

CBRNe

Spring 2010

WORLD

CBRNe World
conference info –
see page 24



Arrested Development
FBI approaches to stopping
the CBRN terrorist

Goin' loco
Brazilian and South American
CBRN threats and capability

Auld Acquaintance
Welcoming the return
of anthrax deaths



GENENCOR®
A Danisco Division

Together we can
protect you while you protect our future



A better way.

The world's first biobased line of decon products to neutralize chemical and biological warfare agents

- DEFENZ™ VX-G for V-type and G-type agents
- DEFENZ™ B-HD for HD agents and biologicals
- Broad decontamination with backward and forward equipment compatibility

For more information, call +1 800 847 5311 or visit www.genencor.com.

DEFENZ

Decon Enzymes...biobased solutions that tackle the toughest threats.

© 2010 Danisco US Inc.
Genencor® is a registered trademark and DEFENZ™ is a trademark of Danisco US Inc. or its affiliates in the United States and/or other countries.

Leader

Tough times ahead

Many in the CBRN industry are used to low levels of funding. Rarely does a CBRN defence project reach a Category B funding level; mainly they are treated as the “insurance policy” – the money you don’t miss but which you need to pay in case the worst happens. For many governments the worst has happened, yet it was not a terrorist disaster so much as a financial one. Now, like other companies facing bankruptcies, ministries of defence and interior are looking deep into their budgets to see what figures they can expunge – and many are wondering whether they could miss a few CBRN insurance payments. I mean, it won’t be for a long time – and nothing has happened so far! Sweetie? Honey? You OK with that?

The UK is probably the worst example of this, excepting those countries really teetering on the brink of bankruptcy (Portugal, Ireland, Iceland, Greece and Spain). Projects such as the Scene Assessment System (SAS – see *Winter 2009 News*) are being slashed for no other reason than money. The Home Office put out a very badly-worded letter (of the sort that, when you quote, from it people instantly say, “Oh, I can see how you read that into it, but really it is very clear. What they meant was...”) stating the operational and economic landscape had shifted since the business case was established and that SAS should now be considered a “generic requirement”. These phrases created a Vimy Ridge-sized hole in the UK civil defence lines; organisations such as the Police CBRN Centre had been herding the different police forces into the SAS sack, only to find the Home Office/Treasury had cut the bottom out of it – and now they are running wild. The SAS was not only going to be a detector platform but also, more importantly, the hub of mobile CBRN defence operations – providing a common operational picture (COP) for CBRN and other activities.

Not only will the forces now be off buying individual pieces of kit willy-nilly, but they will also be buying COP systems because they believe (rightly) that the landscape has not “shifted significantly” and there is still a requirement. I can live with the 52 territorial police forces going out and buying different equipment (but please, no Sniffex!) – there might be some issues but they are mainly minor – but buying an array of different COP/Information hub systems would be a monumental disaster. I would like to say the Home Office has a plan. I would like to say this has been considered. But financial imperatives, and (frankly) some senior individuals who regularly prove they haven’t a clue about CBRN on the conference circuit (to the extent of not even being able to define biological warfare), suggest this is unlikely. At some point in the distant future, when we are out of the slough of financial despond, the Home Office will look at the multitude of systems that don’t talk to each other, have limited interoperability with national assets and many other individual quirks, and wonder: “How did this happen?” Presumably they will come to the conclusion that it was “nobody’s fault” and the resulting fix will cost an order of magnitude more than if they had done it now.

Usually you are able to look across the Atlantic and see – if not a picture of perfection – at least a pot of gold that is worth bestirring yourself for. Currently, however, US military CBRN procurement is finding itself in its own pit – and largely one of its own making. Changes in defence procurement policy have managed to miss their aim, and instead of making the process quicker and easier have managed to make it more complicated and longer. US industry is up in arms about the whole process – to the extent they have submitted articles for publication that are so negative as to be commercial suicide (we have yet to have a “self-immolation” section, but if there is a big enough demand...) There is also talk of companies pulling out of the CBRN market. Ironically, this is not going to be seen as negative by those companies that are “pure CBRN”, and have held the CBRN torch through other lean times. As bigger projects have been shelved/delayed/downsized, prime contractors have started sniffing through the CBRN sector. There is no doubt they bring advantages – all those lobbyists and highly paid ex-Four Stars sing songs that Washington understands – but most of them don’t understand CBRN apart from what it means to their balance sheet (though there are at least two exceptions). The image below is offered as an example of the sort of thing that will only aid the primes, with their legion of procurement officials, and will ostracise the smaller companies who will take one look at it and flee. (And no, there was nothing to be gained by making it a bigger picture; it makes even less sense then...)



The lean times are coming. Despite the doom that is being foretold about the JPEO, it will continue to be an attractive market – as the largest it has to be – and those with the most innovative kit will undoubtedly be able to depend on the kindness of strangers to guide them through the procurement tunnels. Brian O’Shea offers a critique in this issue of the EU, which still appears unable to mount a significant effort to support European industry and research – especially if the rumours about further downsizing at TNO turn out to be accurate. So there is little solace there. Perhaps the world has turned upside down, as Brazil, India and Australia have significant CBRN defence projects underway – success might only come to those companies prepared to look further afield...

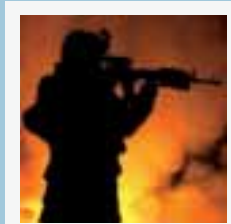
CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

C Contents



1-5

Leader
Contents
News



Letters

6-7



G-Men: AD Majidi of
the FBI and MG Spoehr
of the US Army

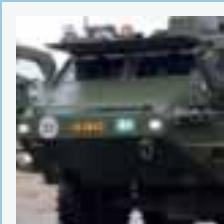
8-16

Asian adventure:
CBRN defence in
Malaysia and
Indonesia



18-23

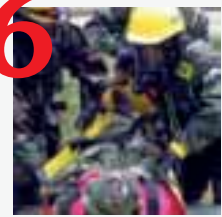
Built to design: Swedish
CBRN developments and
the CBW symposium



24-32

33-36

Crawl space:
USAR casualty extraction
from the hot zone



Bio civil responses:
Anthrax deaths and
bio mass decon

38-46

Chemical awareness:
Contamination and
chemical detection



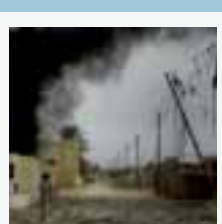
48-56

Biological tendencies:
Mobile labs, BioEdep
and BioSparq



58-70

Containing the boom:
Man portable ECM
and containment



71-78

**Published by Falcon
Communications
Limited**

Editor
Gwyn Winfield

**Business Development
Director**
David Levitt

Art Director
Tony Denton

Assistant Editor
Steve Johnson

Sub Editor
Patrick Bateman

**Contact Details
For Sales**

Cell: +44 (0) 7769 554 051

For Editorial
Tel: +44 (0) 7974 537 016

Fax
+44 (0) 1962 889377

Email

gwyn.winfield@cbrneworld.com
david.levitt@cbrneworld.com

CBRNe World
10 Chestnut Avenue
Littleton, Winchester
SO22 6PL, UK

Web: www.cbrneworld.com

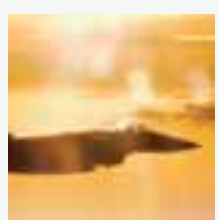
CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com



79-81

**Chemical eye in the sky:
Potential for UAVs in
CBR detection**

**Money for old rope?
EU initiatives and CBRN**



83-84

**Pampas power:
South American and
Brazilian CBRN**

85-89

Capability Profiles



90-101



**Explosive detector roundup
and Prairie Dog***

102-104

Advertiser Index

20/20 BioResponse	67
Ahura Scientific	55
Airboss Defense	55
Argon Electronics	33
Avon Protection	13
Bertin Technology	65
Biral	63
Blucher Saratoga	63
Bruker Detection	19
CBRNe Convergence	24+25
CBRNe World Playing Cards	82
CBW Symposium	77
CoBRA Software	35
Cristanini	47
Draeger Technology	27
EnviroNics	57
Eurosatory	59
Genencor	IFC
Germfree	68
Global Security India	86
Hot Zone Solutions	37
I Bodi	21
ICx Technologies	39
Idaho Technology	61
Intelagard	53+ OBC
Lion Apparel	21
NBC Sys	41
NTOA	42
OWR	49
Paul Boye	11
Proengin	51
QinetiQ North America	75
Remploy Frontline	34
RS Decon	45
Scott Health& Safety	29
Smiths Detection	IBC
Source Vagabond	13
TSI	17

CBRNe WORLD (ISSN No: 2040-2724) is published quarterly – in March, June, September and November - by Falcon Communications Ltd, and is distributed in the USA by DSW, 75 Aberdeen Road, Emigsville PA 17318. Periodicals postage paid at Emigsville, PA. POSTMASTER: send address changes to CBRNe WORLD, c/o PO Box 437, Emigsville, PA 17318-0437.

Legal Niceties:

Reproduction in whole, or part, of any content of *CBRNe World*, without prior permission, is strictly prohibited.

Any correspondence should be addressed to The Editor, *CBRNe World*. We acknowledge the assistance and hard work of many individuals, associations and organisations who have contributed to this magazine. The information published in this magazine has been published in good faith and the opinions contained in the article are those of the author and not Falcon Communication Ltd. Photos are credited individually, non attributed articles are from the *CBRNe World* archive. © Falcon Communication Ltd 2010

Front cover photo ©FBI

* Crystal Ball has to be delayed this issue due to operational deployment

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

CBRN News

PRODUCT WATCH

Pittcon 2010

Pittcon, for those that don't know it, largely centres around lab-based equipment, and lots of it. There are about 1,000 stands and 30,000 delegates, but here and there are some absolute chemical gems. The Editor's first pick would be 1st Detect – www.1stdetect.com – with its man-portable ion trap mass spectrometer, which has recently had \$1.8 million pumped into it by the Texan Emerging Technology Fund. Unlike other systems, this is properly man-portable, weighing in at 7kg and able to be held in the hand like other chemical detectors such as Raid, Cam and Chempro. Second would probably be Torion with its Guardion-7, which was everywhere (on at least three stands). A portable (25lb) GC-TMS, it has its own user-friendly sample collection system, and has been designed with PPE in mind. Third prize would go to Delta Nu for its range of raman detectors, especially its Rapid ID – another competitor seeking to unhorse Ahura (now of course Thermo Scientific) as lead runner in the raman race. Indeed, Pittcon was a wealth of raman detectors, all with their own unique selling points: Perkins Elmer with its Identichex, and InPhotonics with its Inphotote, for example. The Editor was out-nerded by many orders of magnitude...

MedCM news

Elusys was awarded \$143m for further development of its Anthim anthrax treatment. This is for final development, commercial manufacturing and licensing of Anthim, the late-stage therapeutic. DHHS will provide the money for the treatment that has shown a 94 per cent survival rate in animal studies.

Duke University, meanwhile, was awarded a \$43m contract by the Biomedical Advanced Research and Development Authority (BARDA) to develop a genomic-based diagnostic test to determine whether an individual has been exposed to a radiation incident. Sounds like a good idea, *CBRNe World* will keep a weather eye.

In further anthrax treatment news, following last month's \$143m award to Elusys, Pharmathene announced it has received \$78m from DHHS for its SparVax – which is reported to work before and after exposure.

More S10s for UK

While the UK MoD waits for the rollout of the General Service Respirator, Avon has sold another 16,000 S10s into the UK MoD. This is in addition to the three-year contract Avon had with the MoD in 2009 and is clearly nice, if unexpected, support from a customer that had gone with their competitor – Scott Health and Safety – for its next-generation mask. Avon Protection also presented the millionth S10 respirator to General Sir Kevin O'Donoghue – the UK's Chief of Defence Materiel. The S10 has been the stalwart of the Avon product line, though it is clearly having to see off competition from the M50 series, and has been in the inventory for 20 years.

A wild rover for many a year...

Qinetiq North America and Brewer Science and Applied Systems Intelligence are collaborating on an autonomous, self-deploying sensor that would act as a roving bio detector. Work on the programme is being undertaken at Jordan Valley Innovation Centre and is funded by the US Army Research Office as part of the DoD requirement for a tactical CB defence and intelligent network.

I propose to you...

Cristanini launched its new "Proposals for Operational CBRN Decon with different capabilities to decon personnel, vehicles, equipment, soil and fire fighting [sic]". It would be impossible to try and write about these proposals without reproducing the diagrams – and describing them would be a little like ventriloquism on the radio – so the best thing for those interested parties is to contact the company directly at cristanini@cristanini.it

I for improved

Chempro 100i was launched by Environics, boasting an improved number of chemicals detected thanks to an additional six sensors. They now include pressure, flow, FE and MOS-1/2/3, which means, with its expanded TICs library, it can detect things like ammonia and chlorine. Also for the US market, the system comes with an extended warranty for normal repairs and maintenance for the first five years.

First bees, now cockroaches...

Texas A&M researchers have found the answer to the question that has been plaguing all of us – how do you do radiation survey in an area that is too hot for human life. The answer: remote control cockroaches. Yes, all you people who said UAV/UGVs are so wrong – it's cockroaches. Attaching three different radiation sensors and a communication device allows them to send back their reports from up to a kilometre away. Just when I thought that I couldn't get any angrier about bees, another insect comes along...

Turkish lab

Spanish company Indra notched up a contract to provide the Turkish Ministry of Defence with a CBRN mobile lab. The \$4m

contract has to be executed in 18 months and also includes logistic support and training; local partner Nirol will provide many of the mechanical tasks involved in the contract. This is in addition to a contract from the EDA for the definition of a future European command and control system to tackle CBRNE threats. Indra will be involved in the development of technical and operational requirements, as well as architecture for the future system. It will also be able to represent the operation scenario graphically and to provide the different responding units with timely CBRN information.

Office politics

Following the trend of comments in the Winter edition about the need to set up a European office, Bruker Detection (new name, same kit – “Detection” being less scary than “Daltoniks” in the US market, I wouldn’t wonder...) has a new office to liaise with EU/Nato market. Smiths then Bruker... Who next..?



Saint Gobain has increased sales to the DoD, USAF and other US first responders

THREAT WATCH

Past its “Best before”...

Federal Inspectors have found US states have not been storing OP autoinjectors at the right temperatures, raising concern over shelf-life and efficacy. The DHHS found the CDC had not given proper guidelines on storage temperatures and did not monitor those

temperatures as often as it should. The most serious concern is that this might have impacted on some other elements of the strategic reserve that are kept in the same facilities and are subject to similar temperature controls. That would be an expensive mistake.

Fuzzy logic

Rolf Mowatt-Larssen, the CIA’s ex-Director of Intelligence and Counter-Intelligence, claimed in a report for Harvard University that al-Qaeda could have attacked the US with small-scale CBRN attacks if it had been interested in doing so. He went on to suggest they were patient and willing to wait for years to achieve the weapons that could cause widespread casualties. Similar logic would suggest that if I keep buying lottery tickets I might, one day, win the jackpot – that doesn’t stop me spending the small wins though. At some point they are going to have to do something CBRN, no matter how small, or turn into a terrorist Rotary Club.

Quadrennial Review fallout

The US Quadrennial Defence Review was launched (http://www.defense.gov/QDR/images/QDR_as_of_12Feb10_1000.pdf) and retained a high degree of CBRN focus. The most pressing change is the re-organisation of the CBRNE Consequence Management Response Force (CCMRFs). These large organisations that were designed to deal with 10kt nuclear attacks will now be “re-jiggered” (that’s a technical term), so there is one CCMRF. The National Guard will now form ten Homeland Response Forces (HRFs) within the FEMA regions in addition to their CST role. In addition to this, the QDR has enshrined the need to: establish a Joint Task force Elimination HQ, to better plan, train and execute WMD elimination; to research countermeasures and defence against non-traditional chemical agents; to enhance nuclear forensics; to secure nuclear materials; to expand the biological threat reduction programme; and to develop new verification technology to ensure foreign state compliance. The whole CCMRF/HRF thing will, no doubt, take a while to bed down, and it is

interesting to ask whether the publication of Mirzayanov’s State Secrets had an impact on the QDR. Would novichoks have been there without him?

New UK Fire Service guidelines

Bob Hark of Dorset Fire and Rescue announced at the NCEC hazmat event in Birmingham, UK, that the Operational Guidelines for hazmat and CBRN would be reviewed over the summer and launched in the third quarter of 2010. It is to offer operational, tactical and technical advice, but sees the two disciplines being closely linked. Ron Dobson, the UK Fire lead on CBRN, has said he wants to see a coming together of fire and hazmat and Bob Hark agreed, stating: “A CBRN incident is a hazmat incident”. The Guidelines will offer technical guidelines for PPE and decon, for example, but will only be advice; the various forces do not have to follow it. If, however, they choose not to then they would have to follow their own internal processes – which would most likely be legally tested by the Health and Safety Executive in court, where it will examine why they did not follow the approved guidelines. It is too early to offer definitive opinions on this, but it does seem worrying at the moment; there is little oversight of military learning, little or no agent fate work, a generic risk assessment for bio, and all of the guidelines have to be evidenced by the UK Fire Service College. So it sounds worrying. Interested individuals – and those who would either like a review copy, or wish to make comment – should contact Bob Hark at Dorset Fire.

To be sure, to be sure...

Ireland recently approved its Biological Weapons Bill, which prohibited the use, development, retention, transfer (*et al*) of biological weapons. The ban will apply to all vessels and aircraft registered in Ireland, members of the Defence Forces and also citizens of Ireland outside the country. The Dail (Irish Parliament) has heard arguments that the bill doesn’t cover transit through Irish airspace and airports. Just as well poteen is a chemical weapon...

Birth Defects in Falluja

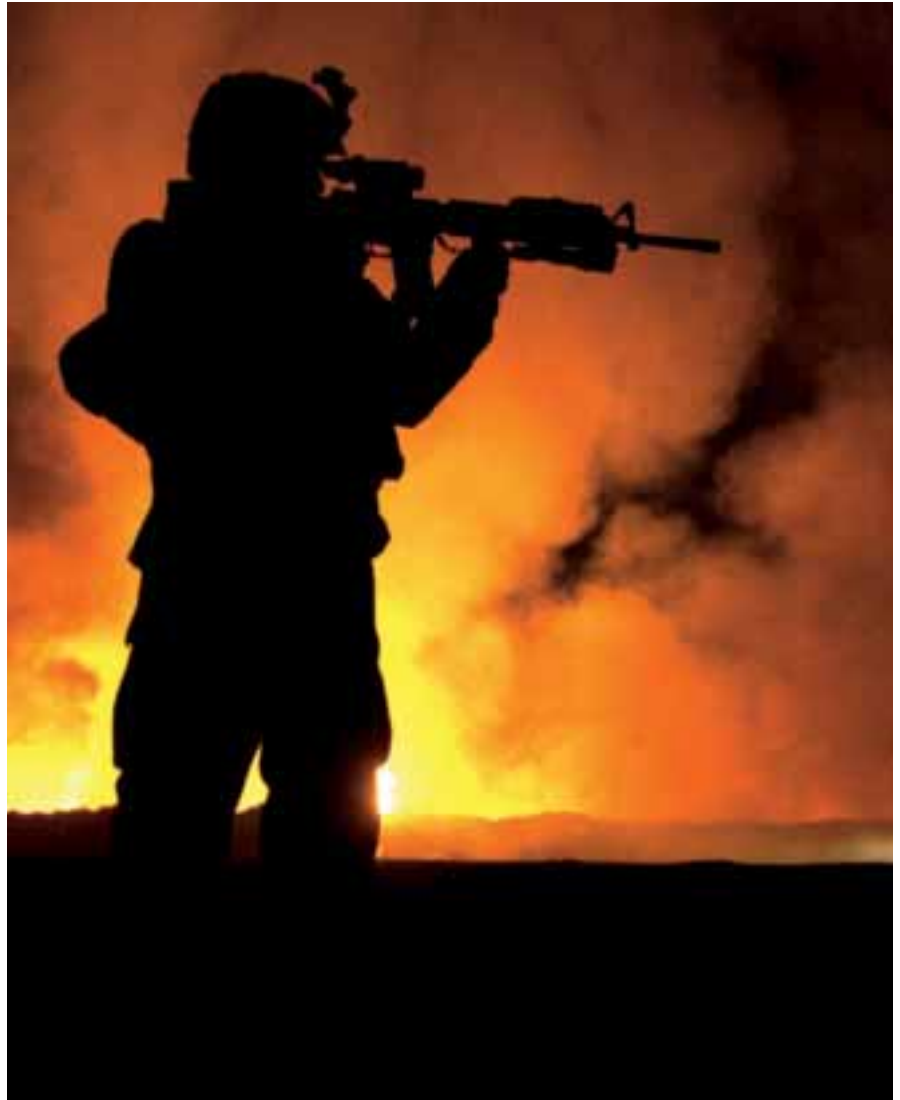
Sir,

Birth defects that arise in conflict and post-conflict situations have grave and complex implications for the affected children and their parents, and for everyone involved in post-conflict recovery. The first and most urgent tasks should be those relating to how to help the children and their families try to ameliorate their disabilities. Sadly, the most usual responses include arguments about potential causes or denial of effect, often from those speaking from positions of little knowledge either about the potential environmental contamination or the agents involved (either current or previous use) or of the underlying causes of the congenital malformations.

The people in Iraq undoubtedly face an environmental crisis as a result of conflict. Remedial action is an urgent requirement to ease the health problems of the population. For most of the 1980s and early 1990s, Iraq manufactured, weaponised and used chemical weapons in war, and was not inhibited in their use against both its Kurdish population in the north and its Marsh Arabs in the south. The very same birth defects that are being reported from the Fallujah area have been prevalent in the north of Iraq since well before 2003, when there were only exposure to chemical weapons and not depleted uranium from Western weapons in the north.

This directly focuses attention on which agents might potentially be involved. Fallujah had three major chemical weapons factories under Saddam's regime that made mustard gas and nerve agents, as well as their precursors and a variety of biological weapons including Ricin. The chemical production and storage facilities were probably not operated to safeguard either those involved in manufacture or the surrounding environment. In addition, Saddam's regime had experimented with radiation weapons. Pictures and details of the many thousands of munitions with weaponised agents are in the Iraq Survey Group Final Report and UNSCOM reports. During the intensive bombing of OIF in 2003, over 50 per cent of all the buildings in Fallujah were damaged and toxic agents including dioxins were released into the environment and rivers. In addition to the toxic releases from these events, there are also questions about possible DU involvement.

The advances in sequencing the human genome have enhanced our understanding of causal mechanisms involved in birth defects. In the past, the principal cause of birth defects was ascribed to direct exposure of mothers to agents that damage the foetus



What impact on the local population has the destruction of Fallujah wrought? ©DoD

during pregnancy. However, exposure to genotoxic agents can damage germ cells, resulting in babies with congenital abnormalities. Recent genomic sequencing has revealed birth defects like those found in Fallujah – that include skeletal malformations (extra or fused fingers and toes, skull and limb abnormalities) and heart defects – result from mutations in sperm or eggs. These mutations may have occurred years before the conception of an affected child and many are paternal, not maternal, in origin.

In 2010, we have the ability to measure toxic agents to parts per billion. But the taxing questions are not those relating to our advanced CBRN measurement capabilities but rather to who in military, political and humanitarian post-conflict situations should be undertaking complex environmental assessments, as well as the need for accuracy, accountability and responsibilities when

culpabilities for use are in question. We have the ability to perform highly sophisticated tests for weapons and their breakdown products. We also know how to help children with disabilities, to reduce the burden of effects and to test with sensitivity and care to identify causal mechanisms for these birth defects to help prognosis, treatment, counselling, remediation and prevention programmes. Why have these not been done? Telling the women from Fallujah they should not have children is not only a grossly inadequate response but contravenes the Human Rights Convention.

Yours faithfully,
Professor Christine Gosden,
Pathology Division, and
Derek Gardener,
Biomedical Laboratory Scientific Officer,
University of Liverpool

What lessons did the Convergence Exercise offer for others?

Sir,

During the CBRNe Convergence meeting in late October 2009 in The Hague, Netherlands, an exercise of the local first responders took place. During the conference we were prepared for the exercise by a short videos of the initial stages. The “exercise” was sometimes referred to as a “demonstration” and on other occasions as a “show”. Actually, it contained a little bit of all three aspects, and amazingly all three aspects came across very well despite the limited time available. It is a very good thing that these exercises take place, because we all have to learn how to respond in an adequate way to these kinds of incidents.

Seven different organisations had to work together to resolve a relatively simple incident: a car containing an improvised explosive device (IED) and, as became apparent, some chemicals. The first to arrive at the scene of the incident was the police. One police officer opened the vehicle with his bare hands and found suspicious material in the trunk of the car. He reported an IED. This is perhaps where the inevitable problems with untrained/unprepared responders occurred, as he did not use gloves to open the boot to avoid destroying forensic evidence and possibly transferring contamination. He was also armed with a gun instead of an escape hood. This showed why police deserve the nickname “blue test tubes” for operating in this way in a potential CBRNE incident.

There were no casualties and the suspect driver had disappeared. The thought crossed our mind: “What happens in a situation where there are a lot of casualties from explosions?” – something we see nearly daily in Pakistan, Afghanistan and Iraq. What if the IED was combined with hazardous chemicals, as in this exercise? Will we ever be able to get the emergency services and the police to the scene on time? Will we be able to control the crowd? Will the mobile casualties run away and look for medical attention themselves? Do we have a system for medical treatment of casualties, especially with respect to fast-acting chemicals (the medical “golden hour” for acting upon casualties is shortened to 15 minutes or less in the case of some highly toxic chemicals)? Would it not be wise to learn from the experience of the Ambulance Hazardous Area Response Team (HART) already deployed in British integrated rescue system? These are very important questions and unfortunately we do not have all the answers yet.

The IED was deactivated in an impressive demonstration of what training can do. An expert in explosives, dressed in 45kg of body

armour, deactivated the device swiftly – one of his tricks was to freeze the IED with liquid nitrogen. It occurred to us that it might not be a bad idea to use the same technique for all types of CBRNE devices. Freezing the source of the hazard would most certainly reduce the dispersion of CBRN agents once they are released and would save forensic evidence and also increase the safety factor of the operations.

After the deactivation of the IED some chemicals were discovered, and the other emergency services started to dress-up in their level-A suits with self-contained breathing apparatus (SCBA). An on-site emergency personnel decontamination station, for responders and vehicle decontamination lines, were set up. Looking at this from a military perspective the question always arises over whether this protection not somewhat overdone and severely limits the time a man can operate. Protection of the individual should be at a level necessary but sufficient. Level-A type suits are excellent for protection against splashes or sprays of liquid, but donning and doffing takes time. They are required for work with certain pathogenic micro-organisms – mainly with the objective of enhancing respiratory protection – but will first responders ever get sprayed with agent or will their ordinary mask be sufficient to deal with the concentrations of C or B agents that could be encountered in the pursuit of their duty? Has there been a quantitative hazard assessment showing that this protection is required at all levels? The military decontamination squads in the exercise gave a practical example of this approach. During the set-up of the vehicle decontamination street, the personnel were dressed in the standard military protective gear allowing them to perform long-term work. As soon as the actual decontamination became imminent, they dressed up in their interim impermeable protective suits with integrated ventilation system, which allow them to operate for about one hour. Though the fluorescent green/yellow colour of their suits does not contribute very much to the camouflage of the activity in a military environment...

Other squads came in to do the reconnaissance; samples were taken and analysed on the spot in a truck equipped with a whole B and C analytical laboratory. The Netherlands is a small country and the truck is centrally located and can be moved to incident locations quickly. The detailed information that is obtained in the analysis phase is used as input for the medical community, and sometimes for predicting

down-wind hazard areas. The squads that operated in the reconnaissance and the decontamination were all dressed in variously coloured level-A type suits. The colours were assigned to different functions, so it was easy to recognise the task of every person involved. A minor mistake in the exercise that could trigger criticism is that the whole personnel decontamination site was set-up in the hot zone; people entered and exited after decontamination through the contaminated zone. This arrangement was explained by the moderator as the compromise between safety rules and the limited space of the exhibition.

The beauty of the show was the “Spurfuchs” reconnaissance vehicle, equipped with a special detector for biological agents. It comprises a collector, an instrument to coat the biological particles and a “MALDI TOF” mass spectrometer. The instrument is capable of providing answers regarding hazardous biological agents in a matter of tens of seconds and comes very close to the requirements of a warning system for biological agents. This once more shows the difference in approach of the military and civilian authorities for dealing with CBRN incidents. The military defence system is based on: threat and hazard assessment; detection (to avoid the hazard); physical protection (and, if this fails, medical countermeasures); and decontamination. For civilian casualties the systems looks mainly at decontamination and medical response. Due to the lack of threat and hazard assessment – especially the quantitative aspects – and lacking capabilities for detection, especially a warning area, first responders are forced into cumbersome physical protection and have to rely on decontamination. It is time for the development community to come up with something better. Some companies were already going this route with quick-don protective physical protection and improved detection capabilities.

The demonstration exercise clearly demonstrated the comprehensiveness of any CBRNe response operation, taking into account the policy of “all hazards” from the beginning of the operations. It could be of value to use the defence know-how, in particular regarding physical protection, to prepare the first responders to fight CBRNe terrorism and hazmat accidents rather than relying fully on the hazmat accident approach.

Dr Pavel Castulik, CBR Defense and Protection Consultant, and Dr Jan Medema, Biological and Chemical Defense Consultant

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

Evidence for the Prosecution

It is always interesting to do a retrospective when interviewing people that have been in the magazine before – to see what has happened since. In Spring 2007 Dr Majidi was the Assistant Director for the (very) new WMD Directorate, which had recently been calved off from the Counter Terrorism Office and was in the process of finding its feet. The Hatfill court case (that would later exonerate him) was in process, and, as far as the public were aware, there seemed to be no one else in the frame. Fast forward three years and the WMD Directorate has grown by an order of magnitude; Bruce Ivins had been charged with the “Amerithrax” attacks, committed suicide and the case was closed. And behind all this are the countless hoaxes, scores of plots and dozens of attacks that have gone on in the meanwhile; while there has not been a “spectacular”, there have been a number of very near misses.

The World at Risk report, which is currently spawning US legislation, has suggested a major weapon of mass destruction attack, using biological or nuclear weapons, is imminent sometime in the next four years (see *CBRNe World* Spring 2009). Of far greater likelihood, though lower impact, is the chance of a toxic industrial chemical, toxin or radiological attack – cases that are regularly foiled by the FBI, as opposed to the mainly elusive bio/nuke threat. Does this mean the threat has moved on; that there is little point preparing for the lower impact piece (against which the States is resilient enough) and that all the investment should be made in the bio/nuke apocalypse just around the corner? Dr Majidi suggested it was not that clear cut. “We look at the issues on the horizon,” he said. “We look at the

intelligence report, what is feasible and possible, and then current trends and traces. They all seem to point to the same direction – we have a persistent use of chemical and biological agents on an annual basis.

“One particular issue we have with World at Risk, as far as the declaration goes, is that it is quite vague – it predicts that within five years there is going to be a CBRN attack. From my perspective we deal with that annually anyway. We deal with a number of cases involving chemical and biological issues – rarely radiological, though it does happen, and never nuclear. So what is missing for me with World at Risk is the magnitude. What is the scope of attack and methodology? From my perspective we see the threat outlined frequently, at least a dozen times a year, so World at Risk comes true almost on a monthly basis. Because I don’t understand the scope I can’t do a comparison.”

This is perhaps the downside of having political scrutiny: while it is good politicians are taking the threat seriously, it is unclear whether they are taking the right threat seriously. Is there a fear that in preparing for the big attack that never comes, smaller ones do, as the emphasis has been moved. Dr Majidi suggested it was all about the perception of scale. “Look at the case for Amerithrax,” he said. “This was a case with a number of people dead and a larger number that were exposed, which meant thousands of people had to take prophylaxis. The case cost a lot of money from the FBI and the national expenditure on the things we had to do post-2001. By those definitions it was a major event. Depending on how you count it, however, it could fall into any of the categories, such as a lone wolf

with access to limited amount of material. Was it a WMD attack? Absolutely. So even though it was an individual with small amounts of material, it had a significant impact. I am not saying we are seeing events of the same magnitude, but we are dealing with lone individuals taking on use of chem, bio and rad on a frequent basis – about a dozen times a year.”

Many of these cases can be found in the News pages of *CBRNe World*, and on the website, and the mass of them usually involve someone in a shed in the very middle of the Mid-West pulping castor beans, or storing hydrogen cyanide, or scraping smoke alarms, to send to his bank manager/governor/the UN/that guy who looked at me funny. These are dangerous individuals who are better behind bars, no doubt, but they are hardly the threat to world civilisation we are all expecting. Is it the case that the big nebulous plots get disrupted early (like the Barot plot in London), while the lone wolfs get (arguably) closer to fruition because there is either less network to intercept or because there are so many of them? “I wouldn’t say there are more lone wolves out there,” said AD Majidi. “But the information to work with CBR is quite prevalent on the Internet. You look at chat rooms, bulletin boards or generic information sources – there is a lot of information out there. WMD or CBR issues are nothing new; they have been around for decades. Recently we have begun classifying them as CBRNE – but in the past we worked with these things and classified them as either terrorist or criminal – they are nothing new.

“What we have seen is an increase in the number. That is down to a number of reasons. One is the availability of the



'Hmm, perhaps the veal is off.' The FBI responds to one CBRN incident a month ©FBI

information; another is the fact that more people are cognisant of using CB material to cause an additional level of anxiety for everyone involved. If you look over the past two decades, a number of shows you see on TV that have a sophisticated script move towards CBR issues to keep audiences' attention – it heightens the level of potential impact the materials might have. Overall I don't see it as anything we haven't dealt with significantly in the past; we are just more vigilant on how we go after it."

As many newspaper articles seek to remind us, it is not difficult to create a CBR device and, as long as the media portrays them as dangerous and the delinquents choose to spread the information of how to do it, then there will be a self-sustaining demand. The concern would be that it becomes "trendy" in the same macabre way that school shootings have; that instead of choosing to vent your angst with conventional weapons you choose to do it with non-conventional ones. Once that happens there is a good chance the column inches will give it the space to expand – as has been seen with cases of ricin and chlorine. "I hope that is not the case, but we can't second guess what might happen," said Dr Majidi. "We

focus on two things. Chem, bio, rad and nuke are going to be put in one basket called 'Stuff'; the ability to use it in a basket called 'Expertise'. So we focus on stuff and expertise. Every time there is a nexus of stuff being available and the expertise to use it, that provides concern for us, assuming the intent is not good. Two weeks ago we had a shooting in Alabama – a biology professor shot six of her colleagues. Would it be possible for an individual in her mindset to use something other than a handgun? Those are the things we worry about all the time. The fact that someone has an expertise, or access to material, does not mean they will use CBRN as a means of harming, whether it is spectacular or not. It takes a certain mindset to think I am going to have a spectacular effect, rather than I am going to harm people."

The Directorate itself has grown from being a team of approximately 30 people to one of 300 – and the expansion has not just been in personnel, but also in capability. The lessons learned from the Amerithrax case showed there was an urgent need for non-traditional forensics – the ability to gain evidence and information from the agent used. There are Hazmat Response Teams (for example) in 27 offices, with another five

to come. These teams range from eight people to 32, depending on the size of the office (New York, for example, is a 32). These provide expert analysis and train and equip the locals. The CB Sciences Unit has a team of 30 PhD scientists to provide sample analysis plans and to act as a conduit between the partner labs that handle specialist samples (such as ECBC) and the field operatives. The FBI has also opened a new WMD training facility in Quantico, as well as improving on their laboratory and expert analysis.

Many of these are central assets (admittedly a resource for local departments), but if there continues to be a prevalence of lone wolf attacks, which are locally orientated and dealt with, will there be a shift in the balance of investment down to the local offices? "You never know where the lone wolf is coming from," said Dr Majidi. "Simply because an individual, or a group of individuals, is focused on the use of CBRN doesn't imply it will be at the national or local level. Our focus is on prevention and looking at the modalities – 'stuff' and 'expertise'. This takes away the prejudice that it is going to be local or national, terrorist or individual, as you divorce yourself from who is going

Evidence for the Prosecution

to take part in activities and focus on expertise and materiel. Then, regardless of who is going to be doing it, you still have a handle on how you are going to chase it down, how you are going to develop CM and prevention approaches to identify potential impact.”

As well as their close links to other local assets, such as law enforcement, through the Joint Terrorism Task Force (JTTF), the FBI (along with other agencies such as the ATF) also has a lot of agents deployed in military theatres of operation – specifically Iraq and Afghanistan. While the FBI’s general focus is on counter-terrorism their speciality is forensics, so they have a wide variety of teams out in the field chasing down the forensics, both traditional and non-traditional, to see whether it can be tied into an individual or a facility. Or, as Dr Majidi puts it: “To make sure we are forward-leaning so when things show up in the homeland we have a better handle on what could come our way”.

Acting Section Chief Jack Salata went into more detail. “When we look at Afghanistan, which is a different outfit to Iraq, we are reading the intel and we have learned extremely valuable lessons since 9/11,” he said. “Especially when significant attacks have occurred, specifically in Madrid in 2003 and in London in 2005 – both the attack and the failed attack – and in 2006 with the plot against the airliners which was the most significant attack. These give us insight and put us down the track with the bad guys; how they are sending information through the Internet. Training and the ability to conduct an attack today means you don’t need to attend a camp; you just need to log on to a website.”

Another tool in the bag is the Infragard system, which links the FBI in with a wide variety of CBRN scientists in academia and industry. The system is set up to provide the non-FBI/DHS members with information/intelligence that allows them to protect their facilities and assets, and in return they provide the FBI with pertinent counter-terrorist information. Considering the past history of CBRN attacks, and the level of scientific skills needed to create an effective CBRN device, this would seem to be one of the

FBI’s most valuable early warning systems. “We are not singling out science,” said Dr Majidi. “The focus is ‘stuff’ and ‘expertise’; these can be got through the non-scientific community, and that is what we have seen. We are not singling out scientists; it is material of concern for us, and who has the access and the expertise with that materiel. It is more generic. If you look at James Cummings [Maine supremacist who hoarded radiological material], he was not a scientist; he was a white supremacist with access to material.

“If you look across many cases you find there are individuals who are non-scientists who gain access to material, but there are also scientists that gain access to material. Tools like Infragard are helpful; we get a multitude of leads from them and hunt them down. Most of them turn out to be irrelevant once we go through the process, but sometimes they end up as cases we worry about.”

Perhaps the biggest catalyst for lessons was the Amerithrax attacks, which forced the growth of a whole range of scientific skills and analysis. “That was it – that was the defining moment,” said Dr Majidi. “We had collected samples and evidence and then we had to sit back and say ‘We have lots of stuff; who can work with it?’ One of the challenges we had was that even simple routine activities such as taking digital photos of the evidence were exceptionally difficult, because routine digital cameras couldn’t capture quality pictures if they were put into biologically safe containers like gloveboxes. So how do we do that in the right way? We have developed the tools since then, but since we were working with bio we decided to do a comprehensive programme that did all CBRN issues.

“We generally deal with a lot of routine stuff; white powders and ricin has now become routine. Everything else becomes a one-of-a-kind research project – and we get a lot of one-of-a-kind. From a forensic point you can see it in the lab; over the last decade we have made great strides moving from a traditional to non-traditional forensic space. Traditional would be hair, fibre, fingerprints, DNA, trace and so on, while

non-traditional is things that are relevant to that modality. For rad, telling what it is – what the isotope ratio is and whether you can do age dating; for bio, can you do total genome, do you know the impurities, the mutation rate; for chem, do you know if it is a pesticide or a chemical agent and what type, and can you tell production sources?

“We look at all that stuff, but we do it in partnership with great agencies. All of this takes tremendous resources and our resources are spread through the US government, so we are partnered with expert labs throughout the country to do this type of work. We have a hub-and-spoke model; the FBI lab at Quantico act as a hub and we have lots of spoke labs – depending on what we are interested in we activate those labs. What we have added to that is that, along with the non-traditional forensics, every one of these facilities has an FBI individual trained to collect traditional forensic signature. So FBI agent lab officials are trained to work at a national lab, can suit up and go in the lab and collect traditional forensic signatures alongside lab officials collecting non-traditional forensics.”

The closing of the Amerithrax case, with the deceased Dr Ivins being the de facto culprit, has caused a certain amount of turbulence in the US CBRN science base. In part to deal with this, the Department of Justice and the FBI released their Investigative Summary (<http://www.justice.gov/amerithrax/docs/mx-investigative-summary.pdf>) and supplementary material (<http://foia.fbi.gov/foiaindex/amerithrax.htm>) on the case. The American Academy of Science is currently reviewing the science involved in the case, and it would be presumptuous, with the limited skillset in the office, to try and offer any dedicated appraisal of the science. Where the case does become turbid is in the motive. Dr Ivins never confessed to the case; he acted in many suspicious ways, but without the cross-examination in court it is difficult to find a motive hook to hang all the science on. There is no doubt Dr Ivins was in many respects a disturbed man (his poetry is clearly not up to Hallmark standards...). Certainly motives such as “life’s work destined for failure”, and “abandoned in his personal life”, do not mark him as particularly unique.

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com



Paul Boyé

TECHNOLOGIES

www.paulboye.com

THE GLOBAL RESPONSE TO CBRN THREATS

Detection - Individual Protection - Collective Protection
Decontamination - Medical Counter Measures - Training

Paul Boyé

1564 AVENUE DE LAGARDELLE
31810 LE VERNET - FRANCE

TEL: +33 (0)5 34 48 21 10 - FAX: +33 (0)5 34 48 21 15 - email: export@paulboye.com

Evidence for the Prosecution

In fact, none of this is unique. There are countless murder cases with similar circumstances; often when the case comes to court these aspects are examined and expert testimony builds on what is in the file. Without the court case, this aspect does look weaker than it might be. It must, therefore, be a bitter disappointment to Dr Majidi and the team that the case never went to court, that the science behind it wasn't publicly tested by opposition and that the motive behind it wasn't made apparent through his own testimony. Without these aspects the nay-sayers in the CBRN science world will always harbour doubts. "There will always be individuals who doubt the findings," agreed Dr Majidi. "I am sure that is going to be the case for a long time. In terms of the science, we have the National Academy of Science validating and reviewing the methodology used by us – not validating the result but the approach. We have other organisations looking at other aspects of the case, and those reports will be out in a short period of time. So, while we didn't get the chance to go forward and argue the case in a court of law, we are taking steps to make sure various portions of those cases are reviewed by other groups and individuals to provide another layer of confidence.

"This is disappointing to everyone engaged in the case, as well as people outside the FBI – the US community at large – as we didn't see this discussed in an open court and the ultimate resolution was not provided to everyone. As with any case that is not ultimately resolved in a court, there are always going to be questions, and we welcome them. What we have done because of the Amerithrax case is identify a whole series of lessons learned, such as how to deal with cases like this and what the significant issues that we have to cover are. The developments at the lab – and the existence of the Directorate itself – stem from findings of the Amerithrax case. So we have learned in a major way from that case. We would have liked to see it to its full conclusion, but we have done a lot to ensure future cases like that are dealt with in the spirit that I mentioned – with trained individuals, new capability and capacity that we did not have before."



The FBI do both conventional, and non-conventional, evidence analysis and collection ©FBI

In terms of the Academy report itself, Assistant Director Majidi was fairly sanguine. "It is up to the Academy," he said. "We will welcome any suggestions or findings that come from it. I will be surprised if I am surprised. The work we have done at the lab has had a series of scientific panels vetting it; it wasn't done in isolation. There were always one or two independent labs verifying their stuff."

Interested readers will be able to find out more on the FBI at the CBRNe Convergence conference in November 2010 in Orlando – where Dr Majidi will be speaking – as the FBI are one of our Supporting Partner Organisations. What, however, is the growth pattern for the FBI? Having been on a period of intensive growth for the past three years, is it time to consolidate, or is the threat such that further growth is needed? "We

are at a place where we feel quite comfortable with our span of control, with the training programme we have put in place, with the agent cadre and analyst cadre and also the support personnel," said Dr Majidi. "It meets the critical need for the foreseeable future, barring nothing major happening. There is a lot of learning to be gained through the whole process; there are things we do today we did not do 24 months ago. The Litvinenko case is a perfect example; who would have thought someone would have used polonium? It is through our interaction with the Metropolitan Police that we were able to develop those lessons learned, so if we do see a case like that happen we can operate with a basic understanding of how you deal with an individual exposed to polonium and what are the investigative leads you should look at."

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com



MAXIMUM

NBC HYDRATION

Maximum NBC protection with taste-free technology



CONVERTIBLE

NBC HYDRATION

NBC PROTECTION with the convenience of an everyday hydration system



WWW.SOURCE-MILITARY.COM

SOURCE[®]

phone: +972 4 8574 370 ext 230 | e-mail: military@source-vagabond.com

Visit SOURCE VAGABOND SYSTEMS at
CBW SYMPOSIUM, SWEDEN 2010 Booth No. B:23

ST53

VERSATILE PROTECTION
FOR SPECIAL OPERATIONS



ONE SOLUTION INCORPORATING
APR, SCBA & PAPR CAPABILITIES

Visit Avon Protection Systems at Counter Terror Expo 2010 stand Q14



AVON PROTECTION

t: +44 (0) 1225 896705

www.avon-protection.com

e: protection@avon-rubber.com

Major General Thomas Spoehr, Director of Force Development for the US Army, talks to Gwyn Winfield about the role for CBRN in future Army plans.

Force Projection

GW: we tend to be focused pretty far down the food chain in the magazine – which is the opposite end of your current posting. Perhaps the best way to start would be with a short overview of the post...

TS: It is called the Director of Force Development, and the core mission of the directorate is to build the Army's equipment investment programme over the next five years. We try and map out where the Army is going to go in terms of procurement, research, testing and evaluation. In the meantime, when we are not doing that, we work on the current equipment for the warfighter and the current equipping issues, write strategies for equipping and take care of near-term, urgent needs that might crop up in Iraq or Afghanistan. There are others that do that, but if it becomes a big effort, like equipping the surge of forces in Afghanistan, that was such an Army-level effort that we became involved making sure the kit was going to be there on the ground.

GW: The threat for the next five years has to be predicated on guesswork, so how much of it is fourth-generation – how much of it is all-in warfighting? How do you work out the balance of investment?

TS: The Army has become a full-spectrum operation: offence, defence, stability and civil support, with an emphasis lately on counter-insurgency. So, along with our

other domains, such as intelligence, we have moved CBRN defence into the area of counter-insurgency and threats to stability. So, although it has to keep a foot in offence and defence, it has moved into stability and civil support.

GW: Often within peace support there is also the “return to normality” mission, which crosses over into some of the Environmental and Industrial Health and Hygiene issues. For example in Fallujah, where they are suffering from post-natal mutagenic effects, perhaps caused by a hazmat incident. The ability to take samples in a combat environment, as Fallujah can be, and bring them back to the lab would seem to be a CBRN role...

TS: We have to be prepared to go where civilian contractors or Department of the Army civilians either can't or would rather not go. Until it stabilises to the point where you can step out and others can come in, that may be more professional, then we, the CBRN Corps, [MG Spoehr was previously Chief of the Chemical Corps – see CBRNe World Spring 2007] have to be able to fill in the stopgap. Once you can let a contract for health surveillance, for example, then someone can provide hazmat expertise

and you become are better off. That will be more effective and cost effective than an Army soldier.

GW: You have an extensive CBRN background. What does that provide for you in your current role?

TS: I tell folks that CBRN people are used to operating in other types of units – so even though we have CBRN units we don't spend much time in them. We get to see the other branches of the Army operate, and we get a lot of joint experience which means we don't come in with preconceptions of what Army functions might need more attention or resources. It gives you an ability to rise above it all and see where the Army should focus their efforts impartially. I tell folks that CBRN officers are some of the most versatile – and I am not suggesting that I am that way – but it gives them the ability to rise above it all and look across.

GW: In terms of that vision, is it a case of “commeth the threat, commeth the sector”? If we looked at the threat of ten years ago then the mixing of Force Development and CBRN might be more of a clash; previously the posting would have gone to armour or artillery, but now it is a nicer fit for CBRN...



©DoD

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

TS: I do think it is a nice fit and a trend that will continue – that CBRN officers operate in all sorts of environments they never used to be in. They were confined to their specific area, but now they are working on training the Iraqi army, or the Afghan Ministry of Interior and, because of the demand on the Army, you are seeing they are moving out of their traditional roles and into more diverse ones. That will pay off in the long run.

GW: One of the problems of dealing with the Quadrennial Defence Review (QDR) and other changes in the battlespace is that CBRN is often one of those things people like to take out because “We’ll never really need it”. Do you find, coming from a CBRN background, you are able to help and persuade people of the validity, or is it a hindrance as people expect you to say that?

TS: I haven’t had to, and that has been good news. The 2010 QDR continues the same emphasis on CBRN that the 2006 QDR did. It places it highly, talks a lot about protecting the homeland, and elevates CBRN to a higher level than it was in previous QDRs. So I have not had to do a lot of missionary work at the Army level; if you bring Army leaders a reasoned proposal for what you have to do you generally don’t have an uphill battle, and it is refreshing. So whether we are trying to equip the 20th Support Command or get a new detector or mask, then I have not had to forcefully say we have to do this based on my background. It has been able to stand on its own merits.

GW: Over time there have been varying calls for orthogonal detection – using non-CBRN detectors in a way that allows them to provide additional information. (For example, acoustic sensors can, in theory, tell whether there is a chemical or HE fill in shells being fired, and thermal imagers can, in theory, pick up the thermal signature of a biological plume). Previously there has not been anyone in a senior enough position to endorse orthogonal detection’s potential. Is that concept still there to be embraced or has technology moved on and made it redundant?

TS: I’ll speak for myself personally, as I don’t know where the Army or the DoD is on that concept. I have never been a big advocate of the thought of using traffic control or fire control radars and optics to do that. I have always thought it would be a bit fanciful that it would come together

and work like that – but what I am seeing is that our intelligence community is becoming better at fusing intel and putting together signals intelligence (sigint), human intelligence (humint) and electro optics and infra red (EO/IR) and imagery. So I don’t know that we will ever reach the situation we were thinking a couple of years ago where we could tie all these sensors together and get much better tipping and cueing. That is not one of my priorities, but the intel community is getting there on their own, and the CBRN world will be a consumer of that intelligence.

GW: Another area where there are big expectations is within future soldier technology. Where do you see the CBRN piece of that? Will it be the Natick “Power Ranger”, (beloved of PowerPoint) with chameleon chemically protected body armour, or something more sedate?

TS: The biggest advance you will see in the next five years – and in my world I talk only about things that are funded, as everything else is a “good idea” – is the Army’s huge funding aimed at connecting soldiers to the digital backbone. This will allow squad leaders, and maybe even fire team leaders, to be equipped with a networking radio, a computer, a heads-up display and the ability to make calculations and see a lot of things they were not able to see in the past. I can see huge application for that in the CBRN world: they can pull up reference tables, overlays of contamination, get warnings a lot more precise than we could in the past, etc. I am sure there are good people working on it, but we are just now being able to field the next-generation mask – the M50. I have heard there are efforts underway on the suit, but I don’t see us going into some advanced protective technology in the next five to seven years.

GW: One of the things QDR brought in was the need to look at novel chemical agents again. How much of that threat is shifting from the semi traditional chemicals – CWA and TICs – towards novichoks [See CBRNe World Summer 2009] and things like that?

TS: It has to be a balance. There is a belief the technology we are fielding does a fairly good job with the conventional agents that are in all the books, and now we need to spend a good portion of our research money on these new agents. So

you will see a shift, where the majority of our R&D will be looking at these new agents. It has always frustrated me when you get a new piece of equipment, like the ICAM or the mass spectrometer in the Fox, and find out how difficult it is to upgrade the library. We like to think it would be like an MP3 player – you could load a new pattern on there and it could detect it. But all that early generation architecture was closed; it required someone to unscrew it and put in a new thing. I would like to think all the current detectors have an upgradeable library.

GW: How much of a realistic threat is the biological, compared to the chemical? Especially the old fashioned BWA plume that needs stand-off detectors, samplers and point detectors, as opposed to a fourth-generation BW attacks involving adulteration of food and water that don’t need such trappings?

TS: Before the anthrax attacks I would have agreed with you. I am not willing to rule out anything now. That gentleman had access to high-speed knowledge and equipment and proved one person working alone could accomplish it. I am not convinced a large-scale release outside of a state actor is possible, but if you look at Iran or North Korea we still face a wide variety of threats. If I had to bet my money, I would bet on hazardous chemicals first, a point release of bio and then a tactical nuke. If I could only name three things, that would be the order.

GW: You have oversight of the National Guard element, and as far as CBRN is concerned the CSTs have been a major investment. What is their future?

TS: The Guard pretty much volunteered and encouraged the DoD for more of a role in Homeland Defence. We were on track to have three CBRN Consequence Management Response Forces (CCMRF), though we have moved away from that. We are now going to have ten Homeland Response Forces (HRFs), one in each FEMA region, and the National Guard will make up the preponderance of those. So there will probably be one active duty CCMRF, and the other two will be smaller and be command and control headquarters, which focus on command and control of other Army or DoD forces that come in to support later. We will rely on the ten HRFs to do the bulk of the quick response – so the National Guard will do more to defend the homeland.

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

Force Projection

GW: Will the CSTs support the HRFs? Are the HRFs in addition to or instead of the CSTs?

TS: The HRFs are in addition to the CSTs.

GW: So will the HRFs need to be able to deal with a single 10KT nuclear strike in the way that the CCMRFs are able to?

TS: I think so. It is not clear to me whether they will take the place of the CBRN Enhanced Response Force Package (CERFPs) or be in addition to them. I am not sure that that is decided, but these are going to be more codified than the CERFPs. The CERFPs always had an element of ad-hoc-ery to them, and these HRFs have been recognised in the QDR and accompanying planning documents.

GW: One active CCMRF, two other CCMRFs, ten HRFs, 17 CERFPs... What is the chain of command, and how is that relationship going to work...

TS: It is still to be worked out. Obviously on a day-to-day basis these Homeland Response Forces will be under the control of the governor of where they reside at that moment. Then there is an emergency. There are a number of options, and I don't know whether the DoD has come to grips with the command and control. If there was a hugely catastrophic loss of life, then it could be federalised and place the HRF under CCMRF, or some element of Northern Command (Northcom), but if it didn't warrant a huge Federal response

then it is possible the HRF could remain with a State status. But that detail is still to be worked out.

GW: QDR gives you a certain amount of visibility for planning, but how do you bring in innovation in force development? Does the five year time scale impose conservatism?

TS: Exactly. You don't want to get locked into a specific programme and put all your eggs into it, so I am trying to push them to think about buying more frequently and less of it. So if you buy out the entire requirement for a certain chemical detector and then next year, or the year after, a newer, better thing comes along, then you have wasted your opportunity. We are going to buy more frequently and take more advantage of what industry is producing.

GW: Doesn't this force you towards a Key Strategic Partner approach, or a Systems House as was used for FCS and FRES? So you buy a capability, rather than a piece of kit, such as a chemical detection capability...

TS: Another way to do it is to take a "set kit and outfit" approach. So we will write a requirement that says we want a set kit that contains a capability such as laser stand-off detection, hazmat vapours sensing, etc. Then we may entrust a Joint Program Manager under BG Jess Scarborough [Joint Programme Executive

Office for Chemical and Biological Defence] on an annual, or bi-annual basis and say "What is the best of the breed for hazmat vapour detection? I am going to replace it within set kits and outfits. I am going to put it in this set." This is as opposed to continuing to buy the same thing year after year. It plays hell with training as you have multiple flavours of equipment, but you are a much more capable force and you keep people engaged and they are reading magazines and seeing the exact kit they have.

GW: Training in the homeland is part of it, but a lot of the time in-theatre troops learn how to use kit through playing with it. Then, when they get rotated, there is not a hand-over, and the new unit goes through the same process. It is a bad way to learn, and it is this in-field transition that is the real challenge.

TS: It is, but I have a lot of faith in the American soldier. A lot of the soldiers you come across pick up the equipment, call the manufacturer, get a soldier's manual and just figure it out. It is the same way people don't usually get taught to use Word or Excel; they just figure it out.

GW: Anything to add?

TS: The U.S. Army must become more versatile in its materiel programs, rely more on commercial off the shelf items and decrease the time it takes to develop and field programs.



The US has to balance current conflict requirements with future ones ©DoD

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

Verify Respirators are Working Properly

- Separate tests for overall mask integrity, outlet valve, and drink tube
- Single head form fits most respirator types and sizes
- Accessory for the PORTACOUNT™ Respirator Fit Tester
- Integrated particle wand pinpoints leak locations
- Easy to use

To get a free brochure or further details please contact us:

TSI Incorporated
US-Toll Free: 1 800 874 2811

TSI Instruments Ltd.
UK-Tel: +44 (0) 149 4 459 200

Web: www.tsi.com E-mail: answersEU@tsi.com



Mask Integrity Test Accessory (MITA)



Eastern medicine

Colonel Dr Faizal Baharuddin, of the Malaysian Ministry of Defence, on building Malaysia's CBRN defence capability

The history of military medicine in Malaysia started when the British Military Medical Officers served in Malaya in 1933, but the Malaysian Armed Forces Health Services was not formally established until 1960. It was then known as the General Service Corps (Medical). The General Service Corps (Medical) was renamed as the Malaysian Medical and Dental Corps (MMDC) on 11 May 1967. The MMDC was awarded a Royal Charter on 7 June 1997, and the designation was changed to the Royal Medical and Dental Corps. The present Colonel in Chief is the Sultan of Perak, Sultan Azlan Muhibbuddin Shah ibni Al-Marhum Sultan Yussuf Izzuddin Shah Ghafarullahu-lah.

The Malaysian Armed Forces Health Services (MAFHS) has a tri-service role, providing healthcare to the army, navy and air force personnel. It also provides service to the families, veterans and civilians employed by the Ministry of Defence. The vision of the MAFHS is to become a world-class military health care service provider by delivering a fit, healthy and medically protected force, capable of delivering quality care everywhere. Its mission is to conserve the fighting strength of the MAF. In order to achieve the vision and mission,

a long-term strategic plan has been developed.

The MAFHS is headed by a director general with the rank of Lieutenant General. He is assisted by the Director of Medical Services, Director of Health Services, Director of Dental Services, Director of Pharmaceutical Services and other general, administrative logistic staff. There are presently three armed forces hospitals in the MAF, each providing between 150-200 beds. All these hospitals are well equipped with state-of-the-art diagnostic and therapeutic facilities. One of these hospitals also houses the Institute of Underwater and Hyperbaric Medicine which specialises in the treatment of diving-related injuries.

The provision of field medical support is undertaken by the Medical Battalion. It has in its inventory specialised modules on wheels which can be deployed within a very short time to areas of conflict. Any one of its three companies can be deployed independently to set up a forward hospital in support of a brigade or be grouped together to establish a field hospital to support a division. The forward or field hospital has all the necessary specialists and ancillary backup services and facilities, such as a

laboratory, blood bank, radiology, induction and resuscitation rooms and operating theatre, as well as dental and preventive medicine services.

Each infantry battalion has its own health centre. This facility provides primary care services such as maternal and child health services, preventive medical care, laboratory services and a ten-bedded ward. The medical staffs under command of the unit comprise a medical officer and several military and civilian paramedics.

Several dental centres are located in military camps at Brigade level. They are staffed by a Dental Team comprised of dental officers and dental auxiliaries. Dental services are also provided at the armed forces hospitals, the Medical Battalions and on board ships.

The Institute of Health Training is responsible for the training of doctors and medics in the armed forces. It conducts courses for staff nurses, military medical assistants, health assistants, operation theatre technicians, X-ray assistants, laboratory assistants, dental assistants and dental hygienists. It also conducts the Medical and Dental Officers Orientation Course.

In November 1996, the Institute of Underwater and Hyperbaric Medicine started its operation at the Naval Hospital in Lumut. Its primary role is to provide specialised services in hyperbaric medicine, and has since become the country's referral centre for diving-related injuries. To fulfil its educational role, the institute conducts several courses such as the International Diving

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

Performance



... leading supplier for integrated platforms

MM2:

- **Mobile Mass Spectrometer**

RAPID:

- **Stand-off detection for chemical agent clouds up to several kilometres**

Bruker Detection is the world leader for chemical, biological, radiological, nuclear and explosive detectors. This year we are proud to celebrate 30 years of development, engineering and manufacturing of easy to use and military hardened reliable detection equipment.

See us at DSA in Kuala Lumpur, April 19th – 22nd, 2010

Contact us for more details and a system demonstration! www.bruker-detection.com

Eastern medicine

Medical Officers Course, the Hyperbaric Chamber Management Course and the Basic Underwater Medicine Course.

The Institute of Aviation Medicine was established on 11 August 1976. It is equipped with a ten-man decompression chamber and an ejection seat training module, as well as facilities for mobile cardiac monitoring, radiation and noise level monitoring, disorientation trainer and other sophisticated hardware. The most recent addition to the institute is the latest generation high performance human centrifuge (HPHC) which provides G-tolerance training to local and foreign fighter pilots. This institute also conducts training for the astronauts in the Malaysian Space Program (ANGKASAWAN) which is run in collaboration with the Russian Federal Space Agency (RUSCOSMOS).

The MAFHS has a total strength of 3,689 personnel, comprising of 461 officers, 2,903 non-commissioned officers and 325 civilian medical personnel. The corps is comprised of doctors, dentists, veterinarians, pharmacists, nurses, psychologists, physiotherapists, dieticians, nutritionists and other related healthcare professionals. These personnel are trained locally and abroad in various clinical and non-clinical specialties.

Newly enlisted doctors have to undergo a month-long Medical and Dental Officers Orientation (MODOO) course. Besides this, they are also encouraged to attend other military courses such as the All Arms Tactic course, the Staff Duty course, the Staff College course and other related training programs.

MAFHS involvement in the civic action programme is aimed at assisting civilians in areas where access to health care is difficult. These programmes are also delivered during military operations to win the hearts and minds of the local population. The programme covers a wide spectrum of medical and dental services such as: outpatient medical treatment facilities; pre-hospital emergency care; inpatient facilities at Armed Forces Hospitals and Battalions Health Centers; surgical treatment and post-surgical care; obstetrics and gynaecology treatment including antenatal and postnatal care;

immunisation for infants, children and adolescents; dental treatment; and public health education.

The first participation of the MAFHS in the United Nations Peace Keeping Operation was in October 1960 at Leopoldville, Congo. Over the next four decades, the MAF Medical and Dental team participated in several peace-keeping missions, namely Cambodia, Somalia, Bosnia Herzegovina, Timor Leste, Western Sahara and Lebanon. Malaysia is fortunate to be situated in a naturally disaster-free zone. Within the past few years, however, several natural disasters had befallen its neighbours. The MAFHS provided humanitarian aid to the casualties of the tsunami in Aceh in December 2004 and the Battagram earthquake in 2006.

The MAFHS has been honoured by the Federation Internationale de l'Automobile (FIA) to be named the official healthcare provider of the Petronas Malaysian Formula One Grand Prix since 1999. To date, it is the only F1 Medical Organisation in the world to be awarded with the ISO 9001:2008 certification from COFRAC France, TGA German, SINCERT Italy, SIRIM Malaysia and UKAS United Kingdom.

The MAF medical team has also been given the responsibility of providing medical care at international sports events such as the World Motorcycle Grand Prix, the Commonwealth Games, Le tour de Langkawi International Cycling event, the International Cricket Council Trophy Tournament, the World Football Youth Cup and several other international and national events.

In order to ensure comprehensive force health protection for MAF troops, the MAFHS has underlined CBRNE Medical Defence Capability Development as a key initiative in its long-term strategic plan. This is based on medical intelligence of new trends in asymmetric warfare, accessibility and availability of biological production, re-emerging infectious diseases and recent advances in the field of biotechnology.

To cater for this important mission, the MAFHS has established the CBRNE Medical Defence Capability Development Program and Committee. The aim of this committee is to study the requirement and offer solutions based on the threat

assessed. Other responsibilities of the committee include studying and making recommendations on preparedness plans, evaluating policy, providing doctrinal consults, developing and building pharmaceutical stockpiles and evaluating technology (health and non health) related to the CBRNE environment.

The committee is headed by a CBRNE medicine lead expert, and consists of physicians of various background related to the CBRNE field such as public health, occupational health, emergency and trauma, infectious disease, pathology, internal medicine, anaesthesia, psychiatry and psychology. The capability will serve the purpose of homeland response and to ensure troops are operationally ready. This capability will augment the army engineers, navy and air force roles in their respective theatres of operations. At the national level, the capabilities developed will enhance the total health security framework and will ensure the Malaysian Government will be able to respond swiftly if ever the borders of Malaysia are threatened.

The Malaysian Armed Forces aims to enhance human capital management by developing competent and quality personnel. A Faculty of Medicine and Defence Health will soon be operating under the National Defence University of Malaysia. This faculty will offer a five-year medical degree programme which incorporates subjects of military importance such as disaster medicine, battlefield medicine, aviation medicine and underwater medicine in its curriculum. In future, this faculty hopes to offer the Postgraduate Diploma in Military Medicine and Master of Defence Health.

The new Armed Forces Hospital in Kuala Lumpur started operating in 2009. It will become the tertiary referral centre for the MAFHS, as well as the centre of excellence for disaster medicine. This hospital has a bed capacity of 332 and is equipped with the most technologically advanced medical equipment. The MAFHS has also embarked on a long-term strategic plan to achieve its vision and mission. It has adopted the Balance Score Card Management Strategic Tool to implement and monitor its development plan.

Lion

CBRN protective ensembles

Safety. Readiness. Identity.

Lion Apparel is a global leader in the provision of certified CBRN protective clothing. Its unique capability to deliver comprehensive peace of mind to any size of organisation is impressive. Lion supplies some of the world's leading agencies including the US Army, US Marine, Orlando Police Dept, Fire Dept City of New York, Northern Ireland FRS and Dutch Specialist Police. With a comprehensive arsenal of CBRN capability to meet every size of requirement, challenge Lion to find your perfect CBRN protection solution.

MT94
Multi- Threat
Garment



ERS
Extended
Response Suit



ICG
Improved
Chemical Garment



MIGZ3
Mass Incident
Garment



MiTE
One Piece
Ensemble



CB-XIT™ -
Turnout gear with
CBRN Protection



For more information
call (001) 937/898-1949,
email CBRN@lionapparel.com
or visit www.lionapparel.com

6450 Poe Avenue, Suite 300, Dayton OHIO 45414, USA.



innovative

T E S T P L A T F O R M S

/ ANTHROPOMETRIC, ARTICULATED TEST PLATFORMS /
/ BREATHING, SWEATING, MOVING HEAD FORMS /
/ SOFT POLYMER SKIN-LIKE SURFACE / RUNNING MANNEQUINS /

i-bodi - Provide intelligent solutions for industry,
first responders & government organisations.



Tel: +44 (0) 1280 815300 Email: info@i-bodi.com

www.i-bodi.com

Kevin Salim, a CBRN expert in Indonesia, offers a personal view of his country's threat and capability

Terrorists and CBRN in Indonesia

While the Indonesian president, Susilo Bambang Yudhoyono, was visiting Australia in March 2010, he received a report from the capital that the Indonesian Police had killed Dulmatin – a widely-sought terror suspect – in a raid in the outskirts of Jakarta. Dulmatin was a terrorist leader and one of several suicide bombings masterminds; he committed several acts of terror abroad, and the United States has offered \$10m for his capture. Dulmatin was suspected as a mastermind of the second Bali bombing on 12 October 2002, which killed 202 people (152 foreign nationals, including 88 Australians and 38 Indonesian citizens) and injured 240. He had been on the run for more than 15 years, and during his evasion suicide bombings occurred; his last action was the Marriot bombing in which the bombers were found shortly after the incident.

The Indonesian police and intelligence services were very professional and able to handle a variety of terrorist acts with great success. The question remains, however, over whether such achievements indicate there will be no more terrorist acts in Indonesia or any other countries. According to intelligence analysts, it was highly possible that Dulmatin and his colleagues had studied new strategies and techniques, as well as refining existing methods, due to improved interstate relations. They changed their strategies and methods of attack for at least two reasons. Firstly, there is a closer and more solid government relationship between countries – some of hardliners from developing countries are now supporting their government's moves to expand and extend their relations with developed countries. In

other words, the terrorists have lost their support from radical leaders. Secondly, as a consequence of these changes, they are also likely to change their tactics towards sabotage rather than brutal actions. The question is, what methods or equipment will they use for their actions?

CBRN is considered an ideal “tool” for sabotage. In many respects, the threat of these agents is akin to putting up a military sign that says: “Mines on the road”. It might be a hoax, but it will take time and money to check out. Also, the use of toxic industrial chemicals (TICs) is a relatively hassle-free way of getting a result; they are easily available and, if spilled/dispersed in sensitive locations, they can hamper local industry and commerce. There is also the chance of getting some form of agent into the food or water supply; again, this is likely to be discovered (eventually) and dealt with, but the threat of it appearing in people's homes places enormous strain on government infrastructure, such as the need to provide bottled water, etc.

Attention has been focused on the use of CBRN materials by terrorists since their use in Tokyo, the US and UK – and this will only rise. It is also well known that al-Qaeda and other international terrorist organisations have a keen interest in CBRN terrorism; the use of weapons of mass destruction and the theft of nuclear or other materials from facilities all over the world is thus a constant fear. In a CNN interview, US Secretary of State Hillary Clinton said weapons of mass destruction in the hands of an international terrorist are considered to be the largest threat faced by the United States today – even bigger than

the threat posed by a nuclear-armed Iran. She stated: “The biggest nightmare that many of us have is that one of these terrorist member organisations within this syndicate of terror will get their hands on a weapon of mass destruction.” In reference to the al-Qaeda network, Clinton noted: “They are, unfortunately, a very committed, clever, diabolical group of terrorists who are always looking for weaknesses and openings.” Does Dulmatin figure among the syndicates mentioned by Clinton? How far does Indonesia anticipate these threats?

During previous trips to Australia I met Robert Matthews, who has made a number of threat analyses on CBRN in Indonesia. According to him, the big problem in countering the CBRN threat is the characteristic of “dual use”, and the implementation of legal instruments is believed to be the best tool to counter this. This may be different when the material is in the hands of terrorists, however, since they don't care about either legal instruments or moral sanction; they don't even care about their own lives. In my opinion, there should be an integrated system to counter the misuse of these threats by applying some sort of device which can be used to detect possible misuse from the very beginning in order to provide an accurate early warning. In other words, legal instruments will not be effective without a detection system, and they will be even less useful when there is no awareness.

Unfortunately, the awareness of these dual use characteristics is still very low in Indonesia. In term of biosafety and biosecurity, for example, it has not been implemented well, even though there are four BSL-3 labs more

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com



With 17,000 islands in Indonesia there are a lot of places to hide ©iStock photo

and than 1,800 biological labs under the Ministry of Health. The role of the government in building and improving the capacity of preparedness against CBRN threats is considered very low; most training has been achieved via the contribution of foreign countries such as Canada, which have organised limited amounts of training in co-operation with the Jakarta Center for Law Enforcement Co-operation (JCLEC) and The Co-ordinating Ministry for Politics, Legal and Security Affairs. The first intermediate level training for the CBRN first responder was done in 2008, but with no guarantee that its trainees will be included in a responder team when an accident is occurs. The other training focused on the development of a response system against chemical weapons, which was held in Jakarta in January 2005 and at Surabaya in July

2005 and organised by the Organization for Prohibition of Chemical Weapons (OPCW). OPCW also contributed sets of individual protective equipment (IPE).

When placed in the context of Indonesia's geography, which consists of more than 17,000 islands with a population of more than 230 million, that training is still far from enough. At the same time, Indonesia is considered to be very vulnerable to CBRN attack due to the lack of security systems. It seems the government pays more attention to the non-technical systems. There are limited or insufficient physical CBRN detection systems. Biosafety and biosecurity practices, for instance, are very new to Indonesia.

With regards to awareness, it seems Indonesia (and even the rest of the world) have adopted a "passive" culture – we always needs an incident to increase our level of awareness and

to prompt us into necessary action. This is rarely the case for other threats – we would not wait until our house was in flames to get an appropriate awareness level of fire safety, for example. In the 1990s, a ranking official within the Indonesian government warned there will be a number of terror attacks in Indonesia in the coming years. At that time, not many people believed his statement. After several incidents occurred, however, that level of awareness finally started to increase. The terrorist in this case was using explosives. The question now is: do we need to wait for CBRN incidents to take place before appropriate awareness and readiness levels are reached? Now is the best time for Indonesia to start planning to establish an integrated CBRN detection and early warning system, as well as first responder team.

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

REGISTER TODAY

and benefit from an Early Bird Discount



CBRNe

CONVERGENCE

3rd Annual CBRNe World Conference and Exhibition

2-5 November 2010,

Rosen Plaza Hotel, Orlando, Florida



Growing closer, staying distinct: merging civilian and military response to CBRN and IED threats

Speakers confirmed to date include:

- ◆ **Brigadier General Les Smith**, Chief US Chemical Corps
- ◆ **Brigadier General Jess Scarbrough**, JPEO CBD
- ◆ **Lt. Col. Paulo Malizia**, Chief CBRN Division, Brazil
- ◆ **Dr Wahid Majidi**, Director WMD Directorate, FBI
- ◆ **Dr Christopher Barnett**, R&D Director, Genencor
- ◆ **Nayla Feghali**, Senior Technology Director, RS Decon
- ◆ **Supdt. Alan King**, CBRN Coordinator, Met Police, UK
- ◆ **Asst. Chief Michael McClary**, Las Vegas Metropolitan Police
- ◆ **Steven Pike**, Director, Argon Electronics
- ◆ **Dr Ron DeMeo**, President, Radiation Shield Technology
- ◆ **Lt. Col. Jaroslav Bartos**, Commander Afghanistan LRU, Czech Army
- ◆ **Chief Bob Ingram**, Fire Department New York
- ◆ **Dr Stefano Miorotti**, CBRN Expert, Cristanini
- ◆ **Dr Thomas Waytes**, VP Biodefense Operations, Emergent Biosolutions
- ◆ **Ori Ben Yehuda**, Senior Director for CBRN, Prime Ministers Office, Israel
- ◆ **Dr Jose Luis Sagripanti**, Edgewood Chemical and Biological Center
- ◆ **J.A. Miller**, Director of Strategy, Policy, SOCOM
- ◆ **Vil Mirzayanov**, Novel chemical agent expert
- ◆ **Dr Charles Call**, CEO ICx Mesosystems

Supporting partner organisation

FBI WMD Directorate



CBRNe Convergence: Unique Benefits

- Programme planned by Gwyn Winfield, Editor of *CBRNe World* magazine
- Expert speakers chosen from Europe, North America, South America, SE Asia and the Middle East, chosen for their insight and threat: allowing you shortcuts to best practice.
- Pre-Conference Workshop – title TBC
- *CBRNe World's* global brand, bringing delegates from over 30 countries together annually.
- Hear from the best civil and military organisations about how their recent attacks, exercises and research is improving their CBRN defence capability.
- Streamed sessions allow you to choose the presentations that fit the needs of your organisation.
- Poster presentations, so that you can appreciate some of the developments in science and technology
- Final day capability exercise – MORE SOON!
- Understand how you can bring civil and military forces together in such fields as CBRN, EOD and hazmat, to better prepare for the challenge.
- CBRNe exhibition of over 60 companies. Equip your organisation with some of the leading technology available
- Icebreaker and reception to allow you to maximize your networking potential.

Register online **NOW** at www.icbrnevents.com
or fill out the form overleaf and fax it to +44 (0) 1323 637777

REGISTER TODAY

and benefit from an Early Bird Discount

Exhibitors / Sponsors



GENENCOR[®]

A Danisco Division



**CRISTANINI CBRN
DECONTAMINATION SYSTEMS**

Exhibitors to date

Ahura Scientific



AVON
PROTECTION



GERMFREE



INTELAGARD



Paul Boyé
TECHNOLOGIES

PROEMIN

TEX SHIELD
CBRN PROTECTION



Diphr Measure Life ... Anywhere

To exhibit contact david.levitt@cbrneworld.com
or call +44 (0) 1962 889377

Ylva Larsson-Leufven from the Development Department of the Swedish National CBRN Defence Centre tells Gwyn Winfield about growing government interoperability and new roles

Growing closer, staying distinct...

GW: Has the setting up of the Swedish Civil Contingencies Agency (MSB) had an impact on the Swedish military? Does it mean that, with their consolidation, you either have less of a role or a more defined role which allows you to focus more on deployed operations?

YL: The setting up of the MSB has not had any real impact on the armed forces' role. As with other governmental agencies, they don't have the right to make decisions which impact on other agencies' business. The MSB role is more to co-ordinate and co-operate

resources in the public sector, in the area of rescue and aid contribution. Their responsibility is more about planning for the unforeseen, training civilian personnel, conducting exercises and co-ordinating procurement of equipment within the civilian sector.

The armed forces are still one of the agencies the MSB will co-operate with, especially in the areas of training and exercises. The armed forces have unique capabilities which could support other agencies in the public sector, for example in severe situations, accidents and catastrophes. The National CBRN

Defence Centre and the specialist CBRN units can offer support with CBRN specialists and unique CBRN equipment that is not found in the public sector.

GW: How has the CBRN Light Role Team concept developed? How are you balancing speed of response, from the deployed unit, with analytical confirmation from the mobile lab?

YL: The development of the CBRN Light Role Team originates from developing of methods for the CBRN Reconnaissance Squad and the CBRN Sampling Squad in the Swedish CBRN Company. It



The new Swedish recce system, based on a Patria XA-203 chassis ©Swedish CBRN Defence Centre

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

Protects against dust, NBC threats and cost explosions.



Dräger M48 EP NBC
Combined Filter for
vehicle filter systems

Dräger M48 EP™ NBC Combined Filter with replaceable dust pre-filter

It has been a part of standard equipment in military vehicles for decades: the M48 Combined Filter. The new M48 EP™ from Dräger, with certification according to NATO AEP54, doesn't just offer protection from NBC threats. It also protects your budget. Previously, if the particle filter was rendered ineffective as a result of excessive dust build-up, the entire combined filter had to be replaced. Even though the active carbon was still effective. However now, with the Dräger M48 EP™, featuring a separate dust pre-filter, you can save you this effort. If it is used up, simply replace it with a new, inexpensive pre-filter and significantly extend the service life of the combined filter. Lowering your expenses for operation, disposal and logistics of the NBC protection system. An investment calculated in safety for you.

ADDITIONAL INFORMATION AVAILABLE AT WWW.DRAEGER.COM/DEFENSE

Growing closer, staying distinct...

became obvious that tactical demands for a specialist CBRN reconnaissance unit, as a part of an early-entry force, required enhanced multipurpose capability at squad level.

Analysis of the methods indicated the sampling squad needed the same detection capability as the reconnaissance squad to fulfil its task. It also suggested that it is possible to diminish the number of personnel exposed to CBRN hazards if the reconnaissance squad have sampling capability. The synthesis of these elements has formed the CBRN Light Role Team and its capability. The squad is now a more independent, multi-role and flexible unit than the previous ones.

GW: CBRNe World has been developing the idea of a need for closer co-operation with environmental health and human hygiene professionals. Sweden's type of operational concept – peacekeeping – would seem to fit into this pattern closer than most. What steps are you taking to foster close ties between CBRN and environmental health?

YL: The range of capabilities and training for the CBRN Light Role Team and the CBRN Analytical Laboratory Team are expanded to include parts of the environmental industrial health hazards (EIHH) issue. In the CBRN Company there is one EIHH SME in the command and assessment team.

Our attitude is that the CBRN unit is an asset for the environmental and health professionals to collect data and information which can be processed for the benefit of the troops and the community in the area of operation when needed. Furthermore, the CBRN unit always looks into whether processed information can be dual-used for improvement of the environmental situation for the local community. In 2006/2007, the Swedish CBRN Company produced this type of dual-use information for KFOR to disseminate to local authorities. A similar operation was conducted in Afghanistan in 2009.

GW: Sweden is going to lead nation for the Nordic Battle Group (BG) in 2011. Are you planning for any special CBRN developments? Are there any large events, such as a G8 meeting, that you will be providing security for?

YL: Yes, Sweden will be lead nation for one of the EU battle groups in 2011, but Norway is responsible for the CBRN unit within the combat service support. So far we haven't had anything to do with the Norwegians other than support them with proposals concerning operational capability needs. For the moment they are training for the task on a national basis. In the autumn of 2010 there will be joint exercises during which we can get to know their capabilities.

There are no major events which the EUBG is planning to support. And, if there was, we couldn't use the BG "stand-by force", for such tasks without EU consent. The police are responsible for security at large events such as EU meetings. The police could also ask for support from the armed forces in case of extra ordinary situations.

GW: You have a major AFV/APC contract in 2010. What is the role of CBRN in that? Are you looking at specific CBRN recce systems, a devolved system, or is it going to be treated separately?

YL: There is no contract for a new special CBRN recce vehicle, but we are developing with SAAB Systems an automatic warning and reporting system – AVR – which can be shifted



The New Swedish Light Role Teams will have to liaise closely with civil responders
©L. Sandstrom

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

SCOTT®

RESPIRATORY PROTECTION



Solutions for Military Applications

Scott are specialists in the design and manufacture of respiratory protection equipment. They supply military customers with self-contained breathing apparatus, escape sets, airline breathing equipment and air purifying filters and masks across the globe. A comprehensive range of powered air purifying respirators for Civil Defence applications is also part of the Scott portfolio. Scott are at the cutting edge of respiratory protection technology, developing new products, providing the highest levels of protection, meeting latest operational requirements and standards. Visit www.scottsafety.com for details.

SCOTT®
HEALTH & SAFETY

United Kingdom

Tel: +44 (0)1695 711711

Email: scott.sales.uk@tycoint.com

Finland

Tel: +358 (0)6 3244 543 and -544

Email: scott.sales.fin@tycoint.com

www.scottsafety.com

WHEN CALLING, PLEASE QUOTE REF: CBRNE WORLD_MAR_2010

Growing closer, staying distinct...

between different platforms. The AVR system will use different sensor applications as point, mobile or remote detectors in a network. This will give a force commander the ability to have a CBRN common operational picture in near real-time in his area of responsibility. It also gives him the benefit to instant warning and alarm to every unit under his command when a CBRN incident occurs and is detected. Our previous procured CBRN reece vehicle, Patria XA-203, will be one of the first to have this system.

GW: There was a plan to build an indoor live agent training facility in Umea. Is that still the case? Is there any more detail available?

YL: The plan to build an indoor CBRN LAT facility at the National CBRN Defence Centre in Umea is still alive. All technical and architectural needs are defined and specified. The project has been delayed a couple of years due to reasons of economy and the ongoing transformation of the Swedish armed forces. The Swedish CBRN community – military and civilian – is longing for the facility. A facility like this would make it possible to train all year around independently from outdoor climate conditions. The specifications could very briefly be described as follows. The CBRN LAT will be housed under environmentally safe and controlled conditions. All functions will be contained under one roof, with approximately 3,000 square metres. There will be a control room to supervise and control all systems such as opening and closing doors, under/over pressure, observation cameras, detection/warning instruments, climate and so on. Mask-fitting will be available with particle counting equipment. There will be one larger training hall for up to 16 persons and/or one CBRN Recce APC, or two light armoured squad vehicles. There will also be one smaller training hall/clean room for more exclusive training and testing of equipment. It will be possible to change the temperature between +18 and +40 degrees centigrade, and humidity between 40 and 98 per cent in the training halls.

The facility will offer training with: live blister, nerve and TIC agents; non-harmful bio agents; and radioactive sources. There will also be changing-rooms, lines for personnel and equipment decontamination, automated contamination control, a medical emergency room and a lecture and audience hall in direct connection to training halls.

GW: What advantages are you getting out of the European CBRNE Centre? Are they able to provide anything to the military or is it purely civil. In 2008, Major Risberg was hoping that there might be some benefits, for example. Have these become apparent?

YL: The European CBRNE Centre within the University of Umea is a newly born institution, still under development, although they have managed to get several interesting EU and UN-sponsored CBRN projects. One clear example of that is the bio-inspector course for the UN, which the European CBRNE Centre arranged during spring 2009. The Swedish National CBRN Defence Centre supported with practical field exercises and training for the inspectors. The course turned out to be a success and will most probably be continued in the future. One of the most important benefits is that the establishment of the European CBRNE Centre means the CBRN network in Umea will be even stronger. The network consists of the Swedish National CBRN Defence Centre, the Swedish CBRN Defence Research Agency and the European CBRNE Centre. This strong network will help us all to work with CBRN defence issues from both a military and civilian angle at the same time. This will in the end give benefits to us all.

GW: Are you seeing a greater range of operations for the CBRN operators, such as narcotics and explosive labs in Afghanistan? Is this a threat you are planning for, or is it a distraction from core missions? Have you increased co-operation with SWEDEC and expanded the CBRN-EOD team?

YL: The topics of narcotic and the explosive have been identified. In the

framework of counter-IED, work is ongoing to enhance the capability in this direction. With their unique knowledge when it comes to sampling and analysis, CBRN operators and deployable CBRN field analytical labs will probably be involved. We have a project team working on this. There is currently a CBRN-EOD squad within the CBRN Coy, and we are working together with SWEDEC to increase its capability.

GW: What impact has the economic downturn in Europe had on the military CBRN capability? Are funding lines confirmed?

YL: So far we have ended up intact despite the economic downturn. Some minor adjustments in the procurement plan have been made for CBRN equipment. As you already know, a reduction of the armed forces' strength is in progress and consequently the need for equipment can be reduced. Luckily this means we will be able to supply the organisation with modern CBRN equipment once and for all.

GW: What are the current and future procurements for the Swedish Armed Forces? What are the priorities?

YL: The new CBRN concept for the Swedish armed forces outlines the need for a more active and comprehensive approach on CBRN countermeasures. The ongoing work within EDA Project Team CBRN Countermeasures is much alike. The concept emphasises the importance of prevention measure. Measures like intelligence analysis, risk assessments, information management and sensitive site reconnaissance and hazard elimination are pointed out. One of our most prioritised needs is a CBRN Functional Area Service (FAS) in the Swedish Command, Control and Information System (SWECCIS). Secondly, there is the AVR we referred to earlier, whose data is meant for the FAS. We also intend to obtain additional sensors for use by all services, and a new IPE system (mask and dress) together with a mask fitting system is in procurement. During this and next year, completion of CBRN equipment will be achieved for our specialised CBRN units.

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

The 10th International Symposium on Protection against Chemical and Biological Warfare Agents, in Stockholm in June, has long been a place to showcase new products, we offer some of them

CBW Symposium Preview

Smiths Detection are still finalizing their booth, but delegates will be able to see their Bio-ACT, advanced bio assessment and confirmatory technology, LCD-Nexus, a high performance CWA identifier and TICs detector and Hazmat 360, the latest incarnation of the portable chemical identifier with easy to check results software.

NBC Sys will have two of the products that they were exhibiting to the Asian market at Sispat. One of these is their Meerkat, RBC decontamination vehicle. Based on a Polaris 6x6 vehicle this is able to carry 200 litres of water, an electrical generator and all the devices needed for day or night decon – sprayers, nozzles, lighting, pumps.



Dare you ride the Meerkat? Simplex ©CBRNe World

Bruker Detection, a Division of Bruker Daltonics, meanwhile are celebrating their 30 years of business in CBRN detection equipment. They will introduce in Stockholm a range of new and improved products. For bio detection and identification the manufacturing version of the ePatox Toxin identifier will be introduced, while the increasing need for networked communications with point detectors will be addressed with a radio link between several RAID-XP systems based on a commercial handset solution. The highlight will be a platform solution for light role applications in CBRN detection based on a fully equipped Quad.



ICX's Rapidplex available to be seen on their stand ©ICX

ICx Technologies will be demonstrating on Stand B:14, their latest advancements in biothreat detection and identification. RapidPlex is a fully automated, man-portable system designed to detect and identify bacteria, viruses and toxins from environmental samples in as little as 10-15 minutes. RapidPlex provides simultaneous, multiplexed detection of protein and DNA/RNA markers through parallel antibody and nucleic acid-based assays while maintaining extremely low false alarm rates.

Those agencies looking to get their hands on the US' M53 will be pleased to visit Avon Protection's stand where they will be able to find the FM53. This is based on an unique shape that allows for the easy incorporation of a helmet interface, as well as a drinking system that is capable of drawing half a litre of water in three minutes for rehydration purposes. A range of accessories will also be shown, including robust and flexible visor attachments for high intensity light situations and extreme environments, and a voice projection unit that offers clear audible speech between operatives. The system will also be shown with their ST53 SCBA, which allows the user the ability to switch between positive and negative pressure at a flick of a lever.

Quicksilver Analytics, Stand C:24, will be showing their CBRE Sampling Kits, which are used by many US agencies – CSTs, Special Forces, Coast Guard and the CBRN School. These have been continually improved thanks to a Cooperative Research and Development Agreement with the US Army since 2000 and are guaranteed free of interferences. Assembled under 9001-2008 standards the kits come in a standard and bespoke design, based on customer requirements.

As well as copies of the magazine, and information on CBRNe Convergence, there will also be a boon to the weary traveller, CBRNe World will be offering their Toxic Avenger (4.5%) beer from their Stand on A24. If the Editor can also persuade David we will also have the 6% beer – Improvised Nuclear Device – which can induce somnolence in afternoon sessions. If beer is not to your taste then there will also be the R&D Team wine, this has come from a local vineyard in the South of France, and is sponsored by the clandestine International R&D Team – identify your local rep from the logos on the bottle!



CBRNe World gives you courage ©CBRNe World

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

CBRNe World travels to Indian Head to see the US Marine Corps' urban search and rescue facility for the hot zone

Close fitting wooden box

There is an adage in the British Army, and probably in many armies: "If it's not raining then it is not training". As time goes by you realise what a geo-centric view this is; there are many other climates that are equally as unpleasant as rain. Whether it is baking in the tunnels of the Lieutenant Terry facility in Fort Leonard Wood or the sun-drenched valleys of Nubich in Rieti, Italy, there is a wide variety of unpleasant weather in which to do CBRN training. These places have now been joined (in the minds of the *CBRNe World* office) by Indian Head (Maryland) or, to be more exact, the less charmingly named Stump Neck, at the tail end of some of the worst snow the east coast has seen in decades. We were there at the invite of CBIRF's Commanding Officer, Colonel John Pollock (see *CBRNe World* Winter 2008 for more information), to see their confined space training suite.

CBIRF continues to become more specialised and complex as an organisation. Imbued with the Marine spirit and drive, they have been tasked with a most painstaking and delicate mission (not attributes usually ascribed to Marines): that of getting inside collapsed structures in a contaminated environment, and getting wounded individuals out. As CBIRF become more specialised they become more difficult to pigeonhole – part critical emergency medicine, part technical rescue and extraction and part detection. As such, they lack both military and civilian corollaries (fire comes close, but CBIRF has nothing to do with fire fighting or traditional hazmat tasks). Even though they might not be a copy of any civilian forces, they work very closely with them, and CBIRF funds US fire departments to go to DRDC Suffield and experience the training facility there.

And it is not just fire department teams, but also hazmat, urban search and rescue (USAR) and emergency medical service (EMS) teams too – all in the name of furthering interoperability.

CBIRF works off a dual Incident Response Force (IRF) system, with each IRF having 150-personnel, all of them trained through the Ray Downey facility in Stump Neck. When CBIRF says all its personnel, it means *all* its personnel – everyone from the CO to the religious support team are trained to go into a collapsed, contaminated environment. Colonel Pollock admits historically there has been some veracity to the tag of "CBIRF will never leave DC" (Stump Neck being about 30 minutes' drive from DC), but now they have both IRFs stood up they had one IRF deployed while the other stays on station should it be needed in the Capitol region. Most recently, CBIRF was deployed to the US



Somewhere in there is a body... CBIRF have to do contaminated USAR ©CBRNe World

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

Cost effective and comprehensive instrumented CBRN simulation for classroom and field exercise training



Argon Electronics' PlumeSIM wide-area collective training system enables remote instructor management of our chemical and radiological simulator instruments under a fully configurable 'virtual plume', in real time, over user selected mapping. Instructors can now deliver detection instrument training for multiple personnel, in table-top classroom or field exercise modes, selecting the parameters for the activation of simulation instruments (including the type of threat, release/delivery of single and multiple sources, and a full range of environmental conditions), and record the actions of trainees for after action review from a single location .

For further information:

Argon Electronics LLP

Tel: +44 (0)1582 491616

Fax: +44 (0)1582 492780

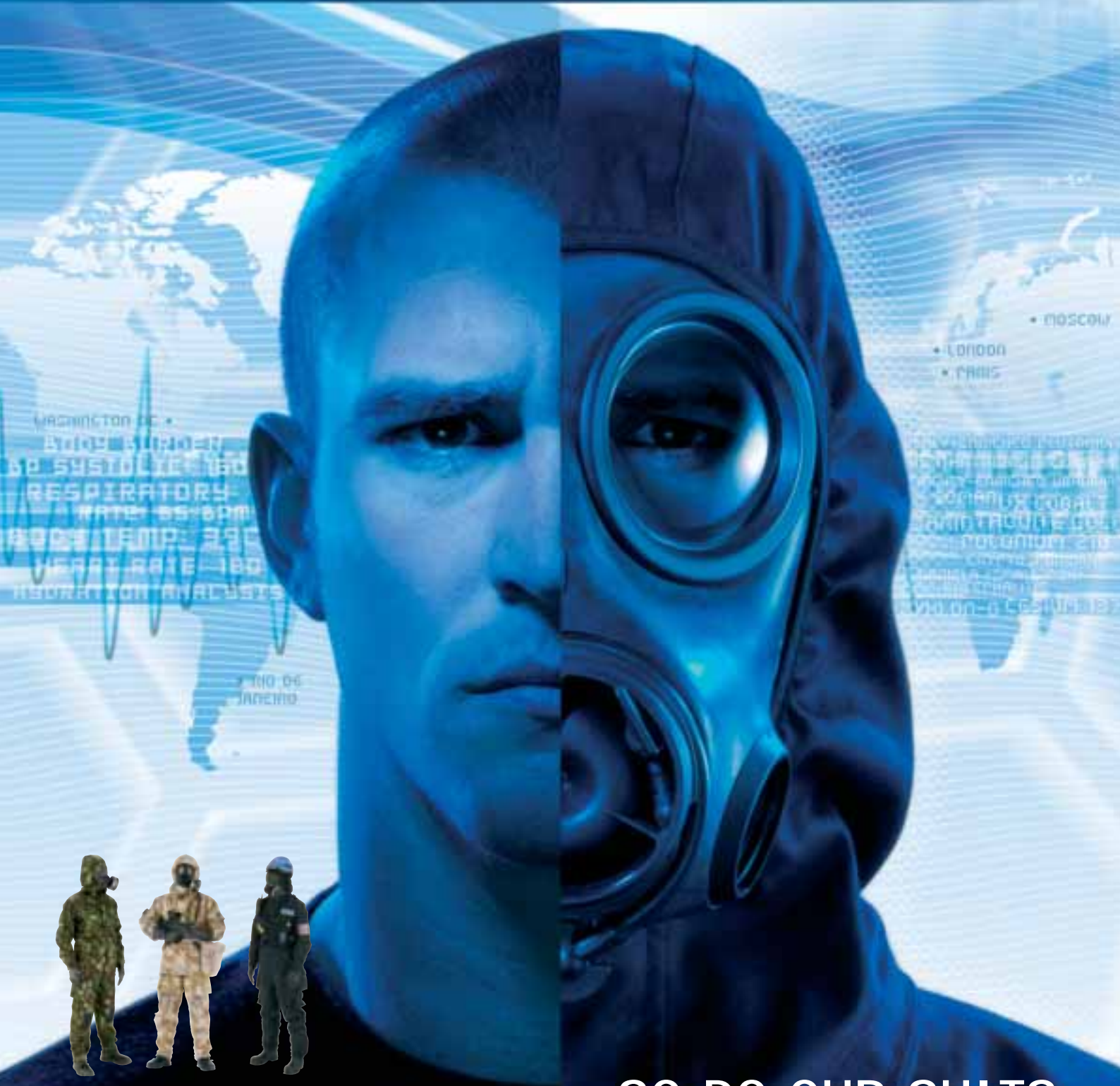
E-mail: sales@argonelectronics.com

www.argonelectronics.com

ARGON
ELECTRONICS

Visit Argon at the USAF Global Medical Readiness Symposium, Orlando, FL, 26-29 April 2010 and CBW 2010, Kistamassan, Stockholm, Sweden, 8-11 June 2010

FIRST RESPONDERS HAVE TO BE PREPARED FOR ANYTHING...



For expert and informed discussion on how to face your CBRN threat contact:

UK Tel: +44 (0)845 241 2990
Email: frontline@remploy.co.uk

USA Tel: +1 703 647 7404
Email: frontline@remploy.com

www.rememployfrontline.com

SO DO OUR SUITS

Remploy Frontline

SURVIVAL EVOLUTION

Close fitting wooden box

border with Canada to provide support for the Winter Olympics, should it be needed. "This was possible because there are two IRFs, both identical in capability," said Colonel Pollock. "We were therefore able to leave one IRF behind. We need to always keep one IRF on station at Indian Head, to keep it close to DC. This has meant we tend to stay put; not only did we not do Katrina or Haiti, but we didn't do 9/11 either. There is some disappointment amongst the Marines when they don't get to respond to things they feel are within our skill set, but we have a tightly focused mission, and we need to be true to that."

The Ray Downey Centre is not only an example of that tightly focused mission, but it is also alive with the ramifications and importance of it. Ray Downey was a FDNY Fire Chief who also happened to be an ex-Marine. When CBIRF was stood up it reached out to FDNY and Chief Downey persuaded a group of his peers to come down and teach the Marines for free. Chief Downey, like many others, answered the call of duty on 11 September 2001, and as a mark of respect CBIRF dedicated the centre to the fallen hero in 2004. Previously it had been a torpedo dismantling facility – most EOD centres, like CBRN, tend to be miles from anywhere – and when they took it on in 2000 the centre was abandoned. The whole facility has been custom built by Marines, with a great deal of expert help, within this shell, even down to Marines' power washing the rust from the beams.

The Centre runs both basic and advanced confined space courses and all graduates must navigate from basic through the advanced trainers. These involve tunnels of varying complexity in a blacked out respirator, so that the participant has to rely on his sense of touch. The basic course has a fixed destination and there is only one way to go – though there are sliding panels that can be swapped around, thus changing the size and angle of the holes that the participants have to squeeze through. As Colonel Pollock notes, this is a quick and simple way of finding everyone's claustrophobic level. The advanced trainers span a far wider range. The most basic of these are further tunnel systems, but with dead ends and floor drops, in which the supervisor releases a bar and the student drops three feet – all in a blacked out respirator. A stage above this is a room based on the sort of detritus left by earthquakes or floods, so the trainee has to find his way across a hugely cluttered living room. This is also done in a smoke-filled room, so an individual learns that if he deforms his respirator squeezing through gaps then agent/environment will get in.

At a stage above this are containerised houses where the trainees do a right handed search – so always working in a right handed direction, to ensure they eventually end back up where they started – and look to extract two dummies (again in blacked out respirators). The centre also does high-yield explosive scenarios where the students are taken out onto what is graphically termed "the rubble pile". Here they are expected to do



If you thought normal respirators were claustrophobic try a blacked out one in a smoke filled room! ©CBRNe World

CBRNe Convergence 2010, 2-5 November, Florida.

CoBRA SOFTWARE
FIRST RESPONDERS' FIRST CHOICE

THREE MORE REASONS WHY COBRA SOFTWARE IS THE FIRST CHOICE

- 1 WEB CoBRA:** provides access to a hosted WEB application version of CoBRA via any internet connection, and Blackberry
- 2 GIS Add-On:** advanced plume mapping display module for CoBRA Software
- 3 Enhanced Support Subscription:** allows users to network multiple CoBRA systems together for real time collaboration

FOR THE NEW BREED OF FIRST RESPONDER

Contact us today for more details at 877-233-5789
CoBRAsales@defensegp.com | www.cobrafirstresponder.com

Close fitting wooden box



CBIRF operate under either Level B or C, and use specialist DIM teams to ensure that they don't need Level A ©CBIRF

360-degree entry, find their way into two cars buried in the rubble and extract the two mannequins inside. At the highest level is the real collapsed building scenario, where CBIRF asks to be informed of any buildings that are about to be pulled down, inserts mannequins, and then when the building is pulled down sends in teams to shore and make safe the site and then send in the extraction teams.

While many of the scenarios are devised with Marine Corps experts, they also outreach to other experts in the field who have been through disasters like the Twin Towers or Oklahoma. "The scenarios generally come from other

disasters," said Colonel Pollock. "For example, Haiti and Chile offer different lessons in terms of the way the buildings were constructed – this has an impact on the way we approach them. We work with many expert contractors to get advanced training scenarios, so we work with people who went through 11 September 2001, etc"

As mentioned, CBIRF does not do fire. It is assumed any site they attend will have had fires dealt with, and if not they will not enter. Their standard entry procedure is in either Level B or C protection; they ruled out Level A on practical grounds – it is not really suited for squeezing through tight spaces –

and physical grounds – 45 minutes does not allow you to do a great deal of search or technical rescue. Level B does mean, however, that there might be problems if they are in an area where there might be pockets of high concentration. This is why all members of CBIRF, whatever their discipline, have to go through the confined space trainer; the detection team will go and locate areas of high concentration and then work out safe ways around them. The team members are all conditioned in training to drag non-ambulant victims out of the debris and over broken ground to the CBIRF (or supporting) medical staff. A great deal of effort goes into some of the engineering tasks, so Marines are taught to estimate the weight of blocks of cement – so that they can work out the forces needed to move or support them. They are also taught how to build a variety of shoring structures, both internal and external, from timber beams, and this has recently been augmented by a new, air-mobile, pneumatic system.

Urban Search and Rescue in the hot zone is a hugely specialist task. *CBRNe World* made numerous requests for interviews with civilian forces only to be told, "Mmmm, yes. Big problem that. Don't really have a solution for it..." It is therefore a task to benchmark the Ray Downey Facility. There are, of course, many USAR facilities around the world, and there is no doubt that, to many of them, the Downey facility would look fairly rustic. There is little emphasis on comfort or virtual reality; big rubble piles are the order of the day. The centre is clearly about work – dirty, dangerous, essential work. Indeed, with the relish only PT Instructors get when there is snow and bad weather, while we were there the Marines were being put through their paces in the confined space trainer, and enjoying the opportunity of dragging sleds around in the cold. As the QDR has put more emphasis on defence of the homeland, and the creation of the Homeland Response Forces (HRFs – see interview with MG Spoehr, P14) generates greater demand, it seems the requirement for CBIRF is only going to grow. It will be busy times for the Ray Downey Facility.

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

CBRN-IED Incident Commanders Course

An improvised explosive device containing CBRN material is a threat that is becoming increasingly likely. However, the mixture of both CBRN and explosives disposal expertise is difficult to find in a single responder.

The CBRN-IED Incident Commanders Course provides you with the knowledge and skills necessary to manage the multiple threats at a CBRN-IED incident and to combine the expertise of CBRN and bomb disposal specialists.

Developed for the European Defence Agency in 2009, the CBRN-IED Incident Commanders Course meets the needs of today's challenging CBRN environment.

Full details of the 2010 course:

<http://www.hotzonesolutions.com>

Topics include:

- *Threat analysis*
- *Device effects and outcome estimation*
- *Command, control and communication*
- *Identification of response options*
- *Development of a response plan*
- *Combining the skills of explosives disposal with CBRN*
- *Implementation of protective zones*
- *Onsite detection and monitoring*
- *Selection of protective clothing*
- *Approaches to render safe*
- *Evidence preservation*
- *Site safety*
- *Media management*
- *Incident termination*



LIVE AGENT TRAINING DEMONSTRATION EVENT October 2010

protection - detection - decontamination - reconnaissance - x-ray evaluation - sample collection - chemical analysis



Full details:

<http://www.hotzonesolutions.com>

Gwyn Winfield looks at the anthrax incidents that have been affecting drug users in Europe

MacThrax – or “The Scottish Pathogen”

The Amerithrax attacks, following in the shadow of the 9/11 attacks, had an impact a number of orders of magnitude higher than the actual deaths – five. Scotland (ten), England (one) and Germany (one) have suffered 12 deaths from Anthrax since December 2009, a fact that has remained below the radar of many news media outlets. This is primarily due to the nature of the incident, and also the type of people affected – no politicians gain votes from hand

wringing about a dozen dead drug users. While there was no doubt the 2001 attacks were malevolent, it does appear the European outbreak was largely benign in nature. Christmas Day 2009 saw the first of 26 heroin users in Scotland admitted to hospital. As opposed to the inhalation variety the US attack saw, all the victims – 26 in Scotland, three in England and one in Germany – in “Macthrax” suffered from an usual variety of skin, soft tissue and bloodstream infection, with

lesions around the injection site and high temperature and chills.

Some, but not all, of the heroin users were “poppers”, whereby the heroin is injected straight into muscle, rather than a vein, and this form of incubation in the body is positive to the generation of anthrax colonies. It is assumed that all the anthrax came from the same source, as cultures grown from the infected are all the same strain, yet this is where the definite end. Currently there has been



“Drugs can screw you up” has never been more true... ©Vetta

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com



IT'S TOO CRITICAL TO IGNORE

COMPREHENSIVE PROTECTION AGAINST TERROR THREATS TO CRITICAL INFRASTRUCTURE

Weapons of terror go beyond explosive devices. Sarin gas, hydrogen cyanide and anthrax have already been used in acts of terror. Now is the time to identify and address the vulnerabilities in mass transit infrastructure.

ThreatSense™ is the first affordable and practical chemical, biological and radiological/nuclear (CBRN) security solution for critical infrastructure, such as airports and rail systems. As a “detect-to-protect” system, ThreatSense uses a layered approach to counter aerosolized threats as well as the movement of radioactive sources while maintaining very low false alarm rates.

ThreatSense can be customized to address unique operational requirements to achieve affordable and effective CBRN threat detection and mitigation.

ThreatSense is currently optimized for, and deployed in, transportation infrastructure, including airports and subways.

Contact ICx Technologies at 1-877-692-2120 for more information or to arrange a tour of our airport demonstration site.

www.icxt.com

NEW THREATS.
NEW THINKING.®

icx™
technologies

MacThrax – or “The Scottish Pathogen”

no contaminated batch of heroin discovered, despite a number of seizures, and no senior-level drug users suppliers have been arrested – though several further down the “food chain” have been. As opposed to the US attacks, where the letters made it immediately apparent it was an attack, the fact that drug users were infected – and infected in their method of use – suggested it was more of a public health issue than terrorism. As such, the UK response has involved Health Protection Scotland and the Health Protection Agency first and police second in a joint investigation.

Dr Brian McCloskey, London Region Director of the HPA, described how they got involved. “The initial problem started in early December when doctors in Scotland started to see cases of unusual illness in heroin users in Scotland,” he said. “In the early stages it was not suspected that anthrax might be involved but as doctors pursued their investigations that diagnosis became a possibility. We provide the central reference service for anthrax diagnosis through our lab in Porton Down; they were contacted and offered advice about how they might diagnose and confirm it. After we saw a couple of cases in Glasgow, it became evident something significant was happening and the only logical explanation we can find – in the absence of any other possible source of anthrax – was that it must have come via the heroin supply. That was partly because the infection was particularly affecting the sites where the heroin injections were made. We also got involved in January when there was a further case in Germany, and a sample of the material grown from the patient in Germany was sent to Porton to be looked at. We confirmed that the bacillus anthracis bug from the German case is indistinguishable genetically from the strain in Scotland, suggesting that it comes from the same source.”

Yet heroin is not only “popped”; it is also smoked and snorted, which would not give the tell-tale lesions. So is it possible Victim One has not yet been diagnosed as an anthrax fatality, and has been shelved as suffering from one

of many other ailments – such as pneumonia – that routinely carry off drug users. “We don’t think so, but we can’t be certain,” said Dr McCloskey. “There is nobody we can see who had all the classical features of an anthrax infection. It is possible someone had inhalational anthrax or septicaemia or meningitic form and was misdiagnosed as an overdose, but I know Health Protection Scotland have thought about that and looked back for evidence of earlier cases, but not found any before the first one from early December.”

In fact, to the layman, it seems miraculous anthrax was diagnosed at all. Mid-December must be host to a wide range of drug users with “flu-like” symptoms, and sleeping rough will generally invite a range of unpleasant skin diseases and infections. Dr McCloskey agreed. “Yes, it is true, but we have over the years worked out protocols for strange or unusual disease presentations,” he said. “In medicine when faced with unusual illnesses we start by eliminating the obvious and then expanding the diagnostic net to less likely causes until, with luck, you find the right cause. In these cases anthrax was certainly in the “less likely” category but, when you start doing blood cultures – once you look down the microscope – you see something that looks strangely like anthrax and people start thinking about it. The death of the Scottish drummer in 2006, plus our case in 2007 where we had a similar case of anthrax in a drum maker, means we have a long association across the UK agencies with diagnosing and treating anthrax.”

Once you move out of the known facts – the users that have been infected – it becomes a great deal of conjecture. While the anthrax is the same strain, that is not to suggest it all comes from the same batch – it is extremely likely but not definite. Ninety three per cent of the heroin that hits the streets in the UK comes from Afghanistan, and the police have pretty good intelligence about the limited number of routes into the country that there are – through Turkey and the Balkans and across the channel into the UK. Most of it is via Afghanistan, and there is naturally

occurring anthrax in Afghanistan meaning potential for contamination of source – though it has not been seen in the UK before.

The police are working on their own intelligence – where it came from and the dealers – but this is not an easy process to trace back. They have done some chemical profiling, like DNA fingerprinting, to see which batches came from a common source, based on a common profile – which has been done for some time. This means that they can trace back different collections of heroin to see whether it came from the same heroin production plant originally. Essentially there are three ways this could have happened: anthrax contamination at source, anthrax contamination during smuggling and transit into the country – and the agencies did consider whether the anthrax came in an animal skin that might have been used to wrap the heroin and that is a viable path – or contamination when it was cut in the UK, or through Europe. The latter is less likely now; to get Germany, London, Glasgow and Blackpool you have to go fairly far back in the chain to get one source of heroin that would cover all of those. It is possible the heroin in Scotland has become difficult to sell now, because of their experience, and it has been offloaded into the rest of the UK. It could be the same batch coming from Scotland to London, but the general view is that it is more likely the contamination happened at source.

Currently, the two options seem to be that either skins were used to wrap the drug at some point, or that contaminated bone meal was used to “cut” the drug. When the interview was done with Dr McCloskey, the former suggestion seemed to be the favoured one; subsequently sources in other emergency services have suggested it is the latter, but there is no empiric proof.

What becomes apparent the more you talk to people about this is the unexpected nature of the incident. If it was an attack there would be some form of chatter to latch on to; the fact there was no motive or culprit means it is difficult to latch onto anything – no



WWW.NBC-SYS.COM
SALES@NBC-SYS.COM
PHONE: +33 (0)4.77.19.19.21
FAX: +33 (0)4.77.19.19.29



CBRNe 'NOVATION



KDTB GOLD®
FIELD BIOLOGICAL DETECTION

MEERKAT®
RBC DECONTAMINATION



VISIT US AT:

NATO INTERNATIONAL
CBRN DEFENCE WORKSHOP
23/24 MARCH - BOOTH #28
> BRUSSELS - BELGIUM

DSA
19-22 APRIL - HALL 2
> KUALA LUMPUR - MALAYSIA

IDEB
05-07 MAY
> BRATISLAVA - SLOVAKIA



TACTICAL OPERATIONS

conference & vendor show

September 19 - 24, 2010 | Pittsburgh, PA

Featured Courses:

Beyond Pipe Bombs: Understanding the Threat of Today's Bomb Makers
Multi-Assault, Counter-Terrorism Action Capabilities (MACTAC)
Current Trends in Terrorism

800.279.9127



www.ntoa.org

MacThrax – or “The Scottish Pathogen”

one knew they were selling contaminated drugs. If the drug was contaminated with skins then it is most likely it was while it was in its resinous state, as opposed to when it is the finished drug and usually poly-wrapped for transit. This would mean the spores would have had to survive the whole drug processing chain; Anthrax spores being as hardy as they are means this is possible, but not all the spores will have made it – it will have gone from a higher to lower state of contamination. The use of contaminated bone meal (one of the common cutting agents, apparently) is more problematic, as the amount of spores in the bone meal could have been high, and would have been added after the processing period – a more benign environment. Yet the amount of infected individuals has been low compared to the amount of heroin consumed, which would suggest the amount of spores in the entire batch is low – the fact that no contaminated heroin has been found is also adds corroboration to this.

Yet what has become of the contaminated heroin? At time of writing (1 March) there have been no more cases for two weeks, which suggests either the contaminated heroin has been destroyed, re-sold, stockpiled or used up. The first avenue is the most unlikely; not only are there solid commercial reasons why they would not do this (drugs killing people is hardly a new phenomenon) but they are not going to know which heroin is contaminated – meaning their commercial rationale will always beat health and safety. There is a chance the drugs have been resold; third world countries (and some second) are far less likely to notice anthrax outbreaks in drug users – especially if anthrax is endemic. The fact that there is still no way of knowing which heroin is contaminated, combined with the fact the heroin is parcelled out quickly after landing in its destination country, means there is only an outside chance the heroin could be dealt with in any bulk form. The final suggestion, that it has been used up, would seem to be the most likely and – bearing in mind the small number of infected – means that

the amount of spores per sachet is going to be small.

This is not to say that the problem has gone away; infected heroin could be in the drugs trade for a long time. Neither the anthrax nor the heroin will “go off” – which means the problem could reoccur, at varying levels, for a long time. Dr McCloskey agreed it was possible. “It’s hard to say since we have never seen this before,” he said. “We have had heroin use in the UK for a long time, and it has been shipped from Central Asia for a long time, but we have never seen a case of anthrax associated with drug use in the UK before last December. So we would be interested to work out why it has happened now, if there is something different – either in the way it was produced or handled – that produced this sudden spike. If there was, are we going to see it again, will it go away, or has something changed and it will be ongoing? Part of our problem will be determining when can we say it has gone away. If it disappears for six months, that doesn’t necessarily mean it has gone away – just that no-one has used that particular batch of heroin, so it might be that someone has stashed it or has bought it. The anthrax will still be viable for some time to come. We would like to find out where it came from, but I am not sure we ever will.”

The more that you look into the case, the more “who knows?!” confronts you. Sadly there are no shipping manifests, no production line quotas, ISO quality assurance or signed affidavits to fall on – and the realisation that infected drugs is the ideal vector for anthrax becomes apparent. It is a most unimpressive vector though; anthrax has no contagion, and as such will only target heroin users – hardly a pillar of society. What is important is this has been a “dry run” – it is a benign release – for a wide range of contingency measures. It improves links between UK/Scotland and the wider world (other law enforcement agencies have expressed interest, links between health and law enforcement, between law enforcement and the user community and between the scientific community. It has also allowed the scenario – which

other individuals involved in “red-teaming” had posited as a potential – to be viewed objectively and countermeasures planned. “It has allowed us to rehearse the systems we would have to put in place if there was another accidental or deliberate release in this form,” said Dr McCloskey. “So we have tested our capacity to get specimens around the country into the lab, to handle and process them quickly and come to definite conclusions. It would be the same system if it was something more than contaminated heroin.

“It also means we have done a lot of work between ourselves, Health Protection Scotland and Center for Disease Control (CDC) in the US to make sure we have the right protocols in place for investigation, diagnosis and treatment. We have also been through the anthrax information websites and taken those up to date with good clinical guidelines; we know how to talk clinicians through what to do and what is the best treatment. We will get feedback on the value of the immunoglobulin [that has been prescribed to the victims], along with CDC, so we will have tested and refined the systems.”

The health protection agencies’ determination to treat this as a public health issue must also be viewed as a success. There has not been the media outcry – “Who will be next in killer contamination? Do you know where your children are?” – that you associate with anthrax. Instead, the various departments have worked closely with each other, said largely the same thing to the media (the most important being – “It is not an attack!”) and just got on with the job. When you look at the results of the chlorine attacks, the first attacks were followed by a series of copycat incidents, and there is no doubt that red force has watched the proceedings with interest and disappointment. It cannot be hard to contaminate drugs with anthrax if you are in an area with endemic anthrax (and have the ability to withstand the drug cartels ire), yet seeing the cool and professional way it was dealt with must mean that a return to the drawing board is needed.

Paul Benda, Director of the CBRNE Directorate within the Pentagon Force Protection Agency,* tells Gwyn Winfield about their findings from their mass biological decontamination exercise

(*Paul was interviewed in 2009 while still employed by PFPA – he is now with DHS)

...A little rain must fall

As you might expect, the Pentagon runs a lot of exercises. Any attack on the Pentagon is going to see a wide range of assets deployed and, while the aim of this exercise was to test multi-agency interoperability and the panoply of stand-off detectors that the Pentagon fields (for more information see *CBRNe World* Spring 2009), much of the effort was aimed at fine tuning procedures: what percentage difference do decon tents make; do rings, watches and glasses need to come off; and, most importantly, do people need to bare all? All of the standards for biological and radiological decontamination have been passed down from chemical decon, which is a far higher standard – and previously have been followed because “it’s better to be safe than sorry”. One of the other elements measured in the exercise was the effect rotor downwash would have on the area and the helicopter, and what impact wetting down the area would have.

This exercise was a follow on from a 2007 exercise in which a dry powder had been used that was still being detected weeks after the exercise. This time, the agency wanted to run a wet agent through, to see what impact that had. It was dispersed from a commercial vehicle by a blower system, which plastered the car park and the Pentagon building itself. Much of this is not new; volunteers are often dusted, or puffed, with a UV luminescent powder before they go into decon so their level of cleanliness can be assessed after – yet this doesn’t entail slopping a massive area with simulant.

Mr Benda agreed that that dusting is the usual method, but that it wasn’t acceptable for this exercise. “That doesn’t give realistic contamination of people,” he said. “The idea of the exercise was to have an integrated decon exercise. The point was to simulate a realistic biological attack using the release of bacteria in the multi-kilogramme range – to contaminate the test field, the volunteers and our landing zone for helicopter operations. We would then be able to figure out how contaminated our personnel got from that kind of release, and test our mass decon process using both standard mass decon, with fire engines squirting water, and normal tent scrub down decon with the National Medical Response Teams. We also wanted to see the differences from our release in 2007, where we saw no re-aerosolisation an hour after our release; it hit the ground and didn’t come up again. The exercise in 2007 used a non-fluid release, so the idea for this one was for a fluid release during which we could look at re-

aerosolisation and run helicopter ops. We would run these if we were doing contingency operations to get people out of the region, and we wanted to find out if they would cause re-aerosolisation. So we had them come into the parking lot to test whether we saw re-aerosolisation and whether, post-event, people got dirty getting to the helicopter with the prop wash. Then we had them land again when we sprayed the landing zone (LZ) with water to try and stop that re-aerosolisation effect.”

So what were the results? “What was really interesting was that the fluidisation makes a huge difference, as we saw re-aerosolisation up to four days later from normal driving and things,” said Paul Benda. “We saw the helicopters cause a lot of re-

RSDL[®]

REACTIVE SKIN DECONTAMINATION LOTION

FAST • EFFECTIVE • SAFE on SKIN

When this is your day job,

**make sure you take
all your weapons
with you.**

**THE FIRST LINE OF DEFENSE
FOR THOSE WHO SERVE**

RSDL[™] Removes Or Neutralizes all known Chemical Warfare Agents

The ONLY Skin Decontamination Lotion:

- Designed to be Carried by Military and First Responders Worldwide
- Tested and Proven Effective by the U.S. DoD and Multiple NATO Militaries
 - Cleared by the U.S. FDA, European CE and Australian TGA
- Decontaminates Known Chemical Warfare Agents Within 2 Minutes



1.888.RSD.econ (+1.888.773.3266) • www.RSDecon.com

RSDecon 107 College Road East, Princeton, NJ 08540 U.S.A. •

Telephone +1.888.RSD.econ (+1.888.773.3266) Fax: +1.516.302.2904

RSDecon is a Business unit of Bracco Diagnostics Inc. © 2009 RSDecon. All rights reserved.

...A little rain must fall

aerosolisation, so people got dirty getting back on the helicopter. We don't have any information yet on how dirty the helicopters became, or the pilot. We found that our personnel were more contaminated, surface wise, in 2007, rather than 2009. So we think the lack of fluidation in 2007 made it more sticky, and it stuck to the people better; we didn't see that in 2009. That is one of the things you can't see with the puffer; it only comes out when you do the 'real' thing."

There are very few occasions when anyone would want to land a helicopter in a contaminated LZ – maybe only during apocalyptic warfighting ops when everywhere is assumed to be dirty and no-one is worried about decontamination, or high-value target extraction where the cost of the helicopter is nothing compared to the individual – so there have been few unclassified tests. Clearly the helicopter is going to get dirty, but what about the LZ and the surrounding area? Does the rotor wash effectively air-wash the area, so that each time the chopper comes in it cleans it, or is it the case that the agent just recirculates and settles again, so the reduction is minimal? Mr Benda admitted the testing of the LZ hadn't been very comprehensive. "We didn't have that many choppers," he said. "We did one test with the initial landing, and then a second when we wetted it down. My guess is it would gradually come down; first there would be an enormous spike, with a lot of things being kicked up, and then reduced from there."

The event itself was moderate in scale, with 80 volunteers being "decontaminated" by a variety of agencies, including Arlington County Fire Department and the National Medical Response Team. Since there was such a scrutiny of post-decontamination cleanliness, had there been a fall-off in the quality as the exercise had gone on, as teams got tired and the novelty wore off? "No, we didn't see that," said Paul Benda. "What was interesting was comparing the gold standard of going through the tent – the soap and the scrubbing down – with the fire trucks and the wall of water. The latter turned out to be as effective, if not a little bit better, for the fire trucks. All this money that is invested in these mass decon tents is probably just a waste of money; they can just set up a mass decon line with some fire trucks – though there is the cold weather issue."



Huge strides have been made in an integrated protection system since 2001 ©DoD

While this is the case for biological agents, thickened chemical agents would still require a more comprehensive approach. This was perhaps the major outcome of this exercise – to force people to think about decontamination as an individual process rather than a one-size-fits-all solution. One of the areas in which the exercise looked again at an old problem concerned the need to entirely disrobe. Chemical decontamination, especially mustard, makes it essential that victims be stripped off entirely, to ensure the genital area is clean. Because that is what we do for chemical, we do it for everything else too. PFFPA wanted to test whether this was, in a mass-decontamination environment, strictly necessary. "We wanted to see whether they could keep their undergarments on, so we swabbed inside the swim suit strap for women, and for men inside their waistband, and we really saw no significant contamination remaining. So, for bio, they could leave their undergarments on. We let them go through with watches, rings and eyeglasses and tested the level of contamination remaining and there was no residual risk; you could leave those on in a bio event."

Clearly the next logical stage of the process is to evaluate exactly which type of underwear offers the highest protection for a bio attack! As attractive as the idea might be in the office of *CBRNe World*, it is most definitely not the next stage in PFFPA's exercise programme, however. Mr Benda outlined the plan for future events. "If we do this again, what I would like to do is wet down our entire test field – the parking lot and Pentagon, and see whether that stops the re-aerosolisation effort," he said. "If you have a large-scale bio attack, and want to

evacuate people, can we bring in fire trucks to hose the area down, thus allowing me to more safely evacuate people without using PPE? That would be one question, and we still need to analyse the data. We have 80 per cent done, and after that we might have more questions."

One of the problems of outside spraying, as opposed to tents, is the collection of contaminated water which poses a threat to life, and also (in terms of anthrax) to the environment. So what system did PFFPA utilise in their hasty decon to ensure the threat was minimised? "For large-scale, outside releases, we don't try to collect the run-off; the whole area is assumed to be contaminated," said Mr Benda. "That is one of the questions: do they create a hazard when they get sprayed with the water? It is a hard thing to measure. In a real event we are not going to worry; we will try and minimise it, but there are dirty people so we know there is hazard. Does that hazard expand when they get sprayed with water? We don't know yet."

With a bi-annual cycle, it will be interesting to see what shape the 2011 exercise will have, but one thing is certain: it won't be anything as mundane as chemical decon. As Paul Benda said, "People know how to do chemical decontamination; there are standard procedures in place and you need to do it quickly or they will die!"

Paul Benda has subsequently moved to the Department of Homeland Security as the Chief of Staff for the Under Secretary of Science and Technology, so with the new Director there will, inevitably, be a new focus. With the threat to the Pentagon not abating, it will also have to be something above of the norm.

CRISTANINI CBRN DECONTAMINATION SYSTEMS



A5009

CONFORM TO THE QUALITY SYSTEM STANDARD AQAP 2110
and ISO 9001:2008



DEPLOYABLE CBRN
ANALYTICAL
LABORATORY (STANAG 4632)



DDMAS LARGE SCALE
DECONTAMINATION SYSTEM
HIGHLY DEPLOYABLE



DEPLOYABLE BIO LABORATORY
CLASS III BIO SECURITY LEVEL



DDMAS LARGE SCALE
DECONTAMINATION SYSTEM
DUAL OPERATORS



RI/CBRN TRAILER FOR CBRN
DECONTAMINATION AND
DETOXIFICATION



MOBILE SYSTEM FOR
AIRCRAFT DECONTAMINATION



TSDM-TACTICAL STEAM
DECON MODULE



SANJET C 1126 HR CBRN DUAL
OPERATOR DECONTAMINATION
AND DETOXIFICATION GROUP



SX34 CBRN DECONTAMINATION
OF SENSITIVE EQUIPMENT
AND SURFACES



CBRN PRODUCTION LINE

**ONLY ONE PERSON
ONLY ONE MACHINE
ONLY ONE PRODUCT**



CRISTANINI

37010 RIVOLI - VERONA - ITALY

Tel. +39-045-6269400 - Fax +39-045-6269411
cristanini@cristanini.it - www.cristanini.com

CBRN World looks at some of the approaches being taken to contamination detection

Out, damn'd spot

In contamination detection, the finding of the invisible is the key to detection. While some elements of CBRN – such as radiological material – lend themselves to it, others do not. Biological and chemical sources tend to fall in the middle; once they become easy to detect it is too late. Currently, for the militarily pragmatic, decon tends to fall into the “We’ll just lock it away and nobody need ever see it again” category, yet as usage shifts from state to terrorist and from in-theatre to at-home, this is less and less an option.

There are improvements in decon solutions – companies such as Genencor and Kaercher are working on new formulations – yet none of these can offer 100 per cent guarantees. Tactics, techniques and procedures are being developed to overcome some of these issues, and to lower the risk, yet they are only managing the problem, not solving it. The ability to see not only the position, but also the concentration, of the agent is key; once activity can be focused and efficacy measured, the issue of “how clean is clean” that has bedevilled CBRN minds can be relegated to the history books.

The problem is largely one of time and area; if a chemical agent has been adsorbed by paint or other materials then even though it is not giving off

vapour that can be easily detected by sensor technology it might, in the case of chemical contamination, still pose a threat to life through contact contamination. For most of the biological agents (anthrax excepted) unless there is a pressing need for an asset or capability, Mother Nature will provide all the decontamination necessary. This is also true, to an extent, for chemical agents, but the widespread, concentrated and immediate danger to life or health values of chemical agents means this is not a practical solution. Agents pose an even greater risk once they have been thickened, and for many the race to discover a solution to chemical contamination detection is the only race worth winning.

Colour me well!

One company that feels it has a solution to this problem is ICx Technologies, and specifically its Agentase line of products. Over the past five years, ICx had been buying up innovative products and companies; of all of them, Agentase’s recent project, their Disclosure Spray might – if it can work well, and cheaply, enough – be the one product that drives CBRN strategy and doctrine, as opposed to merely tactics. “There are three formulations of the disclosure spray,” said Dr Keith LeJeune, General Manager

of Chem Bio Business Operations at ICx. “One targets a benign simulant chemical that we use for exercise and training purposes; another is targeted towards nerve agents, and a third is targeted towards blister agents. Each formulation works in the same way: it starts off as a dry powder that is dissolved in water within a two-stage applicator. The applicator has two reservoirs, one for component A and one for B and they mix in the nozzle when they leave the sprayer. That solution gets deposited onto the surface and there is a local colour change in the presence of the particular chemical to which your formulation is targeted.”

In layman’s terms, at some point in the decon line an operative sprays the contaminated item, and wherever the liquid touches agent it changes colour, so that the operator knows decontamination fluid needs to be applied to this area. This colour change drives the whole basis of decontamination – why clean the whole vehicle/item when you can just clean the affected area? How do you know whether it is clean once it has been through the decon line? The doctrine would need to keep up. Does the decon line spray the whole vehicle prior to decon – to see whether it is contaminated – and then spray it again after to make sure it is clean? Or do you just spray it after decon

CBRN Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com



038 · © composite communication · 0210

Systems for Systems.^{by OWR}

CBRNe threats are directly aimed at people, public life, the most sensitive parts of civil services and military structures.

With a precautionary approach and technical readiness, threats created by terrorist violence or the impact of an attack by the enemy can be limited or even avoided.

With highly mobile user optimized system solutions we help protect the people and the environment and secure the success of peacekeeping operations.

Out, damn'd spot

to see whether it is clean and assume it is contaminated until decontaminated? It would clearly make good business sense for ICx if it was a two step application – and for small-scale releases it is probably the sensible thing to do – but if an entire battlegroup is assumed to be dirty it is an expensive and time consuming way of cleaning them. “Through the use of the disclosure spray with some of our other sensors, we have seen that the decon process is not always completely successful in removing agent contamination from all the intricate surfaces that might be present,” said Dr. LeJeune. “So we envision using the disclosure spray both at the front of the decon line and behind it. The advantage of using it pre-decon is it allows you to focus scrubbing and those types of efforts on areas where contamination is at its highest level. You can use the spray as a decontamination verification tool as well but, in our testing, the efficiency of the process was greatly enhanced by the use of the disclosure spray in front of the decon, both in terms of time and logistics as well as the efficiency of removing the contamination being targeted.”

The detoxification element of decontamination, especially in regards to organophosphates, might mean the agent stops being something highly lethal like VX and becomes something less lethal/dangerous like malathion. Does the disclosure spray therefore target only the exact structure of the agent – so that when it shifts it thinks it is “clean” – or does it target key elements of the chemical structure that remain inherent in all the byproducts? Equally, do certain decontaminant chemicals, that are powerful agents in their own right, end up either providing too much noise for the signal to get out, or have their own reaction with the disclosure spray? “If you have residual decontaminant in significant amounts when you attempt to use disclosure, then the spray will not work,” said Dr. LeJeune. “Many of the decontaminants are based on potent oxidants, and you would oxidise the indicator dyes that are in the spray itself, so a solution that would otherwise be yellow or red turns clear. This in effect tells you the surface is not compatible with the disclosure spray test. When we have done work with

decon processes that use a clean water rinse as they leave the decon line, then that is enough to drive down the presence of residual decontaminants so the disclosure spray can now accommodate them. So gross amounts of decontaminants on the surface is not compatible with any of the formulations of the disclosure spray we have. The clean water rinse does facilitate the use of the spray, however.”

Yet there is still the concern that if the agent is of a low enough purity – as was the case in Tokyo – it might not have enough active elements to start the colourmetric change – or that it has been detoxified to an extent that it is no longer pure. So is there a tipping point where the enzyme will start to work – a binary reaction – or is it graduated so that 90 per cent sarin gives a stronger signal than 30 per cent sarin? “There are limits to what we are able to detect with the disclosure spray on any chemical agent,” said Dr. LeJeune. “So there could be low levels of chemical agent remaining on the surface and we read it as being clean. In most of the agent testing that has been done the limits of detection which have been achieved have been lower than those levels that represent a contact hazard. Are there chemicals in the environment that could impact the overall sensitivity of the disclosure spray in detecting a particular threat? The answer is yes, and we are in the process of identifying what those interferences might be and trying to improve the formulation to account for those interactions.”

The spray gun is currently a fairly unsophisticated mechanism for mixing the two components and spraying them onto the subject. Yet, as anyone who has used any of the commercial versions of these sprayers knows, they can suffer from clogs and this can mean you get an uneven dispersal of the solution. How much of an impact does this have? “That can be an issue if you have clogging in one of the sides of the sprayer,” said Dr. LeJeune. “We currently have a hand-held sprayer, not dissimilar to the type of sprayer you use to clean windows. We also have a cart-based sprayer that we picked up from a US manufacturer that we are tweaking to allow us to go through the process of dissolving the

powders directly in the instrument, so they don't need to be premixed in water. When we have used that cart-based sprayer we find we haven't seen much of an issue with one side not spraying well. As long as the sprays alongside each other are around 20 per cent by volume, the performance of the overall spray is not affected.”

The system starts off as a stable, dried powder, which can be stored for years. Once the system is required, this powder needs to be mixed with water and then the user has a batch of active component that can be used up to 24 hours after first mixing. Yet the likelihood is that, when this is first needed, nerves are going to be a little frayed, practices forgotten and adrenaline kicking in. So what happens when the mixture isn't agitated enough, and there is an uneven distribution of the mixture? “The enzyme dissolves in water pretty fast,” said Dr. LeJeune. “When we talk about a hand-held sprayer, a small amount of agitation is sufficient to get all the enzyme and all the water soluble components to dissolve. That said, there are some additives in there that help the eye to perceive colour when you are spraying things onto dark surfaces. As you might imagine, we have a liquid spray that is either yellow or red and that is pretty easy to see when you are looking at a wall that is painted white, but when you are spraying on asphalt it is not as easy to see so we put some additives in there to allow you to perceive colour on dark surfaces. Those things tend to want to fall out of solution and require you to give the hand-held version a little shake – no more than you would a bottle of orange juice. That problem is a little more difficult to manage when you get a cart-based system, and that is why we are modifying the version we have to allow us to get that agitation on board. So, for that application, we need a bit of help and we are building that help into the sprayer.”

ICx is currently waiting on news from the JPEO CBD on a possible series of user tests. In preparation for this they are in talks with a range of pharmaceutical and agriculture enzyme manufacturers to get them to work as contract manufacturers to scale up the

A complete range of biological and chemical detection products for all platforms:

- Armored vehicles
- Ships
- Critical infrastructures



AP4C



AP4C-V



MAB



AP4C-F

PROENGIN

1, rue de l'Industrie, 78210 Saint-Cyr l'Ecole FRANCE

Tél: (+33) 1 30 58 47 34 / Fax: (+33) 1 30 58 93 51

Website: www.proengin.com

E-Mail Address: contact@proengin.com

Out, damn'd spot

work, should it be required, which will also bring costs down – essential for a system that will be sprayed around like it is going out of fashion! The team is also looking into different applications of the technology – such as using it as a forensic dissemination tool so the dispersal method can be tracked and evaluated, or for it to map the extent of contamination. They are also working on a new product along the same lines. “We do have some ongoing development work where we are essentially trying to devise a threat disclosure spray, where you have a single formulation that is capable of detecting a number of threats,” said Dr. LeJeune. “That is one area where we are trying to innovate into, bringing multiple enzyme detection technologies within a single formulation.”

Laser life

Photon Systems are bringing an entirely different solution to the same problem, using Deep UV (DUV) lasers and raman systems they have developed for Nasa missions. They are zapping the subject and then analysing the return data to ascertain what chemical or biological material might be present. As opposed to other raman manufacturers, however, they work at a moderate stand-off distance – allowing for a swifter approach to detecting contamination. Sadly, a great deal of the work they are doing with DTRA is classified, but Ray Reid, President of Photon Systems, was able to go into some detail. “We use UV lasers, raman and fluorescence measurement methods, so all the sensor information is based on UV and raman scattering and fluorescence emission after we pulse the laser onto the target,” he said. “All the other sensors out there are contact sensors; they tell you when the sensor is touching the substance. We work at moderate stand-off distances.”

There is a range of other stand-off sensors out there; some use passive FTIR, which is great for detecting vapour clouds yet not so good at surface contamination. There are also those using active FTIR, however, that can stare at a point and pick up minute traces of the vapour, although these currently have not been used in a decontamination role. This, Ray thinks, is where their experience from the Nasa

programme comes in useful. “We have a contract with Nasa as part of their planetary protection programme. This is to look at spacecraft and measure organic and biological load on the spacecraft; it is very similar to military applications, except this is to examine the biological load of a spacecraft when it is launched and then when it comes back. Our goal on that programme, like any decon programme, is to scan that vehicle and determine how many and where are the bacterial spores. We do that from a robot that scans the craft. We have done it for a long time with Nasa, and it is the same methodology for military vehicles.”

While the method might, in the loosest sense, be similar, there are different drivers – Nasa is keen that the shuttle is clean, and that takes as long as is necessary, as opposed to a battlegroup that might be needed in operations NOW! How does the system work without the luxury of time? Mr Reid suggested speed is, in fact, one of their greatest selling points, “Our lasers are rated by the Department of Commerce as being available for sale to anybody, and they send out 100-microsecond wide long pulses, and we take all our data in 100 microseconds. That might not tell you how quickly you can do a vehicle, but it works very fast. It is not like the traditional raman system from ICx, or ITT, that take many minutes to take data; we take data in 100 microseconds.”

As anyone who has bought a car knows, speed costs – and the last thing anyone wants is a gold plated system next to enthusiastic decon troops sloshing around caustic decon agents. Is there a lower-cost option, with a slower process and lower spec but which still provides a useful capability? “We sell systems to Nasa for \$30,000-40,000. I don’t know what the others charge, but that is not expensive. We are one of the lowest-cost solutions, as well as the one of the most sensitive and easy to operate and the quickest. That is our intention: to move towards the military solutions. We are probably in the same price range as Ahura.”

This is, perhaps, one of the cross-over systems within CBRN, as recce/detection responders tend to be different people from the ones that stand

on the decon line. Once you start providing the decon soldier with detection systems it blurs the divide – for good or bad – but it would seem to be sensible that the first detection systems were simple to use. Will the Photon system be a red/green indicator system? How much scientific understanding does it need, and will it provide you with a superimposed image of where the contamination is? “It gives information similar to other raman systems like First Defender. It gives you a set of probabilities of what the material is – you just point and shoot and it offers one of a set of materials. [The visual contamination mapping] is part of the DTRA programme, so we can’t talk about that, but the answer is probably. If you take a lot of data you can put it together anyway you want, and the functionality will be there to do that. It doesn’t provide an image in the way that a camera might, but it will give you data points.”

The advantage of the Photon system is that it has ubiquity across the battlefield; in essence it is a detector that happens to do surface detection well. It is clearly behind the technology readiness level of the ICx system, but exactly how far is currently not apparent. It would be an attractive solution to have one ubiquitous detector used in everything from reconnaissance to decontamination.

“Throw physic to the dogs; I’ll none of it”

Contamination detection looks like it might finally be arriving, and as such it offers a great deal of change to CBRN – everything from reducing unnecessary laundering of PPE, providing faster mass decontamination and targeting sensitive decon to freeing up personnel from decon lines. These systems are perhaps the first steps towards a system an order of magnitude better than the swab, yet – as is always the case – it is unlikely to be the 100 per cent solution to the problem. ICx is engaged with a number of European, and other, countries all keen to test the solution, to see whether it can cleanse them of their perilous stuff. If its promise holds good then we will be seeing a lot more of ICx’s disclosure spray.

From Battlefields to Boulevards

Are you tasked with saving lives and protecting critical infrastructure?

Whether it's a terrorist threat, domestic uncertainty, asymmetric warfare, or an unintentional incident, it's your mission. Rapidly respond with Intelagard systems and solutions to reduce fear and minimize economic damage.

Deployed in theaters of operation worldwide, Intelagard offers a full line of decontamination systems and solutions, including the chemical/biological decontamination formula, EasyDECON DF200. Proven effective against Anthrax, SARS, TB, and the virus that causes the Avian Flu, EasyDECON may be deployed for large scale incidents and kept close at hand for mailroom safety and pandemic preparedness. Deployed by Intelagard systems, resources are maximized by expanding 750 liters of decontamination formulation into as much as 18,500 liters of finished foam. The thick foam blanket will adhere to inverted surfaces, providing necessary dwell time.

Intelagard systems are also being used with all classes of fire suppression foams and hazmat remediation formulas to quickly remediate accidental and intentional incidents.

For powerful and effective fire suppression and decontamination solutions, be truly prepared with Intelagard.

Rapid
Deployment
Tough
Powerful
Versatile
Effective



 **INTELAGARD**®

1.303.309.6309 • info@intelagard.com
www.intelagard.com



The gas age

Pat Nelson explores the history of chemical detectors

Looking Industrial Age of the 18th Century, rumoured to have begun in middle England and from there found its way around the entire globe, brought about a reliance shift from manual and animal labour toward steam engines and high-throughput manufacturing. Artisans no longer created items in their whole form; instead, several workers on assembly lines glued, hammered or chiselled their one piece of the puzzle into the entire process. Out of this “Age of Enlightenment” emerged large-scale manufacturers that merged chemistry with modern day engineering practices. For the first time, countries were able to marry hazardous chemicals with a delivery system for large-scale chemical warfare attacks. In 1888, one such German company, BASF, cleverly introduced liquefied chlorine gas into pressurised packing cylinders, creating the backbone of modern day chemical warfare.

Focusing on the CBRN threat potential, the situation is comparable. During the previous decade the sum of CBRN weapons was more or less known and, certainly in the field of nuclear and chemical warfare agents, was very well researched. In contrast to this, those nations that were interested in the capability of biological warfare conducted relevant research activities, but this research was done at a far higher level of classification. Fortunately these activities never achieved an acceptable technological research

level, so the capability of bio warfare was rather neglected in comparison to the threat potential that arose from chemical and nuclear warfare agents.

It should then come as no surprise that chlorine gas was the first large-scale deployment of a chemical warfare agent (CWA) used against advancing troops – during the First World War, on 22 April 1915, the German military released nearly 150 tons of chlorine gas near Ypres, along the western front. French forces found themselves overtaken by a noxious, green-tinted cloud of gas and broke ranks – luckily German soldiers were also leery of the chlorine gas and failed to surge forward during the *mêlée*.

Soon, however, ground force troops found they could manoeuvre around the chlorine attack due to its quite obviously agent characteristics – potent smell, green coloured cloud and static movement with little air flow. Additionally, other properties of the gas were soon discovered as well – those soldiers that did not run away from the cloud or just simply stood up with their heads above the trench line were not as effected and suffered the least, if at all, compared to the soldiers who ran quickly through the green clouds or those that rested upon stretchers in the bottom of the trench and were thus heavily exposed to the dense gas that pooled in the bottom.

Despite the low fatality rate of the initial gas release (or because of it) and its desirous chemical properties, the race between nations to create more lethal and molecularly stable chemical agents began. Germany once again led the way with the creation of the organophosphate-based nerve agent Tabun. Not to be outdone, other

nations joined in on the “deadliest nerve agent” hunt, and soon added to the arsenal of chemical weapons such household names as Sarin, Soman, and VX. As the agents became more lethal and their molecules more stable, a new need emerged to not only create the new breed of CWAs, but to also be able to detect and identify them.

With this advancement and stabilisation of CWAs, the requirements to quickly and accurately detect and identify their presence have been and still are an ever-moving target – for detection and identification do not always come hand-in-hand.

But to understand where we are going and why, we should take a step backward to the near-beginning to understand the importance of not only detecting but also identifying the chemical used. The first recorded case where chemical detection and identification tests were admitted as evidence in a court hearing was in Oxford County, England, in 1792, when Mary Blandy was arrested and charged with murdering her father by arsenic poisoning. Due to the slow, painful demise of the victim, the cause of death was easily attributed to poisoning of some kind. It wasn't until one of the household servants found “an envelope containing white powder” that the attending physician could identify the type of chemical employed – in this case it turned out to be white arsenic. This ultimately led to her conviction. Without it, and she may have gone free.

Current day threats are much more complex and far reaching than simple arsenic poisoning. In a true CWA attack, poisonous gases, liquids or solids are released into the

TruDefender FT

When every second counts, reliable results are at your fingertips.



From the makers of FirstDefender, the revolutionary TruDefender FT

handheld FTIR system enables identification of an even broader range of unknown chemicals—right in the hotzone.

- Complements FirstDefender to maximize in-the-field coverage of unidentified chemicals
- Ground-breaking design—fits in your hand, lightweight, yet rugged enough for field use
- Fast and easy to use—delivers accurate results in less than a minute, even for complex mixtures
- Eligible for grant funding; application assistance available



TruDefender | FT FTIR FirstDefender Raman

To learn more call +1.978.642.1132 or visit ahurascientific.com/cbrne

Ahura Scientific

Personal Protective Equipment



THE ULTIMATE PROTECTION

World Leader in the manufacturing and design of CBRN Personal Protective Equipment, AirBoss-Defense has built its reputation by supplying soldiers and First-Responders with superior Individual Protection solutions for over 30 years. Committed to providing the Ultimate Protection to our clients, AirBoss-Defense is continuously innovating using the most advanced technologies to offer products that meet the highest standards.



C4 Gas Mask

- Lightweight and comfortable.
- Shatter proof lenses.
- Available in 4 sizes and 3 colors.



AMG - AirBoss Moulded Glove

- Excellent grip and tactility.
- Ambidextrous and antistatic.
- 24 hours CW agent protection.



MALO - Moulded Light-Weight Overboot

- Latest generation.
- 24 hours CW agent protection.
- One piece Injection moulded construction.
- Ambidextrous: fast donning and doffing.

airbossdefense.com 1-450-546-0283

881 Landry, Acton Vale, Quebec, Canada

The gas age

atmosphere, either dispersed as a standalone attack or in combination with ballistics and explosives. Nerve agents VX and cyanide are the most deadly and can cause significant residual environmental damage.

The CWA event can come in one of many forms, and detectors are required to detect them all. Gas or vapour releases are usually invisible to the naked eye but can sometimes be seen as a cloud where there is little air to quickly dissipate them. The usual route of entry is via the respiratory tract, although in high enough doses they can enter via the skin or eyes. A liquid release is clearly visible, with the consistency of motor oil and ranging in colour from dark brown to clear, but is very difficult to identify without proper training. These agents give off a vapour that can be inhaled and is deadly. Powders (solids) are easy to see but difficult to identify while in powder form.

Chemical detection units are designed to detect and identify chemical agents either prior to their release (in the best case scenario), or to confirm an attack has taken place and identify the scope of damage. Since the Mary Blandy trial in 1792, chemical detection has quickly matured to the status of adolescence, where it has remained for many years. Technologies currently employed range from simple pH-based paper that changes colour in the presence of CWAs to huge multi-technology systems that monitor air consistency and movement to everything in between.

Common technologies used to detect and identify CWAs include those that utilise light waves and those that utilise sound waves. Mass spectroscopy (MS) is the most common of the detection technologies that uses light waves to measure the mass of proteins. Another is matrix-assisted desorption/ionisation mass spectroscopy (MALDI-MS) which identifies protein mass but is also able to distinguish anthrax spores. Raman spectroscopy uses light in a slightly different manner – it

measures the change in the wavelength of a light beam as it contacts the CWA.

Sound wave technologies basically use a quartz surface to analyse sound waves as they pass over the surface and convert these wave patterns into electrical signals. Acoustic resonance technologies take sound wave conversion a step further by measuring the pattern of vibrations as the sound waves are sent into an object. These readings enable the user to determine whether the object is empty or whether CWAs are present; it is rumoured they can also identify the agent present. Each of these systems has its plus and minuses, but no one system can claim to identify everything under every condition.

But if one technology stands out amongst the rest as the “old grey mare” of chemical detection technologies it would be ion mobility spectrometry (IMS). IMS analyses excited (ionised) molecules in their gas phase as they drift down a tube in a carrier buffer gas. This reading creates a chemical “signature” that detects and identifies the CWA. It is not the most fool proof technology (false alarms still occur often enough to cause havoc), nor is it particularly innovative and new, but it has possibly had the most research money put toward it to make it suitable for both military and civil defence use. False positive alarm rates are still problematic, however; all one has to do is monitor the daily news feed coming from a very large, prestigious building in Washington DC to see IMS detectors at work – you can regularly hear a newscaster excitedly reporting a temporary evacuation of some sort due to an alarm in one of its mail rooms. This is more often than not the work of a janitor changing the brand of floor wax while forgetting to notify the proper authorities.

This is not to imply that IMS is not a good, tried-and-true technology worthy of chemical detection praise. There are several worldwide chemical detection programmes still using IMS for their small and large-scale

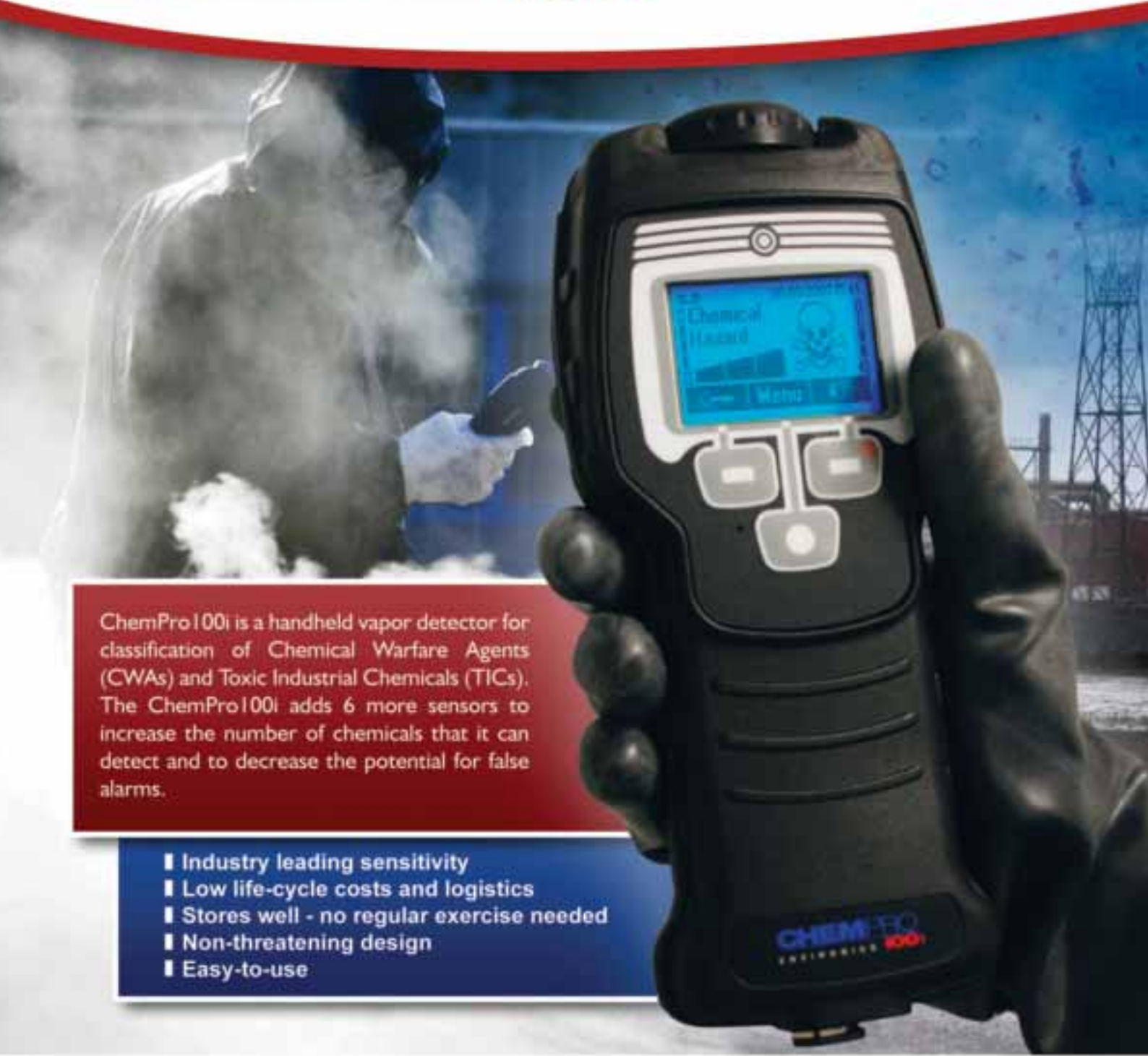
detection systems. IMS has been found to work in a wide variety of environmental conditions – in both high and low pressure conditions and within a very broad temperature range – and can be tailored for specific requirements. Sometimes a false positive under very specific conditions is better than no alarm at all.

Since the 9/11 attacks, the United States has been testing perhaps the most promising of all chemical detection systems – a system that combines several technologies into one structure which works co-operatively to obtain a real-time picture of a CWA release. These systems have been installed in potentially vulnerable sites throughout the US, where large amounts of people travel daily, such as closed-area railways and borders. These systems combine IMS, MALDI-MS with radar detection units (among others) to measure the density of chemicals in the atmosphere. All results are then relayed back to a centralised command centre where automated response protocols are employed. That goes back to the old adage: “out of many comes one”.

While research and development monies are still being invested globally to improve chemical detection systems, one has to question the length of time it has taken the world’s leading military forces to adequately detect CWAs that were created almost 70 years ago. How are these defence units going to address emerging CWA threats on the horizon, such as non-traditional chemical warfare agents? And this doesn’t touch upon “non-lethal” chemicals such as the “fentanyl-derivative” used in Moscow to end the hostage crisis in 2002 where 130 of the 830 hostages died from the effects of the “non-lethal” gas used. If it has taken the respective military and civil defence organisations this long to come close to a detection solution capable of detecting 1950s-type CWAs, can we look forward to a total solution sometime in the next 50 or 70 years?

CHEMPRO

Handheld Chemical Detector **100i**



ChemPro 100i is a handheld vapor detector for classification of Chemical Warfare Agents (CWAs) and Toxic Industrial Chemicals (TICs). The ChemPro 100i adds 6 more sensors to increase the number of chemicals that it can detect and to decrease the potential for false alarms.

- Industry leading sensitivity
- Low life-cycle costs and logistics
- Stores well - no regular exercise needed
- Non-threatening design
- Easy-to-use

EnviroNics has over 20 years of experience in providing CBRN detection, identification and protection solutions for any situation from a single handheld device to a fullscale nationwide detection network.



EnviroNics Oy
P.O. Box 349
FI-50101 Mikkeli, Finland
Tel: +358 201 430 430
Fax: +358 201 430 440
E-mail: sales@enviroNics.fi
www.enviroNics.fi

EnviroNics USA, Inc.
1308 Continental Drive, Suite J
Abingdon, MD 21009 USA
Tel: +1 410 612-1250
Fax: +1 410 612-1251
E-mail: sales@EnviroNicsUSA.com
www.EnviroNicsUSA.com

Monica Heyl, CEO of Monica Heyl and Associates, examines mobile laboratories and whether they know their rank...

As we enter this new decade, the need to rapidly provide highly reliable, actionable information associated with an incident has never been greater. Our battlefields and homelands rely on the ability to deliver analytics to an incident rather than delivering the sample to a conventional, fixed-site laboratory. Providing the information in a timely, safe and secure manner, as well as the science and engineering relevant to the development of a credible mobile analytical laboratory capability, has matured dramatically. Science, coupled with advancements in information technology, has created a fusion of capabilities that support on-the-go mobile analytics. This trend will continue to emerge as new requirements drive innovation and the resulting technologies advance.

So why doesn't every first responder, soldier, civil support team and military officer have their very own mobile laboratory capability, then? There are many considerations that must be assessed prior to the design, development, procurement and fielding of mobile analytical systems. Mobile systems are part of a network of response and are not the only data point that is needed to effectively reach an analytical conclusion.

Samples should not randomly arrive at the laboratory door without

The wheels on the lab go round and round...

accompanying information. Whether the information was part of a network of systems, such as stand-off detectors, point detectors or sample collectors – or from a first responder with a properly field-screened sample – the information will enable mobile labs to be part of a layered process just as it is a part of the solution. Mobile laboratories can be integrated to fill a wide variety of challenges: sample receipt, screening and evaluating suspect unknown materials, environmental health protection and remediation, narcotics analysis and confirmation of clandestine

laboratories. They can respond to catastrophes, terrorism, and a myriad of other actions in theatres of conflict or on our own homelands.

The mobile lab can be viewed as a toolbox with an array of analytical tools that provide information. While many traditional mobile lab capabilities focus on one particular discipline, the possibility of the unexpected threat, and the ability to rapidly refocus the laboratory capability to the current threat, can further challenge the lab designer to address multiple disciplines concurrently. Communications, and the



The Netherlands is one of the latest countries to invest in a mobile laboratory ©CBRNe World

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

INTERNATIONAL DEFENCE WEEK
LAND + AIRLAND + HOMELAND

2010

EUROSATORY

Gathering the world
defence markets for
Business - Future - Innovation - Technology



PARIS 14 - 18 JUNE 2010

www.eurosatory.com

Under the patronage of



Presided over by



The wheels on the lab go round and round...

ability to integrate information from a variety of sources, allow the laboratory to become a powerful component in a pre-planned network of solutions for first responders, law enforcement, war fighters and laboratory clinicians/scientists.

Although many challenges associated with developing turnkey analytical systems for the soldier and scientist have been overcome, a caution must be offered to someone who is setting out as a trend-setter in the development of field analytical systems: "Don't try this alone, at least not without a measured amount of experience". After having spent nearly 20 years studying and developing strategies for mobile laboratory integration, it has become clear to me that "Murphy's Law" *does* prevail. A good, very applicable Murphy's Law quote states: "It is found that anything that can go wrong at sea generally does go wrong sooner or later, so it is not to be wondered that owners prefer the safe to the scientific... Sufficient stress can hardly be laid on the advantages of simplicity. The human factor cannot be safely neglected in planning machinery. If attention is to be obtained, the engine must be such that the engineer will be disposed to attend to it." [Review of the Progress of Steam Shipping during the last Quarter of a Century, Minutes of Proceedings of the Institution of Civil Engineers, Vol. LI, Session 1877-78 – Part I, at 2, 8 (November 13, 1877 session, published 1878)]

It turns out that, when developing field analytical system, the design process becomes synonymous with shipbuilding regardless of the strategy you use to package the capability (suitcases, boxes, modular cases, connex containers or mobile laboratory platforms). The careful planning and preparing one must execute for a sea voyage (regardless of the transportation strategy presented, be it fixed-wing, rotary-wing, rail, truck, land or sea), must have every possible forethought in mind. It is easier to remember the rum than try and synthesise it without the proper components on board.

Refocusing on laboratories rather than the libation, there are technical barriers associated with addressing the

congruent technologies of the traditional CBRNE world. There are also unknown potential threats that are not clearly defined but emerge via hostile or naturally occurring events, and may present themselves as the asymmetrical peril. These difficult-to-plan-for challenges call for the integration of tools that address each disparate possibility. Engineering controls (primary and secondary) become vital to sample collection, reception, preparation, analysis and spent effluent that could contaminate the environment. Robust engineering controls to include redundant and hybrid filtration systems, breakthrough monitors and backup uninterrupted power are only as good as the quality assurances associated with the development, building, manufacturing and testing of such safeguards. Equally important are the processes and procedures associated with the operator's use of engineering controls. Appropriate training, and a basic understanding of their use in the routine and the urgent situation, must be without flaw. It isn't just about what might happen were the genie to get out of the bottle; it is about the fundamentals of the analytical process to include respecting sample integrity, preservation of the sample for further analysis or archival needs, glove discipline, mitigation of cross-contamination and basic practices of prudent analytical analysis.

How do you define the requirements for your field capability after realising it is only part of the system of systems? The answer is by meticulously defining your requirements as they relate directly to you, your organisation and the mission. Using adopted consensus – such as the guidance of Nato STANAG 4632, Deployable NBC Analytical Laboratory as it relates to Nato countries, allies and friends – still leaves unanswered questions that can only be addressed by the user's own requirement. Where is your capability/lab going to be positioned? Will it be inside or outside the area of potential contamination? If contaminated, how will it be decontaminated? Mission duration,

operator's skill sets and training level, sophistication of instrumentation, which particular instruments; the list of questions goes on and on. When there are so many questions and so few absolute answers, modularity of capabilities – which can be interconnected and provide plug-and-play ability for instrumentation, thus supporting components and your infrastructure – is an excellent approach. This approach is also receptive to integration of new technology as it becomes available, and to respond to dramatically different mission profiles.

Transportation technology is a consideration associated with mobile laboratory design. The ability to modularly adapt your capabilities to meet the requirement and transportation situations allows you to adapt to new strategies either during or prior to deployments. Many years ago, we deployed for an international exercise employing the patented Air-Transportable Modular Analytical Laboratory" (US Patent No 5,711,916). We shipped the modular laboratory via commercial carrier from one country to another – everything was working perfectly. When our host arrived to escort us to our next stop on the deployment, however, which was in a much more austere location – and where the actual analysis was to take place – they had arrived with an aircraft that had a much smaller doorway than the one on which we arrived. Although quite difficult, we were fortunate the modularity of our systems allowed for the critical mission to be accomplished.

However the capability is packaged, the ability to generate reliable data is an absolute in analytics; if data is not trusted, the analysis will be flawed. Decisive information is required and any information may be relevant. Reliable data is not necessarily irrefutable; thus, the conventional, fixed-site laboratory still provides the indisputable answers. The conundrum remains, however: which samples should be referred to gold standard, specialised laboratories? The first law is that the quality of the data developed within the mobile lab must be invariant with the location of the analysis, because neither the

They Expect You To Be More Than 80%* Prepared for a Biological Threat



Now You Can Be with the New **RAZOR™ EX**



RAZOR EX

Field Portable BioHazard Detection System

Less than 1% error rate

Screen ten targets in a single run with The 10™ Target Kit

Used by Military, Hazmat, and First Responders

The 10™ Target Screen Kit:

Anthrax	<i>E. coli</i> O157	<i>Salmonella</i>
<i>Brucella</i> spp.	Tularemia	Smallpox
Botulism	Ricin	Plague
<i>Coxiella</i>		



Call **1.800.735.8544** or visit www.idahotech.com to discover how you can reliably protect those you serve.



*Most other field biohazard detectors have a 20% error rate.

390 Wakara Way, Salt Lake City, UT, 84108, USA | 1-800-735-6544 | www.idahotech.com

The wheels on the lab go round and round...

technical standard nor the level of quality should change regardless of where the analysis is performed. If there is a difference between what is done on-site and what is done at a fixed-site laboratory, it should be in the scope of the analysis not in the quality of the results. Materials requiring more intensive analysis are sent to specialised laboratories for confirmation of only those samples worthy of definitive analysis, forensics quality data and determination of attribution.

It was once widely believed (and may have been true) that high-quality analysis was impossible in the field, and that the only type of analysis appropriate for field deployment was screening with handheld devices. Quality assurance is the backbone of any laboratory system, and quality measures gain in significance as you enter the world of field analytics.

Most instruments that provide definitive, defensible results were developed for the laboratory bench top where they were expected to be used in pristine environments. Not so with mobile laboratory instrumentation. These labs are subject to the harshest of environments: sand, dust, rain, extreme temperature, humidity fluctuations, vibration and energy instability – most often to be located in austere locations. These laboratories are designed to analyse the most deadly of materials quickly and reliably. Quality measures must begin with the conception of design; instrument selection must be evaluated not just on its performance alone but also on its reliability and ruggedness – although it is amazing how instruments can be ruggedised (with manufacturer support) by “field hardening strategies”. Their vulnerabilities must also be understood and mitigated.

Another area of foremost importance is how to support a suite of instrumentation with the required consumables and expendables that must be carried on board. This is exactly the reason why instrument selection needs to be coupled with a Conops, to not only do the job at hand but also the job you never thought of doing. All avenues must be explored to make transportation

practical: operators should be able to generate consumables – such as power sources, which are the most demanding consumable required – whenever possible. Plan to minimise the need for gasses, buffers and reagents, as well as thermal loads, extreme oven temperatures, ramping, specific agars, heaters and many other components that support the instruments and the instrumental processes. If instruments and methods are clearly studied, many of these concerns have solutions that can be incorporated into an integrated first class analytical system.

Planning must be from the ground up and address “the system”. Randomly choosing instruments and support equipment based only on preference is downright silly. Mobile laboratories are not designed to be research facilities; rather, they are an integrated development of an incredibly sophisticated (yet much heavier) “black box” that will provide answers to establish situational awareness needed by decision makers to make actionable choices. Innovation is helping us work more safely. The practice of integrating analytical instruments directly into primary engineering controls such as the patented “Super Toxic Analytical Glovebox System” (US Patent No. 5,730,765) provides an increased level of safety for laboratory operators. Ongoing work in this particular area gives promise to advancing industry practices that focus on isolation of the sample from both the area of secondary containment and the operators within the laboratory while still performing analysis.

Too often, users focus on the initial costs associated with the procurement of mobile laboratories. Initial investment costs, however, have proven to be almost negligible in relation to the long-term cost of operations, maintenance, sustainability and training of personnel. While financial resources are of great concern, the value of partnerships and collaborative relationships cannot be understated. In the US, our awareness of potential threats was heightened by the tragic events of 2001, and subsequently we are creating a culture of

preparedness where we are prepared no matter what the threat. Knowing that analytical tools will become smaller, faster, lighter and better allows us to plan for these advances with winning strategies. Inserting automation, whenever possible, dramatically improves throughput and minimises personal danger, not to mention that it offers a financial advantage that places less burden on our resources and staff.

How coalitions, countries and units develop their networks of response will differ, as will the sophistication of the mobile analytical platform – yet as coalition operations become more frequent, standardisation of efforts will become critical. Partnerships allow for adopting standardised methodologies, protocols, procedures and training. Globally, partnerships are key to defeating, mitigating and neutralising urgent situations. Shared resources can minimise logistical burdens and staffing requirements, fill data gaps, affect positive communications and ultimately allow commanders the ability to make timely operational decisions based on highly reliable analytical data.

The requirement to develop and implement improved technology and methodology for performing analytical processes outside the confines of the traditional laboratory increases daily. The advantages offered by performing field analyses at the site of the investigation are numerous, including simplified chain-of-custody, protection of sensitive information and rapid turnaround from sampling to results. This rapid turnaround of sample analysis allows decision makers access to information in real or near real-time, and in today’s world this information is paramount to safety, security and efficiency of cost. It is also absolutely essential in many varied situations that involve potential threats toward our warfighters and our countrymen. Developing strategic alliances with our international partners to share and transition our expertise will better prepare us to use science effectively as a tool against the unknown threat. Within the 21st Century, field analysis will be viewed not as an exception but as the preferred method of analysis.

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

SARATOGA
Blücher Technologies

FULL SPECTRUM PROTECTION
WE GO BEYOND

Blücher GmbH
+49 211 9244 0 phone
+49 211 9244 211 fax
info@bluecher.com
www.bluecher.com

Bluecher UK Ltd
+44 1507 451 443 phone
+44 1507 451 096 fax
info@bluecheruk.com
www.bluecher.com

Teexplorer GmbH
+49 2153 9540 0 phone
+49 2153 9540 70 fax
info@teexplorer.de
www.teexplorer.de

BLÜCHER
Innovation since 1214



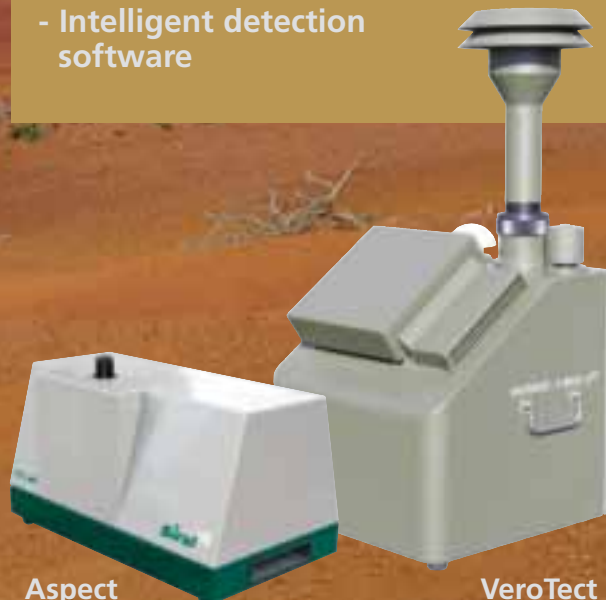
Visit us at the
CBW Symposium

in Stockholm
8-11 June, 2010

BIODETECTION TECHNOLOGY COMPANY

BIRAL'S IN-SERVICE BIO-DETECTORS

- Realtime generic and non-specific bio-detectors
- Intelligent detection software

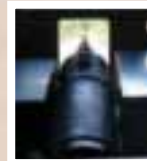


Aspect

VeroTect

TECHNOLOGY DEVELOPERS

STAND-OFF TECHNOLOGY FOR
BIODETECTION



EU BODE
anti-terrorism
project to develop
a spectrally
resolving
fluorescence LIDAR

IDENTIFICATION TECHNOLOGY
FOR BW AGENTS

Biral awarded UK
MoD's PIBBDT
contract to
develop a
portable, specific
bio-detector



T: +44 (0)1275 847787

E: biodetection@biral.com

www.biral.com



Lieutenant Colonel Marc Caudrillier, EDA's Deputy Chairman BioEdep and France's CBRN Program Officer on the Joint Staff, discusses Europe's collaborative attempt to get a comprehensive biological capability programme underway

CBRNe: How are you going to develop a common staff requirement for individual soldier protection? How do you balance the level of equipment coming in through WEU countries – such as Britain and France – compared to Eastern European countries like Bulgaria? What value is it if it is set to the lowest standard?

MC: From my point of view, the Biological Enhancement and Development Equipment Program (Bio EDEP) is just the beginning of a long European story. The main issue is not “how to integrate current

European Bio-Union

equipment” but “how to ensure the compatibility with other European equipment in the future”. Of course, the objective is to gradually implement the most up-to-date standard. When Bio EDEP

components will be fielded in our armed forces, it will progressively replace the existing equipment. Nevertheless, it will significantly increase the biological detection, identification and monitoring (Bio DIM) capabilities of the countries which currently have low-level standard, as it is the common European objective to raise the capabilities of its members to the standard of the most advanced. Moreover, Bio

Germany and France seem to be the biggest drivers in the BioEDEP programme ©CBRNe World

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com



**FRENCH ARMY HAS SELECTED
BERTIN TECHNOLOGIES PRODUCTS
(CORIOLIS TECHNOLOGY AND KIM)
FOR ITS CBRN RECON TEAM**



EQUIPMENT FOR BIOLOGICAL AND CHEMICAL THREATS DETECTION

BIOLOGICAL DETECTION - CHEMICAL DETECTION



● **Coriolis® MS**
Military Bio-collector



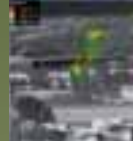
● **Coriolis® FR**
First responder Bio-collector



● **KIM**
Field Bio-Identifier



● **Second Sight® MS**
Stand-off chemical gas cloud detector



European Bio-Union

EDEP is not a protection-oriented programme, but rather a DIM one. The Cap Steering Board decided in May 2009 to launch this programme after the good results obtained by the Project Team – CBRN Detection Identification Monitoring (PT CBRN DIM) in 2009.

CBRN: Many of the eight sub-systems are geared towards a traditional NBC biological threat – large-scale releases. Is this really a threat for deployed EU troops when we consider their area of operation? Is there not a case to be made for biological detection systems being centred on adulteration of the food or water supply?

MC: If I can refer to the French White Paper published in June 2008, one of the main scenarios of commitment of French forces in a high-intensity conflict, including a significant CBRN threat. Such a scenario is also taken into account in the defence concepts of all European countries. As a consequence, European forces must be equipped with systems able to face large-scale biological releases. Due to the large spectrum of operations, less traditional threats, like adulteration of food or water supply, must also be taken in consideration. In Europe, water and food surveillance is generally under the responsibility of the medical services; nevertheless, in case of contamination, commanders' surveillance needs will increase and CBRN units would carry out part of these missions. Those aspects will be taken into account by Bio EDEP, but they are not the main focus of this system.

CBRN: How viable are any detect-to-warn capabilities when so many of them require trained operators to filter out the false alarms, and when those trained operators are unlikely to be within the reach of some of the smaller/poorer countries?

MC: In terms of operational functions, detect-to-warn equipment should not require a specialist. Of course, as of today, the operator is a specifically trained operator in order to avoid a high level of false alerts. In fact, the end requirement is for 2015, and such equipment cannot be based only on the current technologies but needs further research. That is why we will contract firms to develop a demonstrator in 2015, because we want to have a high visibility on which kind of technologies we can rely on. So, functionally speaking, we know what we need in terms of detect-to-

warn capabilities in 2015: we require a detection function which does not rely on the level of specialisation of the operator. Moreover, I am confident that, in a near future, the level of the specialists from European countries will be more homogenous than today. Within PT CBRN Counter Measures we are implementing measures to reach this objective. This kind of initiative will support volunteer member states to reach common standards for education in the EU. If French forces are deployed in operations tomorrow, with CBRN support provided by another European country, we want to be sure the standard of this protection is the same as in France. The best way to reach this goal is to educate our CBRN troops in the same European centre of excellence. But this is another European story.

CBRN: What is the concept of the biological contamination detection? Is it a binary case, whereby once decontaminated any form of activity produces a colourmetric change that requires a reapplication? Or is it only interested in specific BWA such as anthracis?

MC: This is one of the biggest challenges Bio EDEP has to deal with. On one hand, if you want to be sure something is totally decontaminated, you must verify no pathogen is still alive on or in it. Of course, in this perspective, the answer is binary. On the other hand, we are not interested in knowing if there are some living and natural agents on the decontaminated surface. Again, our main focus is to define our operational requirement independently of the existing solutions. What is needed tomorrow is equipment that gives an alert if there is still a live agent within a predefined list, at least on the surface of decontaminated equipment or on the skin of a soldier. Such equipment does not exist as of today, and it will be very challenging to European companies to make it, but it entails great rewards.

CBRN: Is unambiguous identification really the role of military forces in the field? Surely this is the role of government labs on home soil? How then do government laboratories – even military ones – fall under the remit of Bio EDEP? How do you persuade national laboratories that might have spent years building up their own bio libraries that the European Biological Laboratory Network's is the one to use?

MC: This is another challenge. The unambiguous answer to your question is that unambiguous identification is not the role of military forces in the field, but the issue of a European bio library is still open. Of course, national laboratories which build these libraries are not ready to share them for free, but some initiatives were initiated within EDA R&D. We can imagine these initiatives will increase in the near future, and I think these could support the development of such a library. Relative to Bio EDEP, we are developing a second-generation biological laboratory, but we request that it provide us with a confirmatory identification, not an unambiguous one. Nevertheless, the development of a European biological library could support this project.

Today, there are two different approaches in Europe. The first consists of buying a laboratory equipped with biological reagent from a company. This solution is very efficient – both financially and technically, and in terms of agenda. The huge drawback is that your biological force protection effectiveness is strongly dependent on the capacity and the will of a private company to produce reagents. Note this company will not have to be compulsorily a European one. The French approach, which is shared, is to develop its own reagent, in order to avoid being dependent on a private company. This approach led to the specifications of our national project, DetecBio (See CBRN World Autumn 2009). In fact, we ask a national consortium (Bertin Technologies and NBC-SYS) to produce our own reagent based on state-provided biological material. So, in the near future, we will be totally independent and be able to produce reagent nationally.

Concerning a Bio EDEP demonstrator, we will produce equipment like the biological deployable laboratory with their own reagents, bought off-the-shelf. Until the date of fielding of the biological defence system, we have time to develop our own reagents.

CBRN: National projects aimed at the tactical area bio surveillance have all suffered from an element of downgrading of area covered – fewer DIM sensors are bought, which in turn effects the area covered. Is this not a perfect project for an OCCAR-led, European capital funded project that provides a capability for a European capability – as opposed to

using a patchwork of sensors (Verotect, MAB, 4Warn) which will have a sliding scale of confidence depending on who is operating them?

MC: If I understand the question correctly, you are hinting at a European-wide sensor network. The question is difficult to answer, as the requirements for such a network need to be established first of all. Following the Chernobyl disaster, there was some sort of common understanding within the countries affected by the fallout, most of which were European, that there is a need to protect against hazards coming from the outside. But instead of a common European solution, national solutions were deployed. Therefore, the requirement for such a network does seem to exist.

CBRNe: What can we expect from the launch of BioEDEP in 2012? How much of it is already set in stone and what remains to be configured?

MC: From the beginning of this project we determined an agenda, including the launch of the programme in 2012. We tried to respect this agenda, first within PT CBRN DIM, and then within Bio EDEP Preparation Phase Group (PPG). What is quite incredible is that we did not lose one minute from the beginning, according to this agenda. Currently, we are on time to write the business case in 2010, and to promote an MoU in 2011. We have different solutions for the project follow-on, but the most likely is to develop the programme within OCCAR responsibility. After we finish writing the common staff requirements (CSRs) and the business case, it will be up to the political level to accept the proposed MoU, and I am currently confident in the common will of success. In spite of the overall difficulties, a key point is that Bio EDEP is the first successful programme for EDA. Of course, after the strong political commitment in support of EDA development, especially in France and Germany, we are confident we will be strongly supported when we will start the staffing process of the MoU.

CBRNe: We are seeing a general draw-down in government spending on defence, as operations and the economy take hold. With many Level A projects – carriers, fastjets, etc – being pinched, how can we be sure something as esoteric as biological detection will manage to last the next 3-5 years?

MC: We are not sure of it and we will not be sure up to the end, because current budgets are limited and I'm not sure it will improve during the next few years. But, on another hand, biological DIM is still a shortfall in our European CBRN defences and this is the main reason why our headquarters asked us to work on it. Up to now, we always felt a strong will from German and French staff to support this project, and I think that is one of the strongest guarantees we could have. Another hopeful signal is the number of countries participating in this project, and two other countries are still currently deciding whether to join us.

[Readers that would like to know more about the EDA Bio-EDEP programme may wish to attend the Bio-EDEP Symposium held in Paris on 10-11 May 2010.]

CBRNe Convergence 2010, 2-5 November, Florida.

www.cbrneworld.com

Talc? or **TERROR!**

BioCheck®

Suspicious Powder Screening Kits

Screen for multiple bioterror agents simultaneously & eliminate most false threats in minutes.



Affordable, initial screening of unknown powders. Rules out over 85% of powder incidents. Used by over 500 First responder agencies worldwide.

**Tel +1 240 453-6339
www.biocheckinfo.com**

QUICK • EASY • RELIABLE



MAKING LABORATORIES MOBILE



Class I, II, III Biological Safety Cabinets and Fume Hoods for Mobile Applications



Photo courtesy of USAMRIID
Photography by Larry Orsby

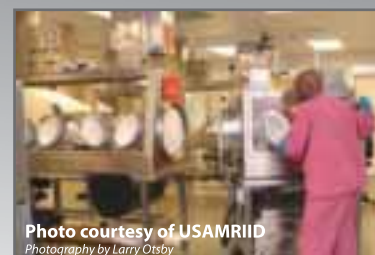


Photo courtesy of USAMRIID
Photography by Larry Orsby

50 YEARS OF
"CONTAINMENT WITHOUT LIMITATIONS"

Bright sparqs

The European Defence Agency (EDA) has identified the need for a coherent architecture for detection, identification and monitoring of biological threat agents (Bio DIM Architecture), based on the operational requirements of the European armed forces when deployed on an expeditionary mission. Under contract from the EDA, Thales (France) and TNO (The Netherlands) have developed this Bio DIM Architecture in the Integrated Bio Detection System Architecture (IBDSA) study. One of the conclusions from the IBDSA study is that operational commanders, when they have to carry out operations in the presence of a biological threat, have a need for a highly selective, sensitive and fast bioaerosol detector that gives a highly reliable warning when an aerosolised biothreat agent is present.

Such a highly sensitive, selective and fast biodetector is presently not available in the market.

Demonstrating the presence of virulent agents (bacteria, viruses and toxins) in the air is often difficult. This is particularly the case when these particles are present in very small quantities (though still able to cause lethal effects). The presence of large amounts of airborne particulates – pollen, soot, sea salt, etc – often exacerbates any analysis. In addition, existing detectors are not selective enough to discriminate reliably between virulent and non-virulent biological particles, often producing false alarms. A great deal of time and money are wasted by investigating false alarms, often requiring highly trained specialists in expensive laboratories – all of which affects the progress of the

mission. BiosparQ, a bioaerosol detector developed for the Dutch MoD by TNO, on the other hand, is sufficiently selective to distinguish reliably between pathogens and other particles in a very short period of time. For this reason, BiosparQ can be effectively and efficiently deployed straight away in the event of a terrorist threat or biological warfare. In addition, it can be operated by untrained staff. In fact, TNO designed the system specifically for this usage.

BiosparQ concept

BiosparQ is based on MALDI time-of-flight mass spectrometry (MALDI TOF MS), an accepted method that is widely used in medical laboratories for identifying micro-organisms in the laboratory. MALDI is an acronym for Matrix Assisted Laser Desorption and Ionisation, meaning that when an analyst prepares a biological sample for analysis in a laboratory MALDI TOF MS machine, a chemical substance called “the matrix” is mixed with the sample, so that the biological particles to be analysed are covered with a coating of the matrix. The matrix then absorbs UV-energy that subsequently breaks down the micro-organism. The fragments obtained are analysed by mass spectrometry, yielding specific mass spectra that are compared to mass spectra of known agents in a database.

The result is a highly selective and reliable instrument capable of detecting airborne pathogens within a matter of minutes. The system’s great strength lies in the high selectivity with which pathogens are distinguished from other biological particles. BiosparQ uses a patented system of sample preparation, which involves extracting biological particles directly from the air and analysing them one by one. This means it only needs a small number of particles to achieve this high selectivity and



BioSparq undergoing BAT testing ©TNO

Bright sparqs

produce a reliable analysis. This saves a great deal of valuable time and limits human exposure to harmful particles.

The system achieves real-time detection and analysis by combining the MALDI TOF MS technique mentioned above with “on the fly” sample preparation. BiosparQ does this through an invention patented by TNO known as a matrix coater. As particles move through the device, they each receive an individual matrix coating. This matrix coating ensures the biological particles emit precise information necessary to distinguish them from other particles. Because every particle is analysed the same way, BiosparQ saves even more time by testing for the presence of all sorts of harmful biological particles in a single sweep.

BiosparQ testing

In order to prove that BiosparQ meets the design specifications, TNO carried out extensive testing in its bioaerosol test chamber. The purpose of the bioaerosol test chamber (BAT-chamber) is testing of bioaerosol detectors under controlled conditions. The chamber is 12 metres cubed, and is capable of generating well-defined aerosols of biological particles in the 1-10µm diameter range. Special techniques are employed to generate very low concentrations of biological agents, down to the range of five agent-containing particles per litre of air (ACPLA). Apart from testing biosensors, the bioaerosol test chamber has other applications. A bioaerosol is generated in the test chamber under controlled and reproducible conditions; outside air is blown into the test chamber through a High Efficiency Particulate Air (HEPA) filter to prevent other particles from entering. An atomiser then sprays a solution containing the biological test agent in fine particles by using a variety of atomisers. In this way it is possible to produce bioaerosols with a particulate particle distribution of 1-10µm.

In the test chamber itself, the air is mixed well with the atomised droplets to ensure the bioaerosol is spread as evenly as possible. The biosensor to be tested is connected to the underside of the bioaerosol test chamber, where

several biosensors can be tested at the same time. Instead of “hot” biothreat agents, biosimulants are used in the bioaerosol test chamber. These are harmless to humans, animals and the environment, but their characteristics are representative of the real biological threats. Frequently used biosimulants are spores of the *Bacillus globigii* (simulant for anthrax) and other bacteria like *Erwinia herbicola* or *Escherichia coli* (simulant for pestilence), viruses like MS2 or *Baculovirus* (simulant for smallpox) and proteins like ovalbumin. As a benefit, no special licence or safety measures are required for the usage of these biosimulants. In addition, aerosols of interferents (salt, diesel soot, Arizona road dust) can be generated in well-known concentrations in the bioaerosol test chamber.

While biosimulants and interferents can also be used in refereed field trials of biodetectors in the open air, the advantage of performing these tests in TNO’s bioaerosol test chamber is that the concentration of bioagents and interferents is measured very precisely – test conditions are therefore known exactly. During four weeks of testing, BiosparQ was exposed to various concentrations of biosimulants and interferents, and also to mixtures of biosimulants and mixtures of biosimulants and interferents. These

tests have proved that BiosparQ is able to detect very small concentrations of a biological agent in the presence of a high background of biological and non-biological particles.

Commercialising BiosparQ

Extensive experiments carried out in TNO’s bioaerosol test chamber have demonstrated that BiosparQ works as intended. Further development for The Netherlands armed forces is ongoing to make it suitable for military field use in a wide range of terrains and climatic conditions. The system is designed to fit in an armoured military vehicle, allowing for quick transport to wherever the threat is present, but it is quite possible that in the future BiosparQ will also be deployed for monitoring pandemics and outbreaks of diseases such as Q Fever as well as other health, environment and agriculture-related applications. It is TNO’s ambition for the future that BiosparQ will be a successful commercial product that meets the need for a reliable, compact and cost-effective bioaerosol detector for military and security applications. TNO is a contract research organisation, and not a commercial vendor of detector solutions; therefore TNO has teamed with ICx Technologies for the development of BiosparQ into a commercial product for the military and security markets.



Biosparq will eventually add bio detection to the Netherlands Fuchs ©CBRNe World

Spread thin, like school jam...

Brian O'Shea looks at the world of man-portable jammers and wonders if they are the coming thing

When the editorial equivalent of spin the bottle gifted me with the opportunity of writing the man-portable electronic countermeasures (ECM) piece, it didn't seem like it was going to be much of a lemon. The need for man-portable jammers would seem to be a given; as much as it would be pleasant to sit in air-conditioned comfort, in either vehicles or facilities, land is held at the point of the bayonet and, at some point, that realisation is going to become predominant in Iraq and Afghanistan. Then those terrorists, fundamentalists and ne'er-do-wells who have been gifted with the realisation they cannot win in a square fight will end up targeting squads with IEDs.

As delightful as the ECM suite might well be in the mine resistant ambush protected (MRAP) vehicle, it does very little for the squad when the vehicle cannot follow their progress. Steve Hill, Director at the ECM

consultancy Electronic Warfare Solutions, agreed. "RCIEDs have become synonymous with the phrase 'roadside bomb,' which is why ECM has been focused on providing vehicle systems to protect convoys," he said. "If you look at the warfare we are fighting, it is important there is a relationship built with the populace – the hearts and minds approach that has been proven time and again – and you can't do that bypassing villages in an MRAP. It is the classic counter-insurgency dichotomy. Eventually, soldiers are going to have to dismount – they are doing this in Afghanistan – and do routine patrols. That means they are susceptible to the IED and RCIED. So man-portables are going to develop over the coming years, as there will be a shift in the way operations in Iraq and Afghanistan function. There will be more foot patrols, more interface with the population and more man-portables – they will become increasingly important."

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

Spread thin, like school jam...

There is a wide variety of man-portable ECMs out there, and it would seem that, as the demand rises, the industry would have a variety of new products it would be keen to talk about. Not so. Selex, L3-TRL and Kirintec all declined opportunities for interviews, and SESP informed us they had withdrawn their man-portable ECM – but were not able to provide a reason for doing so. For what is supposed to be such a vibrant and nascent market, there is a great deal of shyness out

there. Clearly part of it is the desire not to give any information out to “red force”; some of it is clearly the EOD mindset – if we don’t absolutely have to say something, then let’s not – but there is a reticence to speak about man-portable ECM that is not applicable to other forms of ECM.

Part of this reticence is possibly down to health and safety issues – the idea being that, a bit like live agent training, if we pretend it doesn’t exist then we don’t need to talk about it. Not

only do man-portable ECMs kick out a considerable amount of heat, but also a lesser amount of non-ionising radiation. One of the reasons early man-portable ECM had the bearer/user wearing a shiny silver foil headpiece was to try and deflect the heat, but it also goes to show there is a certain amount of trepidation among the users – there can’t be a fight to wear the pack!

Yet the heat and RF emissions are part and parcel of the job of the jammer: kicking out enough watts to provide a safe bubble within which the unit can operate safe from the RCIED. Is this then the technical challenge of the device – finding the right balance between health and safety and protection? Mr Hill suggested it came down to national tactics rather than technology. “What you will see internationally is a wide spread of different approaches to doing this, and they are all loosely based around the individual countries Conops,” he said. “Some people have rigorous health and safety standards. Stanag 2345 lays down a set of guidelines for personal exposure limits, but they are guidelines and are not necessarily enforced. There are ways and means of spreading out your exposure; if you employ safe and effective drills to swap over the equipment between users during the patrol, you limit individual exposure. Spacing will also contribute to minimising exposure, but it does present an issue. How major that issue is compared to the protection against an IED that device is supposed to offer is a question of balance. Some countries will decide they want large equipment carried by one person in the middle of the patrol; others will distribute it among the patrol, meaning they need smaller, less powerful units and it is easier in terms of health and safety and in weight.”

Clearly, man-portable ECM has to be seen as a component of the force protection. There is little point reducing the watts to its “safest” level if that means the squad is so tightly clustered they become a target for other weapons. Steve Hill suggested people need to think about the protection offered by man-portable ECM in a different way



URC's man portable jammer ©URC

than they do about the vehicle systems. “People get a vision that a “bubble” is one big bubble but in actuality it is a combination of different sized, constantly changing bubbles. The issues are not insurmountable, but do require an understanding of the system and how it is affected by the urban and rural environments, atmospheric conditions and proximity to other ECM. All those requirements need to come together with a knowledge base so people can adequately and safely deploy these systems. This is not always commonplace – ECM went “global” over the last five to six years, and before that it was constrained to a certain number of countries. So, in a lot of instances, the new countries are still developing doctrine, TTPs and an understanding of how the equipment they have procured functions. Those lessons learned are happening rapidly – they have to.”

One company working on man-portable ECM – that was able to speak – was Czech Company URC Systems, which has a range of “Star” jammers. “There are four versions of the Star: the Manpack; the new vehicle jammer, Starlight 3, which has an output of 200w; Starlight 6, our six-module jammer; and Star V which is the biggest with output of 740w,” said Milan Janicek, Managing Director of URC.

URC’S Manpack jammer is in service with the Czech Army and has a modular system. Each squad has two packs, made up of two 20w modules – so the total of four modules can be set to a different sub bands (such as VHF, UHF, GSM and WiFi). Their latest system allows for all the bands to be covered, but at a lower frequency. “You can get only two modules which cover all the bands, so you get lower power,” said Milan Janicek. “Each one would be 20w, but module one would have VHF and UHF and the other would do all the rest. So, while both modules would be 20w each, and you could cover all the bands, you would get lower output power.”

Unlike SESP, which has discontinued its man-portable system, URC are finding an increase in interest for its version. “The Manpack requirement is becoming more

urgent,” said Janicek. “Convoy protection will always be important, but patrolling and IED teams or search operations require Manpack because, if you come to a building with a yard behind the building, vehicle jammers will not be effective behind the building. So you have to take the jammer on your back and go into the building with it – it make a smaller protection umbrella but is better than the umbrella from the vehicle.”

One of Steve Hill’s concerns was that of battery changing. With an eight-hour patrol, there is likely to be periodic battery changes – and TTPs need to be set up to deal with this. URC Systems feels it has a solution to this with its modular system which allows you to change batteries per module – which minimises the down-time. In addition, by using lithium ferite batteries, they can recharge them in the vehicle in the same time they are drained.

Mr Janicek admitted emissions and heat were a technical issue, but were not suffered by the Manpack system unduly. “We have done tests which fulfil the requirement of European Standards – 61V per metre,” he said. “If there is a problem we can complement our jammer with a special rod with silver plated fabric, which decreases significantly the radiation into the head. The antennas are close to the head and are 55cm high, of which 20cm is empty space at head level, and the radiator is above the head. This has two advantages. One is the European standard, and the second is better radiation pattern – as if you radiate into the head or helmet you have a loss, and the space in front of you is not well covered.”

As technology improves and tactics mature, new ways of using the jammers and capability will emerge. One step that would presumably free the manufacturer from some of the health and safety issues would be to mount the Manpack on a “mule”-type UGV, which would allow a heavier, more capable system. There would be technical challenges – such as ensuring that the mule is still able to function when the jammer is on. “Potentially it

could [be the way forward], providing the mule is capable of working within that RF environment. Also, the patrol members will still need to be within the jammers effective range, so it doesn’t totally remove the health and safety consideration totally,” said Steve Hill. “Before you put the jammer on the robot, you need to ensure the two aren’t adversely affecting each other . From a mobility perspective, in my opinion, it is best to keep it on the soldiers’ backs – as the Afghan urban environment is not necessarily mule-friendly plus you have the risk of the mule inadvertently initiating other IED types. If you have a robotic vehicle on an eight-hour patrol, it will have to carry its own batteries, and if you have someone on a patrol constantly monitoring the mule then he is not an effective part of that patrol.”

Instead, Mr Hill suggested any advance would have to come out of the technological left field. “Technically, I would argue that the vast majority of systems follow a similar form of technological roadmap,” he said. “They have all been developed along similar lines so who is going to make the next step and move countermeasures on? We are aware of some innovative companies that are looking at developing potentially better and more efficient technologies . If these technologies progress then they could rewrite the rule book and provide a quantum leap forward in threat defeat. The emphasis is on these companies to continue pushing the envelope and hopefully moving these technically advanced developments into in-service systems.”

One way that URC Systems is looking to deal with the next technological change is to see it as a reactive system, as Milan Janicek explained. “Our future development is based around the development of reactive jammers,” he said. “A lot of the information is not for publication but it is intended for vehicles and individuals, and we should have a prototype this year. Then we can use it as a core for all our jammers. The system will not be too big, and the jammer becomes lighter, smaller and less of a health issue.”

Richard Bouma, Senior Scientist at the Netherlands Organisation for Applied Scientific Research (TNO), describes the European Defence Agency's work on explosive containment

Just contain yourself!

Improved explosives devices (IEDs), and the potential use of chemical, biological, radiological and nuclear (CBRN) agents, are among the greatest threats facing European Union operations. The enhancement of capabilities in the field of explosive ordnance disposal (EOD) of devices with CBRN agents is on the agenda of the CBRN EOD project team of the European Defence Agency (EDA). Its members have identified the need for a physical containment system for unexploded ordnance including IEDs with CBR payloads, as a capability requirement, and have asked TNO Defence, Security and Safety in the Netherlands to investigate the whole range of CBR and explosive effects and hazards and propose innovative and cutting edge technological solutions.

TNO has experience in both CBRN protection and munition and weapons effects. Its expertise contributes to the mission effectiveness and reduced vulnerability of the Dutch forces in Afghanistan. Dedicated facilities are used for experimental studies into protection against IEDs, the performance of armour materials and the performance of protective measures such as gas masks and clothing against toxic agents. Training related to CBRN incidents is provided and advice is given for protective measures and the munition storage layout at the Dutch compound in Uruzgan. Specialists from the energetic materials and the CBRN protection groups jointly worked on this containment study for EDA.

A CBR and explosive threat analysis was made, and user requirements were obtained through interviews with representatives from the nations in the EDA CBRN EOD Project Team. In the Netherlands, a national workshop was held with broad representation from the military forces, the police and the forensics institute. Acceptable levels for chemical, biological and radiological agent release were determined for credible threats, based on toxicity

levels as well as minimum safe distances that have to be respected by the public in accordance with the specific scenario and the instructions received by competent personnel managing the event.

procedures. These detailed requirements may be made available through the EDA.

Commercial off-the shelf solutions were reviewed and their performance assessed by grouping them into the following generic classes: bomb-proof



Containment is especially important for CBR-IEDs as the threat from accidental detonation is far greater than conventional ones ©DoD

Important issues from the point of view of the various users include the need to deal with a device in situ, the speed of the operation, non-interference of containment system with the render-safe procedure, portability, handling of containment with limited number of personnel, and ballistic-proof walls. The translation from threats and user requirements into technical requirements for a containment system was obtained by distinguishing between safe procedures. Each render-safe procedure has a different risk in terms of agent release; therefore technical requirements are set separately for each of them. The technical requirements have been grouped regarding the containment effectiveness, the containment structure and logistics, the render-safe procedure related requirements and post render-safe

waste bins, suspect mail/baggage containment units, IED/UXO containment and removal, on-site mitigation and containment, CB containment, and specialties. Their performance was evaluated against the technical requirements. In the end it is the combination of the containment structure and the specific render-safe procedure that will determine the overall effectiveness. One situation was identified where no dedicated commercial off-the-shelf solution exists, although improvised measures could be and were taken in real scenarios.

For this particular situation a concept design solution is given. With the technical requirements in the final report, it should be possible to fill this gap through research, development and engineering of a dedicated containment system.

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

TALON® CBRNE/Hazmat Robots Speed Time to Detection



Save precious lives and almost an hour of valuable time by sending a TALON CBRNE / Hazmat robot downrange to assess an incident before putting any personnel at risk. Our robots are equipped to plug and play up to seven detection instruments including:

- JCAD (joint chemical agent detector) for CWAs (chemical warfare agents) and TICs (toxic industrial chemicals)
- RAE MultiRAE Plus for volatile gases
- Canberra AN/UDR-14 for gamma and neutron radiation

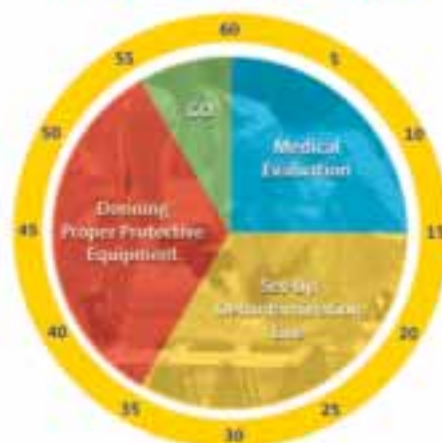
- Raytek temperature probe for temperature sensing
- Smiths APD 2000 WMD (weapons of mass destruction) detector
- ICx Technologies Fido® XT for trace explosives



*Five minutes
to TALON down-range*



*Fifty-five minutes
to Humans down-range*



For further information or to arrange a demonstration, please contact Joanne Armstrong at +1.781.684.3960 or Talonsales@QinetiQ-NA.com

QinetiQ-NA.com

Just contain yourself!

Frank Kaemper, Project Officer Protection, and Jim Blackburn, Project Manager CIED, tell Gwyn Winfield about their input into the containment project

GW: How does the containment project fit into the larger body of work that is underway?

FK: To put it into context of CBRN EOD project teams, in 2006 the chairman at the time was Serge Ferooz (see *CBRNe World* Summer 2007), and they did a capability analysis looking at the whole range of CBRN EOD equipment, concepts, training, quality, etc. Apart from identifying the need for concepts for CBRN EOD, they also identified discrete areas of equipment capability, one of them being dual IPE. We did a study on dual IPE (see *CBRNe World* Winter 2008). The other thing identified was the need for a sophisticated containment system based on the fact that, nowadays, most of our forces are only using plaster of paris and plastic bags for leaky chemical munitions.

JB: The increased likeliness of the asymmetric threat – CBR agents with IEDs – means that the moving of a CBR device is even less desirable than it was in the past. When dealing with a device, the ability to protect the operator, to mitigate the threat from the device immediately and then to go on to some form of technique for dealing with the device are the steps that we are looking at. We are looking at manual neutralisation, which follows on from the neutralisation study, where operators can go into a situation where the functioning of the device is unacceptable and they can take it apart by hand. Each step is about reducing and mitigating the risk that is presented.

GW: At one end you have the “leak, seal and package” drills that have been established for decades, and at the other end there are the large



Containment tends to come in two sizes, light and heavy – welcome to heavy!
©CBRNe World

Nabco-type systems. Are you looking for something that is leak and seal plus, or something more firmly in the middle?

FK: If you do a market survey you will see a lot of solutions. A prime example is Allen Vanguard's Universal Containment System (UCS). What I understand from the operators is that these are industry-driven solutions – nothing has been taken from a military requirement. This is the first time the military has got together in a CBRN EOD community and articulated their requirements. The difficulty was that some of the solutions are heavyweight solutions, being optimised for improvised nuclear devices (INDs), for example, or for chemicals. It was very difficult for people to pinpoint what their real requirements are. The study was based on feasibility and what possibilities there are for containment solutions in the future; that is how Richard Bouma approached it. He took a very broad approach – looking at the market and asking what we have right now. Then, based on discussions with the operator, he identified scenarios of in-situ removal of the device and came up with solutions. That was how the study was driven – that is where the requirement came from.

GW: There is a certain amount of national specificity that must inform any European policy, such as safety distances which vary from country to country. These must have an impact on the system you are prepared to accept – whether it can be deployed by a robot, for example. How does the square peg of national capability and policy fit into the round hole of multinational requirements?

JB: The work we are doing is standardised across the partner member states (PMS) for things like safety distance, in order to find a common thread in the things they are doing. The reality of any type of EOD/IEDD situation is the safety distance always has to be tempered with reality – the safety distance you can achieve with an unexploded chemical munition found in the middle of a farmer's field in Belgium might be kilometres, whereas the safety distance for the same threat in the middle of Brussels would be significantly more challenging. The reality is you would have to work on it with a much lower safety distance purely to mitigate the threat against people. We don't procure kit; we look at developing systems and then providing that study and advice to member states for them to procure. We

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com



Welcome to register for
**the 10th International Symposium on
Protection against Chemical and Biological
Warfare Agents**

**8-11 June, 2010
Stockholm, Sweden**

We invite presumptive speakers to send us their abstracts.

The following topics will be covered:

- ◆ Emerging Threats and Risks
- ◆ DIM/Detection, Identification, and Monitoring of CB Agents
- ◆ CBRN Crisis Management at National and International Levels
- ◆ Medical Management CBRN
- ◆ Physical Protection
- ◆ Commercial Developing Technologies
- ◆ Non-proliferation and Demilitarisation Issues

We also invite exhibitors to take part of
the Exhibition of CBW Defence Equipment

For more information about the exhibition,
please contact cbwx.proj@fmv.se

Register at cbwsymp.foi.se

The venue this time will be Kistamässan, www.kistamassan.com



Just contain yourself!

are not looking at a common procurement; we are looking at providing our member states with knowledge and information and trying to drive them towards similar standards.

FK: This study is an equipment-related study, as Jim said. It is about harmonising our approaches to containment; this is what the study gave us. We had initially hoped the member states would use the results of the study for further progress, common collaboration and perhaps even procurement – like BioEdep. We found after the study that people were very happy with it; it gave us a much better appreciation of what containment is. For example, one EDA partner Member States analysed the results of the study and went straight into procurement as an urgent operational requirement. So, instead of working collaboratively with the EDA, they have fast actioned it and done it nationally.

GW: Does the lack of expert manual skills within many EDA partner nations predicate a reliance on unmanned ground vehicles (UGVs) which in turn impacts on the containment solution? And what impact does the wide variety of UGVs in national inventories have on multi-national guidelines?

JB: EOD manual techniques are used when the risk of the device functioning outweighs the risk to the operator – and that might always be the case for CBR IEDs. It is unlikely you will be able to get a UGV to do it – so how do we make them accessible to a robotic system? By making the requirement open to the users. Currently we are now looking at manual neutralisation as a separate skill set, but we need to capture requirements from the user for both manual and robotic techniques – we have to make it capability driven.

GW: You have been looking at commercial off-the-shelf (COTS) solutions and not getting into detail. What were the broad trends and which came out the highest?

FK: People have to look at the two solutions that Richard came up with: the in situ and the UCS type. The

trouble with the UCS and foam system was that EOD operators would have difficulty looking through the foam to the device, which was a drawback, so we are looking for an innovative solution using gel or something transparent. The other solution was that the device could be rendered safe and removed from the site, and that was pretty straightforward, and there are some good solutions. These solutions range from being very heavy and more IND focused to smaller, transportable solutions useful for smaller chemical devices. People are happy with those two perspectives; CBRN EOD people prefer the in situ one, as that is how they are trained to do render-safe, but we did appreciate there might have to be some more innovation. For example, we are probably looking at some form of tunnelling through the foam to allow operators to render the device safe. People were happy with the study and were happy with the development.

GW: In terms of these future research requirements, how do you go about that? What is the next step?

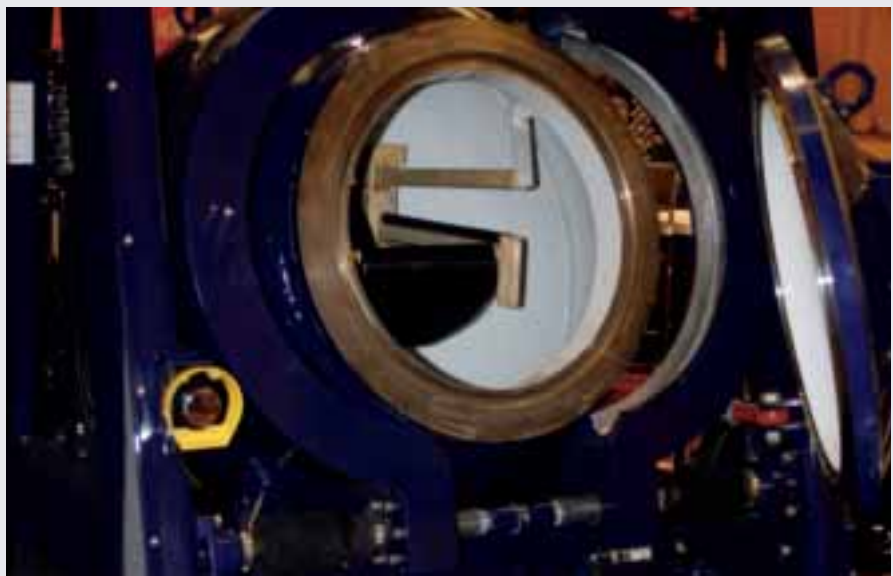
JB: Using the work we have done as a basis, like we do at every stage, we go back to the member states and ask 'What is the interest in taking this forward?' They could take the study and say it is fine they will take the product

and utilise it nationally – that is fine; we have delivered a product. Or they can say that is great and we want to go the next step, and we are guided by what they want to do.

GW: So is there a timescale for the next stage? Is it based on a formal request or are you able to put forward suggestions?

JB: This will be raised at the project team meeting at the end of March, and beyond that we don't have a vision. It was a requirement that we needed to study this, and that the product was this piece of work. This currently is a product; it is not a chain of work, though it may become one if member states' requirements deem it so.

FK: It has been very successful. Containment was an issue in which people didn't have a clear view of what their requirements were, and the study has given them that. It is a clear example of a deliverable and has given them a better appreciation of the problem and their requirements. It is now dependent on the PMS to take this forward, and one of the things we are going to do is write a common staff target. We will look then at the broader CBRN EOD capability, and coming out of that could be the possibility of a common staff requirement based on a future containment system. But we will have to see what the PMS wants.



While the heavier systems do have great capability they do impose mobility and ground crossing restrictions ©CBRNe World



Many countries, such as Finland, are experimenting with UAVs ©CBRNe World

Come fly with me....

Steve Johnson looks at the role of UAVs in CBRN defence

“[They are] almost as complicated as living organisms. In some cases, they have been designed by other computers. We don’t know exactly how they work...”

(Chief Supervisor, *Westworld*, 1973)

The discerning reader may have started to notice a trend with manufacturers. They look at their lovely UAVs, armoured vehicles and UGVs and think, “You know, I really think this could do with a chemical detector. Hmmm and... maybe some go-faster stripes!” Now, far be it from me to come across all sceptical and doubting, but one can’t help but feel a few twinges of concern at this readiness to bolt on extras to systems which we have yet to fully optimise for their primary use.

The issues with CBRN and UAVs are fairly straightforward: what is the concept of their employment? How do they improve CBRN defence in a way that is relevant to the modern threat? What is a useful sensor payload? Should we be spending money improving platforms when we still have much more serious gaps in capability?

Yet before this all becomes a jaded and bitter polemic on misdirected research funding, it seems only fair to examine what products have been developed and what is on the drawing

board. There are certainly plenty of UAV manufacturers. Many of the big primes are dominant – Raytheon, Northrop Grumman and Thales – but the field also has hundreds of SMEs competing well (in between being bought out by primes). Indeed, the large number of manufacturers and national UAV programmes globally means the market picture can seem distorted. UK Trade and Industry (UKTI) describes the global market as being worth \$30billion over the next ten years but, when this is divided by all the programmes, the market seems underfunded with regard to sensor development in general, let alone for CBRN.

UAV systems break down in to a wide range of types. There are fixed wing (Predator, Global Hawk, Watchkeeper, etc) and rotary (Air Robot, Fire Scout), which range from hand-launched through to requiring a runway and capable of carrying significant payloads. My particular favourites are the swarm UAV programmes that look to produce hundreds of co-operative mini UAVs.

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

Come fly with me....

These swarms are quite immature in capability, with numerous hurdles to overcome, but are certainly a technology worth watching. The ideas they generate – dormant swarms of robots able to neutralise attacks immediately, aggressively pursuing contamination and even delivering medical countermeasures – is rather far away for the moment. Many of these ideas also need a leap forward in nanotechnology. The issue of nanotechnology's effect on CBRN is an article in its own right. You might imagine CBRN sensors would not be appropriate for all these vehicle types, but you would be so very wrong. For we can divide the manufacturers and platforms into a number of types: those that have a CBRN sensor package; those that say their system can have a CBRN sensor payload (but remain mysteriously silent about what that would be); and those that are desperately trying to work out how to do it, but write white papers on how their swarms of 35g UAVs will be able to carry out CBRN detection. [At this point the cold flannel is deployed while Steve mutters about vapourware... Ed.]

Part of the problem comes from deciding what you mean by a CBRN sensor bundle. Does this mean sample collection, detection, cloud location or getting meteorological data? For the US it is Locate, Track, Collect, Detect and Identify. These are the specific terms that one of the most recent US programmes adopted, but in the wildest dreams of CBRN technologists (and there are few wilder) there are so many more... wild ideas. An Australian staff officer on secondment to the US Chemical Corps wrote an excellent paper advising on investment in CBRN UAV technology. His vision saw a future where UAVs could also carry out decontamination or neutralise threats by "washing them out" from clouds. There is probably no such thing as a bad idea – but certainly some may need more thought.

The only really credible progress in this field has come from US research efforts, although the Israelis also claim progress in this area. Recent declarations of results by ECBC and Smiths Detection are, however, very confusing. A grand fanfare and press

release in October 2009 declared the successful detection of chemicals by a Smiths sensor mounted on a UAV. Great news for those with goldfish memory, but for those of us with longer memories, and a geek-like obsession with the proceedings of the International Conference on Ion Mobility Spectrometry [Those with similar geek-like memories remember it in the Shrivenham conference in 2003, Ed.], it induced bad déjà vu. You see, back in the early 2000s, a forward-thinking US military instigated two programmes: Chemical Combat Assessment System and Biological Combat Assessment System. These were actually pretty successful, and in 2004 the full test details were released to the conference. I was very impressed, as they had looked at the difficulty of cloud tracking and developed a nice sample retention system to back up the sensors. The chemical sensor package was called Spectrometric Point Ionising Detector – Expendable/Recoverable (Spider) and was a co-operative programme with ECBC and, you guessed it, Smiths Detection. So I was a



Boeing's Scan Eagle is probably the top of the range option ©CBRNe World

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

little unimpressed at their announcement that they had managed to get their LCD Nose Cone detector to detect a chemical in a cloud – really chaps, that's so last decade. Hopefully future announcements may clarify what is so different from the last project. Tender descriptions for the follow-on work from CCAS looked for developments in the sample collection system and improvements in cloud finding and mapping – neither of which were mentioned in the release.

Boeing was the contractor for the BCAS system, and its own successful announcements were in 2008. The fact we have collectively forgotten what was then Boeing's first programme as the lead systems integrator on a solely CBRN programme does them a disservice. The project was awarded to them in 2006 (\$8.2million) and 18 months later they had a demonstrator going and visions of being awarded a second phase and potential procurement of four systems with a value of \$20million. The second two-year phase, solicited as the WMD Aerial Collection system, was tendered in 2008.

The concept of these wonderful machines needs to be fully understood. The US programmes had a pretty strong theme of assessing potential release of agents after a combat strike. The sort of capability you might want before striking potential WMD facilities in rogue states. This concept makes a lot of sense, because it is targeted towards an expected threat. The General Atomics approach of firing out BAE ChemSonde sensors from UAVs to create ad-hoc monitoring networks don't really seem as practical – especially when the wonderful Surface Acoustic Wave technique that ChemSonde uses is so well liked across the detection community.

Slightly less credible is the forward loitering of UAVs with point sensors. Most testing of UAVs to find clouds, especially when you consider the size of space they are moving through, have been problematic. Even micro drone use requires some high-level maths to try to efficiently cover an area which a stand-off cloud detector (Joint Stand Off Bio Detection) or stand off

chemical detector like Bruker's Rapid could do much more effectively. The Japanese Self Defence Ground Force has already mounted Bruker's Rapid on helicopters, and the Fire Scout UAV would be easily converted to a similar role. A combination of tools would make more sense, with stand-off sensors directing point detection and sampling UAVs – mounting stand-off on UAVs as well would make this a very interesting proposition.

Post-event detection and monitoring is definitely a valid role for UAVs and, it is fair to acknowledge airborne radiation monitoring systems have been fielded for some years. Once again, though, it is dubious whether these sometimes very heavy sensor arrays could be mounted on a UAV and less sensitive, smaller detectors would not really fulfil the role. So, whether a release is due to friendly forces' assault, a ROTA event or enemy attack there is a trigger that causes you to send out the UAVs. The fact that in a consequence management monitoring and tracking are more important than verified detection helps. Until really effective miniaturised technologies for detection and identification are available for UAVs there will probably be too many doubts about a single UAV with an alarming LCD 3.3 to trigger a full response.

Should we even be spending money on this area of CBRN when there are much more pressing issues to address? Greatest of these issues are the shortfalls in biological detection and the still very poor co-operation between countries in improving capability. As this issue's article on the EU highlights, although there is a lot of talk about interoperability and co-operative programmes there is still a long way to go – especially for UAVs.

Maybe it isn't all doom and gloom though. Remote inspection by UAV and UGV clearly has a place on the battlefield and in certain cases some sort of CBRN capability would be useful. This might be the ability to deploy drones for remote monitoring – but it wouldn't hurt to realise that improving the other capabilities and systems on UAVs would have a benefit for CBRN defence. Better

surveillance and targeting should make it harder to launch a CBRN attack, and hand-launched drones could give an incident commander an instant overview of a scene before making an approach. The former use would need more research on what indicators could be observed that might indicate CBRN use, and educating operators to think about all relevant threats rather than relying on a CBRN module can surely not hurt.

Let's not forget that all technologies tend to be double edged, and UAVs are no exception. Nato has certainly looked at the threat of UAVs seriously, which would suggest many other countries are also concerned. Certainly at the smaller end of the market, down to hobby shop planes and helicopters, they are cheap, hard to track and relatively covert ways to carry out surveillance or even an attack. Some reports even suggest the use of the UAV as a slow-moving missile to disrupt air traffic in flight or at the take off/landing stage. Yet if you want to really get a panic started then a UAV spraying material out the back over a crowded arena could certainly have effect – even if it might not be effective in CBRN terms.

This raises the very real issue of the use of UAVs in civil airspace. Even on military operations there are concerns about air traffic congestions. This should be less of an issue for smaller, low-level UAVs – in the UK they have been used in Wales, Staffordshire and London for events. At around £20,000 for a basic surveillance UAV, they are a lot cheaper and quicker to task than a helicopter. Potentially people (FAA and CAA take note) make a bit too much fuss about UAVs and risks to planes, and in case of crashes – if a hazmat or CBRN incident has occurred – then perhaps it would be a good reason to clear air space for response assets.

So it's fair to look at procuring some micro UAVs to enhance situational awareness at a CBRN incident. Whether any country can still justify the money and can put together a well-focused CONOPS for a CBRN survey capability for UAV is potentially a bit more doubtful. Advances in other technology, however, could make this a more attractive concept in the future.

Sharp cards!



Due to the popularity of the *CBRNe World* cards, we have sold out of the original batch and been forced to reprint them. The cards are illustrated by our regular artist, Dave Frewin, and based on the designs for the cover of *CBRNe World* Summer 2007.

The cards are standard poker cards (89 x 63mm), have been finished to a high quality and are designed to meet the exacting requirements of gaming authorities worldwide. Printed on 305gsm solar block card, the playing cards are CBRN-themed throughout, full colour and have both one-eyed and two-eyed variants.

To differentiate them from the earlier printing, the hands or the face cards are now holding slightly different versions of their other-eyed variant (so the two-eyed Jack holds sticks of dynamite, while the one eyed has a "bomb").

Once again, these cards are on a strictly limited print run and are expected to run out fast.

The cards are available only through the *CBRNe World* website – www.cbrneworld.com – and cost £5.95, \$12.00 or €9.00 plus postage and packaging. Discounts available for multiple purchases.

Every pack guaranteed lucky*!

www.cbrneworld.com

* Good luck not guaranteed

Brian O'Shea looks at the current EU CBRN Action Plan and tries to offer a Euro-sceptic view and a Europhile view

European Union needs better counsel?

©Eurofighter

The ratification of the Lisbon treaty last December brought in a whole series of powers and structures to the EU. It also linked neatly with the delivery and ratification of the EU CBRN Action Plan. This plan was developed by an EU CBRN Task Force, whose composition is not publicly revealed but was a combination of member state representatives and those industry representative that member states suggested. "Plan" is something of a misnomer because, in effect, it is actually a catalogue of capabilities the EU should have in order to protect its citizens from CBRN threats. It is certainly remarkably comprehensive, with actions covering "prepare" "respond" and "recover". It does sadly fail to consider counter-proliferation and the connection with foreign policy, however. This function sits with member states and the new External Action Service of Baroness Ashton.

Before delving in to the EU CBRN Action Plan, it is worth just looking over some of the EU CBRN initiatives that have gone on in the last year. This is only a sample; the number of programmes and responsible bodies and funding mechanisms is vast.

- European Security Research Innovation Forum Report, Chapter 6. Looks like independent validation of other EU CBRN work, but could be considered biased as its CBRN WG was composed of the same people currently being funded by EU work, and their recommendations bore an uncanny likeness to the work their institutions was already carrying out.
- EU CBRN Action Plan. A detailed (possibly overly so) look at EU requirements for CBRN security. Comes with funding and working groups to co-ordinate EU work on CBRN for the next five years.
- EDA CBRN Intelligence Analysis Course.
- EDA Multinational CBRN Staff and Incident Commander Course.
- EDA CBRN Countermeasures study out to 2030.

- EDA CBRN Functional Architecture Study.
- EDA BioEDEP Programme (see page 64).
- A number of FP7 programmes looking at such topics as: networked mobile CBRN security; co-operative networks of CBRN facilities; directional radiation detection and monitoring for hazards in water sources.

Almost 300 recommendations does mean, however, that the plan is pretty unwieldy and is heavily reliant on sub-groups; even with sub-groups for C, B and R this is still a rather unmanageable target. What is needed, and what will hopefully be published, is a high-level strategy and roadmap for how the EU will be achieving this epic list.

What is certain is that the economic crisis will surely have made more people take interest in the funding available both for research and for procurement. With a €200million FP7 Security call due out with lots of CBRN themes, a major programme from the EDA and more than €10million of expected funding for EU CBRN Action Plan-related activities this year are targets on lots of radars.

Sadly, the point of contact for JLS for the EU CBRN Action Plan didn't respond to any requests for information, which brings us nicely to the most important point on which the plan could fail. CBRN activities in the EU are incredible complex and badly communicated, both within and outside of the EU. A serious effort to actually communicate with the media, public, member states and external stakeholders is vital; this is going to take a serious communications strategy. Returning calls to reporters will be a good start [this is not a new occurrence –Ed.].

A more obvious success in the EU is the European Defence Agency. Working on a relatively shoestring budget, it is not only delivering projects on time and to budget to enhance military CBRN capability but it has also been consciously co-ordinating with Nato and de-conflicting effort, as well as adopting a strong inclusive strategy to

communicate with industry, states, academics and external stakeholders. If a military agency can achieve this then hopefully the Civil EU Action Plan can raise its game and draw lessons from the EDA.

Euro-sceptic view

Sometimes attacking the EU is made a little too easy, and the EU CBRN Action Plan is no exception. The stakeholders in CBRN are many and widespread in a single country, and across the EU it is even worse. So you might think I would be in favour of this grand initiative to pull capability together. Well, I certainly do like the idea, but I rather think what we will see is a bit of progress but predominantly a huge waste of money.

The issue is one of de-confliction and synchronisation of effort. The plan got off to a bad start by not including the international (non-EU) stakeholders from the very start. Only days before the kick-off meeting of the project (a year into the CBRN Action Plan development process), representatives of Nato, Interpol and others were rather unsure as to what the plan was and what it would do for them. This was unsurprising, as the UN and international groups such as the Australia Group and the G8 Global Partnership tend to describe the EU as "frustrating, complex, unclear and precious". One can hardly blame them when the political infighting of DGs and EU institutions are such public knowledge.

Fundamentally, and controversially, there is a real chance the EU CBRN Action Plan will focus on spreading largesse around all the member state research countries rather than looking to get best value with focused projects and investments. It seems very likely that member states will want to see some *justé retours*. But this is only part of the problem. Although there are claims that the position will soften, the EU Security and FP7 work has always been very specific about not being defence-related – so we see the EDA working with a budget an order of magnitude smaller than security budgets. Can we hope civil insecurities will

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

European Union needs better counsel?

acknowledge that in CBRN some of the best research and capability can ONLY be achieved by military establishments and, further, than much military research can be of value to the civil sector and vice versa?

There is a terrible danger in Europe that we end up believing our own PowerPoint presentations about how good we are and ignoring the advances gained by massive investment in the US. The substantial funding made available in Europe seems to have been spread thinly around research institutions that use it to boost their own capabilities rather than actually advance CBRN capability. Worse still, in one case there is an EU FP7 project that is spending more than €3million developing a type of radiation detector that is already available from a UK company! At best this is poor patent research and literature review, but at worst it highlights the self-interest of institutions struggling with their own domestic funding.

Overly large consortium, meetings without consensus, political grandstanding and protectionism are some of the nastier sides of the EU, and I hope the EU CBRN Action Plan will prove me wrong. The simple test will be whether the EU decides to fund duplication of work that has been done outside the EU, rather than acknowledge that in some areas we would be best to engage with the US to share initiatives rather than pretend nothing exists west of Ireland.

Europhile

Nationalists can always get a good cheer from the public by taking a dig at the EU, but some things are too important to ridicule or take cheap shots at. The economic crisis is already having an effect on investment in research and capability for domestic security capabilities, and it will almost certainly get a lot worse before it gets any better.

So the natural reaction may well be to take a protectionist attitude and rile against the high costs of EU membership and the profligacy of EU spending. But this would be to miss the opportunity offered by this downturn. Many of the problems of the EU come from a lack of serious engagement by member states – a half-hearted commitment to projects and institutions. This isn't unique to the EU – equally the Nato CBRN committees have problems with lack of meaningful engagement by some members. Basically, too many people look only for what they

can get out of an institution rather than what they can contribute.

Yet in the corridors of power an unheard of opinion is circulating. Maybe countries need to co-operate in order to share costs and results to be able to maintain research levels and technical capabilities. The UK has already cited closer co-operation with France and Germany, but this is a half effort. What we can potentially see is the EU acting as a clearing house for co-operation and co-ordination of efforts to build an enviable CBRN defence capability.

There are certainly enough instruments for implementation – although the EU CBRN Action Plan is led by DG Justice Freedom and Security, which is traditionally dismissive of the military/defence industry. DG JLS (L for Liberte!) must show very strong leadership to ensure these large financial instruments – especially the FP7 Security funds – do co-ordinate. It is not really clear if there is actually any power to force other agencies to co-operate. Industrial and academic engagement also needs to be wider than just those recommended by countries' representatives. With the greatest possible respect, to believe a permanent representative of a country's research authorities really knows all the possible expertise in their country is naive.

I'd really like to see some of the European Defence Agency's success built on as well. The EDA had been moribund, and more uncharitable people might suggest the same group of people just circulate from one working group to another – from EU to EDA to Nato. Strong leadership from the likes of Frank Kaemper, Jim Blackburn and Hilary Bird has transformed the agencies' CBRN work – so much so that a few countries could take a few tips from its approach to developing research and procurement strategies. It's not perfect – a number of countries really seem to lack a sense of urgency, which is often a reflection of their reticence in contributing to operational missions at UN, Nato or EU levels as well. Interestingly, the ESRI report for CBRN even acknowledged that, of 50 participants from across Europe, 34 did little or no work – a pretty poor state of affairs.

The civil community of the EU has got to realise there is synergy with military research and that it is often undertaken by the same institutions. Nor would it hurt to look at the way in which the EDA has developed a funding structure that allows countries to easily co-operate on research. If a capability is seen as of major concern

to most/all EU member states, the EDA makes a business case for it to be a centrally funded project – a Category A project. Should there be items of interest only to a few countries the EDA acts as a support agency and contracting agency to allow countries to co-operate – a Category B project. Bio-EDEP, a programme to develop biological capability in all fields is the largest CBRN programme from the EDA at over €100million. It looks to close all the gaps on bio, personal dosimeters, modular sensor fits, recce vehicles and, in theory, will not only develop capability but will also lead to collaborative procurement. It would be nice to show multi-state procurement can work, shrugging off some of the past horror stories.

There is a really important opportunity to ensure under-funded national institutions like TNO (where rumours of redundancies seem to occur every six months) CEB, DSTL and FOI can be maintained to keep delivering European capability. A strong EU lead could rationalise what level of capability is needed in Europe and ensure it is funded and properly directed. This would necessitate apportioning research to the appropriate institutions rather than letting them write their own cheques about what they should do. If the EU CBRN task force is sensible it will ensure it doesn't fall in to the trap of letting those institutes advise on spending as well as receive it. It also needs to be inclusive, and that means an end to UK isolation. Part of this is quite simply helping DSTL and AWE better take advantage of funding opportunities (the HPA has been chasing down contracts all over Europe), because European CBRN research that doesn't include AWE and DSTL are clearly not going to be the best they could be. A really true sign of European strength would also include confidence in drawing on the best capability internationally, balancing developing EU academic and industrial base against cost effective spending.

This is a glorious opportunity for the EU to clean itself up and synchronise projects across all EU institutions – but also to synchronize externally with non-EU countries and international institutions. This new, clear and efficient approach to CBRN would be an enviable model to the rest of the world that could act as a model for how to pull together the best practices, policies and equipment from across the world. It will be no small challenge, but if we attempt it sceptically then it can only be doomed to fail.

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

CW: What is the current status of the Brazilian Armed Forces in terms of CBRN defence? What is the basic capability?

PM: The Brazilian army has had troops specialising in CBRN defence since Brazil entered the Second World War in 1944, when it created the Department of Chemical Warfare Center Specialised Instruction (DGQ). The DGQ was structured in order to train officers and sergeants to work in an environment contaminated with chemical warfare agents.

The DGQ was modelled on the US army's Chemical Warfare Service, which provided instructors and material for the development of the course. In 1953 it was recreated as the Society of Chemical Warfare, and on 31 December 1987 was transformed into Cia DBQN [translated: CBRN, Ed.], based in Rio de Janeiro. The army's CBRN defence has been undergoing a process of evolution over the past 15 years, with a doctrinal change in the employment and training of human resources, not only in the operational area but also in technology research and development. Since 1994, the QBN Army Technology Center has been working in the area of defence research, to provide technical support to the development of CBRN defence capability for the troops.

Since 2002 it has created a wide CBRN defence system, the purpose of which is to enable ground forces to be employed in foreign missions, for defence, to guarantee law and order (GLO), and in co-operation with civil defence when operating in environments where there is the presence and/or threat of use of CBRN agents. The CBRN defence system uses a modular organisation, including command and control activities, scientific advice, operational activities, support activities and logistics activities in research and development in support to the Scientific and Technological Development for CBRN defence. Operational activities are conducted by troops with different specialisations, as per their job.

In any region in which they are employed, they will work with designated platoons of public order police to provide an immediate response to CBRN events. They will work primarily to establish a secure perimeter prior to the primary identification of CBRN agents, to decontaminate personnel and assess and

Brazil!

to reduce the magnitude of the event. The troops are also equipped and trained for operations in a CBRNE environment. Troops at Cia QBN Defense and 1 Pel Defense QBN organic Operações Special Brigade, Goiânia, are highly trained and well equipped, with a high degree of mobility to work throughout the country. These troops support the Bda OpEsp (Special Operations Brigade) and, when required, the high command and large units in CBRN operations.

Their main tasks are: to operate in the operating environment contaminated by CBRN; to decontaminate personnel, equipment and vehicles; to recognise, identify and demarcate areas contaminated by CBRN agents; to provide support, when required, to civil defense in detection, reduction, decontamination, and other active and passive measures of protection against radiological, nuclear, chemical and biological agents used by hostile forces; and to co-operate in the training and specialisation of military personnel for CBRN operations.

Scientific and technological advice is provided by the Technological Center of the Army, through the Department of Defense QBN. The QBN Defence Division conducts the following activities: identifying CBRNE agents in their laboratory facilities; specification of technical performance of CBRN defence equipment; selection and testing of CBRN defence equipment; development of sampling methodologies; training in response to disasters with CBRNE agents; operating a mobile laboratory for the identification of CBRNE agents. Research and development activities are performed by the Department of Science and Technology in its subordinate units: the Military Institute of Engineering and Technological Center of the Army. The Military Institute of Engineering is our training school for engineers and graduate, dedicated to research into various lines of interest in CBRN defence, as well as drug development for tropical

diseases and development of methods for identifying chemical warfare agents through spectrometric nuclear magnetic resonance. This system incorporates the national civil defence system, working closely with the various specialised agencies, including EOD teams.

CW: What is the level of threat in Brazil? Do you see this being a local terrorist, narco-terrorist or state funded terrorist threat? Do you see it being a chemical, radiological or biological threat?

PM: Brazil is characterised as a very well integrated nation, without major ethnic, cultural, religious, political or other separatist conflicts which are the common motivation for terrorist groups. The drug trade is more related to issues of urban violence, common to large urban centres; there is no sign of terrorist motivation and if there are they are faced with fierce resistance from the police.

While there are historical precedents, we don't see a near-term threat from the domestic employment of CBRN weapons. Because of the great events Brazil will host in the next six years (among them the 2016 Olympics), and the large influx of tourists, one cannot completely remove the threat of occurrence of attacks motivated by external groups seeking visibility through a "spectacular" attack. The National Defense Strategy states that the military should be built around a capability, rather than specific enemies. Brazil has no enemies, and to ensure we don't have them in the future we seek to preserve the peace and prepare for war. It is within this framework Brazil is preparing to make a serious response to CBRN threats, acting proactively by establishing effective control measures that minimise the threat from CBRN weapons within Brazilian territory. The armed forces, police, hazmat teams, civil defence units and control agencies have had a significant investment in human resources, training and the acquisition of CBRN defence equipment.

ANNOUNCING

GLOBAL 2010 SECURITY INDIA

International Exhibition & Conference on Homeland Security

28 – 30 April 2010
New Delhi



Participate in India's Dedicated Homeland Security Event in 2010
Be a part of the Fastest Growing Market Now!

Contact Us for further information:

Americas/Europe/Middle East
Mr Andrew Marriott

T: +44 (0) 1959 569 297
F: +44 (0) 1959 564 384
M: +44 (0) 7799 890 438
andrewmarriott@globalsecindia.com

Asia Pacific

Ms Sandy Wong
T: +65 6392 5328
F: +65 6392 3098
M: +65 8383 8012
sandy@globalsecindia.com

India

Lt Col Pritam Mehta (Retd)
T: +91 11 32471910
F: +91 11 42828080
M: +91 9811413696
editor@indiasafe.com

Organised by:

GSA Exhibitions Pte Ltd

and

India Safe
Redefining **HOMELAND SECURITY**

www.globalsecindia.com

CW: What research and development capabilities does Brazil have for CBRN defence? Are there any major bi-lateral research agreements? What are the current research priorities?

PM: The army's research and development is conducted by the Department of Science and Technology, via its subordinate units: the Military Institute of Engineering and the Technological Center of the Army. Through funding obtained by the Ministry of Science and Technology through FINEP (company funding studies and projects), the CTEEx [Brazilian Army R&D Centre] has conducted a project to set up laboratory infrastructure for QBN defence, where funds of \$4,000,000,00 are being employed in the acquisition of new equipment for testing, as well as the acquisition of a mobile laboratory for the identification of CBRNE agents.

The mobile laboratory will start operating in early 2011. It will be set within the modern concept of CBRN defence capability to provide unambiguous identification of agents within four hours of receipt of the sample, operating independently from external resources. It can also be transported anywhere in the country in an aircraft. The laboratory system will include gas chromatography and mass spectrometry to identify chemical agents and toxic industrial material. There will also be X-ray fluorescence for elemental analysis, portable radioisotope identifiers, real-time PCR and infrared spectroscopy.

Another important project for CTEEx was the allocation of funding for the NFRAStructure projects, which uses computational fluid dynamics as an assessment centre and risk analysis tool. In addition to these specific army projects, Brazil is developing several research applications for CBRN defence, especially in drug development, environmental monitoring measures and remediation of soil. Recently, the Ministry of Science and Technology has expanded its financing of research related to defence and to fulfilling its Plan of Action for Science, Technology and Innovation (ST&I) for National Development 2007-2010. This will promote research and development of technology focused on national defence priorities and public safety, by supporting the infrastructure of science and technology research institutions (ICTs) in these areas, the training of human resources and innovation in business.

CW: What have you taken from the Goiania incident in 1987? Is this merely a tragic accident that offers little to shape the force now?

PM: The tragic incident at Goiânia was a milestone in the development of the civil defence system and the deployment of a response to a natural radiological disaster. From the lessons learned come successes and mistakes. Brazil has developed a system of radiological protection and a modern system of constantly updating human resources; this is recognised by the IAEA for its excellence. The teaching and structures built as a result of the incident are of great value in preparing to respond to terrorist attacks involving the use of radiological agents, such as a dirty bomb. During the Pan-American Games several organisations participated successfully in the monitoring of local games and the Olympic village.

CW: What is the role of the CBRN forces in terms of homeland security? Is it mainly an augmentation of civil forces – a national role – or a role in the capitol and major cities such as Rio?

PM: The strategic planning of the Ministry of Defence – the National Defense Strategy – defines the role of the military as being to contribute to enhancing the level of national security, with particular emphasis on: improving processes for managing crises; preventing terrorist acts and attacks on human rights, and conducting counter-terrorism operations led by the Ministries of Defense and Justice and the Institutional Security Cabinet of the Presidency (GSI-PR); implementing measures for the security of critical infrastructure, including services, with particular regard for energy, transport, water and telecommunications led by the Ministries of Defense, Energy and Mines, Transport, National Integration and Communications; enhancing co-ordination, evaluation, monitoring and mitigation under the lead of the Institutional Security Cabinet of the Presidency (GSI / PR); and implementing protective measures against chemical, biological and nuclear attack, which is the responsibility of the Civil House of the Presidency, the Ministries of Defense, Health, National Integration, Mines and Energy, Science and Technology and GSI-PR, who aim to

ensure the safety of the people and facilities in the country against the possible effects of such weapons.

The role of the military in internal security is fully integrated with civil forces in regard to CBRN defence. The army CBRN specialist can act directly with the bulk of internal security and support agencies. The role is nationwide, with priority given to large urban centres where troops are stationed for emergency deployment. Cia Defense QBN is located in Rio de Janeiro and one in Goiania Pel near the capital of the republic.

CW: What connection is there between CBRN and EOD forces? Are they kept separate or do they have clear lines of control?

PM: Each of the state police forces and federal police force has their own EOD teams, as well as the armed forces. There is no direct reporting, but instead there is an intensive co-operation between the various teams. Each year, the CTEEx performs stages of training designed to provide EOD teams with the characteristics and peculiarities of CBRN agents. During this stage, the EOD teams are trained to use CBRN protective equipment, detection equipment and CBRN decontamination. The frequency of sporting events has significantly increased the integration of police agencies with the army in CBRN defence, having tasked CTEEx in the detection, protection and decontamination suitable for these teams. The search for greater integration between security forces and civilian military is essential and, as I observed in several international conferences, is not easy due to operational differences and performance protocols.

CW: Where do you see the force developing in the next 5-10 years?

PM: The prospect for development of the CBRN defence capability of security forces in the coming years is excellent. During this time, we will be involved in a number of international sporting events: the Fifth Military World Games in 2011, the Confederations Cup in 2013, the World Cup in 2014 and the Summer Olympic Games in 2016. The resources required to stage these games are enormous, and an increase in resources is needed to make the games safe, which will leave a huge legacy in terms of equipment and preparation.

Professor Maria J. Espona, of Argiq-leps, outlines the diverse range of South American pathogens and asks whether they pose a threat

Epidemiology of natural diseases: a security matter?

Biological weapon (BW) agents are pathogens present in nature that were included in weapons programmes but, in the end, they are just micro-organisms that cause diseases around the globe. Under the Biological and Toxin Weapons Convention (BTWC), disease surveillance is a topic of growing concern, but at the same time it is an arena where specific problems are barely known, sometimes even for experts. This article will discuss the epidemiological situation of BW agent diseases in South America in order to understand the current situation and to confront future challenges.

In order to fulfil the objectives of this research, we analysed the open sources available. To do that, we used Google as a search engine and also the search engines from each website belonging to chosen organisations such as WHO, PAHO and CDC. With regards to a specific study of BW agents in the region, we took as a starting point the Australia Group core list of human pathogens, updated in 2009, because we consider it the broadest and most comprehensive list. From there, we then looked across the Internet to find which agents and diseases are present in South America (Guyana, French Guayana and Surinam were excluded from this analysis because of the almost complete lack of trustable data).

We considered a temporal frame of ten years (from 1998 to 2008) for our analyses and we also registered the sources of the more relevant information (from supranational to local levels) in order to qualify them and categorise them using information quality methodology. (Lee et al. 2006, Fisher et al. 2006, Wang & Lee 2005.)

General framework

The understanding of the regional epidemiological situation will allow us not just know which listed agents are present in the area and their history (background information) but also to have useful information for health plan elaboration and response systems organisation and, at the same time, to have key elements in the attribution process in case of a biological attack.

Anne L Clunan clearly established the importance of knowing the epidemiological background information in the concluding chapter of her book

Terrorism, War or Disease? Unravelling the use of Biological Weapons (2008). In it, she (like the other authors who also participated on the book) pointed out the role and importance of the background information, not just in case of biological attacks but also in health care situations.

In this context it is relevant to point out there is no information source that is 100 per cent reliable and, because of this situation, it is important to consider and use state-of-the-art techniques to obtain the maximum profit from the raw elements used to build the research. Taking into account this situation, we apply

Table 1: BW agents present in South America

BW agent	Country
Dengue fever virus	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Perú.
Eastern equine encephalitis virus	Argentina, Brazil
Hanta virus	Argentina, Bolivia, Brazil, Chile, Paraguay, Uruguay, Venezuela
Junin virus	Argentina
Lymphocytic choriomeningitis virus	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Perú, Uruguay, Venezuela
Machupo virus	Bolivia
Venezuelan equine encephalitis	Argentina, Brazil, Colombia, Ecuador, Perú, Venezuela
Western equine encephalitis	Argentina,
Yellow fever virus	Argentina, Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, Venezuela
Oropuche virus	Argentina, Brazil, Peru
Rocio virus	Argentina, Brazil,
St Louis virus	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela
Sabia virus	Brazil
Flexal virus	Brazil
Guanarito virus	Venezuela
West Nile virus	Argentina



While the jungle may be neutral, many of the pathogens within it are not! ©DoD

information quality and total data quality management techniques and tools in order to perform our research in a deeper and more complete way. This new approach, when applied to the building of epidemiological information databases, allows us to count with a better quality product and to discover the problems with the traditional information sources in this field (WHO, PAHO, Promed, CDC, health ministries, etc). Due to the scope of this paper, the deep study of the different information sources wasn't included, but it was considered a first approximation to it.

Disease surveillance

Taking the section about viruses from the Australia Group core list for human pathogens, we identified the listed BW agents presents in South America through a search of relevant information on the Internet. It was possible to determine the presence of the agents listed in Table 1, both as an endemic disease and outbreak.

It is important to point out the information shown in Table 1 was built considering more than one information source in each case and taking the smallest indicator of presence as an affirmative answer. The last concept is

based on: the complications in determining the presence of a specific disease due to the geographic situation; the characteristics of the labs involved; the health care politics; control regulations; and the difficulties inherent to the diseases and etiologic agents under consideration.

Summary and conclusions

The steps followed in order to fulfil this paper's objectives took us on an information journey. We had several good and profitable moments and also several difficult and complicated ones. But, in summary, we can say we learned a lesson on each step. To study the regional and national epidemiological situation we must know the disease's dynamic and also the behaviour of several organisations.

After going through the relevant information we could make three main points. Firstly, the epidemiological information about BW agents presents in South America is poor, and most of the time is difficult to find and trust. Secondly, the international organisations which deal with epidemiological information showed deficiencies too, especially when it comes to documents presented in different formats. Thirdly, the regional

epidemiological situation was possible to determine and shows a greater complexity than we had expected.

Recommendations

The epidemiological information analysis is a dynamic process and it is important to keep the databases updated and the core concepts under continuous review. The background database's elaboration will give us an advantage both in health care planning and in case of a BW attack. Even when the background information is important, we have to bear in mind the fact that there are other factors which change the epidemiological situation. Among them, we can point out the following: increase of international flights and general globalisation; poor sanitary and living conditions; changes in health and food technology that create new opportunities for pathogens; changes in population behaviour (adventure tourism, trekking, riding, etc); expansion in populated areas; pathogens' evolution; and the rise of new pathogens. As Anne Clunan (2006) said in her book, the paradigm change from "need to know" to "need to share" shows the importance of interdisciplinary work. This is the key to improving the dynamics of biodefense and health care.

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

Reactive Skin Decontamination Lotion

Reactive Skin Decontamination Lotion (RSDL) – www.RSDDecon.com – a patented, broad spectrum skin decontamination product intended to remove or neutralize chemical warfare agents or T2 toxin from the skin, leaving a non-toxic liquid that can be washed away with water. Deployed in both Gulf Wars, RSDL has been adopted by several military services around the world, and is currently undergoing fielding by the U.S. Department of Defense for deployment with U.S. troops.

RSDL has been fielded by the militaries of Australia, Belgium, Canada, Ireland, Slovenia, Sweden, and The Netherlands and by First Responders in Australia, Canada, France, Sweden, and select units in the United States.

RSDL has also equipped first responders deployed to provide security at significant international events, such as the Olympic Games and G7 & G8 Heads-of-State meetings, where it was available to protect VIPs and the public.

RSDL® Removes or Neutralizes ALL Known Chemical Warfare Agents:
GA (TABUN) • GB (SARIN) • GD (SOMAN) • GF (Cyclohexyl SARIN) • VX (Nerve Agent) • HD (Mustard) • T-2 Toxin

www.RSDDecon.com



Idaho Technology's BioDetection Capabilities Overview

Idaho Technology Inc. (ITI) develops, manufactures, and sells the fastest, highest-quality machines in the world for identifying threat agents through DNA analysis. Products include the R.A.P.I.D.® System, RAZOR® EX instrument and Reagents and Test Kits for pathogen identification and sample purification.

RAZOR EX Instrument - The RAZOR EX system detects and identifies biological agents using cutting edge technology. Made for field use, the RAZOR EX is compact, lightweight, and easy to use. It is a field PCR unit that is fast, with ultra-reliable DNA based results. Created for first responders and front line military troops, it is easily operated while working in protective equipment under extreme conditions. The new battery powered unit includes Bluetooth capabilities, bar code reader, and a bright, easy to read color screen.

Reagents and Test Kits - ITI offers high quality, freeze-dried, ready-to-use reagents for the detection and identification of pathogens and biothreat agents.

We Have the Following Reagents and Test Kits Available:

Anthrax - Bacillus anthracis; Avian Influenza H5 Subtype; Botulism - C. botulinum Type A; Brucellosis - Brucella species; Campylobacter - Campylobacter species; Cryptosporidium; E. coli O157; Listeriosis - Listeria monocytogenes; Plague - Y. pestis; Ricin; Salmonella species; Smallpox - Variola; Tularemia - F. tularensis

Idaho Technology Inc.
 390 Wakara Way, Salt Lake City,
 Utah 84108, USA
 Ph. +1-801-736-6354
it@idahotech.com
www.idahotech.com



Smiths HGVI™

The HGVI™ is a hand-held multi-sensor gas and vapor identifier that detects, identifies, and quantifies toxic industrial chemicals and chemical warfare agents, as well as gamma radiation.

The HGVI utilizes H-Fusion™ Decision Enhancement Software and a cutting-edge, sensor technology built on Ion Mobility Spectrometry (IMS), Photoionization Detection (PID), and Taguchi Gas Sensors (TGS). Advanced software combined with multi-sensor technology enables emergency responders to achieve a new level of accuracy and confidence in the detection and identification of chemicals in the field.

Offering one-touch operation, the HGVI is simple to operate in Level-A gear and in any environment. Weighing only 7.5 pounds (or three point four kilograms) it is easily carried or ported by a shoulder strap onto a scene.

Highlight Features of the HGVI include:

- Multiple sensors, utilizing IMS, PID, and TGS technology working together as orthogonal techniques in one instrument.
- H-Fusion®, advanced software developed to interpret results of multiple sensors.
- Unlike traditional IMS devices that use a Nickel 63 IMS source, the HGVI uses a non-radioactive Corona Discharge that requires no maintenance.
- Automatic detection, identification and monitor modes of operation.
- Easy decontamination.
- Identifies a broad range of CWAs and TICs from the ITF-25 list of High and Medium Hazards.
- Gamma radiation detection.



smiths detection
 bringing technology to life

Ahura Scientific

Ahura Scientific develops rugged, ultra-compact optical systems for rapid identification of unknown chemicals, integrating exceptional portability and performance. The company's complementary products--FirstDefender® (Raman) and TruDefender™ FT (FTIR)—were designed to maximize in-the-field coverage of a broad range of hazardous materials and mixtures including TICs/TIMs, chemical weapons, white powders, explosives, narcotics and more.

FirstDefender, the company's flagship Raman system, weighs less than two kilograms, requires no calibration or consumables and can identify unknown substances within 30 seconds – even through sealed glass or plastic containers. Based on Ahura Scientific's patented optical technology and mixture analysis software,



FirstDefender offers superior performance, accuracy and reliability.

Weighing less than 1.4 kilograms, TruDefender FT brings field-proven FTIR technology to the palm of the hand. It is easy to use in Level A gear, yet rugged enough to withstand the rigors of field use.

Key features:

Designed for use in the hotzone. Instruments are lightweight and fully decon-capable to be taken directly to an unknown substance in the hotzone, eliminating significant response time.

Fast, accurate analysis you can act on. Analysis results are returned in seconds. Onboard hazard database provides full safety and treatment information, further speeding appropriate response.

Precise results. Custom software provides clear, definitive results that don't require user interpretation or judgment. Automatic mixture analysis enhances substance identification capability.

Easy to use. Intuitive menu-driven user interface enables even novice users to be proficient with minimal training.

Easy maintenance. Self-contained instruments require no scheduled maintenance or calibration, and use no consumables. More information is available at www.ahurascientific.com

Ahura Scientific

Scott Health & Safety

Scott are leaders in the design and manufacture of Respiratory Protection Equipment (RPE). Their range includes military and civil defence masks and filters, powered breathing systems, self-contained breathing apparatus (SCBA) and escape sets.

Scott have been supplying RPE to military markets for over 30 years. They have supplied the in service filter to the UK MoD for the last 20 years and their M95 respirator ensemble has been in service with the Finnish MoD for over 10 years. From this base M95 has been supplied to meet the requirements of military and Civil Defence customers all over the world including geographic markets as diverse as the USA and Japan, Australia and Chile and the Czech Republic and Malaysia.

Their expertise, at the cutting edge of RPE technology, is indicated by contracts they are currently working on. These include the General Service Respirator (GSR) contract for the British MoD, the M 2005 for the Finnish MoD and the End of Service Life Indicator Technical Demonstrator Programme for the UK MoD.

Scott is part of Tyco Fire and Security, a division of Tyco International. This gives Scott the benefit of the backing and resources of a major international company.

www.scottsafety.com



SCOTT
HEALTH & SAFETY

BERTIN TECHNOLOGIES EQUIPMENT FOR BIOLOGICAL AND CHEMICAL THREATS DETECTION

Bertin Technologies is a multidisciplinary company which provides innovative solutions in the fields of healthcare, sustainable development, defence and industry. For several years, Bertin Technologies has been developing state of the art solutions for the detection and identification of chemical and biological warfare agents. Early warning, detection or identification of chemical and biological weapons attacks, are essential. In order to achieve such functions, Bertin Technologies invests R&D efforts to propose new technologies to CBRN teams.



Biological detection

Coriolis®: cyclonic air samplers for outdoor or indoor collection of airborne pathogens.

Coriolis®MS: ruggedized air sampler for surveillance of critical areas
Coriolis®FR: portable equipment for first responders

Biological analysis

KIM: provides rapid identification of biological agents using the immuno-agglutination under field technique.

Chemical detection

Second Sight® MS: uncooled infrared camera for detection and visualization of dangerous gas clouds (CWA, TIC, and VOC). It has been designed for critical area surveillance and protection against chemical threats.



Contact Information:

Bruno Vallayer
CBRN Director
e-mail: vallayer@bertin.fr
tel: +33 139306070
www.bertin.fr

Bertin Technologies

10 bis, av Ampère
Parc d'activités du Pas du Lac
78180 Montigny-le-Bretonneux
FRANCE

CAPABILITY PROFILES

NBC-Sys

Decontamination, Protection and Detection

NBC-Sys is one key specialist in Nuclear, Biological and Chemical Protection, Decontamination and Detection systems.

Air Treatment Systems:

NBC-Sys has experience in air treatment, of armoured vehicles (installed systems on different generations of vehicles) and hardened or soft shelters.

- Air Filtration Units
- Air Conditioning Units
- Complete range of filters (NBC, NBC+TIC's) from 12 to 300 m3/h

Decontamination systems:

SDA : thorough decontamination for vehicle
SDMS : decontamination for sensitive material

Symoda : decontamination for aircraft
Personnal decontamination line (military and civil defence)

Individual protection:

Gas masks (soldiers and helicopter pilots)
Filters (NBC NATO , NBC+TIC's)
Blowers

Detection systems:

Individual nerve-agent detector
Paper detector
Chemical detector kit

NBC-Sys has also a great experience in the field of **Emergency Response and Disaster Management.**

Intervention face to toxic hazards:

- NBC terrorism
- Civil Defence
- Industrial Accidents (Nuclear and Chemical)
- Hazmat Transportation Accidents

Protecting the public :

- EVATOX™ System
- Active and passive containment system



Contacts:

Bruno DAVID Marketing & Sales Director
Tel: +33 4 77 191920
Fax: +33 4 77 191929
e-mail: b.david@nbc-sys.com
<http://www.nbc-sys.com>

10th International Symposium on Protection Against Chemical and Biological Warfare Agents

The following topics will be covered:

Emerging threats and risks
Detection, identification and monitoring of chemical and biological agents
CBRN crisis management at national and international levels
Medical management CBRN
Physical protection
Commercial developing technologies
Non-proliferation and demilitarisation issues

Stockholm, Sweden 8-11 June, 2010

Register at www.cbwsymp.foi.se



Paul Boyé Technologies

Worldwide leader in research, development and mass production of CBRN/F protective suits, Paul Boyé Technologies offers a complete range of products to meet the requirements of Armed Forces and Civil Defence (soldiers, decontamination experts, aircraft pilots, helicopter pilots, special forces, police forces, military police, medical personnel, fire-fighters). In use within 38 countries in the world, Paul Boyé CBRN protective suits have gained international recognition thanks to their high technological level. Used by all international organisations (UNO, OPCW, IAEA, NATO...) for chemical disarmament operations, they have proven their superiority and comfort in the hardest climate.



Paul Boyé
TECHNOLOGIES

PAUL BOYE TECHNOLOGIES
1564, Avenue de Lagardelle - 31810 Le Vernet - FRANCE
Tel. +33 534 482 110 - Fax. +33 534 482 115
export@paulboye.fr - www.paulboye.com



Paul Boyé
INCORPORATED

PAUL BOYE INC. - Francis Brochu
1107 Oak Tree Drive, Havre de Grace, MD 21078-2570 - USA
Mobile (443) 910-3477 - Tel. (410) 939-3033 - Fax (410) 939-0817
fbrochu@paulboye.com - www.paulboye.com

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

Biral Bio Detection and Meteorological Capability

Bio Detection Capability

Biral designs and manufactures a range of instruments for the detection of airborne biological particles. These have been primarily for the detection and characterisation of biological weapons and Biral detection equipment has been included in every generation of bio detector in service with the UK armed forces.

Our latest real time, generic detection system, VeroTect™, is now being used or assessed by armies and domestic security services world-wide and our Aspect™ Aerosol size and shape analyser has been adopted as the non-specific trigger detector for the Japanese Defence Agency mobile CBRN Reconnaissance vehicles.

Biral has a considerable history of developing prototype systems at the cutting edge of technology and was awarded the UK MoD's PIBBDT contract for the Portable Integrated Battlespace Biological Detection Technology technical demonstrator (a fully self-contained, specific biological warfare agent detector).

Other projects include a UV Lidar system for stand off detection of bio agents and compact systems for the collection and identification of micro-organisms for military applications and for monitoring animal health.

Although much of Biral's biological sensing developments have been for military and security applications these have also been adapted for more general use and are available as commercial units.

Meteorological Capability

In addition to the military bio detectors Biral also supplies meteorological equipment.

The military WeatherPak is a fully sealed, portable weather station, built to survive harsh environments. The basic system measures wind speed, wind direction, wind stability class (turbulence), air temperature, relative humidity, dew point and barometric pressure/altimeter (other parameters such as visibility and present weather are optional). The WeatherPak is rugged (can withstand a drop onto concrete from 1 metre) and can be deployed within 60 seconds.

The HSS visibility and present weather sensor is also portable and can be used on its own or as part of the WeatherPak. The HSS sensors were designed for the military over 20 years ago and have proved so successful that they are now deployed from the Tropics to the Arctic in a wide range of both military and civil applications. The sensor measures the affects on visibility by fog, rain, precipitation, dust, sand and smoke and identifies the type and amount of precipitation.

For more information please contact:

Biral
P O Box 2, Portishead, Bristol, BS20 7JB
Tel: +44 (0)1275 847787
Fax: +44 (0)1275 847303
Email: biodection@biral.com
Website: www.biral.com



Lion delivers total CBRN garment protection

With an outstanding commitment to innovation and service, Lion Apparel is a global leader in the provision of protective clothing and equipment, meeting the needs of the world's leading commercial and government organisations, emergency services and the military.

Lion's unique capability to deliver comprehensive peace of mind protection to any size of operation has resolved the CBRN requirements of a wealth of agencies including the US Army, US Marine, Orlando Police Dept, Fire Dept City of New York, Northern Ireland FRS and Dutch Specialist Police.

Offering an impressive garment portfolio which completely understands the needs of the end user, Lion's CBRN wide ranging

capability includes the single layered MiTE which delivers versatile, lightweight, comfortable easy on/off protection and is ideal for search and rescue operations and incident monitoring. The multiple-hazard ERS suit is a rapid response garment which offers significant protection benefits to the police, bomb disposal, search and rescue and special forces. Other garments include the MIGZ3, an ensemble specifically designed for crowd and perimeter control, and the ICG which offers advanced protection against the world's worse chem./bio threats.

Whatever the size or nature of your requirement, challenge Lion to find your perfect CBRN solution. Please email cbrn@lionapparel.com, visit www.lionapparel.com or call +44 (0)1895 237 359



Hot Zone Solutions

The World's most practice oriented and realistic CBRNE training provider and consulting service.

For emergency responders, law enforcement, military and government clients, Hot Zone Solutions provides:

Live agent training; equipment; Scientific testing and evaluation; Major event CBRNE security; On-site analysis; CBRNE medical certification

Building on more than 75 years field experience in NBC defense, international weapons inspection, emergency response, medicine, forensics, counter-terrorism and non-destructive evaluation; Hot Zone Solutions offers a full spectrum service with core competencies covering the use of biological and chemical warfare agents, toxic industrial chemicals, explosives and radioactive material.

These services are provided at some of the leading training facilities in Europe in cooperation with leading CBRNE equipment manufacturers and suppliers.

Hot Zone Solutions offers corporate and individual

training and can tailor training solutions to meet individual needs, local and national requirements.

With our security division, Hot Zone Solutions can support major's event with trained and certified security personnel; or can provide in-house CBRNE certification for security personnel. This includes detection and monitoring capabilities, sampling, field identification, scene preservation and defensive response.

Hot Zone Solutions offers multiple solutions to evaluate CBRNE capabilities; including surveys, risk assessments, capability assessments, exercise design and management and simulant and live agent training programs.

We pride ourselves on being dynamic, versatile, practical and not only trained, but experienced in handling and working with CBRNE materials.

If you have specific CBRNE training requests or needs, we can provide a solution directly, or through one of our partners.



Powerful and Effective Multi-Purpose Equipment from Intelagard

Whether the mission calls for decontamination, hazmat remediation, or fire suppression, Intelagard systems and solutions provide effective, rapid response capabilities.

Intelagard's next generation systems use Compressed Air Foam (CAF) technology that maximizes resources while minimizing user fatigue. The systems are ideal for decontamination operations, as the foam adheres to vertical and inverted surfaces maximizing dwell time between the agent and decontaminant. All of Intelagard's systems have been field tested in the most rugged and austere environments. From the Macaw backpack to the large-scale High Mobility Decontamination System (HMDS), Intelagard has a system sized to fit your needs.

Intelagard also offers EasyDECON DF200, the powerful and effective chemical/biological

decontamination formulation that kills anthrax, MRSA, Hepatitis A, SARS, HIV and more, and neutralizes HD, VX, GD and other toxic chemical agents. EasyDECON DF200 also removes the smell of decomp from drysuits while lowering bacterial loads that can make divers sick.

Intelagard systems and solutions are in use by the military, Urban Search and Rescue Teams, Civil Support Teams, Public Safety Divers, first responders, and industry.

Maximize your ability to respond with Intelagard multi-purpose equipment.

Contact
Intelagard
1-303-309-6309
sales@intelagard.com
www.intelagard.com



TSI Incorporated

TSI's M41 PATS tests how well a military gas mask fits the soldier. Modern military masks are capable of a high degree of protection, but ONLY if they are fitted correctly and donned properly. The M41 provides a numerical measurement of the Fit Factor of the mask while it is being worn by a soldier.

The soldier dons their own assigned mask and performs a series of exercises that simulate typical activities. The M41 provides a Fit Factor for each individual exercise as well as an overall Fit Factor. When used as part of a training program the M41 PATS ensures that personnel get the best possible protection from their assigned mask.

TSI's Fluorescence Aerosol Particle Sensor (FLAPS™) Systems alert personnel of the potential presence of a harmful biological threat and trigger sample collection and identification systems for threat confirmation. The FLAPS technology offers high sensitivity with low false-alarm rates, while maintaining low operating costs. FLAPS systems are used for fixed, vehicle, and shipboard applications. They are also used as referee systems at most test sites throughout the world.

TSI CBRN Defense products have successfully supported every major U.S. military effort since Desert Storm. They are used by foreign allies worldwide to address emerging defense and homeland security requirements.



Proengin

Proengin has developed biological and chemical warfare agents field detectors using flame spectrophotometry. The well known and world widely used AP2C has proven the capacity of that technology to be the most reliable on the field with the lowest false alarm rate and the simplest ease of use.

The new extended range field handheld chemical detector AP4C
New developments such as the AP4C have extended the capacity of that technology to include chemical warfare agents and Toxic industrial materials in a simultaneous mode. There is no limitation in number of gases detected by the AP4C. All nerve agents, all blister agents and all blood agents can be detected by AP4C within the requirements of response time and sensitivity of NATO recommendations.

Canadian Forces have selected the AP4C to replace their old technology IMS detectors. Their selection was based on the capacity to prove with real live agent that AP4C could meet those standards.

The AP4C has extended the range of chemicals that can be detected by Proengin chemical detectors. All dangerous compounds containing Sulphur, Phosphorus, Arsenic, and/or the chemical liaison can be detected in a simultaneous way.

Of course, as for the AP2C, the AP4C has the capacity to work in very severe environmental conditions (explosive areas) and the measurements are unaffected by high humidity levels or by presence of other organic chemical compounds such as paint.

www.proengin.com



PROENGIN

Environics – Innovative Solutions for Security

Environics Oy is a company, specialized in CBRN Security. The company's portfolio includes everything from a single portable chemical warfare agent detector, to a wide area CBRN security monitoring networks. The company also provides training and consulting services.

This year Environics will release a new product family for radiological and nuclear detection and identification – The RaniidVision. The RaniidVision family consists of high performance RN detectors, which vary from handheld detectors to full radiological reconnaissance vehicles, and online expert database systems. The new modular products enable RN detection for an extremely wide scale of different applications as they can be used either individually or as a part of a larger network. With wireless

communications the setup is easy and all the products can be integrated to the Environics EnviScreen CBRN and Environmental Monitoring System.

The RaniidVision products are:
RaniidPro100 Handheld or Fixed Radiological and Nuclear detector
RaniidPro200 Portable Radionuclide detector and analyzer
RaniidSONNI Radiological Reconnaissance Vehicle
RaniidDB Online expert database system

Another remarkable characteristic of the RaniidVision family is that using the detectors require minimal training yet they each are a high performance expert tool. Ease of use and low maintenance costs are a cornerstone of Environics solutions so the user may

concentrate on the task at hand instead of constantly taking care of the equipment to ensure correct function.

For more information on the Environics RaniidVision products please contact us by mail at sales@environics.fi and for more information on our products and services please visit www.environics.fi



 **Environics**

Germfree

Germfree designs, engineers and integrates mobile laboratories into full military chassis, ISO containers or commercially available civilian vehicles. Integrated Air Filtration-HVAC systems are designed to operate from (-40°C to +43°C) and can be changed from negative pressure containment for laboratory operations (up to BSL-3) to positive pressure operation for collective protection. Laboratories are engineered to meet applicable STANAG requirements. Our latest labs are designed to meet the demands of military missions as well as public health assignments. Germfree experts can work with you for analytical equipment selection and development of a safe, efficient and ergonomic laboratory design.

Germfree's second-generation mobile labs feature safe sample entry from the outside

directly into the high containment Class III BSC-Glovebox with integrated specialized detection equipment. Shielding for radiation protection is available.

Germfree is a leading innovator in the development of ruggedized primary containment equipment (Class II & III BSC-Glovebox and fume hoods) and exhaust air filtration systems that meet or exceed U.S. Military Standards. Germfree specializes in developing interconnected containment systems such as a Glovebox and a fume hood. For the safe and secure movement of samples into and out of containment, Rapid Transfer Ports allow these items to be safely moved between containment systems or even between laboratories without breaking containment.
www.germfree.com



 **GERMFREE**

AirBoss-Defense – the Ultimate Protection

AirBoss-Defense is the Project and Contract Management Division of AirBoss of America Corp. We specialize in the design, manufacturing and sales of Chemical, Biological, Radiological and Nuclear (CBRN) Personal Protective Equipment (PPE).

As part of AirBoss of America Corp. Portfolio of businesses, we have access to diverse rubber transformation and development facilities. Capabilities include rubber custom mixing, calendaring, extrusion, injection moulding and specialized hand assembly products.

Renowned internationally for our CBRN hand wear, footwear and Gas-masks, our range of products also includes Fire Fighting and Extreme Cold Weather footwear (ECW), Multi-Purpose Safety Boots and a wide range of industrial extruded and moulded rubber

engineered products for the defence and industrial markets. We maintain a highly experienced, well-trained work-force of over 350 person and certified ISO 2001:2000.

AirBoss-Defense's «Ultimate Protection» Mission assures the highest quality PPE to our ever-broadening client base including Armed Forces of NATO, its allies and First Responders around the world. We commit ourselves in developing products using the most advance research and innovative technologies to help protect the people that value life above their own.



AirBoss-Defense
Tel: +1 (450) 546 0283, Fax: +1 (450) 546-0213
Email: info@airbossdefense.com
Web: www.airbossdefense.com



20/20 BioResponse

20/20 BioResponse, a division of 20/20 GeneSystems, Inc produces BioCheck Suspicious Powder Screening Kits. Owing to its ease of use, low cost and fast results, BioCheck functions as an initial biological screen by performing a highly sensitive positive protein test. Often used in conjunction with more sophisticated detection instrumentation, BioCheck was developed specifically to allow first responders to quickly rule out the presence of any biological pathogen and quickly restore confidence, preventing widescale evacuations. Highly endorsed by civil first responders and military CBRN teams worldwide, BioCheck is a favored technology when dealing with unknown powders and hoax mailing threats. Useful to both large agencies as well as small municipalities, its low cost and short training requirements make it a favored tool for all agencies regardless of size or budget.

Extensively tested and evaluated, BioCheck has been shown to detect minute amounts of biological material when testing unknown powders. Recent US Army ECBC testing showed sensitivity to as little as 100 µg of Ricin and 1 x 10⁷ cfu of B. anthracis spores.

Based in the Washington, DC area, 20/20 operates a state of the art laboratory with a full team of biochemists and molecular biologists.

Contact Information:
20/20 BioResponse
9430 Key West Avenue
Rockville, MD 20850 USA
Tel: +1 240 453-6339 x103
Fax: +1 240 403-0289
Email: info@biocheckinfo.com
www.biocheckinfo.com



Tetracore - Experience counts!

Tetracore was founded in 1998 by scientists with extensive experience in BW detection. They developed BioThreat Alert® (BTAs) Kits which analyze suspicious samples for the rapid detection of:

Anthrax; Ricin; Plague; Botulinum toxin A and B; Staphylococcal enterotoxin B (SEB); Orthopox (the family of smallpox); Abrin; Brucella; Tularemia

They are by far the leader in first responder field identification of samples for biothreat agents. BTAs are used worldwide by HazMat teams, law enforcement, federal, state, and local governments, and corporations.

Tetracore has now developed an all new instrument for use with our BTAs – the Rapid

BioAlert reader. Superior to other readers previously used with Tetracore BTA strips, The Rapid BioAlert is a fully functional Windows based ultra-mobile PC (UMPC) with Wi-Fi and bluetooth capability – it is smaller, lighter, more accurate, easier to use, and can store data on thousands of readings. It easily interfaces with other computers and, in turn, is easily updatable. Using the Rapid BioAlert eliminates guesswork by providing a quantifiable analysis which can be stored or sent electronically.

Please contact us for more information:
Tetracore, Inc.
9901 Belward Campus Drive
Suite 300
Rockville, MD 20850 USA
240-268-5400
www.tetracore.com



CAPABILITY PROFILES

TALON® CBRNE/Hazmat Module

TALON robots support a modular CBRNE/Hazmat kit that can be purchased as an addition to new or existing models of the GEN IV TALON robot. This latest modular capability from the makers of the widely used TALON family of robots includes detectors for radiation, nerve agents, excessive temperatures, explosives, TNT, and volatile gases.

The CBRNE/Hazmat module is the latest in a series of “plug and play” capabilities being developed for TALON robots to make them more adaptable, affordable, versatile, and cost-effective to deploy. QinetiQ North America previously announced an add-on heavy-duty shoulder and gripper for the TALON GEN IV, enhancing the robot’s ability to lift heavy debris and making it strong enough to carry a mine detector.

TALON® robots have all-weather, day/night capabilities and can negotiate almost any terrain. They can also be configured to support a variety of commercially available x-ray inspection systems, giving the user the ability to drive the robot down range and have it remotely x-ray a suspicious package or suitcase to determine the contents.

For further information, please visit www.talonrobots.com. Grant writing assistance is available.



Systems for Systems by OWR

For more than 50 years the OWR brand has been established in the NBC defence market on an international scale.

CBRNe threats have become part of the reality of today’s life and will remain a threat for the future, but by using modern techniques and user-friendly applications OWR’s mobile and scalable systems for protection, detection, decontamination and medical treatment help protect our societies.

As a systems and technology integrator with experience, know-how and team competency, we realize advanced cost effective solutions that limit the impact of CBRNe events.

Based on depth of experience and continuously evolving design concepts, OWR offers the customer integrated CBRNe

defense systems to protect the valuable systems of human beings.

Contact:

OWR GmbH
Oberschefflenzer Str. 9
74834 Elztal-Rittersbach
Germany

OWR S.A.
Hottingerstr. 17
Postfach 1275
8032 Zurich
Switzerland

www.owrgroup.com
welcome@owrgroup.com



ICx Technologies CBRNE Detection Capabilities

ICx Technologies develops and deploys both laboratory scale systems and compact, portable products for the entire range of CBRNE threats. The detection instruments from ICx are effective, accurate and simple to use. Their sensitivity and accuracy are among the best available while being designed for use in the field. By incorporating detection instruments that sense and identify CBRNE threats, security personnel are provided with superior awareness and actionable intelligence.

CHEMICAL POINT DETECTION

The Agentase™ CAD-Kit™ provides first responders with the ability to conduct surface, solid and liquid interrogation of nerve, blood and blister agents, acids, bases, aldehydes and oxidizers. This kit provides accurate results in field environments, improves detection limits to rival those of expensive handheld electronic

testing devices and provides fast signals that are easy to interpret. The simplicity of this kit makes it user friendly for the entire first responder community.

This sensing technology has been adapted for use in mass decontamination efforts with the Agentase Disclosure Spray™. The solution changes color when sprayed on surfaces contaminated with chemical warfare agents (CWAs). The Agentase Disclosure Spray provides emergency responders with a simple, rapid and reliable method of locating chemical agent contamination to focus decontamination efforts or determine decontamination efficacy.

For more information on ICx detection solutions, visit www.icxt.com



CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

CAPABILITY PROFILES

i-bodi

i-bodi is an innovative leader in project research, development, manufacture and project management. We are specialists in developing bespoke and low volumes of products from customer defined specifications, with particular experience in computer controlled test platforms for CBRN protective clothing and respirator evaluation.

i-bodi has developed heated and sweating, anthropometrically correct mannequins that can bend, walk and run. Head-forms with soft polymer skins that fully articulate and breathe, they can be heated and sweat, and have internal cameras for fogging evaluation and can mimic speech.

With over 20 years of industry experience, we specialise in providing intelligent solutions for both industry and large government organisations.

i-bodi can be employed at any stage of the project lifecycle to aid the customer in the development of their product, from initial concepts through to prototyping and manufacture.

As a contractor we can enhance your project with expertise in CAD design, 3D laser scanning, 3D rapid prototyping, mechanical/electronic and software engineering, product documentation and customer support services.



Dräger – Technology for Life

Dräger is an international leader in the fields of medical and safety technology. The family-owned company was founded in Lübeck, Germany, in 1889. Over the past five generations, Dräger has evolved into a publicly traded, worldwide group. The company's long-term success is based on the four key strengths of its value-driven culture: customer intimacy, professional employees, continuous innovation and a commitment to outstanding quality.

"Technology for Life" is the guiding philosophy. Whether in clinical applications, industry, mining or fire and emergency services, Dräger products protect, support and save lives.

The safety division offers customers consultancy, products and services for an integrated hazard management, especially for personal and facility protection. The current portfolio comprises stationary and mobile gas detection systems, respiratory protection equipment, fire training systems, professional diving equipment as well as alcohol and drug detection units.

The current product range of the medical division includes anesthesia workstations, ventilators for emergency, critical and home care as well as warming therapy for premature infants. Patient monitoring, IT solutions, accessories and consumables, ceiling supply units, light systems and central supply systems for medical gases complete the portfolio.

Dräger has about 11,000 employees worldwide and is currently present in more than 190 countries. The company has sales and service subsidiaries in over 40 countries. Its development and production facilities are based in Germany, Great Britain, Sweden, the Netherlands, South Africa, the USA and China.



Dräger

CBRNe Convergence 2010, 2-5 November, Rosen Plaza, Orlando, Florida. More information on www.icbrnevents.com

DEFENZ™ – Enzyme solutions for Biosafety

Since Genencor® first developed enzymes for defense purposes, the organization has continually invested to further develop these technologies, which has led to some remarkable innovations. We are committed to finding new ways for our enzymes to meet the needs of military and civil defense.

Today, European and U.S. military forces are putting our enzymatic solutions to the test – in order to validate that our products deliver advantages for logistics, safety, and the environment. Defense laboratories in Germany and the U.S. have found, for example that enzymes can greatly reduce logistical burdens, while remaining highly effective in decontaminating chemical and biological agents.

Enzymes are also biodegradable, which makes them a powerful alternative if one is looking to reduce the impact of decon solutions on equipment and clothing. As the enzymes degrade, there will also be less impact on the environment.

As our world faces increasing danger from chemical and biological threats, Genencor continues to introduce new ways to help you respond.

A world leader in industrial biotechnology

Genencor®, a division of Danisco A/S, is a world leading enzyme supplier and a pioneer in enzyme innovation and metabolic pathway engineering. Genencor improves processes and product performance, and creates new products, for a spectrum of industries. The industries we serve range from biofuels and laundry detergents to animal nutrition and food.

In collaboration with customers, technology leaders, governments, and other stakeholders, Genencor develops and manufactures competitive, biobased solutions. Our innovations create value throughout the supply chain, from raw material to finished product, while improving industries' sustainability profiles.

Genencor was founded in 1982, and today is part of Danisco A/S, with a global manufacturing, sales, and distribution network that spans more than 40 countries. The division's dedicated workforce of world-class experts drive Genencor to become the growth engine in industrial biotechnology.

Key markets

Genencor produces and supplies hundreds of enzyme products to customers in more than 150 countries.

Industry focus areas include:

Textiles—desizing, biofinishing or biopolishing, denim abrasion, denim bleaching, peroxide removal, and leather processing

Fabric and Household Care—a complete offering of proteases, amylases, and mannanases for liquids and powders, focused on cold water washing performance



Grain processing—

Biofuels—enzyme solutions for starch conversion

Sweeteners—carbohydrates processing for sweetener products

Industrial Markets—a broad range of applications in processing proteins, soy, and other raw materials, as well as in biosafety decontamination products for medical, military, and first-responder settings

Animal nutrition—a comprehensive range of enzymes and betaine for pig and poultry feeds under the Danisco trademark

Food and beverages—a full range of enzymes and biobased ingredients for the various food and beverage industries

Biochemicals—expertise in synthetic biology and metabolic pathway engineering to design microbes and processes for manufacturing biochemicals and other molecules

Genencor creates value through collaboration

Genencor® works in close cooperation with customers, technological innovators, and other stakeholders to improve business and sustainability outcomes.

We are committed to:

Improving product value and performance

Achieving high-performance outcomes for industry

Creating novel products

Decreasing total manufacturing costs

Increasing production yields

Reducing natural resource consumption

Improving sustainability outcomes

Diminishing manufacturing constraints

Reducing reliance on non-renewable raw materials

Our collaborative projects have led to many technological and commercial breakthroughs.

Find more information at: www.genencor.com



GENENCOR®
A Danisco Division

CRISTANINI S.p.A.

Cristanini company located in Verona (Italy) is a worldwide leader in the research, development and production of CBRN decontamination/ detoxification systems and products. Established in 1972, Cristanini has since acquired a reputation of manufacturing small, medium and large scale CBRN systems and mobile field stations for a simultaneous decontamination/detoxification of personnel, vehicles, equipment, sensitive material and terrain.

Cristanini experience and know-how is the result of years of dedicated research, applied engineering and the production of equipment and accessories with innovative solutions for CBRN detoxification/decontamination.

The R&D program is conducted in cooperation with the most famous University and Institutes, including Nationals Military Labs. The state-of-the-art R&D is validated by more than 25 patents. This is the result of

a creative work and an integrated problem solving approach.

BX 24 is proved to be the most effective CBRN decontamination/detoxification solution in the world. Moreover, Cristanini family of decontaminants includes other products such as BX 40 for aircraft interiors and nuclear decontamination, BX 30 for training, BX 29 for personnel and SX 34 for sensitive surfaces and materials including detection instruments.

Cristanini Company is NATO Constructor since 1987 with NATO Certificate A5009 and with Product Quality Certification AQAP2110 and ISO 9001:2000. Cristanini systems are based on the concept "ONLY 1 SYSTEM – 1 PRODUCT- 1 OPERATOR" that is Sanijet C.921 + CBRN BX 24 Decon/Detox + SANIJETGUN Lance, a system that radically changed the traditional decontamination philosophy.
www.cristanini.com



CRISTANINI CBRN
DECONTAMINATION SYSTEMS

Bruker Detection-Expect the Unexpected

Bruker Detection, a division of Bruker Daltonics, is the leading company in the field of CBRN detection and has for over 30 years been the expert for development, engineering and manufacturing of "easy to use", reliable detection equipment. The Bruker CBRN product line includes stand-off as well as point detectors, handheld as well as stationary, systems for onsite analysis and solutions for platform integrations.

Bruker Detection constantly makes great efforts to improve their CBRN product line and to adapt to the ever increasing needs of the CBRN detection market. The demand for reliable instrumentation in the field of Security and Safety has become increasingly high. Flexible detection equipment, provided by Bruker Detection, enable first responders to fulfil their demanding tasks.

Our CBRN detector range is based on ion mobility spectrometry, mass spectrometry, Fourier Transform IR spectrometry, semi conductor based radiation detection and various bio detection technologies e.g.

Main fields of application are:
Stand-off Detection; Point Detection; Onsite Analysis; Platform mounted applications

Contact
Bruker Detection
a Division of Bruker Daltonics
Leipzig-Germany
Phone: +49 (341) 2431-30
Fax: +49 (341) 2431-404
sales@bdal.de
www.cbrn-bdal.de



First Responders using chemical agent warning instruments RAID-M 100 for their missions



Blücher Technologies: A tradition of innovation

Blücher GmbH in Erkrath can look back over a history that spans forty years. Still in family hands, this traditional company has retained its very high ethical claim of: Always focusing our activities on protecting life.

The core business of Blücher GmbH is the development and production of high-efficiency filter technologies. Based on spherical, high-performance adsorbers - in principle similar to activated carbon - pollutants, smells and other unwanted substances are reliably filtered out of gases and fluids and safely bonded. For optimum protection and comfort in all circumstances, whether in action, at work or play.

Research, development and innovation have made Blücher a world market leader for CBRN protection. Over 10 million of Blücher's SARATOGA® brand protective suits and systems in over 40 countries speak for themselves. Even the most demanding task forces,

including OPCW inspectors who are confronted with CBRN hazards every single day, rely on SARATOGA® from Blücher.

The SARATOGA® systems include not only CBRN but also ballistic protection as well as protection against foul weather, fire and cold. But comfort too is also taken seriously. Integrated ventilation systems for cooling and moisture management with designed-in weight minimisation reduce the physical strain and ensure adequate mobility.



Avon Protection Systems

Avon Protection Systems, part of Avon Rubber p.l.c., is the world leader in advanced CBRN respiratory protection solutions..

CE approved FM53

Avon Protection's multi-functional FM53 now has both CE and NIOSH approval, cementing its position as the most advanced respiratory solution on the market, and Avon as the overall leading designer and manufacturer of CBRN respiratory products.

The FM53 is the only mask of its kind that functions as both a positive pressure self contained breathing apparatus (SCBA) mask as well as a negative pressure filtering device (APR). It has been specifically designed to protect users against the multiple threats and meet the asymmetric warfare challenge of today. It provides protection against traditional chemical and biological warfare agents, select Toxic Industrial Materials (TIMs) and particulate matter, including radioactive dust threats. This means a high protection factor for the wearer, and therefore complete peace of mind. With CE approval, and NIOSH last year, the FM53 is now accessible to a wider range of users, from worldwide Special Forces to leading European police forces.

ST53™

Avon Protection is also applying for CE approval of its ST53™ systems, which it is anticipated will be completed in April 2010.

ST53™ utilises the FM53™ mask combined with modular breathing apparatus technology to provide positive pressure SCBA and/or PAPR capability. Seamless transition between filter protection (negative pressure) and SCBA protection (positive pressure) enables the user to react to his or her operational circumstances when at a scene of an incident. It is in service today with Military Special Forces, police specialist tactical units and Narcotic Clandestine Laboratory entry groups.

www.avon-protection.com



EPD-Mk2-SIM simulation training dosimeter

Now available from Argon Electronics, the EPD-Mk2-SIM provides you with a high fidelity training simulator that enables every operational feature of the real Thermo EPD-Mk2 to be demonstrated without the need to utilize an ionizing radiation source.

Based on the Thermo EPD-Mk2, the simulator uses a standard AA battery, with a minimum 170 hours battery life in continuous use.

Operates correctly with all Thermo EPD accessories including telemetry system.

Operates with all Thermo EPD administration and management software Easy EPD, Easy issue, DCS and ebREMS.

Simulator alarms 1st and 2nd HP10 alarms and HP07 alarms when dose rate reaches preset level.

Simulation of peak dose rates, dose-profile and chirp dose.

Simulation of low battery alarm.

Supplied complete as a system package, a body worn player device enables the EPD-Mk2-SIM to respond to simulation gamma sources, whilst a player interface is also available for the PlumeSIM wide area classroom and field survey training system. Complete exercises involving simulation survey meters and dosimeters can now be created with ease.

For further information on our extensive simulation instrument product range, or to request a copy of Argon Electronics' FREE CBRN Training Equipment Guide, please contact:

Argon Electronics, Unit 16 Ribocon Way
Progress Business Park, Luton, Beds. LU4 9UR
Tel: +44 (0)1582 491616
Fax: +44 (0)1582 492780
E-mail: sales@argonelectronics.com
www.argonelectronics.com



Source Vagabond Systems

SOURCE Hydration Technology is unique and considered the next generation among hundreds of thousands of combat soldiers that are issued with our Hydration systems including: US Army, US Marine Corps, Swedish Army, French future soldier FELIN, UK Army, IDF, Israeli police and others.

SOURCE NBC Hydration Technology:

- High chemical resistance
- Mask compatibility:
 - Type A-XM-50, S-10, FM-12, GSR
 - Type M- M17, M40, M70 Series and MCUZP C4

And some unique features:

- Guaranteed safe and taste-free drinking water: Glass-like™
- Liner technology in reservoir and tube delivers pure liquid taste with no plastic flavor
- Bacteria-Free System: Grunge-Guard™, FDA approved technology

- Unique INDICAP™ filler cap provides seal indication for the user and easy opening for re-fill
- Source R&D special project approach for any hydration application

Source R&D can respond quickly to any custom made inquiries.

What makes SOURCE different?

Innovation- New designs are constantly brought into the market, multiple international patents granted to technologies and components developed at SOURCE. Vast experience in large scale production of military textile personal gear.

Our R&D and Sales team consists of real users with live combat experience.

Our ability to rapidly respond to special requirements of customers and build custom made products.

e-mail: military@source-vagabond.com

Phone: +972 4 8574 370 ext 230



Expo Detection Roundup

	1	2	3	4	5	6
	Fido XT	Fido OnBoard	Fido PaxPoint	Fido Verdict	ClearPoint	DE-tector
Type of Technology Utilised	Amplifying Fluorescence Polymer	Amplifying Fluorescence Polymer	Chemiluminescence	Raman Spectroscopy	Raman Spectroscopy	IMS
Explosives detected	15-20	5-10	1-3	>20	10-15	10-15
Destructive analysis	No	No	No	No	No	Yes
System components	Sensor Head tether, Sensor body	Sensor Head optional handheld components	Sensor Head tether, Sensor body	Analyser	Analyser	Swab
Time to result (s)	<10	<10	<10	<20	<15	<20
Type of substance analysed	Solid, powder, gas	Gas	Gas, liquids	Solids, liquids, powders	Bottled liquids	Solid
Distance to source	Varies	Varies	Varies	Contact	Contact	Contact
Mixtures	Yes	Yes	Yes	Yes	Yes	Yes
Expandable library	N/A	N/A	N/A	Yes	Yes	Yes
Other substance detection	No	No	No	Narcotics, TICs, CWA	Narcotics, TICs, CWA	Narcotics
Concept	Handheld	UGV mounted	Handheld	Handheld	Benchtop	Benchtop
Weight	3.6 lbs	2 lbs	2.7 lbs	14.6 ozs	38.5 lbs	19 kg
Battery life:	8 hrs	UGV powered	4 hrs	Not supplied	N/A	N/A
Training burden	Varies	Varies	<60 mins	<60 mins	Half day	Half day
Tested By	University of Rhode Island, Federal and state agencies	ATEC	TSA	University of Rhode Island	University of Rhode Island, OSU University	In progress with several organisations
In service with	DHS agencies, DoD agencies, non-US militaries and governments	US Army, USAF, Other governments	TSA, Other governments	State department, First responders	Not supplied	New Product



7	8	9	10	11	12	13
XPAK	Hardened MobileTrace	Itemiser DX	Itemiser 3	Multi Mode Threat Detector	Sabre4000	Egis Defender
Fluorimetric Detection	Ion Trap Mobility Spectroscopy	Ion Trap Mobility Spectroscopy	Ion Trap Mobility Spectroscopy	IMS	IMS	Gas Chromatography + Differential IMS
>20	10-15	10-15	10-15	15-20	10-15	>20
No	Yes	Yes	Yes	No	No	Not supplied
Roller	Sample, Calibration, Verification Traps	Swabs	Swabs	Swabs	Swabs	Swabs
<30	<10	<10	<10	10	<20	<15
Particulates	Solids, powders, vapor	Particulates	Particulates	Solids, liquids, powders, gases	Solids, liquids, powders, gases	Particulates , vapors
Contact	Varies	Not supplied	Not supplied	Contact - cms	Contact - cms	Not supplied
No	Yes	Yes	Yes	Yes	Yes	Yes
No	Yes	Yes	Yes	Yes	Yes	Yes
No	Taggants, Narcotics, TICs, CWA	Taggants, Narcotics	Narcotics	Narcotics, TICs, CWA	Narcotics, TICs, CWA	Narcotics
Handheld	Handheld	Benchtop	Benchtop	Handheld	Handheld	Benchtop
4.53 kg	5.45 kg	12 kg	12 kg	5 kg	3.2 kg	26 kg
50 samples	3 hrs	1 hr	1 hr	5 hrs	4 hrs	N/A
1 day	1 day	Half day	Half day	Day	Half day	<60 mins
Military and other labs	NAVEOD, Canadian Border Services, US labs	TSA, Israel PM office, Canadian Border Services	TSA, Canadian Border Services	CSA	CSA	Not supplied
Various Mod/ DoD/ First responders	Not supplied	Aviation, Customs & Borders, Law Enforcement, and Military	Aviation, Customs & Borders, Law Enforcement, and Military	Not supplied	Not supplied	Aviation, Customs & Borders, Law Enforcement, and Military



smiths detection

bringing technology to life

response moving forward

NEW - HazMatID Ranger™ **Handheld FT-IR** **solid and liquid identifier**

Touch-sample technology designed for handheld, backpack or robot portability and ease of use in protective gear.

Quickly and accurately identifies over 32,000 substances including:

- white powders
- WMDs
- explosives
- drugs
- pesticides
- common chemicals
- toxic industrial chemicals

For more information on the HazMatID Ranger and our complete range of emergency response solutions:
call toll-free **1 888 473 6747**
call **1 203 207 9700**
email danbury@smithsdetection.com



NEW!



Bio-Seq PLUS™



HazMatID Ranger™



LCD 3.3™

www.smithsdetection.com

Visit us at:
CBW 2010, 8-11 June, Stockholm, Sweden, Stand no. C:12

Anticipate their next move.



You have the strategy and tactics. Intelagard has the tools you need to counter unconventional warfare. From CBRN attacks to fire, Intelagard systems and solutions have proven to be invaluable in the field and at home. Checkmate.

A planned response reduces terror. And wins the game.

 **INTELAGARD**®

303.309.6309 | info@intelagard.com | www.intelagard.com



Governor Gabriel Cinomis, a Prairie Dog, gives his opinion of CBRN matters from his unique perspective



Prairie Dog

I thought I might take a moment to update the readers of this column on a few items I've spoken of in the recent past. You may recall in a prior diatribe I was bemoaning the forced changeover of my Contractual Minions to Minions of Bureaucratic Orthodoxy. I am happy to report the wheels of government have moved at the expected pace and nothing has happened. In fact, certain portions have placed a freeze on all new hires. This, coupled with rants about the explosive growth of Dogtown's government (not true I assure you; we're actually smaller than ever) favours me keeping people around the Mayoral Den to apply my money, sarcasm, and abuse.

One twist in all of this, however, is that money is being spent on resources quasi-external to Dogtown. The Office of Burrow Security (OBS), ever Byzantine, was recently scolded by the nutless Governmental Office of Looking Down Our Noses at Others. That's not the official designation of said entity, but it is far more descriptive. This agency issued a report saying the OBS was remiss in its contracting efforts. Specifically, they actually aren't letting out any contracts but are simply shovelling money to various Dogtown governmental laboratories. Many of these laboratories are holdovers from the heady days of nuclear proliferation and are filled with a combination of aging theoretical physicists and fresh-furred aimless physicists and engineers. These nameless scientists turn out to be responsible for most of the laser-loaded CBRN detector and identification technology with which I'm ever so happy. They have yet, with all this money poured into them, actually hired suitable nameless scientists steeped in any of the correct fields. Those who are hired are mostly marginalised, poked at with sticks through the cells of their dens, given the dregs of the needed kit and subjected to undue levels of bureaucracy in order to do their jobs.

Recently, the head shrew of the OBS Department of Dubious Technology (DDT) spoke about the "new" direction for DDT, which includes efforts at closer ties with the military, various technology and, apparently in the same new vein, continuing the welfare funding of the governmental laboratories. What infuriates me even more than a speech full of platitudes is this persistent thought of some of these laboratories being actually governmental. Many are run by corporations! Hence millions of nuts of research, technology, and other development money are going, without any competitive bid process whatsoever, to entities run for profit by defence contractors. The ethical implications of this (as well as the potential for loss of genuinely new ideas) make me violently empty my cheek pouches.

Another past topic of interest has resurfaced recently with a report issued by the Ferret Bureau of Investigation (FBI) on Operation Drippy Box – the biological attack on the Mayoral Den. The report makes for fascinating reading, especially if one is a fan of crime fiction.

Since the release of the report nameless scientists, who were previously under penalty of incarceration to hold their tongues, may now wag them – albeit in a limited fashion. One Fort Dogtick nameless scientist, Dr Heinrich Heinke, who worked alongside the deceased accused dog and knew him for 11 years, recently gave an extensive radio interview on the investigation and presented some interesting points on how the accused could not have committed the crime.

For me, one of the key elements has been the inability to place the accused in the area where the box was mailed or to match his handwriting to that on the box. There are further interesting details as well. The FBI has asserted the biological material can be traced to one tube and only one tube which was in the possession of only the accused. Dr Heinke asserts he had possession of the same material in his laboratory which was

located in a different building – something clearly left out of the public report. He further mentions this material was stored in multiple places in different buildings. So much for limited access. There was even a suggestion that, at the time, dogs could piggyback into the areas where this material was stored, thereby leaving only a single security trace behind. (Dr Heinke did not assert this was the case and indicated this was improper procedure – a helpful radio listener provided that titbit.)

Dr Heinke further asserts the accused dog did not have the knowledge or expertise to grow the large quantities of biological material needed to produce the amount which ended up within "Drip-Box", going so far as to say it would have been "impossible" for the accused to do so. Dr Heinke illustrated his point by saying he and other experts independently calculated the accused, given the equipment to which he had access, would have required 50 weeks of non-stop culturing to make the amount of material found. The material is believed to have been made in a fermentor – a belief which stems from the need for large quantities and the finding of silicone in the end material. Silicone is a component of anti-foaming agents used in bioreactors. Dr Heinke stated that not only did the accused not know how to operate a fermentor, but that the only one available to him was non-functional. Furthermore, the material was dried and the device needed to achieve this, while available, was not equipped to handle dangerous pathogens. The vacuum device did not have protective filters, nor was it located in a protected area. If such quantities of material had been dried, the building in which the accused worked would have been contaminated and anyone working there would have been exposed to a potentially deadly aerosol. Even when a sample from the crime scene was taken to Fort Dogtick and extreme care was taken in appropriate containment facilities, some escaped and contaminated the biological safety suite.

The Ferrets note the accused spent several long periods at strange hours at Fort Dogtick. Dr Heinke also has an explanation, however. During that time access to the base was extremely difficult and the accused lived across the street. He was asked by colleagues to enter the base to check on various experiments and Dr Heinke suspects he was also using the computer. This supposition by Dr Heinke could easily be proven.

In my conversations with the FBI, which as you may recall did not end amicably; I noted how they, through a campaign of fear, intimidation, attempted bribery, more intimidation and bullying, gathered their evidence. Dr Heinke further indicates that the FBI lied to the accused, telling him that Heinke had turned him in. Systematically they stripped away all of the accused's friends and resources, either by painting them as turncoats or forbidding them to speak to the accused under threat of punishment and harassment.

Was the accused odd? Was he a strange old dog? Heinke admitted as much when he said, "...as scientists we're all quirky in our own way; we're wired differently." Evidently there is an explanation for the strange visits to sorority houses which Heinke is still not allowed to speak about... Bereft of friends, accused of murder, faced with mounting legal bills (some say as much as 50,000 nuts) and a ruined career – for some reason he chose to take his life, the reason for which we might never know...

As I have often said to Ms Chuckworthy, I believe the actual perpetrator is either well outside Dogtown or has died – died from the same deadly pathogen, so carefully made into a weapon, and intended to inflict terror and death on others. That is, at least, my hope.

Until next I poke my head up,
Gabriel Cinomis