EuropeaN Cbrn Innovation for the maRket CLustEr

Topic: H2020 – SEC 05 – 2016 CBRN Cluster, Part a

ENCIRCLE NEWSLETTER

NOVEMBER 2, 2017

ISSUE 1

WELCOME

Welcome to the the first edition of the Encircle newsletter.

Encircle is a four year H2020 project with the aim of improving competitiveness and procurement of CBRNe technologies for the advantage of both European CBRNe industry and practitioners and, most importantly, the improvement of EU resilience to new CBRNe Threats and attacks.

To improve its resilience to new CBRN attacks and threats, the EU needs a specialized, competitive, efficient and sustainable industry. Capitalizing on its experience in the EDEN Demonstration Project, other CBRN relevant projects, and in the CBRN market and supply chain, the ENCIRCLE consortium proposes an innovative approach to reach this goal in a short to long term perspective. Once achieved it will allow SMEs and large industries to deliver and invest in the best innovations on the market.

The project results are enabled and promoted in two main channels:
1) via a web portal, the Dynamic Catalogue, of available tools and technologies facilitating technologies integration and standardization for SMEs and industries, various market segments and different categories of users and

2) by providing support to the European Commission in identifying research gaps and proposing means to fill them.

In this newsletter we will bring you information on CBRN contracts, equipment, industry insights and the first Encircle workshop. Future publications will contain more information on the project itself and the work being conducted.

Meet The Partners

The ENCIRCLE project involves a consortium of fifteen members across 7 countries, with Universite Catholique de Louvain as a consortium leader.
The consortium is balanced between Industrial partners with expertise in CBRN, universities, RTO's, practitioners and institutions to meet the project objectives.

The Consortium:

ADS/CBRN UK

BAE Systems (BAES)

Environics Oy (EOY)

European Virtual Institute for Integrated Risk Management (EU-VRi)

Falcon Communications Ltd. (FALCON)

Instituto Affari Internazionali (I.A.I)

Mikkeli Development Miksei Ltd (MIKSEI)

OUVRY SAS

Przemysiowy Instytut Automatyki i Pomiaro w (PIAP)

Smiths Detection Watford Ltd. (SMITHS)

Tecnoalimenti (TCA)

Universita Cattolica del Sacro Cuore (Policlinico Gemelli Hospital) (UCSC)

Universite Catholique de Louvain (UCL)

Universite de Nice-Sophia Antipolis (UNS)

Wojskowa Akademia Techniczna (WAT)

Universities

Université Nice Sophia Antipolis

Wojskowa Akademia Techniczna

Think Tank

IAI Istituto Affari Internazionali

End users

UCL Université catholique de Louvain

Università Cattolica del Sacro Cuore

TECNOALIMENTI

Trade Association

ADS

CBRNUK

SME

OUVRY Systèmes de protection NRBC

FALCON communications

EEIG (SME)

EU-VRi

Industry

BAE SYSTEMS

Environics

smiths detection

PIAP

MIKSEI Mikkelin kehitysyhtiö Miksei Oy

CONTRACTS & AWARDS

Here we have outlined some of the contracts that are currently pending and those that have been recently awarded.

CONTRACTS PENDING

Countering Weapons of Mass Destruction,Other Transaction Agreement
Solicitation Number: W15QKN-17-X-0AOT
https://www.fbo.gov/notices/298d05b8de3cadc43bae9f12172b3c09
Counter-Proliferation Technologies and Capabilities, Defensive Operations, Hazard Mitigatio, Threat Protection, and Experimentation and Innovation.

Sentinel XL CAP 2 CBRN PAPR with NiMH Battery in backpack- Powered Air Purifying Respirator VA256-17-AP-8409
Solicitation Number: VA25617Q1269
https://www.fbo.gov/spg/VA/BiVAMC/VAMCCO80220/VA25617Q1269/listing.html
Alexandria VA seeks brand name or equal for the following items:
Equipment Purchase Request is for a Sentinel XL CBRN PAPR manufactured by ILC Dover LD
Must be NIOSH TC-23C-2312 CAP 2 approved for Chemical, Biological, Radiological, and Nuclear use with appropriate filters installed.Must be equipped with either NiMH or Lithium Ion batteries k- Powered Air.

Emergency Escape Mask Respirators
Solicitation Number: SAQMMA17R0525
https://www.fbo.gov/spg/State/A-LM-AQM/A-LM-AQM/SAQMMA17R0525/listing.html
DS/PSP/WMD requires a one-size-fits-all, National Institute of Occupational Safety and Health (NIOSH)-Certified escape hood that is designed to protect against Chemical, Biological, Radiological and Nuclear (CBRN) agents, Toxic Industrial Chemicals (TIC), and Carbon monoxide (CO) for a minimum of 30 minutes.

Toxic gas detection services
Document Number: 308626 - 2017
http://ted.europa.eu/udl?uri=TED:NOTICE:308626-2017:TEXT:EN:HTML&src=0
Ministry of Defence, ISTAR, Chemical, Biological, Radiological and Nuclear Delivery Team (CBRN DT) are looking for the manufacture, Supply & Support of Residual Vapour Detector (RVD) to detect the presence of Nerve & Mustard CWAs by means of a 'wet chemistry' based kit.

CONTRACTS PENDING

Mobile emergency units
Document Number: 307480 - 2017
http://ted.europa.eu/udl?uri=TED:NOTICE:307480-2017:TEXT:EN:HTML&src=0
Mobile emergency units.
Nuclear, biological, chemical and radiological protection equipment.
Specialist training services.

Nuclear, biological, chemical and radiological protection equipment
Document Number: 064200 - 2017
http://ted.europa.eu/udl?uri=TED:NOTICE:64200-2017:TEXT:EN:HTML&src=0
Defence has a possible future requirement for a new chemical, biological, radiological and nuclear individual protective equipment dermal protection capability to replace the existing in-service equipment.

CBRN protection equipment
Document Number: 064200 - 2017
http://ted.europa.eu/udl?uri=TED:NOTICE:64200-2017:TEXT:EN:HTML&src=0
Defence has a possible future requirement for a new chemical, biological, radiological and nuclear individual protective equipment dermal protection capability to replace the existing in-service equipment. The anticipated procurement strategy and subsequent contract will follow a lots based approach. The anticipated requirement is for: lot 1 — suits, lot 2 — gloves and lot 3 — boots and therefore could result in 3 separate contracts being awarded. It is not anticipated that the lots approach will rule out the possibility that a single company could be contracted to provide two or more lots of the system.

CBRN/00213 — Lateral Flow Device and Antibodies (LFDA).
Document Number:2017/S 179-367559
http://ted.europa.eu/udl?uri=TED:NOTICE:367559-2017:TEXT:EN:HTML&src=0
The LFDs must be capable of detecting several agents with the output readable without the use of electronic or optical devices. The LFD will need to be deployable worldwide and be in-service for use by March 2020. Training variants of LFD shall also be required. arrangement. The Requirement shall form an enabling contract for a period of up to 5 years.

Broad Agency Announcement (BAA) for the Advanced Research and Development of and Chemical, Biological and Nuclear Medical Countermeasures for BARDA
Solicitation Number: BAA-16-100-SOL-00001
https://www.fbo.gov/spg/HHS/OOS/OASPHEP/BAA-16-100-SOL-00001/listing.html
Barda is soliciting proposals that focus on one or more of the following areas of interest: Vaccines, Antitoxins and Therapeutic Proteins, Antimicrobial Therapeutics, Radiological/Nuclear Threat Medical Countermeasures, Chemical Threat Medical Countermeasures, Clinical Diagnostics

CBRN Sensor Wireless Platform
Solicitation Number: W911SR-17-R-WLSS
https://www.fbo.gov/index?s=opportunity&mode=form&tab=core&id=87ea7f5fff5da46624d098f1a4add59a&_cview=0T
The Edgewood Chemical Biological Center (ECBC) is seeking a reliable, wireless communications platform. This office is researching options from both government and industry that will result in a solution to enable chemical, biological, radiological and nuclear (CBRN) detectors to be networked wirelessly and to connect to wireless alarms

FEDBIZOPPS.GOV

DEFENCE PROCUREMENT INTERNATIONAL

GOV.UK

Defence Contracts Online

tenders electronic daily TED

CONTRACTS AWARDED

CBRN Canister
Solicitation Number: DPGCITTS170627f
Contract Award Number: W911S2-17-P-0359
Contact Award Amount: $30,030.00

Clothing made of coated or impregnated textile fabrics
Awarded to: Airboss Defense
Awarded by: Ministry of Defence, Land Equipment, Soldier Training and Special Programmes
Contact Award Amount: £6,700,000

Purchase of aerodrome fire extinguishing and rescue work vehicles, special-purpose minibus (CBRN) and trailer-trailers.
Awarded to: SIA "Unimotors Latvia"
Awarded by: National Defense Military Facilities and Procurement Center, Latvia Contact Award Amount: 399 838.71 EUR

Development of vaccine to protect against all ebola viruses.
Awarded to: Integrated Biotherapeutics
Awarded by: the National Institute of Allergy and Infectious Diseases (NIAID)
Contact Award Amount: $6.6 Million

Multi-drug auto injector capable of nerve agent antidote delivery.
Awarded to: Emergent Biosolutions
Awarded by: Medical CBRN Defence Consortium (MCDC)
Contact Award Amount: $23 Million

Provide technical subject matter expertise to study, analyze, advise, research, and develop deliverables in combatting weapons of mass destruction.
Awarded to: Battelle
Awarded by: DOD
Contact Award Amount: Not published

Drone Forensics R&D
Awarded to: VTO
Awarded by: DHS
Contact Award Amount: $928,541

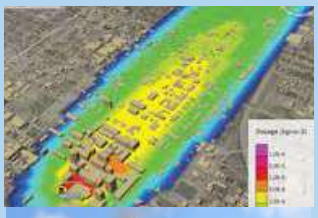
CBRN/00215 Aircrew Protective Equipment and Detection (APED) Above Neck System (ANS) Support.
Awarded to: Crew Systems Corporation
Awarded by: Ministry of Defence, ISTAR, Chemical, Biological, Radiological and Nuclear Delivery Team
Contact Award Amount: $5 592 944

Joint Counter Radio-Controlled Improvised Explosive Device Electronic Warfare system
Awarded to: Northrop Grumman
Awarded by: DOD
Contact Award Amount: $57.7 Million

Development of novel atypical fluoroquinolone antibiotic finafloxacin against biological threat agents
Awarded to: MerLion & DSTL
Awarded by: DTRA
Contact Award Amount: Not Published

Joint Effects Model (JEM)
Awarded to: General Dynamics Information Technology
Awarded by: Aberdeen Proving Ground Edgewood Division
Contact Award Amount: Not Published

Development of a Single Dose Intranasal Post-Exposure Prophylaxis Vaccine for Inhalation Anthrax
Awarded to: Autoimmune Inc
Awarded by: Office of the Assistant Secretary for Preparedness & Response (ASPR)
Contact Award Amount: $120,275,880



The rise and rise of the robots.

Gwyn Winfield looks at the past and future of unmanned ground vehicles

Unmanned ground vehicles (UGVs) are mobility platforms for a variety of sensor packages. What does this mean? Well, if you need to investigate an area that might be hazardous for humans then a UGV can be equipped and sent to investigate at little risk to a person. The type of risk varies; it always involves an explosive (the British were first to use UGVs regularly due to their experience in Northern Ireland in the early 1970s), it is often a chemical, biological, radiological or nuclear (CBRN) risk, and occasionally involves a kinetic/bullet risk (http://www.telegraph.co.uk/news/2016/07/08/dallas-shooting-robot-used-to-kill armed-suspect-micah-johnson-d/).

The sensor package also varies, but with the exception of the cheapest/most expendable chassis they all contain cameras. These cameras then feed information back to the controller, either via a fixed wire or a variety of hand-off systems, such as radio frequency (RF), which allows the controller to stay at a safe distance from the device or area the robot is interrogating. Beyond this, the choice of sensor is threat dependent and can include disruptors to destroy elements of an explosive device, it can sample the surroundings for traces of explosives, chemicals, biological agents or radioisotopes, or eavesdrop on suspects either visually or aurally.

The market is diverse, with plenty of suppliers, however it is starting to coalesce. Initially UGVs often came out of university robotic laboratories, indeed they still do, and many of these next generation devices can be seen in the US Defense Advanced Research Projects Agency (DARPA) robotics challenge (https://www.darpa.mil/program/darpa-robotics-challenge). Alongside the early technology demonstrators were devices brought forward by military necessity (https://en.wikipedia.org/wiki/Wheelbarrow_(robot)).

Often rudimentary, they did only the most basic of tasks. A lot of these latter devices are still used in countries with low threat levels and budgets, but for many responders the market really started to develop when the technology and the requirement got together.

2002 - 2012

Despite slow progress in countries that were under continual explosive device attack, such as the UK due to its Northern Ireland problem, major improvements in UGVs came with the deployment of Nato forces to Afghanistan.

Following a conventional warfighting campaign Nato International Security Assistance Force (ISAF) troops came under sustained attack from insurgents using captured or stolen military ordnance. This was a taste of what was to come in Iraq, where coalition forces were targeted daily in new and inventive ways, resulting in bomb technicians loosing their lives. The need to deal with these ‘roadside bombs’ led to a massive investment in UGV products and provided a learning environment for them in Iraq and Afghanistan.

The coalition nature of the warfare combined with the ongoing shortage of bomb technicians, meant that many countries had a similar requirement to the US (the main partner in the conflict) which led to a broad range of national platforms offering similar capabilities. The increased military UGV capability dovetailed with a real, or perceived, risk from terrorists in European and other nation states, and so law enforcement took an increased interest in UGVs, which were previously regarded as an expensive luxury.

From approximately 2002 to 2012 there was proliferation in the market, but very little innovation. Platforms tended to be fairly small, 20-200kg (44-440lb), and travel on wheels for greater speed and mobility or tracks for greater gap crossing and stair climbing. 'Greater speed' is something of a misnomer as many early UGVs only travelled at 2-4 mph, and the phrase 'time is of the essence' really didn't apply to them.
The weight difference was usually around the role of the robotic arm. The smaller arms were generally geared around placing another camera at a height, or possibly positioning explosives at the scene for a controlled detonation. Larger arms were either needed to drag/lift heavy objects, fire disruptors or to facilitate access to an area thanks to a more complicated manipulator. Whether large or small the manipulators tended to be fairly basic, and so the number of planes of movement within them were limited (though some devices, such as the UK's Cutlass were an exception http://news.northropgrumman.com/news/releases/northrop-grumman-launches-cutlass-next-generation-unmanned-ground-vehicle) .
This was partly due to issues of cost and weight. Heavy arms required larger chassis which limited the scenarios, but there was also insufficient research in this field.

Matters were complicated by the lack of autonomy and the need for a safe distance/communication with the device. Complex landscapes, potentially littered with debris meant that robots were unable to steer themselves, and would require the operator to make every move. In addition, the heritage of these UGVs as explosive ordnance disposal (EOD) devices meant that the concept of RF control was discouraged and operators would use fixed cable to control them, to ensure that RF didn't accidentally initiate the weapon. While wired comms allowed secure control it did put a limit on the devices' range and could result in snagging issues. For CBRN incidents there was also the concern that safe distances and communicable distances might not overlap, thus bringing the operator into the potential contaminated zone.

The result was that UGVs tended only to be found in the larger cities, where the threat was higher and funding more likely, or within the military. This applied in Europe at least. The US had grant funding, which in many cases also included UGVs, and this enabled even a second tier of cities to afford them. While the next 10 years is unlikely to overturn this geographic imbalance, it has produced some economy of scale allowing these devices to become more affordable.

2012 - 2017…

Unfortunately for many innovative robot companies the roseate glow of the post-Afghan/Iraq/terrorist world turned out to be a false dawn. The global economic recession transformed innovative solutions into 'more with less' leading to a period of either consolidation in the market or bankruptcy. The major players, Remotec, iRobot/Endeavor, Qinetiq, etc, managed to maintain market dominance, more or less, while smaller companies were forced to innovate more to stay in the running for contracts.

Unlike the 2002-2012 period, innovation was not so much in the chassis but in the various sensor packages and concepts of use. Indeed in terms of the US market, still the largest, the number of contracts that were put out to tender was streamlined, offering less opportunity for variety of chassis, software and controllers. The Department of Defense (DoD) brought together the Joint Ground Robotics Enterprise (JGRE) to try and manage this process and the drift from warfighting needs to long term requirements.

Europe lags behind the US, which through large procurements such as the advanced explosive ordnance disposal robotic system (AEODRS) and man transportable robotic system (MTRS) has been able to push through a joint architecture for unmanned systems (JAUS) against a certain amount of industrial reticence. Joint software architecture allows a certain amount of plug and play in sensor packages and commonality of understanding. The US was able to bring this together through commercial pressure in a way that Europe, with smaller contracts, was not. Since 2016, however, Europe has surged forward in encouraging standardisation and interoperability through the European non-profit organisation euRobotics (https://www.eu-robotics.net/eurobotics/about/about-eurobotics/index.html).

This has now resulted in joint attempts to bring in ISO standards to help guide the market (https://www.eu-robotics.net/cms/upload/downloads/newsletters/ISO_standardisation_newsletter_2017-08.pdf).

Major European militaries, such as the Germans (http://defence-blog.com/army/rheinmetall-unveils-its-new-multi-mission-unmanned-ground-vehicle.html) and the British (https://www.contractsfinder.service.gov.uk/Notice/fddcdb6f-2e97-4590-aef0-c3f5597f0f5a?p=@RRPT0=NjJNT08=UFQxbl) are improving their UGV fleets and this is likely to be mirrored by other militaries, too. The civilian market remains slow, with greater interest/investment in airborne surveillance/UAVs (http://www.bbc.co.uk/news/uk-england-devon-40595540), a move that puts them about 15-20 years behind the military.

As regards roles for UGVs, this looks likely to be shaped by complementary improvements in haptic feedback and opportunities for dual manipulators. Haptic feedback is essentially 'touch' for UGV operators, it allows them to feel objects. Improvements in haptics, and the joysticks that control them, is the difference between picking up a glass and crushing it. Led by commercial sector opportunities in fields as diverse as surgery and fruit picking, this will give UGVs opportunities to interact more sensitively with their environments. It could, for example see UGVs involved in collecting liquid or solid forensic samples/evidence or able to move objects carefully without disturbing entire crime scenes. Dual manipulators essentially give robots the chance to hold/fix an object in place while another manipulator interacts with it. When combined with haptics, this could enable UGVs to attempt manual neutralisation of explosive devices (the 'cut the green wire' beloved of Hollywood) or close off hazmat pipes in a 'pipe jumble'.

While not as good as human interaction, it potentially brings near-human interaction to non-permissive environments.

The other improvement has been in sensor networks and repeaters. Part of the problem with UGVs is that they are expected to be used in urban environments, which have complicated topography and are challenging in terms of distributed signal. For example, once a UGV goes round the corner of a building the RF signal could attenuate to the extent that the UGV is marooned, or the operator cannot see potential snag hazards before they happen. Improvements in mesh networks and repeaters now enable users who were operating via remote systems to patch signal from one repeater to another to boost a signal before it collapses and generally ensure a more certain outcome. Innovation is happening on both sides of the robotic street, and 2016 saw a great deal of interest in the ability to auto navigate - GM paying $600m for Cruise Automation an autopilot start up (http://robohub.org/18-867-billion-paid-to-acquire-50-robotics-companies-in-2016/).

Algorithms for the driverless car will quickly make their way into the government robotics field, and should signal be lost the UGV will either be able to continue to the next waypoint or return to its operator. There is already a certain amount of autonomy in responder UGVs (http://endeavorrobotics.com/pressreleases/endeavor-robotics--fka-irobot-defense---security--completes-move-to-new-advanced-robot-development-c), and while specialist modules are likely to remain outside the industrial/commercial market, there is little doubt that they will either be amended or inspire CBRN, EOD and other mission modules.
Thanks to improvements in mobile phones, the optics market has been through a major boom. Cameras that were cutting edge even three years ago look sadly obsolete now, and this situation will continue. Similarly, miniaturised processing power has benefited from improvements in mobile telephony, and this is also likely to continue. With the exception of haptic controllers, UGV controllers are likely to remain the same for the foreseeable future. Many systems are designed with controllers that closely resemble those from popular gaming consoles such as Playstation and Xbox, which gives the user immediate familiarity. While there is nothing to stop the controllers from evolving this is only likely to happen in line with commercial gaming improvements.

2017 and beyond!

Paul Scharre, director of the Future Warfare Initiative at the Centre for a New American Security (https://www.cnas.org/publications/video/the-ai-revolution-paul-scharre-the-director-future-of-warfare-initiative) sketches a worrying, if bright future for UGVs in warfare.
From the other side of the house comes a concerning and bleak future for UGVs from the Campaign to Stop Killer Robots and a recent open letter (https://www.theguardian.com/technology/2017/aug/20/elon-musk-killer-robots-experts-outright-ban-lethal-autonomous-weapons-war).
Considering the prevalence of drone use, and the embracing of both ground and aerial robots by 'red force' (https://medium.com/war-is-boring/an-iraqi-shi-ite-militia-now-has-ground-combat-robots-68ed69121d21) it seems very likely that there is a rich future ahead for UGVs.
Despite Russian prototypes like Fedor (www.youtube.com/watch?v=EJn9UgADcPY), the future is likely to look similar to the past. Appliqué kits for in-service (or even retired) vehicles will see previously-manned vehicles become unmanned, and these could range from Fuchs style

CBRN reconnaissance vehicles through to CV90 style armoured fighting vehicles. In terms of civilian UGVs these are likely to look much the same for the next five years.

The limiting factor is not the technology, but the emergency services' budgets.
Agencies that already have fleets of UGVs are likely to want to stay with the same kind of chassis, to reduce training and fleet costs, and those without are unlikely to invest in robots rather than humans. Sensor packages are likely to be improved, at little investment cost and no impact on training etc. While these budgets slumber the commercial market will soar, as has been seen in the relationship between hobbyist UAVs and police/fire ones, so that when the financial case is stronger the capability will be much greater. This means that the future for UGV manufacturers without a foot in both camps is a bit flat, if not bleak.

CBRN FRANCA

Image copyright The Flag Shop

Bruno Vallayer,vice president of sales and marketing at Bertin, talks to Zoe Rutherford ,about the company's role in Europe and how he thinks EU projects fit into the development of new technologies

Bertin Technologies is one of Europe's leading companies supplying systems and instrumentation for high technology sectors including Defense and CBRN, laboratory equipment and health physics. It is involved in all stages of the innovation cycle, from R&D to the delivery of finished equipment. Part of its aim is to become market leader in the CBRN field, and as such Bertin has been expanding the company's horizons and entering into markets outside its usual reach.

In January 2015 Bertin became the sole shareholder of Sapyhmo, described as"a global leader in nuclear instrumentation solutions and track and trace solutions for industrial use". This merger was initiated by the development, in common, of a new radiometer for the French army. One way to become the market leader in any technology is to purchase one of the leading companies in the field! Next, in July 2017, Bertin announced anotheracquisition, this time purchasing 100% of the share capital of the Swedish company Exensor, a supplier ofnetworked unattended ground sensor (UGS) systems. This saw the company move into an entirely new market, entering in to the production and supply of tactical contact detection equipment.

For many, the CBRN market has been flat at best in recent years, with budgets remaining low. Most companies are 'battening down the hatches,' yet Bertin is going in the opposite direction. So what has it seen that the others have missed? Where is the potential that fuels this growth?

M Vallayer felt that the answer was one of global, rather than regional, vision. If Bertin wants to be a leader in the field of instrumentation solutions for critical markets, defence, nuclear and life sciences, then it needs to invest in the market so it can provide personalised solutions to end users."We want to provide new and innovative products that can be military and civil. Saphymo was acquired for just this reason, we wanted to enter the nuclear detection market to be in touch with these critical market solutions."

Bertin purchased Exensor to boost its product portfolio in the day to day equipment that soldiers need to do their jobs. It is more of a strategic rather than market driven move, and is based on key investment drivers. Saphymo and Exensor happened to fit within these drivers and M. Vallayer believes that these defence and nuclear markets offer both growth opportunities and are linked with critical instrumentation. Fundamentally, nuclear power plants rely on high end instrumentation to measure and detect nuclear activity, minute changes in the background could be the start of something serious. Equally in the modern battlefield you cannot perform without the optronic to detect your target and the network to pass that information on. Both these markets view quality instrumentation as critical, and it is within markets like these that Bertin wants to grow and become a leader.

Previously Bertin focussed on cutting edge products, like standoff chemical detection and biodosimetry, which while useful are not core equipment in the same way as respirators or radiation dosimeters are. Traditionally dosimeters haven't changed much in the past 50 years, while the computing and graphical user interface (GUI) have evolved the technology has not. This means that Bertin needs to balance volume sales of current generation technology with low unit sales of next generation value added products. How do they balance the commercial psychology between the everyday and the someday?

"It's difficult to sell value addedCBRNproducts, it is the Maslow's Pyramid [Hierarchical five step model of human needs. Ever Knowing Ed.] effect of CBRN," said Bruno Vallayer."If you are responsible for the CBRN budget with money to spend, you do not start with value added CBRN Products, you start with mission critical or even basics.

For CBRN there are two basics, individual protection and tactical contact detection equipment.

"You are right that some key equipment has not been innovative for years past, but this can change and we want to provide innovation in this field. When we supply equipment to end users we try to provide something that is innovative and dual use. For instance from the radiometer we developed for the French army, we have derivate a civil multipurpose radiameter for contamination control in the nuclear industry. We won recently a first contract for EDF with it. The innovation we provided within for example, was the proximity detection element of the probe, which was something that had not been available before. It is a simple innovation··· but it's still innovation! Innovation can be provided even in mission critical equipment, it is not only for high end expensive equipment."

It is also useful for any company involved in CBRN to have a foot in allied fields, such as life sciences. This allows for the ruggedisation of breakthroughs made in commercial activities for the mission critical market. As Bertin looks at its research portfolio does it see this movement happening in both directions, can CBRN technology can have an impact in these civilian/commercial sectors?

M Vallayer stated that it could and offered the example of the SaphyRad radiometer that was chosen for the French army's Dora project."[Dora] is a perfect example of where CBRN technology can have an impact on the commercial and civilian sectors and is exactly what we are seeking 90% of the time. Whenever we develop a new product for CBRN we try to find an application for it in dual markets. Second Sight was developed to detect clouds of chemical warfare agents and 18 months ago we won a big contract from Aramco, which is a leading oil and gas companyin Saudi Arabia,to conduct surveillance of chemical plants. Pure CBRN technology with a foot in both military and civilian applications."

Bertin has previously been involved in European Commission and other multinational (EDA) projects with its biodosimetry products. What was the medium term advantage of that to Bertin and what advice would it give to similar companies? M Vallayer felt that the experience had been useful for Bertin and recommended it for other companies too. While it might not have resulted in any immediate sales what it did provide was an opportunity for the company to meet potential future customers and research organisations that would help in ongoing research endeavours."When you develop equipment for a new need no-one understands how to operate it, yet companies like Bertin are tasked with developing this mission critical equipment. The person using it trusts their life to the equipment, and you need to provide expert evaluation to show end users that the equipment works well. If you don't have this network you cannot really deliver equipment to the market and this network is what EU projects provide, along with expertise and feedback."

While Bertin wasn't involved with Eden, Bruno Vallayer was interested in Encircle as it provides the pathways, networks, and links to individuals in the fields of expertise that the company needs, and which it might not be able to access otherwise. In line with the Eden projects goals what Bertin would like to see more of is further engagement with the EU in developing concepts of operation to put equipment in the hands of responders and develop some tactics, techniques and procedures. He is also keen that the EU takes a role in educating member states on the nature of the threat.

He explained:"Everyone has doctrine and operational procedures for the classical threats, such as chemicals and radiation.

We now have new threats coming, and biological agents are among them. It could be a task at the EU level to say that equipment, protection, and doctrine is needed for these new threats, if that is not done then everyone is going to say, 'I don't have the money' or 'I don't know how to do it, so I will wait'."

It is not just multinational consortiums that are trying to better develop markets, as national consortiums (like Encircle partners CBRN UK and Mikkeli Development Miksei of Finland) are also trying to do something similar. M Vallayer was previously head of the French CBRN industrial group, which has had various international successes over the years. As he looks at the task for what he led, but on a larger scale, what advice would he give to the consortium?

He thought that mass played a large part in it."The European CBRN industry is one of the most effective in the world. If you look at the whole CBRN industry then it is composed of Germany, France, Italy, a little from the UK and then some American companies that mainly cover the US market. So why is Europe so effective? That's simple, it's because we are the biggest and have the largest CBRN companies and agencies. Of the big players in the field of CBRN 70% are European, and then you have US companies to cover US needs."

Despite this division the US is still the largest single national market in CBRN, and US CBRN companies are well placed to serve it through their grant-backed contracts. Should European CBRN companies fear US competitors entering their market and stealing share? Bruno Vallayer thought not, and suggested that it was down to the Europeans' vision of the market. European companies are used to surviving off numerous small contracts, whereas the US has been bred on larger deals. For them it looks a little like 'small beer'.

What does the future hold for Bertin and European CBRN protection? Arguably the purchases of Saphymo and Exensor will put Bertin in the unique position of being able to combine the disparate business units and start providing true, reliable unmanned, networked ground sensor networks with CBR sensors, such as dosimeters and other RIDD that would be invaluable in critical infrastructures such as nuclear power plants. As these systems are built they can be networked and a nationwide system created where all power plant radiometry data could be monitored from an independent central location. Such network of sensors could therefore, be a step forward in initiating a rapid, coordinated response to nuclear emergencies. This is also a capability for which the EU can play a role in order to build to true European network of sensors for radioactivity and not only an addition of national ones.

THE FIRST ENCIRCLE WORKSHOP

On September 7th and 8th 2017 the first Encircle workshop was held at the Military University of Technology (WAT) in Warsaw, Poland.

Day one began with talks from consortium members informing the participants about various aspects of the Encircle project. We began with an overview of the project, its purpose, the make-up of the consortium in terms of the different types of knowledge and experience that they contribute, the links between the different CBRN communities and how the Encircle project aims to create bridge between these disparate communities in order to create a more cohesive CBRN community in Europe. We then heard about the Dynamic Catalogue, how the different aspects of it will work and how those that register will be able to use, and benefit, from it. The catalogue will be easy to use and at present holds around 300 needs and gaps and will continue to grow as it is used by the community. We also received information on the subject of Market Analysis. We learned about the current market space and how it is very fragmented on both the supply and demand side with differences between first responder and defence sectors and that there will be yearly analysis performed of both EU and international markets, that the method of engagement for the analysis will be via multiple routes including social media, email and the Encircle website and that this would be done via survey. There will be four surveys available which will be targeted at different user groups and they will be refreshed over a twelve-month cycle.

Session one of the workshop was a review on past and current EU activities in the CBRNe domain. We heard interesting talks from the Polish NCP about funding opportunities in H2020, Project eNOTICE gave a talk about CBRN training centres, project iLEAnet informed us about innovations through law enforcement agency networking, project 34 gave a thought provoking talk on CBRN event response and related medical emergency response. We then heard from the ERASMUS+ project who informed us about the development of CBRN training programs for Polish police officers, this was followed by a talk about Project DAIMON, the project which renders decision aid for marine munitions in the Baltic Sea region, after this we heard from the Independent Anti-Terrorist Sub Unit of the Regional Polish Police about building CBRN capabilities and mitigating risks at air and road border crossings.

Session two focussed on the results of the first activities undertaken by Encircle, part of this will be that the results from the thematic workshops conducted at this event will form part of the calls for future topics, we were also informed of some of the next steps to be taken which will include ascertaining whether the needs and gaps identified under the Eden project still exist and are still valid.

The afternoon of day two consisted of thematic workshops on needs and gaps. A scenario was presented to the participants and we were split in to four groups focussing on protection, detection and identification, decontamination and recovery, and situation recovery and command/control, during these sessions the participants ran through the given scenario and upon discussion tried to identify needs and gaps that they felt were present. All four of the groups then returned together and the summaries of what had been discussed was presented to all, this promoted some very good discussions amongst the participants and made for a very productive session. Day two began with a session on CBRNe Policy and Procurement Considerations and consisted of talks from the Polish Internal Security Agency about the CBRNe security system in Poland, and a very engaging talk about Chemical and Ecological Rescue services by the Polish State Fire Service, this was followed by a talk about EU CBRNe Policy and one on the lessons learned from the Eden project.

Overall this first workshop was a great event, everyone who attended was engaged by the talks and made it an interesting and valuable networking experience bringing together practitioners and industry and starting conversations which can lead to innovation.

If you would like to know more about the project please visit the website at http://encircle-cbrn.eu/

To find out more and register for the Dynamic Catalogue see information on the next page.

Register in one of the communities:

To register for the Dynamic Catalogue visit the website and follow these intructions:

- Click either on “Register in the Practitioner and Customer community” or on “Register in the Technological and Industrial community”,

- Fill in your organization (if not yet registered), points of contact, functions fields,

- For the Technological and Industrial community, fill at leas tone tool or project.

- Download the Letter of Intent to sign and return scanned when filling your profile,

- Submit your request (at the bottom of the questionnaire),

- You will receive an email with a link to activate your account, when the consortium accepts your request, and choose your password

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