

CARGO SECURITY INTERNATIONAL

INTERMODAL TRANSPORT SECURITY INTELLIGENCE

www.cargosecurityinternational.com

Volume 10 Number 3 June/July 2012

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A man wearing a grey hoodie, a grey cap, and blue jeans is running on a brick-paved area. He is carrying a large black bag in his right hand. In the background, another person in a dark uniform is visible, and there is a brick wall and a purple structure.

**PUTTING CRIMINALS
TO FLIGHT:**
Cash in Transit
security success

NATO combats IED

*Dr Franco Fiore
talks to Cargo Security
International about
NATO's efforts to
defeat IEDs*

According to the **Joint Improvised Explosive Device Defeat Organization (JIEDDO)**: 'Improvised explosive devices (IEDs) are the weapon of choice of terrorists because they require limited skills to build and provide dramatic results for very little investment of time, money and effort.' The public relations benefit of a surprising spectacular explosion far outweighs attacks using more conventional weapons.

In 2005, the **North Atlantic Treaty Organization's (NATO) Consultation, Command and Control Agency (NC3A)**, the technology arm in support of Alliance missions, began the work to take on the biggest threat to its troops in Afghanistan that continues to this day: IEDs. NATO's presence in Afghanistan began in 2003 at the request of both the **United Nations (UN)** and Afghanistan's democratically elected government. In the same year, NATO assumed leadership of the **International Security Assistance Force (ISAF)** operation, ending an average of six-month national rotations. NC3A currently provides direct support mainly to three locations in Afghanistan, namely at ISAF headquarters, Kabul Afghan International Airport (KAIA), and the Kandahar Airfield, as well as others.

JIEDDO has reported that the use of IEDs in Afghanistan remains at 'historic highs', while detection of these threats continues to be a crucial problem. Lt. Gen. Michael Barbero, programme executive officer of JIEDDO, estimated that there were 1,600 IED events in Afghanistan in June and July 2011 alone. Compounding the detection challenge for NATO forces was the nature of these explosive devices, mainly homemade and unsophisticated, that made them difficult to find with conventional mine-detection equipment.

'ISAF officials on the fields had to quickly realise that Afghanistan entry control points were not equipped with the right type of equipment to scan vehicles and personnel,' says Dr Franco Fiore, NC3A's Principal Scientist and Project Manager for IED defeat

'We need to catch the financier, the builder, the transporter, and the placer so that we can break the chain of IED production and the IED is never built in the first place'

programmes. 'The opposition's aim may have been to inject threats and fear with vehicle-borne and suicide bomber IEDs, targeting the strategic level of the Alliance.'

Containing the rising threats

With a request from the theatre, staffed through the Joint Forces command, NATO's operational command, the **Supreme Headquarters Allied Powers Europe (SHAPE)**, tasked NC3A and Dr Fiore's team to translate the Minimum Military Requirements (MMRs) coming from theatre into technology solutions to safeguard and screen vehicles and personnel at entry control points for IEDs.

Dr Fiore heads up the IED expert agency for all issues related to counter-IED, force protection and counterterrorism missions (including research and development, and procurement) supporting the ISAF in Afghanistan, NATO headquarters and NATO nations.

According to Dr Fiore: 'The enemy's goal is to cause harm to persons and to the community to influence political ideas and potentially the behaviour of a nation (such as withdrawal of their forces), inject terror in the population, discredit ISAF forces on the ground at the eyes of the Afghan population, and create terror in general – leaving everybody in fear. Targeting the strategic level of the Alliance with IEDs is just another means of reaching their goals.'

Dr Franco Fiore is the Principal Scientist and Project Manager for IED defeat programmes, with the North Atlantic Treaty Organization's (NATO) Consultation, Command and Control Agency (NC3A).

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IEDs in Afghanistan

Dr Fiore continues: 'The threat is not only IEDs, but also explosives and weapons smuggled onto the base so that they could assemble IEDs inside the base.'

'We need to catch the financier, the builder, the transporter, and the placer so that we can break the chain of IED production and the IED is never built in the first place. As an example, if we stop a supply truck coming in to Afghanistan carrying ammonium nitrate, a well-known precursor for building explosives, from being delivered to questionable and doubtful places, you avoid possibly hundreds of IEDs being built.'

Optimal solutions

Dr Fiore and his team went to work turning this military requirement into a technical mission: to deploy stand-off detection sensors against vehicle-borne and suicide bomber devices.



The first procurement was slated to secure the large base of KAIA — one of the busiest entry control points in Afghanistan and also home to the Kabul airport. The counter improvised explosive devices (C-IED) technology and systems chosen would be deployed at multiple entry control points to screen vehicles, cars, packages, parcels, and people while maintaining safety and high-throughput.

The C-IED systems would allow for the detection of explosives, vehicle-borne IEDs, suicide bombers, weapons and radioactive materials in a stream of vehicles and people crossing the entry control point.

After conducting an extensive market survey and an International Competitive Bid in 2006, NC3A selected a broad

range of x-ray inspection solutions from **American Science and Engineering Inc. (AS&E)** that would be combined with radiation detection sensors from **CANBERRA**. Dr Fiore found AS&E's screening solutions to be the right fit for NC3A's main concern, IEDs, because of their specialised technology to find both organic and non-organic threats.

NC3A's initial procurement included a broad array of AS&E's systems for the ISAF headquarters' and the KAIA airport's gates.

These non-intrusive x-ray inspection systems include:

- multiple *Z Portal* systems for screening trucks entering the base. The high-throughput, drive-through screening system is designed to generate multiple, photo-like images of the contents of the container or vehicle for superior detection of organic threats including explosives, and other contraband. The system's three x-ray views — top, left and right — provide maximum screening capability and facilitate image interpretation
- *OmniView Gantry* for screening densely loaded trucks. This system combines high energy transmission inspection with AS&E's unique *Z Backscatter* x-rays with multiple views. According to Dr Fiore, the system's 'sharp and crystal (clear) images' are ideal for threat and contraband detection
- multiple Integrated Personnel Screening Modules (IPSMs) for screening all personnel entering the base. The system incorporates AS&E's Smart Check Personnel Inspection System and Gemini Parcel and Baggage Screening System, combined with a CANBERRA Radiation Detection Sensor, all integrated in 20-foot shipping containers for comprehensive inspection of individuals and their belongings in a relocatable checkpoint.

Operating in Kabul

A typical checkpoint consists of a scanning area, followed by a staging area where the vehicle remains until the analyst clears it and, in case of necessity, a search area.

'The C-IED systems would allow for the detection of explosives, vehicle-borne IEDs, suicide bombers, weapons and radioactive materials in a stream of vehicles and people crossing the entry control point'

The layout is, of course, configured to reduce risks for ISAF soldiers to a bare minimum. Everything is done stand-off — with a remote control station about 100 to 200 metres (m) away so that there is no contact between potential suicide bombers or vehicle-borne IED bombers and force protection personnel.

When a truck enters KAIA, it parks under the *OmniView Gantry* system for inspection. The driver steps out, and the *OmniView Gantry* scans the truck. The driver then enters the *IPSM* container and he is screened with the *SmartCheck* system while his luggage is scanned by the *Gemini* system. If the images are cleared, the middle door opens and the driver gets his luggage and goes to ID check, gets his paperwork, goes back in the truck and, if the truck is cleared as well, then onto the base.

A similar process occurs in the other gates with a higher throughput requirement, where, instead of the *OmniView Gantry*, NC3A uses AS&E's multi-view, drive-through *Z Portal* systems for scanning vehicles. And at one gate designed just for pedestrian traffic, NC3A uses just the *IPSM*. Dr Fiore says that the *IPSM* allows 'force protection to do their job in a more secure and safe way'.

Evaluating critical elements related to site layout, AS&E's project managers worked with NC3A officials to evaluate traffic and pedestrian flow to optimise throughput at the checkpoints. 'AS&E worked with us to determine where to position the systems, looking at traffic flow, and also how to move traffic through the systems. There was a helpful collaboration between NATO and AS&E during the planning and implementation,' says Dr Fiore.

Securing Kandahar Airfield

In 2007 NC3A held a second International Competitive Bid to secure Kandahar Airfield, determining that similar IED detection technology would significantly boost the NATO Alliance's ability to supply the base. It was clear to Dr Fiore that they would implement a similar set of technology solutions at Kandahar, given the success of the first, and AS&E's Z Portal systems were selected a second time for deployment at three entry control points. The installation of the devices was accomplished well ahead of the opening of the control point.

'The quick implementation of the

systems would not be possible without the joint effort of experts from the NC3A project team, our NC3A Field Office in Kandahar, the Acquisition Support Group, and our contracting partners support,' comments Dr Fiore.

As recently as 2010, NC3A secured another Z Portal system for ISAF headquarters along with two under vehicle inspection systems. And in May 2011, NC3A purchased its first Z Backscatter Van (ZBV) system, installed at KAIA. The ZBV system is a highly mobile screening system and allows for immediate deployment in response to security threats and is an ideal tool for NATO's security applications. Dr Fiore indicates that the results from the ZBV have been very positive in its early deployment.

Implementing these AS&E systems and other technologies has enabled NC3A to significantly boost safety at the entry control points without compromising the need for rapid and seamless logistics that the bases rely on. They deliver the highest throughput for all ISAF entry control points and reduce risks for soldiers.



Measuring success

Even though much of Dr Fiore's work is confidential, he says: 'I can tell you that we have found prohibited items to be smuggled into the base. AS&E solutions have been successful in detecting these kinds of threats, as well as objects that were not supposed to be on a person, such as a cell phone or liquids. Often individuals forget about cell phones in their pockets, but AS&E's SmartCheck system detects them; if you don't have a good system, items can slip by,' says Dr Fiore.

According to Dr Fiore, the troops have been part of the entire process – providing information and feedback for the initial security requirement and also having a voice in the solution selection – and have been pleased with the outcome. 'The soldiers are very satisfied with the technology and service teams,' he says. 'Our soldiers know very well how the systems work. The troops receive regular training, use the systems every day and are happy to use the technology quite extensively.'

Utilising technology for counter IED programmes is more important than ever in combating terrorism in Afghanistan and around the world. Defeating IEDs remains one of the military's biggest challenges. Dr Fiore and his NATO colleagues are happy to share their story, believing in an open, less bureaucratic operational approach. He concludes: 'We think it's good that people know what NATO is doing, what we do for the NATO nations, and how we can potentially help them.'

