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CONTAMINATED DEVICES

Steve Kennon looks at the challenge and techniques of chemical and biological IED disposal

EOD is a tricky beast at the best of times. Whether in a homeland security or war-fighting role, the increasing technological sophistication of devices and knowledge sharing between terrorist groups mean the EOD operator’s challenge has never been greater. It is a constant battle between those who would deploy the bombs and those who would prevent them. Although the current situation in Afghanistan has firmly focused minds on the threat from conventional explosive IEDs, there is increasing concern over the risk posed by chemical and biological (CB) devices.

Although still a rarity, the evolution from high explosive to a CB device is one which extremists are either exploring or have already developed and deployed. In reality, these weapons do not present the risk feared by many doomsayers but public perception, fuelled by the media and cult TV shows, is that they have a menace eclipsed only by the nuclear threat. Any terrorist incident must have far-reaching psychological effects on its target audience. The possibility, and consequent fear, of violence must be equal, if not greater, than the act itself.

In a world where terrorist acts utilising high explosives are an almost-everyday occurrence, CB devices offer an effective method of spreading fear and grabbing media headlines out of all proportion to the casualties they cause. The media response to the Tokyo underground and US anthrax attacks are witness to this fact, considering the actual numbers of casualties was relatively small.

Differing groups may have specific aims which make CB weapons attractive, but in general the main factors are: CB weapons, used effectively, are capable of causing larger number of casualties than explosives – the challenge is using them effectively; they offer a more accessible and cost-effective WMD than nuclear options; as mentioned above, their psychological effects are far greater than conventional IEDs; and they imbue terrorist groups with a status which may assist a them with a status which may assist a them in negotiations regarding their political/religious goals.

In essence, CB weapons offer a cost-effective way of producing high levels of fear and casualties – what terrorist wouldn’t want them? The problem, thankfully, is that the CB option is not an easy one. Few groups have the organisation and ability to acquire the materials, never mind deploy them in a weaponised form. Al-Qaeda has been studying them for many years but has yet to carry out a successful significant attack. Even where groups have succeeded the effects have been limited – with the Aum Shinrikyo attack in 1995, the sarin was not deployed as an aerosol due to technical issues, despite the group having the time and resources for research and testing.

Despite the irregularity and crudeness of previous attempts, most experts would agree that it is not a matter of “if” but “when” an attack happens. Judging by the number of CBRN conferences and seminars, it is clear there is great interest in the subject. But is the focus of these events correct? Based on past event programmes, the spotlight seems to be firmly on identification, protection, decontamination and mass casualty handling. Any agent has been released, one could be forgiven for thinking nothing can be done prior to the “bang”. From a CBIED perspective, however, an explosion is simply the end result of a long process with many stages, all of which offer opportunities for intervention. Figure 1 illustrates stages before and after a CBIED has initiated or been found. At every step, EOD or other security services should have the capability to neutralise the threat.

In reality this means specialist equipment and training. The desired end result for EOD technicians is the same as for any IED: the safe disposal of the device; minimising loss of life; minimising damage to property; and the collection of forensic evidence. Unlike a “standard” IED, however, the character of a CB incident has some distinguishing features which pose additional challenges: it must be identified as a CB threat; normal disposal methods may not be appropriate due to the risk of rupturing the container; there may be delays in response due to longer evacuation times as cordon distances are increased and containment and decontamination systems are established; the team will have to work in protective clothing (assuming they have it in the van) as well as bomb suits, which encumber the operator and leads to increased exhaustion rate; there will be heightened levels of attention from the media and senior officials; and there will be heightened anxiety levels within the team and other emergency services.

That is, of course, if the team consider a CB threat in the first place. The fates of two EOD operators and a Welsh beach, last September, offer a note of caution in this regard, when a mustard shell was blown in place, covering the operators and the nearby flora and fauna with agent. Thankfully both operators and beach were fine after treatment. The situation, however, illustrates the need for a correct threat assessment and demonstrates the consequences.
device and, dependent on the scenario, give false positives. While it can identify the elemental composition of the fill, it cannot identify the internal structure of a device but can provide any information on the nature of it; and neutron activation analysis, found in devices such as the Portable Isotropic Neutron Spectroscopy (PINS) system, is a common system in use with many specialist EOD teams. These systems tend to be more portable, faster, need only limited access and, of course, 100 per cent accurate. Still relatively new, they have a number of options in this regard, some more attractive than others.

Invasive techniques can prove difficult – by simply making a hole in the device, accepting leakage and hoping the containment system and protective clothing is up to the task. Alternatively, the more elegant solution is to utilise specialist equipment which can drill into the target, regardless of material, without allowing the contents to escape. An operator or ROV can then extract a physical sample for analysis. In any incident there is a balance between risk and benefit based on knowledge and a thorough assessment. In any incident there is always a danger that an action may initiate the device, but doing nothing is not a luxury EOD teams have. The challenges and pressure surrounding a CB event are so much greater due to the nature of the threat and its longer-term consequences. As such, EOD teams must be equipped and trained appropriately prior to a call-out. An EED team in a “Noddy” suit, with a chemical agent monitor (CAM) and a “give it a go attitude” is not good enough.

Investigating a suspected CB device may be sufficient for identification. They can suffer from being complex and heavy, and might require shielding due to radiation emissions. In many cases they also require access to the complete circumference of the target. Invasive techniques can prove difficult – by simply making a hole in the device, accepting leakage and hoping the containment system and protective clothing is up to the task. Alternatively, the more elegant solution is to utilise specialist equipment which can drill into the target, regardless of material, without allowing the contents to escape. An operator or ROV can then extract a physical sample for analysis. In any incident there is a balance between risk and benefit based on knowledge and a thorough assessment. In any incident there is always a danger that an action may initiate the device, but doing nothing is not a luxury EOD teams have. The challenges and pressure surrounding a CB event are so much greater due to the nature of the threat and its longer-term consequences. As such, EOD teams must be equipped and trained appropriately prior to a call-out. An EED team in a “Noddy” suit, with a chemical agent monitor (CAM) and a “give it a go attitude” is not good enough.