

# Cherry Remarks on Draft License

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*To be presented at the July 12, 2012 public meeting*

At the height of the Cold War in the early 1960s, the US Army fielded the Davy Crockett nuclear-capable weapon system – a recoilless rifle - in two versions, the “light” M28 and the “heavy” M29. Both versions required the use of spotting rounds to adjust fire ~~before firing~~ to ensure that the high explosive training ~~round~~ or nuclear warhead impacted at the desired location. The Army and the Atomic Energy Commission (AEC) test fired the Davy Crockett nuclear round at the Nevada Test Site on July 17, 1962. The test, called Little Feller I, was the last atmospheric nuclear weapons test at the Nevada Test Site before implementation of the Partial Test Ban Treaty. The nuclear warhead otherwise was never fired either in training or during warfare.

The M28 system used the 20-millimeter M101 spotting round to adjust fire. To be prepared for combat, Army units assigned an M28 Davy Crockett mission required use of the M101. The M101 contained 6.7 ounces of D38 alloy, which provided the M101 the weight required to mimic the trajectory of the main warheads. (The spotting round for the M29 Davy Crockett did not contain D38 alloy.)

D38 alloy consists of 92 percent depleted uranium (DU) and 8 percent molybdenum. Therefore, to manufacture, test, and train with the M101, the Army required a source material license from the AEC.

The Army first applied to the AEC for such a license on May 1, 1961. The cover letter for that application read:

Transmitted herewith, approved, is a request from the Ordnance Corps for an Atomic Energy Commission license to obtain depleted uranium. It should be noted that the proposed use of the material includes not only machining of barstock alloy at Lake City Arsenal, but distribution of the assembled item to the Army Field Forces. We request that your reply include, in addition to the license, if it is feasible to issue such a license, guidance on controls required for the end use of the item.

The AEC issued source material license number SUB-459, dated November 1, 1961, to the Army. That license authorized testing, fabrication, and distribution of the M101 to Army field units for use in accordance with procedures in the application dated September 19, 1961. The AEC license did not include any “guidance on controls required for the end use of the item.” Additionally, neither AEC nor its successor, the Nuclear Regulatory Commission (NRC), used any of many opportunities in later years to include “guidance on controls required for the end use” of the M101. These opportunities included numerous license amendments, license renewals, license terminations, decommissioning actions, and mandated re-looks during the last fifty years.

As the Army stated at the NRC’s Predecisional Enforcement Conference in Arlington, Texas, on May 10, 2011, “... all available evidence indicates that DU was not believed to pose a health hazard and the AEC/NRC had no issue with the Army leaving the expended DU lying *in situ* on the ranges.” The Army

continues to believe that the M101 DU poses neither a health hazard to humans nor a threat to the environment. Despite its historical position, the NRC now deems it necessary to impose "guidance on controls required for the end use of the item" that, for the most part, are onerous, expensive, and not supported by scientific evidence. Army leaders responsible for preparing our Soldiers for combat indicate that the proposed NRC license conditions and the restrictions have an adverse impact on the Army's ability to conduct essential training and maintain Force readiness.

When the Army encountered and identified M101 DU on a range at Schofield Barracks during construction of a new training complex in 2005, the Army informed the NRC of this discovery. The Army then made good faith efforts to find all other Army ranges where the M101 may have been fired. The Army also complied with NRC requirements to submit an application for a new source material license. To date, the Army's efforts to study M101 DU in Hawaii have cost approximately ten million dollars. Two resulting baseline human health risk assessments for residual depleted uranium support the Army's contention that M101 DU does not pose a hazard

Given the absence of NRC-required "controls required for the end use of the item," the Army may not have been obligated to inform the NRC that it had encountered M101 DU in Hawaii but did so regardless.

The NRC initially indicated to the Army that the new license only need recognize and document the presence of the M101 DU on Army ranges. This was reasonable, since M101 DU did not pose a health or environmental hazard and the Army maintains strict control over access to its ranges. However, NRC's requirements for the M101 DU gradually increased to the level shown today in the NRC's draft license conditions.

The Army takes issue with these license conditions, particularly those pertaining to restrictions on necessary military activities on affected ranges; environmental radiation sampling, including air, plant, soil and water monitoring; and burdensome notice and consultation requirements for normal range use activities such as live-fire exercises or range clearance activities for explosives safety. The Army believes these license conditions amount to virtual control of Army operational training ranges by the NRC, and are not reasonable in consideration of the following factors:

- Low risk that the M101 DU poses versus the high cost of performing environmental radiation sampling for an indefinite period
- Low probability that M101 DU is leaving the impact areas in measurable quantities
- Low probability that M101 DU can be detected against the naturally occurring background uranium in environmental samples off-range
- Strict control of access to and activities near and on operational ranges in accordance with DoD and Army explosive safety standards
- Existing Operational Range Assessment Program under which Army has investigated all Army ranges for releases of contaminants off range, with continuing future requirements for reviews and response if necessary

All RESRAD calculations using conservative scenarios, such as the resident farmer scenario, lead to an annual dose on the order of ten microrems per year. Using the NRC's radiation risk estimate of  $4 \times 10^{-4}$  health effect per rem in NRC Regulatory Guide 8.29, the risk that M101 DU poses is about  $4 \times 10^{-9}$  health effect per year in a resident living in an M101 impact area. The Environmental Protection Agency's hazardous substance response regulation, the National Contingency Plan, which applies to radioactive materials as well as other contaminants, establishes a range of acceptable risk. The M101 DU calculated risk is well below those EPA established risk levels.

The Army does not yet know the costs for the environmental sampling that the NRC is requiring in its license conditions; it will determine these costs during contracting. However, rough estimates, not counting continuous air sampling, are about \$100,000 per year at each Hawaii location. Additionally, the implementation of continuous air sampling alone will cost several hundred thousand dollars a year at each Hawaii location. The Army will incur similar costs at each of its other 15 M101 DU-affected installations. . The unquantifiable cost is the additional risk to the lives of our deploying Soldiers who will not receive critical training due to these restrictions and requirements. The use restrictions and requirements the NRC proposes as part of the Army's license will continue to produce adverse impacts and lead to expenditure of limited, un-programmed funds to implement monitoring that has already shown to be of no benefit.

Therefore, the Army believes the extremely low risk that can be calculated for M101 DU on its ranges and the very low probability for such DU leaving its ranges do not justify the costs of the proposed restrictions and license conditions to which the Army objects. No health benefits or reductions in risk to human health and the environment are apparent for the implementation of these conditions.

Numerous studies over the years show that uranium is relatively immobile in the environment. This does not even take into account that the D38 alloy composition of M101 DU that might remain on Army ranges further immobilizes the DU. All M101 spotting round fragments located so far in Hawaii, including those found in range impact areas, have been mostly intact, with minor spalling detected only on the soil within a foot or so of the fragment. The Army has no evidence that the D38 alloy will leave the M101 impact areas in detectable amounts.

Aside from this, if all of the M101 DU in a particular impact area were to disperse uniformly in the surface soil (top 6 inches) of the impact area, its activity concentration would be no more than 0.5 picocurie per gram (pCi/g). For comparison, a typical background concentration of natural uranium is about two to three times this concentration. The NRC screening level in the NRC's NUREG-1757, "Consolidated Decommissioning Guidance," for uranium-238 is 14 pCi/g. Therefore, the M101 DU present on IMCOM ranges may already fall below NRC cleanup criteria.

More realistically, given that the M101 DU remains mostly intact, the small amount of M101 DU that might be available for migration through any pathway would produce an activity concentration that is orders of magnitude less than 0.5 pCi/g. Such a DU concentration is not detectable against the variable natural uranium background concentration.

Finally, although the NRC suggested that it might cease requiring the Army to perform environmental monitoring once the Army produces some unspecified amount of negative site-specific data, it would not include this stipulation as a license condition. Instead, the NRC has said it will require the Army to apply for a license amendment requesting relief when adequate negative site-specific data become available. Without appropriate language and specific, attainable goals, the Army would continue costly environmental monitoring while the NRC considers the amendment application.

I emphasize that the Army takes seriously its commitment to the protection of the public it serves from all types of hazards that may be related to our operational ranges, as well as the proper preparation and protection of our Soldiers and completion of our assigned missions. . Our Soldiers, Retirees, Department of the Army Civilians, and their families live, work, and play on the installations at issue and in the surrounding communities. Their safety and health will not be compromised. Additionally, having the ability to fight and win the nations wars, while protecting the lives of our Soldiers, requires significant, relevant, and realistic training. The proposed restrictions severely limit this training, putting our Soldiers at unnecessary and unacceptable risk.

We hope to work with the NRC to achieve a reasonable balance of the competing demands associated with our need for effective training for National Defense and our collective responsibility to protect the public and our military communities. To achieve this balance, the Army requests the NRC delay issuing any license for the possession of M101 DU at least until the end of August. his will allow the Army the time its requires for the Army's leadership to address the specific set of conditions outlined in the draft license, which the NRC recently provided, and submit formal comments for the NRC's consideration.

Thank you for your attention to the Army's statement.

That concludes my remarks.