United States Department of Homeland Security

Information Bulletin

(U//FOUO) IED/VBIED CONSTRUCTION AND TACTICS OVERVIEW

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(U) OVERVIEW

(U//FOUO) The Intelligence Community currently has no specific, credible intelligence indicating that domestic or international terrorist organizations intend to use Improvised Explosive Devices (IEDs) or Vehicle-Borne Improvised Explosive Devices (VBIEDs) against targets within the Homeland. ***However, both foreign and domestic terrorist groups continue to use IEDs/VBIEDs as a frequently employed method of attack***, and in particular, the frequency of lethal IED incidents overseas is cause for continuing concern.

(U//FOUO) IED design and construction is limited only by the creativity and skill of the bomb-maker. In addition, IEDs may be secreted within containers that disguise their presence, and have been artfully concealed within objects as varied as books, toys, portable radios, shoes, and vehicle body panels. This makes it particularly difficult to anticipate specific bomb designs until an IED attack has been carried out. Despite these challenges in detecting IEDs, information from recent events can be used to assist in considering techniques to mitigate and respond to IED

incidents.

(U//FOUO) Specific attention must be paid towards the possibility of secondary IEDs designed to attack first responders coming to the scene of an initial IED attack. ***All IED mitigation and response plans must include the possibility of secondary device attack.*** An IED or VBIED attack may use a single device of one type, several similar devices, or combinations of IEDs and VBIEDs. There are instances where IEDs are used in conjunction with direct fire (e.g. small arms and rocket-propelled grenades) to produce combined-arms effects on the target.

(U) IED CONSTRUCTION

(U//FOUO) All IEDs and VBIEDs consist of four basic elements: 1) power supply, 2) initiator, 3) explosives, and 4) switch / sensor. The effectiveness of the IED is not solely associated with the amount of explosives used; rather each IED should be considered as a complete weapon system. Each element can be crude or sophisticated, depending upon the skill and resources available to the bomb maker. By tailoring each element the device can be specifically designed to result in a deadly effect.

(U) P.I.E.S.

A simple mnemonic used to understand the basic elements of an IED is ***P.I.E.S.***, which consists of:

- **P**ower supply: usually a battery, in the case of a VBIED it may be the vehicle battery, but could also be the match used to light the time fuse (the predominant non-electric method of firing a device is time fuse and a blasting cap)
- **I**nitiator: used to detonate the explosive charge, typically a blasting cap, but could be comprised of an improvised electric device or chemical designed to produce enough shock and/or heat to start the detonation process
- **E**xplosives: the 'main charge' may consist of commercial, military, or home-made (amateur made) energetic materials such as ammonium nitrate – fuel oil blasting agents
- **S**witch / Sensor: used to activate the Initiator, and comes in many forms
  - "Victim Initiated" is any method whereby one of the victims is responsible for activating the 'switch', and could be by trip-wire, infrared / motion detector, or pressure
  - "Time Delay" can be any electronic, mechanical, or chemical method to establish a time for detonation after the actual start of attack, often time delays are used in conjunction with other switches / sensors to provide the attacker a safe period to escape the area
  - "Remote Control" may be through hard-wire or any wireless technology such as cell phones, two-way radios, and pagers

(U//FOUO) Recent concerns regarding cell phones as IED "switch/sensor" components have led some jurisdictions to deactivate cellular communications relays. Although this may prevent the use of the cell phone as a remote control device, they can still be used as IED components. Many cell phone models include an electronic timer feature, as used in the March 2004 Madrid train bombings. The deactivation of cellular communications systems may not eliminate the possibility of cell phone use in IED construction.

(U//FOUO) In order to increase the effects of an IED, the bomb maker may include materials designed to generate high-velocity fragments upon detonation. Historically, fragmentation has been responsible for the majority of casualties from IEDs. "Shrapnel" is a term associated with "primary fragmentation," and is defined as any material of sufficient hardness to puncture human skin when propelled by force of a bomb or destructive device to which it is attached. The distance fragments can travel with enough force to penetrate skin depends upon their initial direction, weight, and aerodynamic characteristics, which in most instances is significantly greater than the maximum blast effects distance.

(U) FRAGMENTATION

Fragmentation has generated the majority of casualties from IEDs. There are two categories of fragmentation:

- Primary – comes directly from the explosive device, resulting from the shattering of explosive containers with very high velocity
- Secondary – formed as the result of high-blast pressures on items close to the explosion, and includes broken glass from shattered windows, or debris from adjacent structures

(U//FOUO) A Vehicle-Borne IED (VBIED) is a variation on typical IED construction, and is comprised of the same four basic elements listed above. The typical differences between IEDs and VBIEDs are: 1) the larger size of the explosive charge, and 2) the requirement of the vehicle as both the delivery and initiation platform for the IED. The explosive or "main charge" in a VBIED may be concealed within body panels, the trunk, gas tank, or under the seat. In some instances, terrorists have made no attempt to conceal the charge, which was sitting within view on seats in the passenger compartment. The other elements of the device may be distributed throughout the vehicle, for example the switch / sensor located on the steering wheel and the power supply is the vehicle's battery. Common firing systems for VBIEDs have included time fuse, suicide or "dead man's" switch, electronic, or mechanical timers. In the case of large VBIEDs, the main charge would be expected to occupy the trunk and/or back seats of a sedan or the cargo compartments of larger vehicles. Searches of undercarriages and engine compartments are primarily intended to protect only a vehicle's occupants and are not essential for protecting facilities against VBIEDs.

(U//FOUO) A suicide bomber by definition is an attacker who does not expect to survive an attack with an IED. A suicide bomber may be the driver of a VBIED, or carry an artfully concealed IED. There is also the possibility that an individual carrying an IED may not be aware of the existence of the device. This individual is typically referred to as a "mule," or a "proxy" bomber and may be asked to carry the device by a trusted third party with or without knowledge of the contents.

(U//FOUO) Recent open-source reporting suggests that IEDs used in attacks overseas have increased in sophistication. Bomb makers have been known to survey the results of each device, and 'improve' designs and employment tactics as required. This is a natural progression in bomb-making; just as new technology migrates to consumers, the bomb makers can incorporate this new technology in their device design. The main area of technology integration in IED design is within the "switch / sensor" element. This is typically the component that "triggers" the bomb to detonate. Technology integration in one element of IED construction does not require increased sophistication in other elements. For example, sophisticated "switch / sensor"

elements can be used with crude amateur-made explosives. Conversely, crude improvised time fuse and initiators may be used with high-quality, military explosives. Most importantly, successful bomb makers have been known to communicate their integration of new technology to other bomb makers, and may even pass on specific assembly instructions during training or via the Internet using modern "distance-learning" techniques.

(U) IED TACTICS

(U//FOUO) An IED attack or campaign may consist of a single device, multiple devices of similar construction, combined with VBIEDs, or used in conjunction with direct-fire attacks (e.g. small arms and rocket-propelled grenades) to create a deadly combined-arms tactical problem for responders. As with IED construction, IED employment tactics are only limited by the creativity of the attackers.

(U//FOUO) In many instances, bomb makers may test their designs prior to beginning an IED attack campaign. Timothy McVeigh, responsible for the April 1995 bombing of the Murrah Federal Building in Oklahoma, tested elements of his bomb design prior to attack. Ramzi Yousef — a planner of the 1993 World Trade Center bombing — tested a bomb design in December 1994 onboard Philippine Airline Flight 434 which was intended for attacks against 12 U.S.-flagged air carriers in Operation Bojinka the following month.

(U//FOUO) Of primary concern for first responders is the potential for secondary devices. Secondary devices are IEDs that are designed with the intent of detonating shortly after an initial explosion, with the purpose of either being the primary casualty-causing attack or attacking first responders.

(U) SECONDARY DEVICES

A single detonation does not mean that the attack has been completed – a secondary IED may be placed in the area to:

- Kill or injure victims that had been "channeled" to a specific spot by an initial detonation, as happened during the Bali, Indonesia bombing on October 12, 2002
- Specifically target First Responders arriving at the scene of an initial detonation, as was the intent of Eric Robert Rudolph (USPER) during his attacks on abortion clinics in the late 1990s

(U) SUGGESTED PROTECTIVE MEASURES

(U//FOUO) The Department of Defense Joint IED Task Force recommends the following "4 C's" process when encountering suspect IEDs or detonations:

- Confirm – always assume the suspect device will detonate and assume presence of secondary devices, use hard cover and minimize exposure, note any strange wires, antennas, or anything 'out of place,' confirm and communicate location and description of device to responding Bomb Technicians
- Clear – remove people from immediate area, don't allow anyone to remain within line-of-sight of the item

- Cordon – establish entry point for first responders, check evacuees for possible attacker (may be close to device), ensure 360 degree evacuation
- Control – only permit essential first responders inside cordon

(U//FOUO) Assume the attacker is observing your response. Pay particular attention to individuals using cell phones, key fobs (miniature remote keyless entry systems), and two-way radios in the vicinity of the incident.

(U) CONCLUSION

(U//FOUO) IEDs continue to be a favored method of attack by terrorists worldwide. IED design and employment is only limited by the imagination of the adversary. Design innovations overseas may be employed domestically. They may be crude or sophisticated, but any IED has the potential to inflict significant loss of life.

(U//FOUO) A simple mnemonic to help understand the basic elements of an IED is ***PIES*** – Power supply, Initiator, Explosive, and Switch / Sensor.

(U//FOUO) All responders to an explosion must consider the possibility that the initial explosion may not be the only, or even the primary attack. ***Always assume the presence of secondary devices.***

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