requirement for written authorization by either CINCLANTFLT or CINCPACFLT was now necessary for "break out and staging" of the ammunition from the magazines.

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The report concludes with an exit meeting summary. NRC's examination of the joint Navy-Marine Corps Litigation Investigation into the events surrounding the inadvertent expenditure of DU penetrators on Vieques concludes that multiple instances of human error combined with an enhanced operational tempo (OPTEMPO) in preparation for deployment into battle contributed to the breakdown in standard operating procedures. "Based on the results of the inspection, the NRC determined that the NRSC properly identified a Severity Level IV violation. This violation and other contributing factors resulted in the unauthorized expenditure of DU ammunition. The NRSC (Naval Radiation Safety Committee) appropriately issued a Notice of Violation to the responsible command. The NRC did not identify any additional violations. NRC Inspection Manual Chapter 2810, "Master Material License Inspection Program", states that the NRC will not take any further enforcement action, to cite or to pursue escalation for Severity Level IV violations by permittees that have already been identified and adequately corrected by the Master Material Licensee's Radiation Safety Committee."

**Enclosure (13), Document Title and Date:** Depleted Uranium Awareness Training for Healthcare Providers, dated May 4, 2000.

**Executive Summary:** Promulgation of specific guidance for Afloat and Ashore Commands (Active Duty and Reserve) regarding the health effects associated with exposure to depleted uranium. Guidance is directed to medical department personnel with discussion of the heavy metal toxicity associated with internal DU sources. Training for healthcare professionals in videotape (26 Minutes).

**Enclosure (14), Document Title and Date:** Depleted Uranium (DU) Training, dated June 16, 2000.

**Executive Summary:** ALL HANDS training database co-maintained by the Commander-In-Chiefs, Atlantic and Pacific Fleets (CINCLANTFLT and CINCPACFLT) for single source downloading of training materials prior to deployment. Training database contains Power Point presentation on the sources and hazards associated with exposure to depleted uranium. Additionally, presentation contains restrictions on the use of depleted uranium as a controlled material under the cognizance of the Nuclear Regulatory Commission. Training file of information to be downloaded by all commands prior to deployment. CINCLANTFLT has distributed 350-400 compact discs with training presentation and associated Instructor's Guide (attached). As training changes, a single point correction is all that is required to update or change the training (presentation or Instructor's Guide).

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**Enclosure (15), Document Title and Date:** Depleted Uranium Instructor's Guide, dated July 14, 2000.

**Executive Summary:** ALL HANDS training database co-maintained by the Commander-In-Chiefs, Atlantic and Pacific Fleets (CINCLANTFLT and CINCPACFLT) for single source downloading of training materials prior to deployment. Instructor's Guide on the sources and hazards associated with exposure to depleted uranium. Contains restrictions on the use of depleted uranium as a controlled material under the cognizance of NRC.

**Enclosure (16), Document Title and Date:** NRC Inspection Report No. 45-23645-01NA/00-04, dated July 13, 2000.

**Executive Summary:** This refers to the inspection conducted May 31 through June 13, 2000 of the depleted uranium recovery operations on the Live Impact Area of Vieques, Puerto Rico. The purpose of the inspection was to determine if the recovery operations performed by the Navy were carried out in a radiologically safe manner and in accordance with the "Survey Work Plan for Depleted Uranium (DU) Penetrators" that was submitted to the NRC for review on January 10, 2000, by the Naval Radiation Safety Committee. The NRC determined that the DU recovery activities were performed in a radiologically safe manner.

**Enclosure (17), Document Title and Date:** Survey Work Plan, Depleted Uranium (DU) Penetrators, Vieques Naval Target Range, Live Impact Area, Vieques, Puerto Rico, dated August 8, 2000.

**Executive Summary:** Navy contractor survey plan based on a modification of the original Survey Work Plan prepared by the Naval Sea Systems Command Detachment, Radiological Affairs Support Office, Yorktown, VA. A contractor prepared survey Work Plan for the resumption of depleted uranium penetrator recovery operations on Vieques under a negotiated agreement with Navy.

**Enclosure (18), Document Title and Date:** Review of Contractor Survey Work Plan for Depleted Uranium (DU) Penetrators, Vieques Naval Target Range, Live Impact Area, Vieques, Puerto Rico, dated August 29, 2000.

**Executive Summary:** NRC letter to the NRSC acknowledging the receipt and review of the Contractor Survey Work Plan by the headquarters staff. "NRC Region II has determined that the procedures and methods described in this plan should be adequate to detect and recover remaining DU penetrators on the Navy's firing range."

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**Enclosure (19), Document Title and Date:** Investigation of Various Target Areas on the Live Impact Area, Inner Range, Vieques, Puerto Rico, dated September 29, 2000.

**Executive Summary:** Comprehensive radiological survey of various target areas on the Live Impact Area, Inner Range, Vieques, Puerto Rico, conducted by a Navy health physicist (Ph.D.) during the period of May 29, 2000 to June 12, 2000. A representative of the Nuclear Regulatory Commission, Region II, accompanied the Navy health physicist. The survey clearly refutes previous allegations of widespread radiological contamination of the Live Impact Area on Vieques.

**Enclosure (20), Document Title and Date:** NRC Inspection Report Concerning the Environmental Survey at Vieques Island, Puerto Rico, dated September 28, 2000.

**Executive Summary:** NRC inspection report to the Commonwealth of Puerto Rico Secretary of Health, Dr. Carmen Feliciano de Melecio, MD, dated September 28, 2000. The report refers to an inspection conducted during June 6 through 15, 2000, on Vieques Island, Puerto Rico, in the Eastern Maneuver Area, the Atlantic Weapons Training Facility, including the Live Impact Area, and the civilian areas of the island west of the Eastern Maneuver Area. The report presents the results of direct measurements and analysis of samples taken during the inspection. In summary, there was no depleted uranium except for that found in the holes from which the Navy had recovered DU penetrators in the Live Impact Area. During the inspection, NRC inspectors and representatives from the Radiological Health Division of the Puerto Rico Department of Health obtained directed measurements and collected environmental samples in the areas described above.

**Enclosure (21), Document Title and Date:** NRC Inspection Report No. 45-23645-01NA/00-09 dated October 6, 2000.

**Executive Summary:** This refers to the inspection conducted on September 11, 2000, of the depleted uranium (DU) ammunition recovery activities performed by naval and contractor personnel on the Live Impact Area of the Atlantic Fleet Weapons Training Facility on Vieques Island, Puerto Rico. The enclosed report presents the results of the inspection. The purpose of the inspection was to determine if the recovery operations were carried out in a radiologically safe manner and in accordance with the "Survey Work Plan for Depleted Uranium (DU) Penetrators" that was submitted to the NRC for review on January 10, 2000, and subsequently amended on August 18, 2000. During the inspection, direct observations related to the recovery of DU ammunition were made by the inspector, and discussions were

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violations were not identified. The NRC determined that the DU recovery activities were performed in a radiologically safe manner and that coordination problems in clearing dense vegetation in areas where unexploded ordnance was present, which previously affected the recovery of DU penetrators, had been resolved.

**Enclosure (22), Document Title and Date:** Letter from U.S. Environmental Protection Agency, Washington, DC, to Naval Sea Systems Command, dated February 2, 1982.

**Executive Summary:** Letter from the U.S. Environmental Protection Agency to Naval Sea Systems Command stating that they agreed with Navy that the use of the Close-In-Weapons-System firing a depleted uranium penetrator did not violate the Ocean Dumping Act as it applies to radioactive materials. Attached supporting documentation includes dispersion models and normal uranium concentrations in seawater.

Copy to:  
NRC REGION II

Without Enclosures:  
BUMED (MED-211)  
NAVSEADET RASO  
OSAGWI