COUNTERING IMPROVISED EXPLOSIVE DEVICES
THE AIR POWER CONTRIBUTION

Many of us have seen on TV and read in newspapers, the carnage left behind after an Improvised Explosive Device (IED) has detonated in a crowded marketplace or a congested roadway. IED operations by insurgents have so far killed thousands of people and their scale and relative success have constrained the freedom of manoeuvre of coalition forces, affecting their ability to conduct effective operations in places such as Iraq and Afghanistan.

An Improvised Explosive Device is normally ‘homemade’ and fabricated in a simple unsophisticated manner incorporating destructive pyrotechnic or incendiary capabilities designed to destroy, incapacitate, harass or distract. Activation of an IED is done either through a time switch, remote command operation (wired, radio controlled) or by the victim (via pressure plate, infrared or trip wire). Even though air power has the capacity to completely isolate a theatre of operation, IEDs will always be available to insurgents by virtue of the fact that they are improvised from commonly available material. Countering this threat therefore, will per force have to be a multi-faceted operation conducted in theatre.

Until relatively recently, the fight against IEDs consisted mostly of distancing or protecting personnel and equipment from the blast either by avoiding likely IED sites or using better armour. Today, however, a more holistic counter-IED effort is underway that is designed to counter not only the IED itself but also the terrorist networks responsible for their deployment—in other words treating the IED threat as a system with recognisable nodes. Due to the dispersed nature of most IED systems, attacks against the live IED itself will only have tactical impact and not adversely affect their broader employment. The military systemic approach to a comprehensive counter-IED action will be to:

- Isolate the entire IED system from its external sources of support;
- Interdict all the nodes of the system to disrupt the IED capability; and
- At the tactical level, neutralise emplaced IEDs.

Countering the IED threat is a joint activity that requires a fully integrated and systematic approach, and synchronisation of effort by different agencies at the strategic, operational and tactical levels.

The primary requirement to prevent insurgent groups from employing IEDs is to isolate them from their support infrastructure. Air and space capabilities are well suited to this task in the larger theatre by continuous visual and electronic monitoring of the surface environment. This continuous monitoring can lead to the identification of insurgent lines of communication and supply as well as their supporters, all of which can be interdicted. Concerted surveillance and intelligence operations can disrupt the IED network and target the strategic supply lines and the personnel and locations used to build and distribute the IEDs. In this way, the entire system can be neutralised.

Interdiction of an IED system is a job well suited to air power. The inherent rapid response capability of air power makes it possible to identify and interdict enemy safe houses, IED factories and caches. Further, if IEDs are being transported, either between warehouses or for operational deployment, air platforms are the interdiction weapons of choice due to their ability to carry out discriminatory and precise strikes rapidly and from long ranges. Besides...
destroying the physical components of an IED system, air platforms can also interdict the communications and the electronics nodes associated with triggering them, unconstrained by terrain or physical distances between the system nodes.

Airborne assets also contribute significantly to the forensic analysis process designed to neutralise IED systems. This involves fusing large amounts of intelligence and surveillance data to backtrack from an IED attack to determine the sources from which the attack emanated to locate the bomb-making facilities and the associated support organisation. In both Iraq and Afghanistan, airborne assets use their inherent ability to quickly locate an IED attack point, identify suspicious individuals or vehicles in the vicinity and mark them with laser designators for apprehension by ground forces if possible, or destroy them outright if necessary.

Neutralising the effects of an IED requires that the device is either prevented from detonating or sufficient protection is provided to make it ineffectual. Until recently, Western nations concentrated on improving the protection provided to ground forces with improved armour and flexible tactics. The insurgents, like all complex adaptive organisations, have countered by increasing the sophistication of the IEDs and by specifically targeting Explosive Ordnance Teams that diffuse identified IEDs.

IEDs can only be completely neutralised if they can be found, which is a difficult task. Airborne platforms carry a wide variety of sensors and their speed and loiter capability ensures that a few platforms with discerning sensors can cover a large geographical area with high fidelity. Some IED-detection sensors under development for airborne platforms include lasers and stoichiometric diagnostic devices, which can detect very low levels of explosives compounds. Other specialist sensors include ground-penetrating radar and infrared cameras, both of which can search for either the IED itself or indicators of its presence such as disturbed soil or command wires.

Besides destroying or disabling an IED in situ, another means of preventing their detonation is to prevent the activation command being sent to the device. A common means of activating an IED is by using radio transmitters to trigger it when the target is within range. This can be countered by electronic jamming devices that use low-power radio frequency (RF) energy to block the signals of radio controlled explosives detonators, such as cell phones, satellite phones and long-range cordless telephones. Other electronic countermeasures (ECM) include high-power, high-frequency RF energy to neutralize the electronics controlling the IED. While ground-based ECM systems can counter simple transmitters, airborne systems offer greater effective range and are more flexible in their application, as they are traditionally designed to operate in a very complex airborne electronic warfare environment.

For Western nations, most of the impact of IEDs is felt not in terms of the cost associated with countering them or replacing damaged equipment, but through IED-related deaths. If not carefully countered, this can have a devastating morale-sapping effect on the force as a whole that will transcend the purely tactical environment. Therefore, reducing the strategic impact of IEDs is the long-term objective of all counter-IED activities. In current counterinsurgency campaigns, support personnel providing ground based logistical resupply to coalition forces have suffered heavy casualties, largely from IEDs. Air power can reduce the exposure of extended logistics lines by providing air logistics support, thereby bypassing the IED threat.

There is no doubt that IED systems pose a significant threat to conventional military forces. Like most threats, the best way to neutralise them is to conduct coordinated and joint countering activities across the entire threat system. Air power brings decisive, lethal and responsive direct-effect weapons as well as a vast array of joint-force enablers to the counter-IED effort. The probability of success in neutralising these sophisticated systems is greatly enhanced by the optimum employment of air power capabilities.

- IEDs threaten the freedom of manoeuvre of surface forces
- IEDs must be perceived as a system and countered accordingly
- Air power provides a significant number of options in systemic counter IED activities

“The proliferation of IEDs on the battlefield in both Iraq and Afghanistan has posed the most pervasive threat facing coalition forces in those theaters … IEDs are a weapon of choice and are likely to remain a major component of the Global War on Terrorism for the foreseeable future.”

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