



## **Anticipating Future IED Threats: International Approaches to Counter Next-Generation Improvised Explosive Devices**

### **Purpose**

Today's Improvised Explosive Devices (IEDs) pose a major security threat to armed forces and civilian populations. The goal of this workshop is to enable security forces and law-enforcement to get ahead of the terrorists by identifying future security shortfalls and requirements with regards to the next-generation of Improvised Explosive Devices.

The workshop seeks to anticipate potential terrorist research & development efforts regarding next-generation IEDs, in order to develop forward-looking security requirements and the necessary tools to neutralize and defeat next-generation IEDs. The workshop will also examine the IED supply chain in order to focus on the means to deter, detect and interdict IEDs before they are deployed.

### **Background**

The terrorist attacks of September 11, 2001 attacks marked a revolution in the nature of conflict. The 9/11 attacks involved the hijacking of civilian aircraft by Al Q'aeda terrorists which were then used as guided improvised high explosives on suicide missions to damage and destroy key defense and economic targets inside the USA – the Pentagon in Washington DC, and the World Trade Center in New York. The combination of the aircraft impacts and tons of blazing jet fuel created an air burning bomb that increased temperatures several hundred degrees above the tolerance of the concrete and steel supporting the buildings.

The direct physical impact of the 9/11 attacks was dramatic: Al Q'aeda scored major direct hits on America's political and financial capitals -- 3,000 thousand people were killed (as compared to 2,117 at Pearl Harbor), the World Trade Center buildings in New York were destroyed and the Pentagon in Washington was severely damaged and disabled. The secondary impact of the attacks was equally dramatic: the complete closure of Washington National Airport for one year, rerouting of all air traffic around Washington DC and Manhattan, the collapse and subsequent government bail-out of the US airline industry, and the biggest one-day and one week stock market fall on Wall Street in history (the Dow Jones index dropped by 14%). At the tertiary level, the attacks had major political and military consequences. They directly led America to restructure its government, its budget, and its approach to security: first by declaring war on terrorism and launching what in effect became a two-front war with invasions of Afghanistan (2001) and Iraq (2003); and then by creating the Department of Homeland Security – one of the largest government agencies in American history in order to combat the threat of terrorism. The 9/11 attacks also have had profound effects upon NATO – which invoked Article 5 of the North Atlantic Treaty for the first time in its history, declaring that 9/11 constituted an armed attack against all the members of the alliance.

Since the 9/11 attacks, improvised explosive devices have been used extensively by terrorist and insurgents as their asymmetric weapon of choice - in the wars in Afghanistan, Iraq and Syria, and also in terrorist attacks on civilian targets in Asia and Europe that have had serious economic and political impacts on the countries involved.

Improvised Explosive Devices have proven relatively easy to assemble and deploy, but relatively difficult to detect and disarm before they are detonated. The war in Iraq has demonstrated that current-generation IEDs are already capable of destroying armored military convoys and well-defended buildings. Terrorist attacks in Europe have underlined the economic and psychological disruption capabilities of IEDs: the Al Q'aeda train bombing in Madrid, Spain in 2004; the London tube and bus-bombs of 7/7 2005; and the narrowly averted attempt to blow-up transatlantic airliners in August 2006 using improvised liquid explosives disguised as harmless substances such as toothpaste and drinks in carry-on luggage.



Events in Iraq & Syria demonstrate that IED design evolves rapidly. The US-led coalition invaded Iraq in early 2003. By late in that year, 40-60% of all insurgent attacks in Iraq began with an IED. Initially, some attacks were followed by direct fire, but increasingly insurgents turned to remote detonation or suicide bombers using IEDs as a stand-alone means to attack a convoy. The IEDs were often hidden along highways and disguised in meals, drinks, or dead animal carcasses, alternatively they were encased in cement, placed in manholes, or in tunnels under the road. At first, some of the IEDs were detonated using relatively simple, off-the-shelf, low-technology devices such as garage door clickers and toy car remotes which required line-of-sight and close proximity to the target. Quickly, the insurgents developed greater standoff capability using radios, mobile phones and other remote control devices in order to watch from a distance and not be compromised.

The proficiency and frequency of IED attacks using conventional explosives in Iraq and Afghanistan is alarming in itself, given that the US-coalition forces in Iraq and the NATO forces in Afghanistan have limited capability to detect improvised explosive devices, and that existing countermeasures such as “Warlocks” which enable premature detonation of RF proximity-fuzed IEDs also have the adverse effect of disrupting local unit communications. Even more alarming, it is clear that insurgents and terrorist groups such as Al Q’aeda are undertaking serious R&D efforts to develop next-generation conventional IEDs, using new explosives and deployment technologies, as well as IEDs using radiological, chemical and biological warfare sources.

This workshop is designed to use the knowledge of the current IED threat as a baseline to anticipate future IED challenges and future security requirements. For instance, what are the implications for military communications and current counter-terrorism tools if terrorists develop IEDs with ultra-wide band frequency capabilities? What are the next potential targets?

### **Attendees**

Representatives from several NATO and Partner countries will participate in the workshop including the US Government’s lead counter-terrorism technology agency, the Russian Academy of Sciences, and key states in the Black Sea & Caucasus regions which are used by terrorists as transit routes for illicit trafficking of IED materials.

The workshop will bring together scientific experts on conventional explosives, organic chemistry, and related chemical, biological and radiological threats, as well as public and private sector policy makers, experts on terrorism, and first responders including law-enforcement, military, and intelligence officials, in order to identify future IED security challenges and to develop corresponding responses.

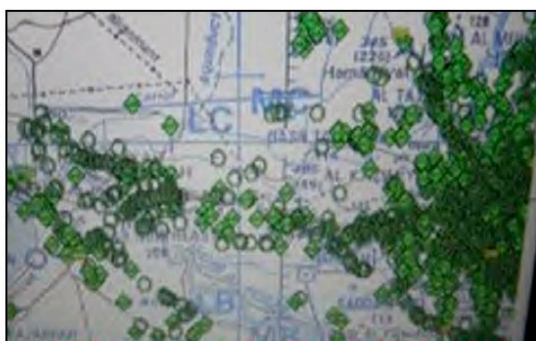
### **Goals**

- Overall: To identify future security shortfalls and requirements to counter the threat of next-generation Improvised Explosive Devices. To improve international co-operation to counter the threat of terrorism. To encourage states to address new threats in new ways.
- To establish a baseline of current terrorist IED capabilities and current security vulnerabilities as a necessary precursor and context for identifying next-generation capabilities.
- To identify & counter potential future IED capabilities with regards to conventional explosives, chemical, biological and radiological sources.
- To identify & counter existing and soon to be released technologies that can be easily obtained and modified by terrorists in order to deploy IEDs.



- To focus on the IED supply chain in order to identify terrorist vulnerabilities and to develop means and methods to deter and interdict IEDs before they are deployed.
- To develop Indicators and Warnings of IED development in order to reverse engineer terrorist efforts and stop the development of new IEDs at the earliest point in the supply chain.
- To encourage the development of an international database of IED-related trafficking similar to the IAEA Illicit Trafficking Database for nuclear and radiological sources.
- To assist government efforts to identify, prioritize and execute research and development projects to access, diagnose and defeat improvised explosive devices, including improvised chemical, biological, radiological and nuclear devices, and vehicle borne improvised explosive devices.

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