

December 27, 2012

MEMORANDUM TO: Andrew Persinko, Deputy Director
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

FROM: Dominick Orlando, Senior Project Manager **/RA by DPersinko for/**
Special Projects Branch
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Licensing Directorate
Division of Waste Management
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Office of Federal and State Materials
and Environmental Management Programs

SUBJECT MEETING SUMMARY – TECHNICAL MEETING BETWEEN
U.S. ARMY INSTALLATION MANAGEMENT COMMAND AND
U.S. NUCLEAR REGULATORY COMMISSION STAFF TO DISCUSS
LICENSING DEPLETED URANIUM AT THE SCHOFIELD BARRACKS
AND POHAKULOA TRAINING AREA IN HAWAII, DECEMBER 12,
2012 (DOCKET NO. 040-09083)

On December 12, 2012, staff from the U.S. Nuclear Regulatory Commission (NRC) held a technical meeting with the U.S. Army Installation Management Command and Judge Advocate General (the Army) staff to discuss the licensing of depleted uranium from the Davy Crockett weapon at the Schofield Barracks and Pohakuloa Training Area (PTA) in Hawaii. The purpose of the meeting was to provide the Army with NRC staff's assessment of the Army's comments on a draft license (NRC Agencywide Document Access and Management System (ADAMS) Accession Number ML12265A173) that the staff developed in June 2012 (ML12179A321). The meeting was noticed on November 20, 2012. Interested members of the public were offered the opportunity to observe discussions between NRC and Army staffs and to ask NRC staff questions at the conclusion of the business portion of the meeting. Enclosure 1 is the meeting attendee list.

In its response to the draft license referenced above, the Army requested (in descending preference):

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- An exemption for the US Army from licensing depleted uranium from the Davy Crockett weapon under the provisions of 10 CFR Part 40.13(c)(5) or 40.14 or,
- That NRC issue the source material license with no conditions other than those pertaining to possession and decommissioning or,
- That NRC issue the license with modified license conditions and no requirement for environmental monitoring.

The staff informed the Army of its conclusion that an exemption pursuant to 10 CFR 40.13(c)(5) or 40.14 was not warranted and that a license with some limited environmental monitoring (air monitoring during ground disturbing activities and range burns) was necessary. The staff provided its rationale for reaching the conclusions on the exemption request and the individual Army comments on the draft license conditions. Enclosure 2 is the NRC staff's assessment.

The meeting was very useful and informative, and the Army stated that it was committed to moving the process forward. The Army discussed many of the staff's assessments and conclusions, but stated that the Army's comments were not to be considered final until the Army had a chance to discuss them with other affected Army commands. The Army also stated that it reserved the right to provide comments until after it has the opportunity to further review the NRC staff's assessments. As such, no decisions were made at the meeting concerning the final content of the license. In addition, the Army requested that they be allowed to respond in writing to the staff's assessment and asked if they could provide data demonstrating that certain license conditions and environmental monitoring were not necessary. The Army also indicated that several of the other license conditions should not be necessary, such as consultation of the Fish and Wildlife Service, as the Army already has mechanisms to accomplish the intent of such license conditions. NRC staff indicated that the Army could provide any additional information to justify their position.

At the conclusion of the business portion of the meeting, the staff responded to the questions posed by members of the public and a representative of the Office of Hawaiian Affairs.

Enclosures:

1. Attendee List
2. Staff Assessment

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OFC	DURLD	DURLD	DURLD
NAME	NOrlando	CHolston	DPersinko for NOrlando
DATE	12/19/12	12/19/12	12/ 27 /12

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Attendee List

Meeting Between U.S. Nuclear Regulatory Commission Staff and U.S. Army Installation Management

December 12, 2012

U.S. Nuclear Regulatory Commission

Larry Camper, DWMEP
Andrew Persinko, DWMEP
Susan Chidakel, OGC
Tracy Stokes, OGC
Brett Klukan, OGC
Tanya Oxenberg, DWMEP
Betsy Ullrich, Region I
Maureen Conley, OPA
Janelle Jessie, DWMEP
Robert Johnson, DWMEP
Chad Glenn, DWMEP
John Clements, DWMEP
D. Blair Spitzberg, Region IV
Dominick Orlando, DWMEP

U.S. Army

MG Al Aycock, IMCOM
COL Greg Baldwin, IMCOM/SJA
MAJ Paul Muething, AELD
Kristin Thomasgard, HQDA
Hans Honerlah, USACE
Greg Komp, AMC
Ann Wright, OGC
Dan Smith, HQDA
Robert Cherry, IMCOM

STAFF ASSESSMENT OF US ARMY RESPONSES TO DRAFT LICENSE CONDITIONS AND REQUEST FOR EXEMPTION

Request for an exemption pursuant to 40.13(c)(5)

The Army takes the position that the depleted uranium (DU) is the same as a counterweight. The definition (in Webster's online dictionary) of a counterweight is an equivalent weight or force: counterbalance; and the definition of a counterbalance is a weight that balances another. The DU did not counterbalance the round in this sense and was used to simulate the trajectory of the nuclear projectile.

The exemption contained in 40.13(c)(5) includes five conditions, including that the counterweight is manufactured in accordance with a U.S. Nuclear Regulatory Commission (NRC) or Atomic Energy Commission (AEC) license (the rounds were), that the counterweight is marked in two ways (the rounds were not marked in any way), the counterweight cannot be chemically, physically or metallurgically treated or processed (firing the round physically processed the round), and that the counterweight was not manufactured using Australian-obligated source material (the Army is silent on this).

The Army infers that markings were not required prior to 1969, when 40.13(c)(5) was revised. However, the regulations in effect when the rounds were manufactured did contain requirements for marking counterweights. The rounds do not contain any markings.

In addition, the Statements of Consideration for the 1962 revision to 40.13(c)(5) indicates that the counterweights are to include "plating or other encasement" assumedly to prevent oxidation of the uranium. The 1969 revision indicated that plating or covering of the counterweight was no longer necessary because the manufacturing techniques used provided adequate protection against oxidation of the uranium. Oxidation is clearly occurring on round fragments at the Schofield Barracks.

Based on the above, the Army has not demonstrated that the rounds (1) are similar enough to the counterweights that are the subject of the exemption in 40.13(c)(5); and (2) that the rounds meet the marking requirements of either the 1962 or 1969 versions of the exemption. Thus, the staff has determined that the Army has not provided adequate justification to grant the exemption request.

Request for an exemption pursuant to 40.14

The Army cites several Army regulations that the Army claims ensures that activities on Army ranges do not endanger life or property or the common defense and security and that the exemption is in the public interest. In its response to the proposed license conditions, the Army used the RESRAD computer code¹ to estimate doses for two scenarios: Resident Farmer and Current Worker. The Army assumes the RESRAD default values for most parameters. The

¹ RESRAD is a computer model code designed to estimate radiation doses and risks from RESidual RADioactive materials developed by Argonne National Laboratory (ANL). The Department of Energy (DOE) through ANL currently maintains code and version control (DOE, 2008).

site-specific inputs are the area of the contaminated zone and the concentrations of DU, which are based on the contents of 1000 M101 rounds distributed evenly across the contaminated zone area. As defined in *NUREG-1757, Consolidated Decommissioning Guidance, Vol. 2, Rev.3*, the Resident Farmer scenario assumes that a farmer moves onto the site and grows some of his or her diet and uses water tapped from the aquifer under the site. Pathways include external exposure from soil, inhalation to (re)suspended soil, ingestion of soil, ingestion of drinking water from aquifer, ingestion of plant products grown in contaminated soil and using aquifer to supply irrigation needs, ingestion of animal products grown onsite (using feed and water derived from potentially contaminated sources) and ingestion of fish from a pond filled with water from the aquifer. The Army calculated the dose for the Resident Farmer scenario to be 3.3×10^{-4} mSv (0.033 mrem). The Current Worker scenario assumes that a worker is in the contaminated area for 160 hours out of the year. Also, the only pathways are external gamma, inhalation, and soil ingestion. The Army calculated a dose of 1.1×10^{-5} mSv (1.1×10^{-3} mrem) for the Current Worker.

The NRC staff determined that the Army's RESRAD analysis described in Section 3.3.1 of the Environmental Radiation Monitoring Plan (ERMP) is conservative for the following reasons: (1) the Army uses RESRAD defaults for most of the parameters, which are conservative for a generic site; (2) the Army assumes 1000 M101 spotting rounds were fired as opposed to 714 rounds; (3) the Army assumes the rounds are concentrated within a smaller area than is the likely case; and (4) the resident farmer scenario is a conservative scenario. The Army assumes that 1000 rounds are contained in a single target area of 1 square km (1×10^6 m²). The ERMPs describe three target areas for Schofield, and three for the Pohakuloa Training Area (PTA) - each being 1 sq km. By assuming a smaller contaminated zone area than what is likely the case (one target zone in total as opposed to six target zones), the concentration is biased higher so is therefore a conservative assumption. The NRC staff notes that RESRAD accounts for the dose due to the in-growth of the progeny such as Th-230, Ra-226, and Pb-210.

In summary, the NRC staff has independently verified the RESRAD calculations provided by the Army, and finds the use of scenarios, parameters and assumptions to be reasonable and appropriate. The results from the RESRAD analysis support the staff's decision to not require environmental monitoring of the soil, sediment, surface water or groundwater. However, although RESRAD assumes some portion of the contamination is available for inhalation, the code does not attempt to simulate the environmental conditions present during ground disturbing activities such as a fire or use of high impact explosives and therefore is not relevant to the requirements for air monitoring. RESRAD, by default, assumes a mass loading for inhalation of 2.0×10^{-4} g/m³, which is the air/soil concentration ratio of airborne contaminated soil particles, taking into account short periods of high mass loading and sustained periods of normal activity on a typical farm.

Based on the above, it is not clear if the activities requested by the Army, such as range burns, live fire exercises, etc. have the potential to allow DU to be released from the impact areas. Thus, the Army has not demonstrated that DU will not be released from the ranges in excess of NRC criteria at 10 CFR Part 20 and, as such, granting an exemption pursuant to 10 CFR Section 40.14 is not warranted.

Comments on Army responses to proposed license conditions (letter designations are from the Army comments, License Conditions (LCs are noted)

- a) (LC1) The Army requests a correction to the name of the licensee. The staff agrees with this requested revision.
- b) (LC2) The Army requests a revision to the licensee's address. The staff agrees with this requested revision.

The Army did not comment on LCs 3-7.

- c) (LC8) The Army requests that the authorized possession limit be revised to only include the DU that is present on the HI ranges. In its initial application the Army requested an authorized amount of 8,000kg, as this was the total amount of DU that would need to be authorized for all Army installations. As the Army will increase the requested authorization limit as each installation is added to the license, the staff agrees with this requested revision.
- d) (LC9C) The Army is requesting that NRC not require environmental radiation monitoring plans. The NRC staff has determined that, as indicated above and detailed below, some environmental monitoring is necessary. Therefore, the staff does not agree with this revision.

The Army did not comment on LC10 that specifies the place of use

- e) (LC11) The Army requests that the staff not require monitoring when personnel or equipment exits the Battle Area Complex (BAX) Radiation Control Areas (RCAs) after training exercises because the Army did not detect contamination on personnel during BAX construction and because the Garrison does not have the equipment or personnel to support exit monitoring. The Army did not provide data supporting their statement that they did not detect contamination on personnel or equipment during BAX construction. Therefore, the staff does not agree with this revision.

The Army stated it can provide this information, and if it demonstrates that no contamination was found, NRC may be able to accept this request. Army staff also clarified that adequate survey equipment was available at the Hawaiian installations.

- f) (LC12) The Army requests relief from environmental monitoring at all DU ranges. Because each site will entail different environmental conditions, the staff cannot determine *a priori* if environmental radiation monitoring plans will be necessary. Therefore, the staff does not agree with this revision.

The Army did not comment on LC13 which requires notification, to NRC, if Davy Crockett spotting round fragments are found at Army installations not identified in the list provided by the Army.

- g) (LC14) The Army requests that all changes made to the requirements for installations named in the license be applicable to any newly identified installations. As the staff is not aware of the site-specific circumstances associated with as yet unidentified

installations, conclusions regarding the type of information necessary to support an amendment to include the unidentified installation on the license cannot be drawn *a priori*. Therefore, the staff does not agree with this revision.

- h) (LC15) The Army requests that records of Garrison Radiation Safety Officers (GRSO) not be submitted to NRC. The staff reviewed the applicant's qualifications for individuals responsible for implementing the radiation safety program at the Schofield Barracks and PTA in accordance with the applicable requirements of 10 CFR 40.31 and according to guidance in NUREG-1556, Volume 7, Sections 8.7.1 and 8.7.2. The GRSO position meets most of the requirements in NUREG-1556, Volume 7, Section 8.7.1 for an RSO and all of the requirements for an authorized user (AU) in NUREG-1556, Volume 7, Section 8.7.2. NUREG-1556 does not include guidance on the qualifications for RSOs below the License RSO level, but includes guidance for AUs that use or directly supervise the use of licensed material. The AU's primary responsibility is to ensure that radioactive materials used in his or her particular lab or area is used safely and according to regulatory requirements. This position is comparable to the GRSO, and as indicated, the GRSO meets all of the requirements for an AU. NUREG-1556, Volume 7 Section 8.7.2 states that applicants shall provide the name of each proposed AU with the types and quantities of licensed material to be used and information demonstrating that each proposed AU is qualified by training and experience to use the requested licensed materials. In that the rationale for approving the qualifications for the GRSO is the same as that for approving an AU, the notification requirements for each should be the same. Therefore, the staff does not agree with this revision.

The Army discussed the privacy concerns and administrative burden this condition might incur, if it was enforced at all other Army facilities. NRC staff stated that training information could be kept confidential and the NRC staff agreed that the Army could propose a revision that included notifying NRC of a GRSO change, but maintaining the training records at the individual facilities.

- i) (LC16) The Army requests that NRC delete the requirement to consult with the US Fish and Wildlife Service (USFWS). Pursuant to Section 7 of the Endangered Species Act, NRC consulted with the USFWS on the licensing of the HI sites. USFWS requested that this condition be included in the license. This does not impose any new requirements on the Army and it ensures that NRC's consultation with USFWS is adequate. Therefore, the staff does not agree with this revision.

The Army stated that other statutes controlled their interactions with the USFWS and that these ensured that the appropriate consultations would be made. NRC staff stated that the Army could discuss the issue with the USFWS. If USFWS agreed with the Army, and the Army provided the NRC with the USFWS concurrence, the condition could be removed.

The Army did not comment on LC 17 and 18 that requires the Army to submit decommissioning cost estimate and financial assurance instrument within 90 days of the issuance of the license. The NRC staff stated that, as a Federal entity the Army could use the Statement of Intent discussed on Page A-121 of NUREG-1757, Rev. 1. In addition, the staff indicated that the cost estimate could be based on similar estimates for Army facilities with DU.

- j) (LC19) The Army states that DOD Directive DoD 4715.11 does not prohibit firing high explosive rounds into areas containing DU. This statement appears to be inconsistent with previous statements made by Army staff since 2010. The Army has stated that this requirement was initially intended to apply only to testing ranges and its application to operational training ranges was impacting training. Based upon the Army's current reading of the DoD Directive the Army has concluded that high explosive rounds can be fired into areas containing DU.

The NRC staff stated that the principal concern is to ensure that DU is not being released from the ranges in excess of NRC effluent release limits and that individuals occupying the RCAs on the ranges were protected. If the Army were to implement air monitoring adequate to detect airborne depleted uranium during ground disturbing activities, including firing high explosive ordnance into the RCAs, the license condition could be revised. The NRC staff also stated that the Army would need to inform NRC of the planned firing, but that, if a situation arose that precluded prior notification (such as one based on an emerging international emergency situation or national security) the NRC staff could be notified after the firing had been completed.

- k) (LC20) The Army did not request revisions to this LC regarding posting of signs.

Due to time constraints, and the need to allow time to address questions from the public, the staff summarized their assessment of LCs 21-24. The staff's assessments of these LCs are detailed below.

- l) (LC21) The Army requests that the license condition be revised to more closely match the language in the RSP. The license condition applies to site decommissioning and activities that would require the ground to be disturbed with the intent to release the site or portion of the site for unrestricted use and remove it from the RCA. The statement in the Radiation Safety Plan (RSP) refers to the incidental discovery of DU fragments. In the past the Army has performed decommissioning activities at HI sites and determined that the areas are suitable for release for unrestricted use. The license condition, in conjunction with conditions 22-24, are necessary to ensure that the Army complies with the requirements of 10 CFR 40.42 (NRC's decommissioning regulations). Therefore, the staff does not agree with this revision.
- m) (LC22) The Army requests that the license condition be revised to include DoD agencies to perform decommissioning activities. NRC does not preclude decommissioning activities being performed by entities other than the licensee as long as they are conducted under a license that authorizes the decommissioning activity. However, the safety and regulatory compliance responsibility remains with the licensee (in this case the Army) and as such the NRC will require the Army to ensure that decommissioning activities are conducted in accordance with all applicable regulations and license conditions. Therefore, the staff agrees with this revision.
- n) (LC23) The license condition applies to site decommissioning and activities that would require the ground to be disturbed with the intent to release the site or portion of the site for unrestricted use and remove it from the Radiation Control Area. NRC regulations at 10 CFR 40.42(d) require that licensees inform NRC when an outdoor area will no longer be used for the principal activity within 60 days of the determination to permanently

cease the activity and submit a decommissioning plan within one year. The Army requests that the NRC delete the requirement to inform NRC of intended decommissioning at its HI installations. The staff recognizes that activities on ranges may be fluid and may need to be accomplished quickly to ensure adequate training of Army personnel. However, in the past the Army has performed decommissioning activities at HI sites and determined that the areas are suitable for release for unrestricted use. The license condition, in conjunction with conditions 21-24, is necessary to ensure that the Army complies with the requirements of 10 CFR 40.42.

The license condition can be revised to include a requirement to notify NRC within 60 days as outlined in 10 CFR 40.42(d). However, if the licensee intends to release the area for unrestricted use the Army will need to comply with all of the requirements of 10 CFR 40.42.

- o) (LC24) The Army requests that the requirement for the Army to comply with the 2004 Programmatic Agreement be deleted. Pursuant to Section 107 of the Historic Properties Act (HPA), the NRC consulted with the Office of Hawaiian Affairs and the Hawaiian Historic Preservation Office regarding the licensing of the HI installations and their representative indicated that this condition was acceptable. This requirement does not impose any additional requirements on the Army and helps NRC fulfill its obligations under the HPA. Therefore, the staff does not agree with this revision.
- p) (LC25) The Army indicates that this condition is dependent on the results of discussions regarding the environmental monitoring. No change at this time.

Because the staff had discussed the rationale for its conclusions regarding the Army's comments on the environmental monitoring and due to time constraints, the staff summarized the conclusions resulting from its assessments of the Army's comments on LC q and r (1-7). The staff's assessments are detailed below.

- q) (LC26) The Army requests that the requirement to perform continuous air monitoring be deleted. Based on the staff's evaluation of the Army's RESRAD modeling above the staff agrees that continuous air sampling is not needed, but has concluded that air samples should be collected during range fires and ground disturbing activities. The rationale for this conclusion is that (1) the Army's burn data had large uncertainties and therefore, is not useful; and (2) RESRAD does not attempt to simulate the environmental conditions present during ground disturbing activities such as a fire or use of high impact explosives and therefore is not relevant to the requirements for air monitoring. Therefore, the staff does not agree with this requested revision.

The Army asked if it could supply additional air monitoring data demonstrating that air monitoring is not necessary and the NRC staff indicated that it could, but that site-specific data was the best way to demonstrate that DU was not being released from the RCA and that air monitoring using site-specific information could be a basis for revising the LC in the future.

r) (LC27)

1. Sampling plant species: The study the Army provided to support the license application concludes that there was plant uptake of DU. NRC staff believes that was an inaccurate conclusion because the data collection was compromised by mixing the plant ash with soil beneath the plant that contained oxidation products. The staff believes that the Army can correct this conclusion by taking additional plant samples to show that there has been no uptake. The only Army studies that have shown plant uptake has been in the plants that absorbed the DU from contaminated surface waters. Therefore, the staff does not agree with this revision.

The Army questioned why plant samples were necessary if the plant remained in the RCA. The NRC staff indicated that plants could be consumed by animals and transported out of the RCA. However, the Army has used a report that includes an erroneous conclusion and, therefore, the report does not support the Army assertion that there is no plant uptake of DU.

2. Soil sampling: Based on the information provided by the Army DU, does not appear to be transported and soil samples only indicated DU where visible oxidation products were present. Therefore, staff agrees with this requested revision.
3. Detection of DU outside of the RCA – Army did not comment on this LC.
4. Soil sampling locations – This condition is no longer necessary because the staff has concluded that soil sampling is no longer necessary. Therefore, the staff agrees with this requested revision.
5. Groundwater sampling – The groundwater is far below the surface and modeling indicates that it will not reach an aquifer for several thousand years. Therefore, the staff agrees with this requested revision.
6. Surface water sampling – This is not necessary because (1) PTA has no surface water transecting the site; and (2) surface water is limited at the Schofield Barracks Water samples already collected do not indicate transport after 40 years. Therefore, the staff agrees with this requested revision.
7. Streambed/sediment sampling – Not necessary per “6” above. Therefore, the staff agrees with this requested revision.