

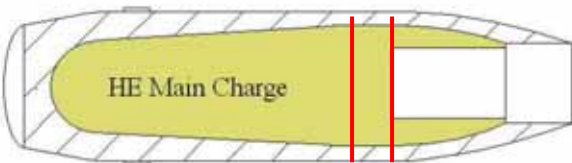
The EHP has progressed extremely well since the last update.

In spite of the rainy season arriving in Cambodia; most of the remaining construction upgrades are complete and 36 different disposal charges have been proto-typed. The efforts are now focused on developing ways to extract the explosives more quickly and to design ways to begin the production process that is supportable in field conditions.

One promising way to accelerate the removal/recovery process is to cut the ordnance across the diameter to provide a free-flow path for the explosives once the case is heated.

To do this correctly, the cut must be made at the widest point of the inner diameter. A cutaway of the US M-1 105 mm filled projectile is used as an example:

The best cut for this specific projectile is between the two red lines, which will provide a free flow path for the explosives in both nose and body.



The item shown below is a US M-1 105 mm TNT filled projectile being prepared for cutting with the DiaJet Osprey. This photo also shows the fuze well liner, which is common in NATO ammunition.



The first cut with the Osprey goes approximately half-way through the casing. The ordnance is then rotated 180o for the second cut; however designs are in progress for a slowly rotating table to improve on this.



We have found that by using a “hack-saw” motion with the Osprey (simply moving the cutting head back and forth), a 105 mm projectile can be cut in half without rotating it. The off-set of this approach is the amount of time spent “hack-sawing” as opposed to rotating the ordnance 180o degrees.

With the ordnance cut at the correct location; the case is then inserted into the steaming adapter recently designed by our Cutting and Melting Manager



Some more improvements are planned for this adapter; however the initial results are already very promising.

During tests with the TNT filled 105 mm projectile; the main charge explosive dropped free from the case in less than two minutes after steam was applied.



With some more improvements to the steam adapter and the addition of the rotating table, processing time for large caliber projectiles will drop substantially.

Aside from the progress made on explosive recovery; charge development has also progressed very well.

The 15 gram cylindrical charge previously tested was redesigned using 18 mm PVC pipe (Nick-named "Pencil Charge"). The charge weight was increased to 30-50 grams, depending on end-user input.



The 30 gram version successfully destroyed a Chinese DK-82 recoilless round when positioned as shown and no evidence of shape-charge forming could be found (The *recommended* disposal charge for this item is 570 grams).

The 70-80 gram General Purpose (GP) charge was tested against heavier cased ordnance. In previous tests, this charge penetrated two 5 mm steel plates with power to spare.



During practical testing on the demolition range, this charge when positioned as shown effectively destroyed ammunition with a case thickness of approximately 15 mm of steel.

For destruction of un-fuzed large caliber USSR and Chinese projectiles; the "Fuze Well Insert" has proven to be very effective. A local, inexpensive (\$0.15) PVC

fitting was found that fits perfectly inside the fuze wells and holds between 30-35 grams of explosive.



This charge allows the ordnance itself to be used as donor charges when stacked and staggered correctly. It is also effective against light skinned items and has already been used to destroy a Chinese Type 72A AP Mine.

Development continues on linear shaped charges for bulk demolition of fuzed, thick cased items, and on platter charges for use as fuze disruptors and base-plate removal of large, air-delivered bombs.



Limited success has been achieved with the shaped charges, but the team feels more can be accomplished with less; so development continues.

The platter charges show much promise as a replacement disruptor/dearmer. The penetration power is within expectation and they are simple to construct. The photo below is of an early version being tested against three 20 mm steel plates



The addition of the PVC reducer and pre-cut stand off at the end also facilitates accurate aiming of the charge. Larger versions have already been cast and will be tested in the base-plate removal role.

Through coordination with CMAC HQ; the Royal Cambodian Armed Forces (RCAF) have generously turned over a good supply of US 105 mm and USSR 122 mm projectiles to the EHP for processing. If

this phase is successful, the RCAF has stated there is more ammunition to follow.

The EHP team is now planning to recover the explosives from the RCAF ordnance, conduct a limited field production of select charges and provide an initial distribution to CMAC and HALO for field evaluation.

EHP Site hosts demonstration of NVESD Technology for new US Ambassador to Cambodia:

The Honorable Joseph A. Mussomeli visited the EHP site on November 4th for a demonstration of select US NVESD R&D technologies being tested in Cambodia.

The event was presided over by His Excellency Khem Sophoan, Director General, Cambodian Mine Action Center, and Mr. Robert Doheny, US Principal Deputy for Resources, Office of the Assistant Secretary of Defense for Special Operations and Low Intensity Conflict (OASD SO/LIC). Official guests included representatives from the CMAC Demining Units, the HALO Trust, Japanese Mine Action Service, Mines Advisory Group, and Norwegian Peoples Aid.

After introductions by CMAC and HALO Trust regarding the landmine and UXO situation in Cambodia, Ambassador Mussomeli received demonstrations on the Handheld Standoff Mine Detection System (HSTAMIDS) and the DTW Tempest system with both the ground-engaging flail and vegetation cutting head.



Afterwards, a full tour of the EHP facility was conducted including a live demonstration of the DiaJet Osprey Water-Abrasive cutting system and actual re-casting of explosives recovered from



USSR PMN-2 anti-personnel landmines into disposal charges.

Following the tour of the facility, two other Golden West neutralization developments were demonstrated for Ambassador Mussomeli; the binary LEP and NMX Foam systems. Both systems were funded by NVESD and are soon to be trialed by CMAC in field operations.



The destruction of four antipersonnel mines completed the demonstration, two from charges cast the previous day by the EHP (*detonated by Amb Mussomeli*), one by the LEP system, and another by the NMX foam (*detonated by Mr. Doheny*). The Ambassador was extremely pleased with all of the NVESD developments, commenting multiple times, on "How much sense" the EHP concept made.



The Future:

US DoD/NVESD has planned funding to continue development at the Kampong Chhnang (**KC**) site for Fiscal Year 06; by the end of which the EHP team will have refined the methodology to convert large caliber projectiles and similar sized items into disposal charges for the Demining and EOD teams.

Continued operation of the KC EHP facility will then depend on external support and coordination with NVESD.

The facility at KC is not large enough to safely test explosive recovery procedure on high capacity air-dropped bombs, and the current Osprey water-abrasive cutter is not well suited to conduct large scale cutting of these munitions.

CMAC currently has plans to establish an EOD unit in Kampong Cham to address the increasing casualty rate of that area.

This area also possesses enough space to co-establish an EHP facility designed to support processing of large munitions such as 2,000 kg air-dropped bombs.

With the amount of explosives contained in these munitions, the potential benefits to the Demining and EOD teams are obvious. With close coordination between CMAC and the RCAF, *a substantial reduction of the Cambodian munitions stockpile is also possible.*

