

# BRACED FOR IMPACT

## Gwyn Winfield investigates the work going on behind the scenes in the European Commission's Impact programme

**T**O MANY in Europe, the work of the European Commission is neither known, nor cared about. There is too much going on in their own national spheres to wonder what the Commission is doing, especially as their work rarely has any impact on their lives. It would be an exaggeration to say that the work being done in the Innovative Measures for Protection Against CBRN Terrorism (IMPACT) will change this paradigm, yet the chances are that the programme will have a lasting effect.

There is always a great deal of scepticism about politicians, whether national or international, getting involved in the work of regional, or even national, agencies – such as police, ambulance or fire forces. This scepticism usually revolves around the belief that nothing will come of it; it will be

a lot of talk and pontification, but at the end of the day it won't make a deal of difference to those on the front line. That is certainly not the intention of the forces behind Impact; in fact, it is very much the opposite. Embedded in the programme's genesis is the need for something real to emerge at the end.

Pieter de Smet, a Director General at the European Commission, strenuously denied the suggestion that Impact will result in a bundle of files no-one will read: "In the framework programme the rule is that we fund up to maximum prototype, as the way of funding only allows us to do that kind of research," he said. "But the end result has to be used in some way; there is an obligation on the consortium to either take a patent or publish it, so the taxpayers' money has a purpose."

This idea can be taken to the extreme where it actually benefits non-European industry. Once the research is published it is open source and "free" to all. Mr de Smet agreed that a scenario whereby no European company either wants, or is able, to produce a profitable model, but a US or Canadian company can, would mean that the European investment would be diminished. While the likelihood of this is slim, a solution devised in Europe but lacking the requisite national flag printed on the side – and therefore inimical to national interests – is far more likely. This may mean the solution would only find a few buyers, resulting in a high unit cost and few export sales. Mr de Smet explained further, "There are two aspects to this. We don't fund research at an EU level to find EU solutions. We fund research in support



Impact delivered a training exercise designed to study the protection requirements. All photos © TNO.

Impact is a smorgasboard of projects; at one end there is the pure research, at the other physical prototypes that may make it into the hands of the civil first responder.

of the competitiveness of EU companies, universities and research institutions. Secondly, if that innovation is turned into a product and delivered to the market, it is down to the final users – whether private or public – to choose the products they want. They choose these products, at either a national or European Parliament level; these are “added value” at the European level.

“Then there is the issue of taking up the results for research – specifically in the security research. The end user is often a public entity, and the question is value. We want the products to make it to the market and be used even more – because Impact is about security. The last thing we want is to develop the product and have it rust away somewhere. How do we solve this? We do this during the call for proposals by bringing the end users on board or using them as a steering board to follow the product. This helps product development and allows a direction for it to be delivered to market.”

Impact is a smorgasboard of projects; at one end there is the pure research, at the other physical prototypes that may make it into the hands of the civil first responder. The latter is an important distinction – the original idea was to have the programme linked into some similar work that the European Defence Agency were doing, in order to allow economies of scale and avoid duplication. While there were a number of advantages and support for this approach at the tactical level, the “Grand Strategic” political players decided they wanted this to be strictly civil – meaning that there is a high degree of visibility and transparency between the military and civil work groups. It does, however, raise the spectre of duplication and working in silos.

Impact is part of the European Security and Research Advisory Board’s (ESRAB) work on counter-terrorism. This is a generic, non-CBRN specific body of research that covers four mission areas:

protection against terrorism and organised crime, border security, critical infrastructure protection and restoring security in a crisis. The astute among you will have realised that, while CBRN is not a topic per se, it does in fact occur in all four mission areas. These mission areas are then assigned various work streams – in all there will be five demonstration programmes, 20 integrated projects (being mission specific) and 120 capability projects (being technology development and multi-mission and mission specific); in other words, the more specific the result, the fewer the work streams.

At the very top level there are five demonstration programmes, and one of these is CBRNE – the others being European-wide integrated border control systems, aftermath crisis management systems, logistics and supply chain security and security of mass transportation (and yes, it seemed to me that they all should have CBRNE in them too...). What perhaps

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makes this relevant to a whole host of people is the budget: Impact is not small beer. The Security Research part of FP7 (Financial Plan 7) comes in at €1,400m over a period of five years! €80m is likely to be spent in 2007 alone, which turns into a hell of a lot of research and hopefully an awful lot of output. Exactly where this money is going to be spent can be found in bewildering detail at <http://ec.europa.eu/enterprise/security>, and is likely to involve a deal of head-scratching and spreadsheets.

To pare it down to “So what does it mean to CBRN?” is a lot easier. Impact has resulted in eight work packages (WPs): WP 100 – building scenarios and preliminary risk assessment; WP 200 – mission and operational concepts; WP250 – immediate response team capability; WP 300 – CBRN weapon early warning detection systems; WP 400 – biological weapon detector technologies; WP 500 – protection of the rescue team or people involved; WP 600 – decontamination; WP800 – sampling and analysis of suspect materials. These work streams are being investigated by a series of different institutions, from CBRN-specific organisations such as France’s CEB, to broad research establishments like TNO, through to CBRN industry members such as Thales, Environics, etc.

◆ WP 100 is a process of identifying CBRN scenarios to be used as planning tools and also to develop threat assessment tools. While WP100 is probably the purest research – it’s scenarios are generic, meaning that they are both useful and useless to specific forces in equal measure (as no force is likely to have the exact scenario sketched out) – they are key to informing all the other WPs so they all have an idea of what “threat” they are responding to. An example might be terrorists crashing a lorry full of sulphur dioxide into a sports stadium where the release valve is stuck open and the TIC leaks out. These have proved useful to the

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stakeholders and more are planned. They have 90 agents in their database, (nine bio, 15 rad and 71 chem); this is not meant as an exhaustive list, nor as indicative of what forces will face, but it is a start and will be continually updated.

◆ WP 200, the scenario analysis, interrogates scenarios from WP 100 to establish some common themes. These have found, for example, that, out of 20 scenarios, EMS is the only first responder needed in five of them; that 14 required fire and 13 police. These are subject to national procedures, but this is eased by the fact that, for many European countries, the first responder of choice for a CBRN incident is the Hazmat team which resides universally with the fire departments. This analysis then feeds back into WP100 by identifying scenario gaps, but also results in a risk assessment model and a computer “game” of the scenarios. The team studied six European countries (Austria, the Czech Republic, France, Germany, The Netherlands and Sweden) and tried to design an operational concept, and from that requirements, for first responders.

This is probably one of the most problematic of the work streams, as it will be attempting to show first responders how to deal with a CBRNE event. Chief Superintendent Andrew Sigsworth, from the UK’s Police CBRN Centre, suggested this might be something the UK could learn from. “There are still areas where we can develop massively,” he said. “We have good structures in place with the G8 nations, we share tactics, we have the quadrilateral group – AUSCANUKUS – and the R&T establishment is well plugged into Europe. But we have to have a structure in place at the tactical level, and I don’t think we have that at the moment. The UK has had to design the command doctrine, the statements of requirement, etc, but these could have come from any country in the world. It is more difficult at the tactical

level than the equipment level. You can use that same piece of equipment in many different ways – the response to any alarm could be dealt with in 30 different ways. Now, some of those may well be of interest to UK police, and others may not. We miss out on that cross fertilisation of response, but that comes down to individual capabilities.”

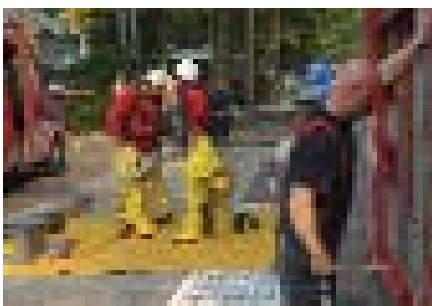
Dr Pascal Stephan of the French DGA was of a different opinion. When asked whether this was something the French were hoping to get back from Impact there was an emphatic response: “No. For France the response is well organised, with Piratox, etc. What we would like to get from Impact is the ability to promote contractors in Europe in developing technology – not in developing concept of use. We want it to focus on technology and the involvement of companies.” The need for Impact to have a wide angle on CBRNE has been dictated by the needs of the EU countries – this much is clear.

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WP 200’s findings from this survey, which they want to expand, was that none of the six had an integrated team in place, that first responders are often the first trigger that something has happened (the blue canary approach) and that mass decontamination is likely to provide, due to the time it takes to set up, more of a psychological than physiological role.

◆ WP 250 – the immediate response team capability – aimed to develop three sets of requirement in CBRNE systems: training aspects, logistics and to analyse the training needs for first responders. The team has put together a requirement database, and is working towards a “system approach” and utilising the database for system and sub-system definition.

◆ WP 300 is for chemical and radiological detection, and has started with a review of current equipment and the underlying technology. WP 300 looked at four chemical detectors: Chempro 100 (Enviro-nics), Gid-3 (Smiths Detection), Raid-M (Bruker Daltonics) and AP2C (Proengin) and one radiological detector, SSM1 (Arcs). These were networked together determine whether they could provide a systems-fusion synergy. These detectors were chosen because they utilised a variety of different ways to detect (mainly) chemical agents, and were tested at CEB. The systems-fusion concept was broadly successful, but it was hampered by a number of technical problems. Since the sensors were all competing products and the sensor-fusion was also done by a competing company – Thales – there was a great deal of reticence to share information on the signal and it was agreed that there would be a modified process to guarantee commercial interests. All four chemical agents could be physically integrated and could provide both temporal and spatial data fusion, and this integration work may well be one of the major advances



to reach the first responder.

◆ WP 400 is the biological part. The team came to the conclusion that, while radiological detection was mature and chemical detection was growing, biological detection was still embryonic. There was an initial technical evaluation that tested five technologies – DNA-based; analytical-chemical; affinity based and optical. These were tested for three simulants – living bacteria, spores and toxin – at three concentration levels at a total of eight laboratories. All the systems managed to detect the simulants in some form, but some lacked sensitivity, some lacked selectivity, the time of response was measured in minutes at one end of the scale and days at the other, and this response time differed from lab to lab. The team also measured the natural background of bio-aerosols and showed the sharp disparity between sampling at ten seconds and a minute – some of the spikes picked up at the ten-second sample were missed completely by the minute sampling. While the discovery that no single technology was able to do what was needed was not new, the research work that VTT did will be of inestimable value in an area that is often devoid of this sort of comparison.

◆ WP 500 – the protection of the first responder community – was focused on an evaluation of the current equipment, the task analysis of the equipment and an attempt to identify possible technological solutions. This saw the Impact team launch a full scale exercise at TNO Netherlands in September last year, to try and isolate some of the key issues. While some of these were basic, such as the need to allow drinking and to have one communication system for all units, others, such as the need to provide escape hoods for all victims and that all first responders should have PPE (even if they are safely in the Cold Zone) are more

**WP 100 Building scenarios and preliminary risk assessment - FOI**

This work package will aim at strengthening the understanding of the CBRN threat. An important step will be to shape a generic approach which could lead to agreed methods for analyzing the threat, tools and equipment.

**WP 200 Mission and operational concepts - CEB**

The objective here is to understand and establish the mission and detailed role of different first responders in participating countries. In a workshop, first responders from Europe will be gathered to share experience, problems and capabilities to be developed, ultimately leading to the design of an EU operational concept.

**WP 250 Immediate response team capability - Thales**

The objective is to enable quick and effective response to any CBRN event in all EU Member States employing the operational concept developed in WP 200, hereby focussing on the system itself, training aspects and logistics.

**WP 300 CBRN weapon early warning detection system - TNO**

The first objective is to determine which gaps exist between C and R/N detection systems available now and in the near future and the requirements for detection systems. The WP will formulate and resolve technological solutions to fill the defined gaps, build and test a network to connect different detectors.

**WP 400 Biological weapon detector technologies - VTT**

Recent and near-future technology developments will be reviewed, and promising technologies will be selected. The second objective is to push new developments based on the selected technologies and the defined requirements.

**WP 500 Protection of the rescue team and/or people involved - ARC**

The objective of this work package is to establish the required performances of protective gear used in a counter-terrorist setting. Current and state-of-the-art equipment will be evaluated.

**WP 600 Decontamination - SUJCHBO**

A task analysis will be performed to make an inventory of how the responders act. Furthermore, a review and evaluation of state of the art equipment and procedures will be carried out on the basis of the outcome of the first objective.

**WP 800 Sampling, Transport and Analysis of suspect materials - FOI**

The objectives and description of work within this work package describes the goal of having an integrated and coherent approach to sampling, transport and analysis of samples within the EU.



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interesting. The findings from 500 suggested that there was a need for more cooling systems, emergency isolation systems and monitoring systems for protection levels in PPE.

◆ WP600, the decontamination programme, aimed to define performance needs for counter-terrorist decon, define protocols for mass decontamination, field test mass decon facilities and recommend doctrinal improvements. This programme probably ran contrary to a great deal of established thinking. The team concluded that mass decontamination is not yet possible in an acceptable time, that mineral sorbents (such as Fuller's Earth) should be stockpiled, and that first responders needed to rethink disrobing at cordons because of the spread of contaminant from large piles of contaminated clothing. Two recommendations that were easier said than done were for rapid chemical decontamination of hair and legislative requirements for the management of large CBRN scenarios. The former comes up against military doctrine, which would be just shave it all off, but some countries (and many individuals) may well have ethical problems with such sudden depilatory action. As for trying to standardise any approach in legislation, as Andy Sigsworth and Pascal Stephan showed, this is not a straightforward task.

◆ WP800 – the sampling and analysis section – had main objectives of enhancing the preparedness of civil labs to handle and analyse CBRNE material. The group noted that, while there were specialised labs for CBRN, there was little experience of such and a shortage of equipment that could deal with mixed samples. There was also a worrying shortage of SOPs for toxins and TICs and that the bio experience came from the military or food and drink experience – there was little effort to focus on unknown

agents and the abiding worry about the different needs of sample identification and forensic evidence. WP800 is now going to focus on developing a strategy for sampling mixes and unknown samples and to train laboratory staff under realistic conditions and scenarios (using simulants) to ensure safety and efficacy.

While some of this work is likely to end in an application, it is not the only effort going on in Europe. The European Defence Agency (EDA) and Nato are also involved in research in some of these fields, and because of the nature of the “church and state” – or civil and military – there is likely to be some form of duplication of effort. Pavel Cerny, Technology Manager of the R&T Directorate at the EDA, suggested that, while this might not be as bad as it sounds, “It would have made sense to tie the EDA and EC research even closer together, but the decision was made by the nations to keep it separate. This was not the idea of the EDA. You have to realise that 75 per cent of the EDA members are also Nato members, so there is no loss – we are not doubling up. It is down to the member states to tell us that there is some duplication.”

Pieter de Smet agreed: “This is a relevant question,” he said. “It is important that member states inform us where we should take care not to duplicate. EDA and the EC work closely together and we have one project in common at the moment – an example of our co-operation – the software defined radio. There is a civil application for that and a military need, and it was a project selected in the last call for preparatory action and it was also selected and recognised by the EDA, and we are pushing to get both sides together. Unfortunately there has to be a dividing line, if nothing else in the way that it is funded. We come from a community budget and they get what the member states will

put in – but that is a concrete example of how we would work on future projects.”

2007 will be a busy time for Impact, with a series of deadlines and contract awards. It will also see a further maturation of the various work streams. This is not a legislative process, however; the members of the EU are not forced to accept their findings, and Impact will be measured by its spread. The UK is perhaps the odd one out – as Andy Sigsworth himself noted, the UK tends to look across the Atlantic because of its multi-lateral treaties, but many of the other countries don't have this opportunity and concentrate more on the European side. As Pascal Stephan noted, France feels that its response is mature enough not to need the tactics, but other nations, particularly those new to the EU, will not be so lucky; the further down the capability scale you go, the greater the reliance on Impact's findings. It is costly and time-intensive to develop tactics and procedures, and many civilian forces that are struggling with budget deficits and a shortage of highly trained manpower will welcome Impact in a way that those more mature, and financially comfortable, countries will not. While Impact may result in a few interesting pieces of technology, its lasting legacy is probably going to be in bringing many of the CBRN undeveloped countries up to something approaching parity.

