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Paper

GAINING ACCESS INTO A LARGE VEHICLE BOMB

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ABSTRACT

Terrorism is one of today's greatest threats, bombs the terrorist's weapon of choice. The potential of these bombs and the many ways they can be initiated is why we need more than one way to defeat them. We have gone remote, and are using robotics. Robotics allows an up close view of the problem, and a chance to determine the appropriate action and the appropriate tool.

Basic robotics allows for remote viewing, gripping, and a potential shot with the disrupter. But there are times when simple access to a suspect item is a challenge alone. This access capability may alone allow us to interrogate the device in a manner to determine the next appropriate action. So, an access tool for robotics is required.

The tool of choice is the German engineered mini MACE, a water abrasive cutting tool deployable with robotics. ANT Applied New Technologies AG (ANT) has worked with bomb squads overseas and in the United States to make the technology available to all bomb squads. ANT's mini MACE is now mated with robotics platforms allowing for such remote deployment.

The mini MACE is recognized as the important missing link to complete the robotics to neutralize and/or defeat the enemy with the least amount of loss (especially life).

1. INTRODUCTION

In order to describe the deployment of the mini MACE system together with our Remotec Mark-V robot we are using a fictional example:

2. THE INCIDENT

2.1. The Observation

Somewhere in the middle of Las Vegas: It's the early afternoon, a coffee shop employee notifies the police after seeing something strange occur. A man has stopped and parked a large van in front of a large office complex across the street from a casino; he was seen leaving the van with an unusually quick pace. Because of the increased threat potential, employees have been reminded to watch for odd/suspicious behaviours and he wanted to make others aware of his observation.

2.2. The Alert (Notification of Appropriate Authorities)

The police responds immediately and confirms the threat and makes an assessment. The appropriate notifications are made and all resources needed are dispatched. While evacuation is underway the resources arrive and the bomb squad begins to establish its concerns and needs.

3. INVESTIGATION

3.1. Inspection

After evacuation the suspicious vehicle needs to be inspected further. Using robotics an approach is made and nothing is evident from the outside. An attempt to view inside the vehicle proves impossible due to obstructions and tinting. K-9 is used and the dogs alert at the rear door, signalling the possibility of an explosive present.

3.2. High Alert and further Evacuation

The alerts and obstructions increase the concerns for the bomb squad and police. The perimeter is extended and further evacuation takes place.

3.3. Consideration of Options and Procedures

With all intelligence considered the vehicle is determined to be a possible VBIED. Considering the potential remote ops is the choice. Fearing the van may be booby trapped or sensitive to movement, the normal consideration of entering or moving the vehicle is discounted. Operations need to commence immediately and with no dynamic technique that may cause much movement of the vehicle. Accidentally causing the

VBIED to function by normal means of disruption (head shots and other counter measures) is not acceptable in this environment.

The best and recommended option is to use the mini MACE system to make access. The mini MACE (Mobile Abrasive Cutting Equipment) has been developed by ANT Applied New Technologies AG in Germany as a remotely operated access tool for a wide range of containers which may be used to conceal IEDs, regardless of the body material (steel, aluminium, plastics, wood, fibreglass, glass, etc.).

3.4. Access Procedure

Within minutes the Remotec Mark-V (figure 1) robot with the mini MACE is ready for deployment. The van is approached and it is decided that an access hole cut in the upper right side is the best approach. It takes just a few minutes and there is an access hole with a diameter of about 8 inches. (figure 2). A camera is placed to peer though the access hole and we are now able to inspect the inside of the van with our robot. This is a minimally intrusive system causing little to no motion to the LVBIED

3.5. The IED

Still remote, through the robot's camera system, now it can be seen that the van is full of ANFO (ammonium nitrate and fuel oil). Unable to see the entire explosive/firing train, some wires are visible on the left. A second hole is cut on the left side. This exposes the booster charge, the initiator, and the electronic timer.

3.6. The actual Render Safe Procedure

Based on the findings it is decided then that we have enough information to now use the disrupter mounted on the ROV (or alternatively a bottle of water with a charge ..??). But wait, why do that when we can just reach over and reactivate the mini MACE and RSP (render safe) the device by cutting/separating the firing train at the timer, or cap/booster. The same with the booby trap device. No collateral damage outside the van. A second inspection through the access hole gives the needed visual to allow for the safe opening of the vehicle.

3.7. Final Investigation Process

Now with the vehicle safely opened and all the evidence still intact the investigative agencies can do an intensive search for suspect without having to reconstruct the vehicle and/or device. Which is what would need to be done if another method of RSP had been chosen, even with a favourable outcome.

4. CONCLUSIONS

This example shows that the remotely operated access tool mini MACE using water abrasive suspension jet cutting enables a successful render safe procedure for a Large Vehicle IED without causing severe collateral damage and saves evidence without introducing any other explosive residues that would later have to be ruled out. An actual incident did occur similar to this. The tools at the time were not able to help in any way and were useless; this is what opened our eyes to the true needs to render safe such a real world incident.

Together with the mini MACE and our robot we are now able to access to any container which may have been used to conceal IEDs, regardless of the body material (steel, aluminium, plastics, wood, fibreglass, glass, etc.) (see figures 3 & 4).

Furthermore the evidence recovery increases the chances to find the suspect/terrorists. This technology is being used more and more for render safe procedures (i.e. pipe bomb, figures 5 & 6). As this technique becomes known it is being requested more by the investigating agencies, because it simplifies the prosecution process, by not damaging evidence or introducing explosives that need to be ruled out. The actual device can be brought to court, not a recreation.

5. ACKNOWLEDGEMENT

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6. FIGURES

Figure 1. Remotec Mark-V robot with a mini MACE system on the trailer

Figure 2. Cutting an access hole in the side of the van

Figure 3. Test cut of a wind shield at HDS

Figure 4. Successful cut of an access hole into a wind shield

Figure 5. Successful cut through an IED with a pipe bomb

Figure 6. Cut pipe with evidence