Destruction of Cluster Munitions in Moldova

For some countries affected by cluster munitions, the obligations to demilitarize that accompany ratification of the Convention on Cluster Munitions may appear daunting. In 2009, however, Norwegian People's Aid undertook a pilot project in Moldova to find a cheaper, more efficient alternative-disposal method. They discovered that not only can destruction of cluster munitions be done more effectively, but also that by using locally administered programs, international organizations can promote capacity building and increased employment while also bolstering national pride and commitment to the Convention on Cluster Munitions.

by Colin King [C King Associates, Ltd.]

During the Oslo Process, it became clear that several nations were concerned about their obligations to destroy cluster munition stockpiles under Article 3 of the Convention on Cluster Munitions. In fact, it soon became apparent that this might be a significant obstacle to signing or ratification for some countries.

Industrial demilitarization plants exist in several developed nations; however, costs are high, and most are running at or near capacity. Even if the resources were available, it would be uneconomical for an industrial unit to gear up for the disposal of small quantities of cluster munitions, especially if these were unusual types. A new process would involve a great deal of additional effort, including research on the ammunition, development of a new procedure, fabricating or adapting existing machinery, retraining the workforce, development of adequate quality control measures and so forth.

The need for another option led Norwegian People's Aid to examine alternative-disposal means on a national or regional basis. One possible benefit of using locally administered programs was program ownership. This ownership, or increased national involvement, brings with it tangible gains, such as capacity building and increased employment, as well as intangible gains, such as a strong demonstration of commitment to the CCM and a sense of national pride. Other potential advantages of utilizing locally administered programs included lower cost and faster completion. During the 2008–09 period, a preliminary study established that locally administered, alternative-disposal options were realistic.

Moldova Pilot Program

The concept of small-scale regional programs was presented at the 2009 Berlin Conference on the Destruction of Cluster Munitions;[1] here, Moldova was among a small number of delegations that approached NPA to express an interest in a pilot project.

An NPA assessment team visited Moldova in October 2009 and identified five types of Russian cluster-bomb and submunition payloads in the Moldovan inventory. The submunitions included three types of anti-armor bomblets (PTAB-2.5, PTAB-2.5M and PTAB-10-5) and two types of fragmentation bomblets (AO-1SCh and AO-2.5RT). Externally, the bombs were in reasonably good condition, suggesting that the submunitions would be well-preserved.

Unloading of cluster bombs. The NPA team conducted all work at a Bulboaca military

Moldovan soldiers, under supervision, removing the tail from an RBK-500 cluster bomb.
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facility, which includes a demolition area. Bomb disassembly was carried out in two adjacent tents, despite extremely cold weather and heavy snow. A team of Moldovan soldiers, trained in demolition under NPA supervision for unloading the submunitions from the bombs and assembling the demolitions, mainly used the first tent. The NPA team used the second tent for submunition disassembly.

The two types of bomb containers, RBK-250 and RBK-500, were similar in structure and were easily unloaded once the tail section was removed. After refining their technique, the Moldovan soldiers successfully conducted the unloading procedure in approximately 20 minutes per bomb.

Submunition disassembly. One of the primary objectives was to create simple, practical processes to remove bomblet fuzes, thereby exposing the explosive filling in order to make subsequent demolition simple and safe. This objective was achieved with four out of the five submunition types, with the AO-2.5RT as the exception. A number of these bomblets were also dismantled and defuzed; however, the process was considered too delicate, and therefore dangerous, for inclusion in a regional destruction program.

In keeping with the concept of regional program ownership, locally available tools were used wherever possible. The few exceptions included hook-and-pin wrenches and a chain vice, which was particularly useful for securing the bomblet bodies.

Explosive demolition. Successful explosive demolition of cluster munitions is notoriously difficult, as unexploded submunitions tend to be "kicked out." Bomblets may become armed as they are ejected from the demolition, risking widespread site contamination with hazardous ordnance.

The relatively straightforward process of removing the submunitions from the bomb body makes successful demolition substantially easier. Furthermore, taking the additional step of defuzing the bomblets before demolition not only eliminates much of the residual hazard, but also exposes the high-explosive filling, thus further increasing the likelihood of complete detonation.

Once defuzed, demolitions were prepared by placing the bomblet bodies in wooden ammunition crates and covering them with a layer of TNT demolition blocks. This allowed the indoor preparation of shots, minimizing the time needed for final preparation at the demolition grounds. The efficiency of this process indicated that this technique could be employed successfully on a far larger scale.

AO-1Sch bomblet bodies after the explosive charge has been burned out.

Burning. Burning has a number of potential advantages for bomblet destruction, including avoidance of the noise and shock involved in demolition, elimination of the need for large stocks of high explosives, minimizing metallic contamination, and the retention of steel scrap.

Burning normally requires detonator extraction and exposure of the main explosive filling, which was easily achieved in a single step by removal of the fuze-assembly from all of the bomblet types, except for the AO-2.5RT. Once defuzed, the bomblet bodies were stacked into wooden ammunition crates and covered with a propellant layer that had been salvaged from artillery ammunition. The bomblet bodies were then ignited remotely using electrical squibs placed into small bags of black powder.[2]

The A-IX-2 explosive used in the AO-1SCh bomblet was particularly difficult to ignite, and burning out these bomblets required careful preparation. A number of successful burns were conducted, once again indicating the technique could be applied within a large-scale process.

Inerting. A selection of each bomblet type was designated free from explosives for use as demonstration and training aids. This involved complete disassembly of the fuzing-system to locate and remove all components containing energetic material and refitting the now free-from-explosive fuze assembly to a bomblet body from which the explosive had been burned out.

A simple quality-control system was implemented for the inerting process, involving two people independently confirming the absence of explosive components, with each marking the assembly using paint. The finished training aids were then marked clearly in blue, the NATO color code for inert items.

Re-use of warheads. Fuze and tail-assembly removal offers the possibility of retaining the shaped charge warhead for non-hostile applications, such as explosive-ordnance disposal, demolition or engineering. This option was highlighted during early program proposals and is especially relevant to the warheads used in PTAB bomblets; it may also be applicable to dual-purpose improved-conventional munition, such as the US M42, M46 and M77 series.

Removing the fuze from a PTAB-2.5.

PTAB-2.5 and PTAB-2.5M-bomblet disassembly confirmed the achievability of this option. However, a complication in the PTAB-2.5M-shaped charge is the presence of a flash-receptive detonator, which must be pressed out to make it safe.

Conclusions

The research-and-development phase of Moldova's pilot program was a great success despite extreme weather, a difficult operating environment and a restricted time frame. The operation confirmed that regional demilitarization programs involving Russian cluster bombs require minimal resources and could, therefore, be implemented anywhere.

As an unexpected bonus, Moldova quickly announced its intention to ratify the CCM, having been commended for its positive engagement and encouraged by its ability to achieve the demands of Article 3. Moldova subsequently became the final state needed to trigger the CCM's entry into force.

In addition to the immediate results, the availability of such a national capability may well prove valuable for further regional cluster-munition destruction programs. Furthermore, the facilities and expertise in ammunition disposal may be utilized or adapted for other ammunition types, which will inevitably require attention as aging Soviet ordnance becomes unusable.

Currently, the NPA team is liaising with a number of other countries that are interested in developing their own locally administered cluster-munitions destruction programs. The question is whether the principle can be applied safely to more complex or challenging ammunition, such as cargo projectiles, rockets and NATO cluster bombs.

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Note: Since this article was written, Moldova has concluded the final phase of this project, in which their entire stockpile of cluster bombs was destroyed. The work was carried out by Moldovan soldiers under the supervision of NPA and C King Associates Ltd, making them the first nation to achieve compliance with CCM Article 3 using a "self-help" demilitarization program.

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