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Using Bomb Disrupters in Demining Operations

The use of bomb disrupters has substantially impacted the demining community from the time of their invention to the present. Proparms Ltd., an explosive ordnance disposal (EOD) manufacturer, is also making headway with their products, which will help continue its efforts in landmine casualty reduction.

by Jennifer Cox, Associate, Proparms Ltd.

Introduction

Although they are normally used for very specific circumstances, disrupter and dearmers-type devices can be effectively used in neutralizing a variety of mines and mortars. Constantly evolving research and development (R&D) efforts have resulted in companies not only improving upon current demining equipment, but also finding new applications for tools that were originally created for other purposes. In fact, agencies around the world have been testing and utilizing EOD devices in destroying pieces of UXO, AP mines and other mortars. They are also discovering the effectiveness of such tools when the conditions are right. One expert explained that as with any use of a disrupter, you are not attempting to destroy the device, but only attempting to defuse the device if you can find a way of attacking it. Use of a disrupter is not a method of mass mine clearance, rather it is a method for when a mine is used as an improvised explosive device (IED), or when a single device is



The 20-mm Neutrex firing a 70-grain watershot at an MO81 mortar.

found. Disrupters become another valuable tool to an operator when he or she cannot risk high explosive attack and a potential high order, but direct attack at the fuse must be possible and therefore the type of mine will be critical.

Historical Content of Disruptor Use

Waterjet bomb disrupters have been used since World War II, when delay mechanisms were widely used in Europe. The Royal Engineers Bomb Disposal Officers Club was one of the first organized groups to take on the task of defeating these bombs, and they began by using fuse keys to neutralize a wide range of explosives. Some of the first disrupters soon followed, including the Steam Sterilizer, which circumvented the fuse by emptying the bomb of its explosive and the BD Discharger. Once the war had ended, demand for such tools slowed, and it was not until a couple of decades later that efforts returned to improving these devices.

In Canada, during the 1970s, civilian bomb disposal advanced as a result of political unrest and the Federation



The MO81 fuse after neutralization.

Liberation du Quebec (FLQ) terrorist groups, particularly in the province of Quebec. The Surete du Quebec (SQ) found that their needs were not being met, perhaps because their own prototype of a bomb disrupter involved shooting a water-filled condom from a gun clamped into a Black and Decker Workmate table. It actually worked quite well, except for the fact that upon firing, the device would move, thus throwing off a proper aim. SQ approached a company called Proparms Limited, a supplier of specialized props and weaponry to the Canadian Film Industry at that time, to design a tool capable of the applications at hand. Thus, the Neutrex disrupter was born, Canada's own principal method of soft packaging disposal.

Creating Versatility in Disruptor Use

Since that time, these tools have been looked at in other applications as well. Chemical/Biological/Radiological/Nuclear (CBRN) is one of the more recent threats that has been explored, as a disrupter is capable of targeting a specific component and separating it from the rest of a device without releasing any chemical or other hazardous agents. Recoilless technology is another innovation that enables a disrupter to be fired from a robotic arm without causing significant damage to the machine (Proparms carries two calibers of recoilless disrupters, 12.5 mm and 20 mm, along with three Neutrex versions, 12.5 mm, 20 mm and 29 mm). Finally, demining operations have begun calling on manufacturing companies like Proparms to extend their test and evaluation programs to include data gathering in this area, and preliminary results are promising.

"The targets are very specific, but all of our disrupters can be used as dearmers," said John Mains, Manager of R&D at Proparms. Recent events have led to a heightened awareness of security, and the capabilities of tools in this field are being altered and reconsidered. The company is in the process

of creating a separate dearmers system to meet this need. "We're also developing specialized slugs mainly for use against hard targets," Mains said. The projectiles include chiselhead slugs, flathead slugs and others. "This represents entirely new activities for us. We're looking at expanding the range of targets. There has been some testing against static or ballistic targets, but there's still a long way to go. We have to have live targets and an area [to test in]."

Success Using Proparms Disruptors

Gerard Gamma of Sealadair in France is one of Proparms' many agents from around the world. He has been conducting demining R&D in part with France's military and has found that under the right circumstances, disrupters can be an effective tool in rendering mines and mortars safe. In a test involving the 12.5-mm recoilless disrupter against AP mines like the PRM2, PROM and POMZ with an external igniter such as an MUV or UPROM, standoff of up to two meters was possible, and the unit was deployed from a mini camera tripod stand. The ammunition used was a cartridge with a hollow steel slug; a laser was used for precision aiming. The method exercised in this particular case involved cutting the MUV igniter attached to the mine to prevent detonation. Total time of operation from loading and aiming to firing was approximately five minutes. Other targets involved were the mine-type

VMRUD, which entailed a three-meter standoff by a 20-mm Neutrex disrupter, proving the capabilities of yet another caliber of Proparms' disrupters. Successful tests by the same party have involved the 20-mm Neutrex disrupter against certain mortars as well, namely the MO81 and MO60, which fired either a steel slug or water as a projectile.

Evaluation programs have also taken place in Denmark with another of Proparms' agents, Peter Kjaer Jepsen, and his company, Danminar. From his work in disarming mortars with the Danish army, he and his team have concluded that when the application is suitable, Proparms' disrupters perform safely and accurately at neutralizing such devices. For mortars up to 81-mm that have small fuses (like an m49), a frangible round will easily remove it, he reported. But for larger mortars (and therefore larger fuses) like a 525, a steel slug projectile was recommended. If housing is made from aluminum or steel, casing must also be considered. "It is the small details you have to pay attention to," Jepsen said. Testing is ongoing with both of these groups. It must be noted as well that these are preliminary tests where the capabilities have been established, but further research is to be completed.

Future Endeavors Contain Much Promise for Disruptor Use

The use of EOD bomb disrupters in demining operations is not a recent idea,



A 12.5-mm recoilless disrupter defeating a PRMZA with an MUV fuse.



A 20-mm Neutrex neutralizing a MRUD directional fragmentation mine.

but perhaps the awareness of it is. According to Mike Wilson, the Executive Director for the Canadian International Demining Corps (CIDC) in Europe, the British army has been using disrupters and dearmers since the early 1970s. "They were also used with great success in the Falklands conflict in 1982," he said. "The main equipment used was the rocket wrench/dearmers that was used to either unscrew fuses or cut them off before they could operate. This equipment was developed mainly for the Soviet threat but was then used on other nationality fusing mechanisms."

According to demining research at the University of Western Australia, landmine clearance is becoming a huge industry, approaching \$1 billion (U.S.) a year. Proparms has been receiving an increase of inquiries concerning demining capabilities of their disrupters. Casualty rates have fallen significantly, the university assures, as a result of carefully targeted demining programs and other innovative projects. "You're always working in the dark," Mains said. "[End-users] all describe the need differently, and we try to balance opposing requirements for the same product. It's a challenge." The UXO Center of Excellence points out that this is due, in part, to demining requirements changing over a much shorter period of time. Therefore, the prototypes that are being developed today are only the beginning of equipment to come.

*All photos courtesy of the author.

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