Issue 3

ENCIRCLE MAGAZINE

Delivering change in the CBRN community

equivital™

You protect us:
Black Ghost protects you

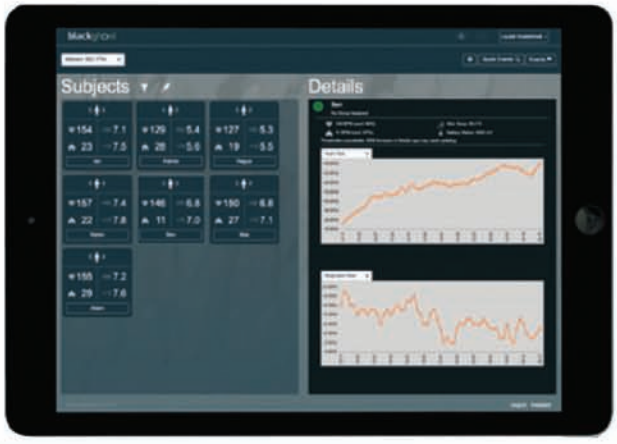
Keeping you safe in challenging environments

Black Ghost offers a lifeline for anyone operating in hazardous working environments. It acts as an early-warning system for dangers like heat stress and extreme fatigue – saving the lives of those who risk their own safety every day in the course of their job.

From soldiers and firefighters to oil and gas maintenance workers, all it takes is a simple body worn monitor to track the physical health and safety and location. A user-friendly interface displays each individual's key physiological data in real time – enabling you to intervene before there's a problem.

Key benefits:

- ☑ Health and safety reassurance
- ☑ Improved performance
- ☑ Optimised operational efficiency



Black Ghost military training system provides real-time actionable information for critical decision making.

Introduction

Welcome to the third edition of the 'ENCIRCLE Magazine.' If you missed the previous ones then you can find them on via the Encircle News pages http://encircle-cbrn.eu/news/page/2/. Inside this issue you'll be able to find what we have been doing in the preceding year. You'll find interviews and articles explaining what is behind this innovative four year project and further information on some of the new consortiums that Encircle helped bring into being! Encircle provides support and assistance to the whole European CBRN community, including first responders, and will act as an enabler for the Part B of the Sec-05 H2020 CBRN Cluster.

ENCIRCLE is only Part A of the SEC-05 H2020 CBRN Cluster topic and will assist subject matter experts by understanding their particular needs e.g. investment, integration, customer needs and thus tailor the support so it addresses these challenges. The blend of expertise in the project, including national CBRN consortiums, allows a truly unique perspective, especially when it comes to providing assistance to subject matter experts (SMEs).

The work that Encircle did resulted in a number of EC Calls in May, there were over 200 responses to it and we hope to welcome more consortiums to the Encircle family in due course. We have progress reports on the previous three Terriffic, Cosmic and EU-Sense in the following pages. You can find out more on these projects via their websites https://www.terriffic.eu/ https://www.cosmic-cbrne.eu/ and http://eu-sense.eu/. ENCIRCLE is instrumental in identifying the gaps in CBRN defence for the Part B calls, and while it is not involved in the bid process will re-join the equation once contract is awarded to act as valued assistant to the consortium. This process will continue and we hope to be able to report on what we have done to help the new consortiums in future issues.

One of the ways that the consortium provides assistance to the entirety of the CBRN community is through the dynamic catalogue. This designed to allow the industry and the user community to come together to discuss requirements, capability and best practice. The catalogue has been optimised to allow ease of use and will be regularly updated by the consortium to continually improve the offering the remaining three years of the project. You can find more information via www.encircle.eu/

Improved communication and understanding of user requirements will result in early and better identification of market needs and the solutions needed to fill it. The products that will result from this mechanism should provide a faster route to market for the SME and allow a more competitive and vibrant CBRN industry. These improved products should also result in an evolution of tactics, techniques and procedures, which will advance user response and help keep Europe safe from terrorist attacks and other incidents (criminal acts, accidents or emerging infectious diseases etc).

Please keep updated on our activities via http://encircle-cbrn.eu/ and the Linked In Encircle group. Here you will find information on upcoming workshops and events, valuable information on other EC projects and the way to register for the catalogue. If you have any queries please do not hesitate to contact me on zoe.rutherford@cbrneworld.net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Published by Falcon Communications Limited

Editor
Gwyn Winfield

Business Development Director
David Levitt

Business Development Manager
James Ross

Business Development Executives
Anna Dziaczkowska

Marcoms Manager
Zoe Rutherford

Sub Editor
Jenny Walton

Art Director
Tony Denton

Contact details for editorial:
+44 (0)1962 832 534
zoe.rutherford@cbrneworld.net

Web: http://encircle-cbrn.eu/encircle/

LinkedIn: Encircle EuropeaN Cbrn Innovation for the maRket CLustEr

Falcon Communications Ltd
Suite 26, Basepoint, 1 Winnall Valley Road, Winchester, Hampshire SO23 0LD, UK

Meet the team

ADS
ADS is the premier trade organisation for all companies operating in the UK Aerospace, Defence, Security and Space industries globally. CBRN-UK is an ADS Special Interest Group representing UK industry's CBRN capability to government, emergency responders, the military and Critical National Infrastructure operators. The group represents the full spectrum of suppliers, from large multi-nationals to SME's and academic start-ups. The aim of CBRN-UK is to act as a focal point to represent the interests of its members to domestic and international Government and other organisations or companies concerned with the CBRN sector of business.

BAE Systems
BAE Systems is an international company engaged in the development, delivery and support of advanced defence and aerospace systems. BAE Systems has, via its extensive business portfolio, an immense breadth and depth of Electronic Systems expertise and experience in the land, air, sea and metropolitan domains. This experience includes development of Crisis Management solutions at a technology, product, platform and system-of-systems level, as well as core skills in knowledge management, systems integration and project management.

Environics
Environics is a Finnish company with 30-year experience and the world's leading supplier of Chemical, Biological, Nuclear and Radiation (CBRN) detection devices and monitoring integrated solutions, ranging from personal safety to national security. We provide innovative solutions for different safeguarding organizations in 50 countries, from civil defence and homeland security to the military. Behind our comprehensive range of products and solutions is a highly competent team of experts having years of experience in the implementation of demanding projects in CBRN fields.

European Virtual Institute for Integrated Risk Management (EU-VRi)
EU-VRi is a European Economic Interest Grouping (EEIG), which aims to facilitate or develop the economic activities of its members by pooling of resources, activities and skills, thus yielding new opportunities, not or hardly achievable for members when acting alone. In 2016 EU-VRi has 48 (6 founding / 36 associate / 6 honorary) members coming from 21 countries and from various sectors. EU-VRi promotes the integration of Safety and Security in industry and research and supports the identification and facilitation of standardization opportunities within European research with dedicated services and activities.

Falcon Communications
Falcon Communications Ltd. is a UK based SME and involved in publishing, consultancy and conference activities. It publishes the world's leading magazine on CBRNE matters, *CBRNe World* (www.cbrneworld.com) and also produces the largest events in the field, the CBRNe Convergence series. In addition to this the company has provided technical and commercial consultancy to some of the largest companies in the CBRN sector and has been engaged in a variety of EC consortiums

Istituto Affari Internazionali
Istituto Affari Internazionali (I.A.I.) is one of the major Italian think tanks in the fields of foreign policy, security and defence issues and EU affairs. An independent approach characterises policy-oriented research of the I.A.I. S&D Programme at the crossroad of four strands: the policies adopted by national and international institutions and organizations in the security and defence field; the relevant industrial and technological dynamics; the operational developments in the military and civil security areas; the politico-strategic interaction in the Euro-Atlantic framework. In several EC-funded project S&D Programme has developed a significant expertise in organizing and bringing security end user and stakeholders communities into technological projects and in managing feedback collected in workshops / interviews in compliance with the classification and confidentiality rules set by the EC

Miksei
Mikkeli Development Miksei Ltd. (Miksei) supports local and regional companies in creating jobs and innovations, increasing sales and exports, and developing new lines of business. They supports local and regional companies every step of the way, from start-up to growth and internationalisation. Typical development issues involve business models, financing, and sales and exports. Business training is also an important part of our services – Miksei has a network of experts in most aspects of business. Mikkeli is a home to CBRNE Finland, a group of companies representing Finnish CBRNE expertise. Miksei manages several national-level CBRNE related projects and also participates in EU-level safety and security programmes

Ouvry
OUVRY is an SME Company, based in Lyon – France, which specialises in the study, research, development and manufacturing of CBRN personal protective equipment and related concepts. They offer concepts across the full spectrum of CBRN protection: ranging from impermeable solutions through to wholly air permeable solutions. We manage the entire supply chain: feasibility, development, manufacturing, quality control, logistic and after-sales service based on a Quality system management ISO 9001- MQRP 2010 compliant. OUVRY has developed a good experience as prime contractor for complex programs with the European Defence Agency, the National Agency for Research ANR and the Defence procurement Agency DGA in collaboration with various foreign partners.

Przemysłowy Instytut Automatyki i Pomiarów
PIAP is a leading Polish research institute active in the fields of robotics, automation, machine vision and measurements systems, with a vast experience in developing unique solutions in the field of industrial automation, security and defence technologies, information technology, industrial and mobile robotics as well as measuring devices. For over 15 years PIAP is a successful developer of mobile robots used in EOD/IED and SAR missions. Research performed at PIAP facilities is concentrated on mobile autonomous systems, innovative human machine interfaces, data fusion, image processing and CBRN detection and environmental sampling systems. PIAP's experience in designing and production of CBRN payloads dates back to 2009.

Smiths Detection
Smiths Detection designs, manufactures, sells, and services advanced products for detection and identification of hazardous chemicals, explosives, and narcotics for the military, emergency response, transportation, ports & borders, and critical infrastructure security markets

Tecnoalimenti
Tecnoalimenti (TCA) is an Italian consortium of industries for research and innovation that integrates horizontally and vertically the main industrial players of the agro-food chain. As a non-profit research organisation, Tecnoalimenti S.C.p.A. is composed of 28 food sector industries and one financial institution, Intesa, as trustee of Ministerial funds. TCA acquired a wide experience in carrying out collaborative innovation and dissemination activities at national and international level, becoming today the leader organisation at national level within the agro-food sector. It has a wide experience as coordinator and partner in over a dozen of European projects and national projects, a selection of which is here reported: TRACEBACK, eMensa, HighQ RTE, Bioactive-net – Healthgrain – Baseline – http://rditac.com – Einstein II – TRISK .

Università Cattolica del Sacro Cuore
The UCSC research program closely collaborates with 16 internal colleges, 62 departments and 93 research centres. Their common goal is the understanding and study of those topics that have proved vital to the well-being of each human being: the new frontiers of economics, bioethics, environmental recuperation, developments in the judicial fields, family dynamics, major mass phenomena, the evolution of political systems, new horizons in medicine, the technological applications of physics and mathematics, and the most recent discoveries in environmental research. Within EU Project EDEN (FP7) UCSC is provided ethical monitoring and supervision through the evaluation of different tools and demoed the ethical review of selected deliverables. Most of these EDEN activities were handled through an Ethical Helpdesk.

Université Catholique de Louvain
UCL-CTMA (Centre for Applied Molecular Technologies) is a mixed academic-clinical-military biotechnological platform. It hosts at a single location, a joint civilian-military clinical and research staff of ~34 people with multidisciplinary expertise and acts as reference biotechnological platform specialized in genetics and molecular genetics for IREC/UCL as well as a reference CBRN-biological platform for the BE-Armed Forces. UCL-CTMA is a technological transfer-applied science research unit specifically acting as "Biothreat control unit of Defence Laboratory Department (DLD-Bio)" for the BE-MOD, as well as for the CUSL. One of the main tasks of UCL-CTMA is to develop clinical and emerging DNA- and protein-based methods for a rapid diagnosis of genetic disorders and for rapid, specific, sensitive detection, identification and monitoring of infectious agents.

Université de Nice-Sophia Antipolis
Nice-Sophia Antipolis University (UNS) is the second largest multi-disciplinary French university with 26,000 students and more than 2,500 staff members. The university, research oriented, is developing innovative pedagogic and research actions with many international collaborations.

In 2016, UNS has been awarded with IDEX label on JEDI project for research activities and as one of the 10 major research center in France. Polytech Nice-Sophia has developed during the last years an exceptional network of industrial partnerships – more than 350 companies – mainly focused on innovation and ICT adapted to various sectors. The exceptional international environment of Sophia Antipolis strongly reinforces this dynamic.

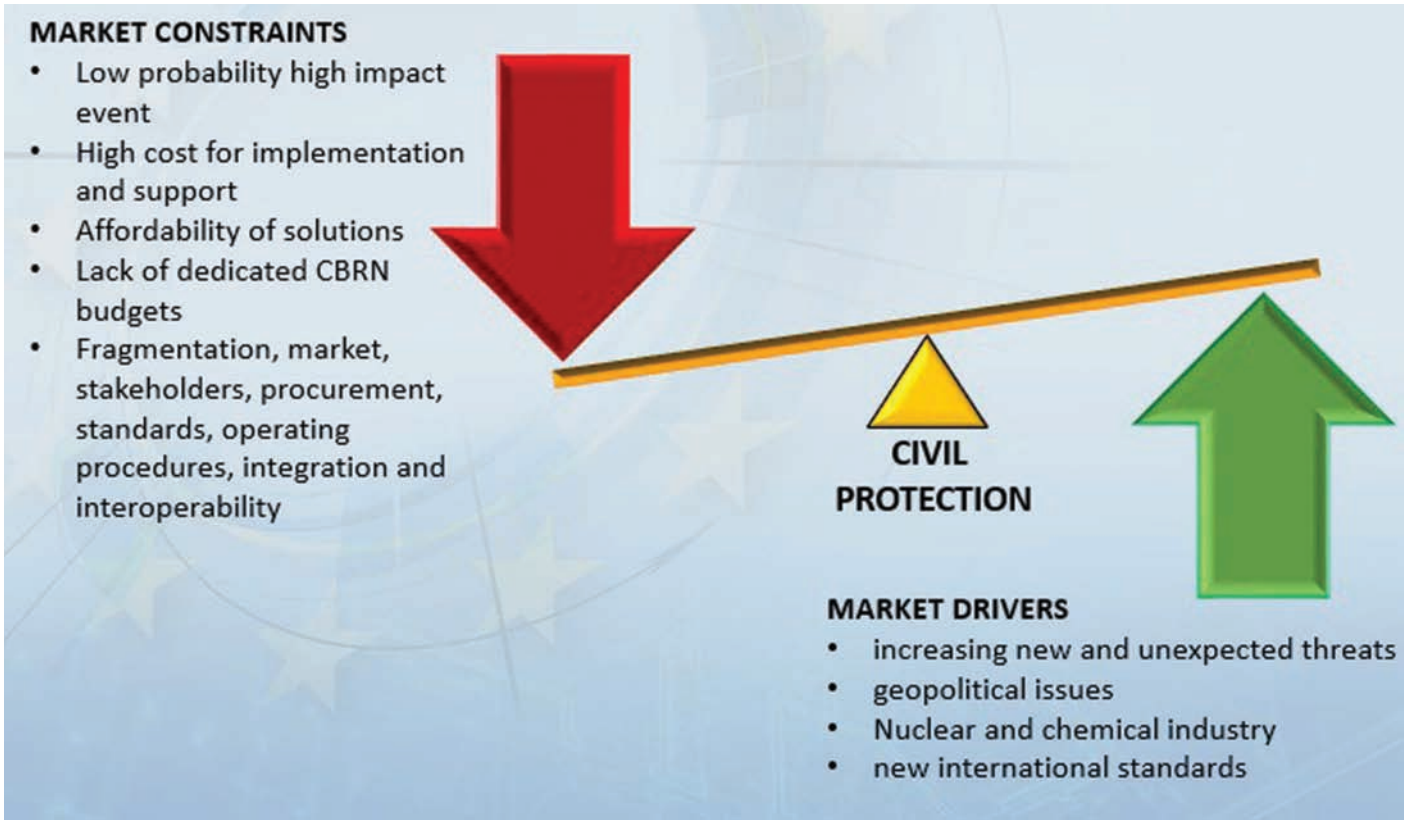
Wojskowa Akademia Techniczna
The Wojskowa Akademia Techniczna (WAT) is a public and military polytechnic university under supervision of MoD and Ministry of Science and Higher Education. The WAT is the largest military university in Poland and the most important provider of scientific and research support for Polish Armed Forces. The highly skilled research staff combined with many newly developed and well-equipped research facilities, an appropriate education environment and modern accommodation facilities have earned the WAT highly distinguished credentials both at home and abroad. The main emphasis is on applied research, which results in wide co-operation with Polish and international companies leading to developing products and technologies that are often commercialized.

CBRNe Integration Challenges

The ENCIRCLE market analysis survey conducted earlier in the project highlighted a number of challenges around the integration of CBRNe innovations into the civil protection domain. These include a perception that there is lack of comparable standards and interfaces, and that innovators are developing tailored and bespoke technical solutions for each practitioner, making interoperability and integration less efficient. It should be noted that other domains, such as defence, have more common standards allowing easier integration of new solutions.

ENCIRCLE would like to provide advice to innovators on the types and standards they should consider in the development of their solutions to provide them better access to the market, together with solutions that will be more easily integrated into the civil protection market. As a first step an initial survey and workshop was been conducted with both the Practitioner Networks and the Technological Community. The results of this first survey as well as a standards collection spreadsheet are available in the ENCIRCLE Catalogue net-works and groups forum (discussions group). The initial findings, which we would like to review with the wider community, in the future are set out below.

A survey was conducted with the practitioners to examine what should be implemented in the next few years for improved interoperability, whether that be technical or operational. Response to the questionnaires has been limited and as such there is insufficient data for a hard conclusion or recommendation, but the results are summarised as follows:
The technological survey explored what should



CBRN standards need cooperation between military and civilian agencies
©CBRNe World

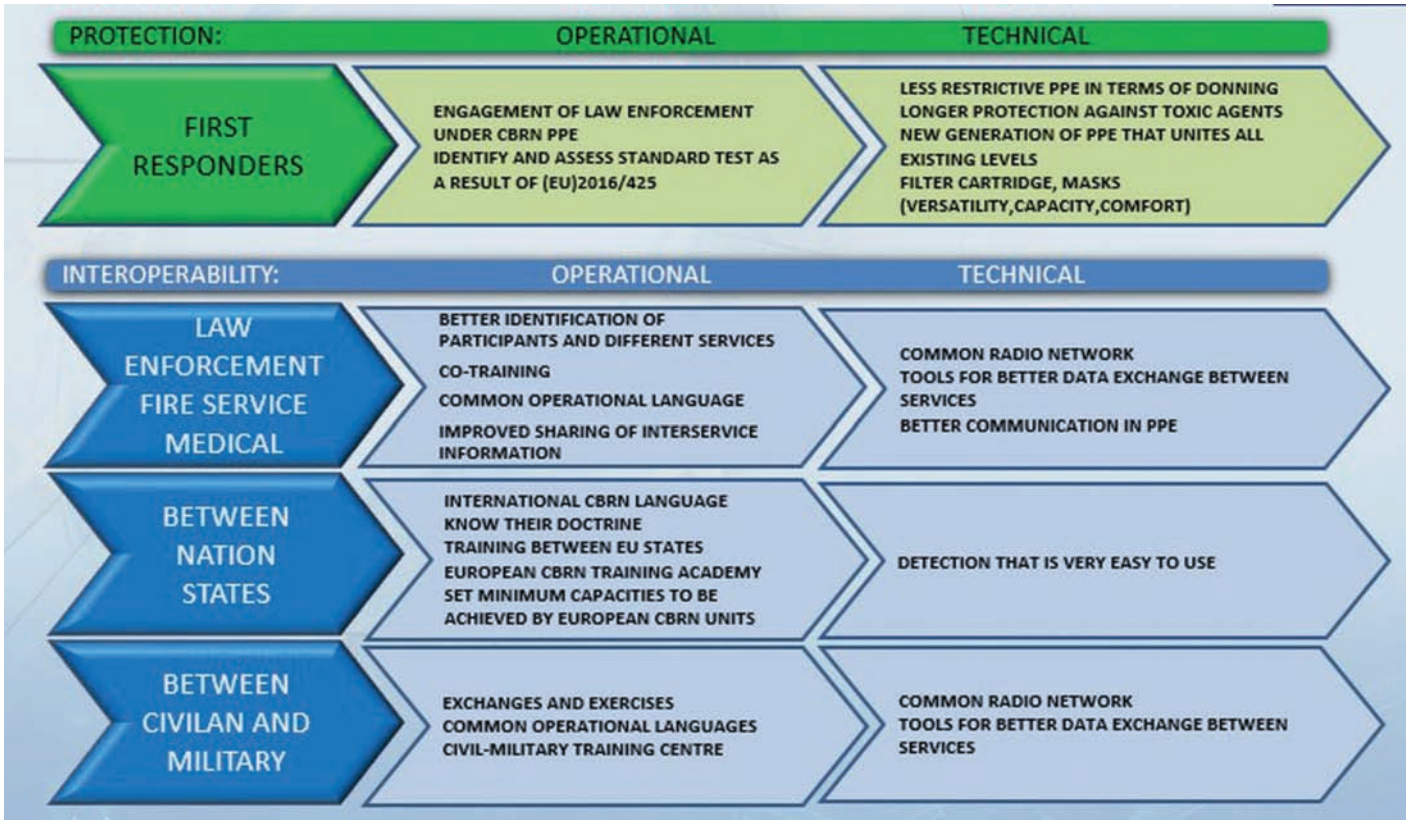
Clive Goodchild, External Technical Coordinator, from BAE Systems on the CBRN market drivers

be the communication methods, protocols, and user interfaces and displays that developers should consider in their project development. This is especially important to allow better integration and to take advantage of digitisation and connectivity.

For detector and sensor communication, Lan/WAN for wired and WLAN IEEE802-11 for wireless were the preferred choices, with additional interfaces suggested such as Power over Ethernet. It was almost unanimously agreed that these interfaces should be security protected, although no common universal method is apparent from the results. The exception to the interface protection was for open networks where the public could provide information.

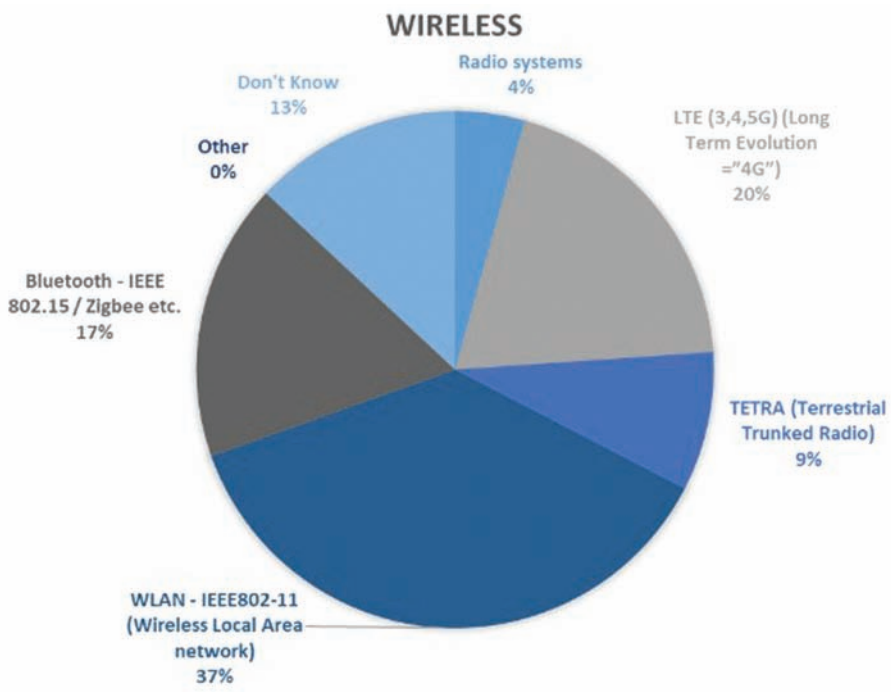
The results for whether there should be a specific CBRN protocols and format to provide CBRN real time information was less clear, as the majority of the respondents simply did not know. So, this will require more assessment, although Nato standards were suggested as well as the Sensor Observation Service OGC standard and XML.

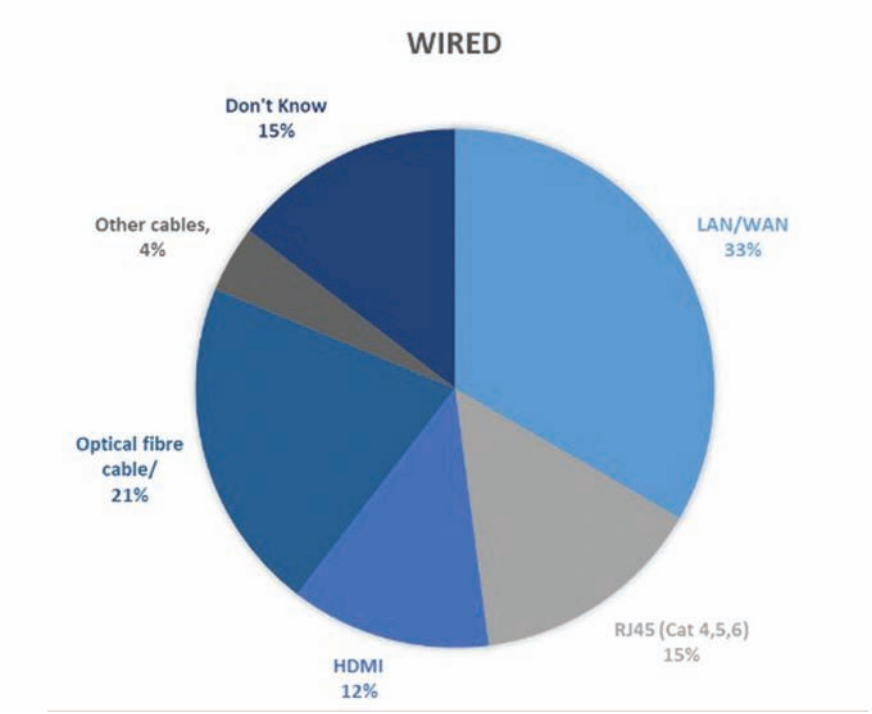
Concerning the user interface and which data user interface types and display should be used for future applications, web based user interfaces and graphical user interfaces were the primary data user types. Personal computers/laptops/tablets and mobile phones were the preferred displays, followed by the newer consumable technology in the form of smart watches and wearable displays using augmented reality. A key driver for all these user interface displays is that they need to be mobile, rugged, useable with personal protective equipment, and run on the lowest possible reasonable bandwidth.



Finally, a question that was put to both communities concerned whether there is a need for a common European civil protection symbology supported by commonly understood terminology. This would be used to facilitate information exchange; promote common awareness of assets, hazards and vulnerabilities; support at a glance situational appreciation from map displays; and ultimately support collaborative and informed decision making. The overwhelming response from everyone who responded to this question was 'yes' providing they are clear and intuitive. It is considered that this is important feedback that the standards organisation should take into account and there may be existing standards that can be drawn from - such as Nato's - to save re-inventing the wheel.

ENCIRCLE will be examining these results more fully and welcomes contributions and collaboration to examine this area further, so that better guidance can be made to developers to ensure better innovation uptake, interoperability and integration of new innovations. Contributions can be made directly either on the forum or by contacting the consortium.



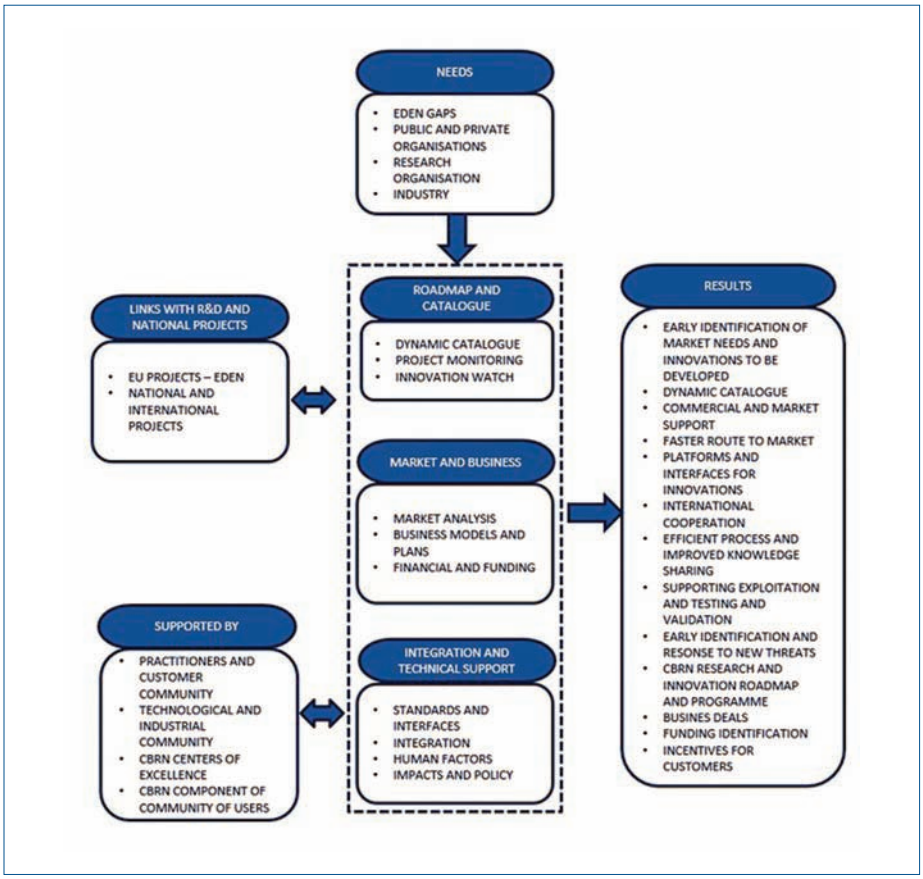


About the Project

Learn more about the ENCIRCLE project, what it will do, how it will do it and when!

EuropeaN Cbrn Innovation for the maRket CLustEr (ENCIRCLE) is a four-year coordination and support project to address the European commission's Horizon 2020 security topic: Chemical, biological, radiological and nuclear (CBRN) cluster. It will support the commission by identifying research gaps and proposing sensible and innovative research and development projects to fill them. This will be achieved by bringing together CBRN practitioners and industry professionals to create an organisation that can get to the heart of the real CBRN needs and gaps and bring to market new technology to assist and benefit those on the ground.

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



How the project meshes with other elements ©Encircle

industries to deliver and invest in the best innovations on the market.

ENCIRCLE has five key objectives aimed at promoting innovation and business development to fill market gaps in the project timeframe:
1. Create an open and neutral EU CBRN cluster,
2. Provide a sustainable and flexible vision and roadmap for the development of the European CBRN market and innovations,
3. Provide integration with platforms (systems, tools, services, products) by proposing standardized interfaces and future EU standards to integrate CBRN technologies and innovations developed from the Part b projects of the H2020-SEC-05-DRS CBRN Cluster call,
4. Support CBRN safety, security and defence commercial and market services,
5. Improve and facilitate European CBRN dissemination and exploitation.

The project is conducted by a consortium of specialized industries, trade associations and research organisations with flexible and lean procedures under the advice of the EC Community of Users. It will rely on two large interactive communities: practitioners and customers, and industrial and technological providers: the latter including many SMEs. To optimize the needs and gaps assessment, as well as innovation development, acceptance and success, ENCIRCLE will establish formal links with other consortia such as future Part b projects.

The main expected impact is the enhancement of the EU CBRN industry's competitiveness. This will allow it to enlarge its market share while increasing the benefits of the EU research and innovation to improve CBRN preparedness, response, resilience and recovery efficiency.

Pret a Porter

The ENCIRCLE Dynamic Catalogue is an open and neutral platform associated with commercial and technical services. The Dynamic Catalogue provides a platform for industry and technological providers to showcase European CBRN capabilities as well as provide a knowledge source for practitioners and policy makers.

You need to be first registered as an ENCIRCLE Community Member to access the catalogue.

You can register in a Community at different levels associated with different "rights":

Practitioner and Customer community member:
- On behalf of your Organization or as an "individual",
- With or without (operational) systems and tools, Technological and Industrial community member:
- On behalf of your Organization or as an individual expert,
- You need to register at least one tool or one project to be accepted.

Registration Process

- You can access the ENCIRCLE Dynamic Catalogue page either directly at https://www.encircle.eu/ or via public page of ENCIRCLE project at http://encircle-cbrn.eu/catalogue/
- Click either on "Register as Practitioner and Customer community" or on "Register as Technological and Industrial community",
- Fill in the organization, points of contact, functions compulsory fields,
- For the Technological and Industrial community, fill at least one tool or project,
- Electronically sign the Letter of Intent (LOI) by ticking the box when prompted
- After receiving your LOI, your request will be approved by the project Management Board
- At the end of this procedure, you will receive a link to activate your account and choose your password.

Once you have received your registration confirmation you will be able to access the catalogue and begin to contribute to the content and community networks. The objective is to gather users, tools and needs and for the CBRN community to work together through the catalogue.

The catalogue has been designed in an easy to use format and, importantly, it is secure. It contains a variety of resources such as tools, projects, conferences, community networks and 'market place' functions where users will be able to place their needs in front of other users who may be able to help fulfil them.

Other functionalities of the catalogue will be a technical support section which will contain sections on integration and standards, an innovation watch summary and a roadmap summary and a funding, procurement and business section, this will provide information on sources of funding, procurement agencies and cluster business discussions.

The catalogue currently contains over three hundred needs and gaps which will continue to grow with use and input from the community.

This beat is Tecnoalimenti

Zoe Rutherford spoke to Marco Gerevini and Mariantonella Palermo from Tecnoalimenti (TCA) about the work they have been doing on standards and interfaces

One of the first tasks to be undertaken as part of the Encircle project was to source and collate information on currently available standards and interfaces in the CBRNe arena. This was no small task, and work on it continues as new tool providers join the catalogue, new networks and relationships are formed, and as the Encircle project delivers more integration actions.

ZR: What has Tecnoalimenti been doing as part of the Encircle Project, for how long, and with whom?

TCA: Tecnoalimenti started its work tasks at the beginning of the project and will continue to the end. We have just been involved in work package four (WP4) and work package five (WP5).

In WP4, in particular WP4.3, Tecnoalimenti has been involved in finding financial support, mainly in the first 12 months of the project. What we did was to carry out a detailed analysis of the Italian financial instruments available and gather information on national funding opportunities used to support SMEs in developing innovations and R&D initiatives, of course with a focus on CBRN innovation. Our information was collated with that obtained by the other WP partners and developed into a report on the funding and support available internationally.

Our main role in the Encircle project has been as leader of WP5.1: Standards and Interfaces. This activity's goal is to investigate and gather information on the existing standards and interfaces related to CBRN tools and technologies. Our aim is to define a picture of the most appropriate standards and communications interfaces that can be used for future innovation in the CBRN marketplace.

We have been working in close collaboration with BAE Systems, who have supported and helped us understand all the things related to the technical issues on standards and interfaces. We have also received support from other Encircle partners such as ADS, Universita Cattolica del Sacro Cuore, and IAI, who have helped to open doors for us to contact CBRN partners, groups and communities, and facilitate our information gathering.

ZR: What skillsets does Tecnoalimenti bring to this project?

TCA: Tecnoalimenti has over eight years' experience working within agrofood working groups in the Italian national network of security research. We have also participated in strategic planning for national CBRNe and agrofood industries. Tecnoalimenti has good experience in CBRN, but our main strength is in developing contacts with groups, networking, and speaking with people from different areas and scientific disciplines. Regarding CBRN, we previously had an excellent opportunity to test our experience

and skills during the EDEN project, where we organised three large demo exercises in different food facilities using lots of different tools from the EDEN catalogue. This required us to communicate with and coordinate lots of different people, and so we now bring to Encircle, this experience in establishing networks, and communication with tool providers.

ZR: When it comes to finding standardised interfaces, how difficult has it been, or have you found that there are more available than you anticipated?
TCA: It was not difficult to speak with people and to ask for standards. The hard part was establishing contacts with people in the first place, which is why were happy to work with other experts who could help to open doors. We have found that the most important thing, is explaining who we are and why we want the standards. Technicians we have spoken to want to share information, but they need to understand why we are asking for it; once we explain this to them, they are very happy to share with us. The biggest difficulty, with any project, is time. People are busy, and we need to explain exactly why we are doing what we are doing, what benefits they will get by assisting us, they are then almost always willing to give us the time.

ZR: Have you been working with the European Committee for Standardisation (CEN) or silo specific organisations, such as the European Network of Law Enforcement Technology Services (ENLETS), to try and help you understand standards, and help you promote Encircle to them? Is there any one organisation that has an overview of standards and interfaces?
TCA: To answer the second part of the question first, no, we have not found an organisation that has a general overview of all of the standards. In my experience, and my understanding of the work which we are doing now, we haven't found any one organisation that has a clear vision of all the standards.

We have not worked directly with CEN, we have worked mainly with tool providers, but we are starting now to be involved in some CEN workshop agreements (CWA). Thanks to our activities and those of the people involved in the CWA, they understand our experience and that we can bring something to the working group. For example we have been invited to be part of the CEN workshop on trial guidance methodology. Between Tecnoalimenti and ADS we are on three different CWA between us at present, and I think we will be involved with more in future. This has been another good learning opportunity for us, within the lifetime of the Encircle project.

ZR: How have you been working with the Part b projects to ensure that they are aware of the available standardised interfaces, and to help them develop products that can be integrated?
TCA: As Tecnoalimenti we don't interact directly with the Part b projects, for several reasons. The Part b projects did not start for some months after Encircle, and our work began, and to keep things streamlined the liaison is done between the coordinators of Encircle and the coordinators of the Part b projects. The coordinators are currently liaising to gather information about the tools of the Part b projects and their standards.

ZR: So, once you have that information from the Part b projects you will be able to advise them on the standards and interfaces information you have gathered that will be of benefit to them?
TCA: Yes, and what we did in our survey and information gathering was to select the most appropriate communications interfaces to be used in order to overcome challenges with future innovation, and thereby make interoperability and communication between standards easier.

ZR: Have you been looking outside the Encircle catalogue for standards and interfaces, or only within it?
TCA: We started within the Encircle catalogue, and selected standards from the Encircle tool providers, before developing a methodology on what information we required and the best way to collect and collate it. We then used this methodology to go outside the Encircle catalogue, identify those with the standards we may require, and speak with them and gather information.

ZR: In moving outside the Encircle catalogue to look for standards, have you found that your discussions with various tool providers have encouraged them to join the catalogue?
TCA: Yes, as we explain the Encircle project and discuss the benefits of the catalogue with them it has encouraged some to join in. This, of course, is not our main aim, that is to gather information, but people signing up to the catalogue and adding tools is a nice outcome of our conversations with them.

ZR: How long did the process of identification, collection, and information collation take? What lessons have you learned from this process, other than the need for a standard working methodology as described earlier?
TCA: The main lesson for us is that the activity is much more time consuming than we anticipated. We have learned that we did not allow for the number of man months (MM) that would actually be required, when writing the proposal. We want to continue with the work, even without the required MM budget as this is a very important activity, and as we continue with the work, so our learning and expertise increases along with it. Working with Encircle we are increasing our ability to participate and contribute to future projects.

What we would like is that at the end of the project Tecnoalimenti's work (in collaboration with other ENCIRCLE partners) will be something to leave the commission, practitioners, and the tool providers. Something useful for the future, beyond the end of Encircle.

ZR: What types of standards and standard operating procedures (SOPs) have you been looking for? How will these help the Part b projects in the long term?
TCA: We are identifying and cataloguing protocols, for example for emergency communications, management of information, clothing and protection devices. At present we have identified and catalogued 89 different standards in the specific sectors of detection, identification and monitoring, protection, information management, decontamination, and communication. In addition we identified seven different classes of communication interfaces for future innovation.

ZR: Have you whittled down the 89 standards you found into a list of those that are most appropriate?
TCA: So far we have identified that the most appropriate are those for communications interfaces for future innovation. Once we have dealt with those we will move on to the standards.

ZR: What do you see as the major challenges to standards and interfaces in the next three to five years, and how can Encircle help people get in front of it?
TCA: If you see Clive Goodchild's article on CBRNe integration challenges (p.6-8) he puts it best by saying: "There is lack of comparable standards for CBRNe innovation for the civil protection domain and as a result innovators are developing tailored and bespoke technical solutions for practitioners making interoperability and integration less efficient. For the CBRNe market innovative tools and solutions are often developed at national level which results in special requirements being defined resulting in fragmented procurement. A major challenges is how to have appropriate standardised and harmonised tools that are compatible with national bespoke operating procedures and interfaces. ENCIRCLE would like to provide advice to innovators on the type of standards they should consider in their solution development to provide them better access to the market and provide solutions that will be more easily integrated into the civil protection market and would like to collaborate on how we can achieve this. Please contact ENCIRCLE if you are interested."

Another major issue is also the time it takes for European standards to get generated and agreed, we need a much more agile system to meet the fast pace of technology development. An option for the Horizon Europe programme could be that the topics should not be so open and there should be recommended standards and interfaces that need to be used for innovation actions.

ZR: What are the next steps for the standards and interfaces work package? What work remains to be done?
TCA: We invited some experts, and the coordinators of the Part be projects, to join the Encircle online forum and utilise it. In future we need to promote and utilise the forum and the feedback we get from it. We need to continue to collect information about standards and share them with the community of experts. Also, during the project, we would like to be able to individuate some standards for the CBRN community, or perhaps make suggestions for some standards for future innovation, not only what we have done for the communication interfaces. Tecnoalimenti's aim is to do our best to achieve the highest results possible.

ZR: What have you, and Tecnoalimenti, gained from the Encircle project that you can use for the future?
TCA: The experience we have had, getting in touch with a lot of experts, will be of benefit to us and though the project we have made lots of new contacts and links that we can continue to work with in future. We have learned a lot about the technical side related to standards, and the technical issues related to tool innovations and technologies, we have learned why there are standards, what the standards mean, and the language beyond the standard, that was something that was quite new for us.

ZR: Have you enjoyed the process, learning about new and different standards beyond your usual scope of experience?
TCA: We have enjoyed it a lot, this has been a very important activity for me, increasing my knowledge. We, Tecnoalimenti, have also got to understand the CBRN world though working on Encircle, the standards, and the problems facing the CBRN market. We must thank Clive Goodchild for helping us to understand a lot of these things. I can say that for us, being involved in WP5, and being part of the Encircle project, has been a very rewarding activity.

Events

In our last e-newsletter we let you know where you could see Encircle in the coming months. Since then we have attended three of those events, below you can read what we got up to and how we promoted the project across Europe.

3rd International Conference CBRNE – Research & Innovation, 20-23 May 2019, Nantes.

The CBRN Research and Innovation (CBRN R&I) conference is a relatively newcomer to the European CBRN event calendar. This was now its third iteration, following on from previous events in Cap D'Antibes and Lyons, but it gets stronger and stronger each time. Nearly 400 scientists, researchers and first responders attended the four-day event, all keen to be able to share knowledge and make new contacts. Encircle was there in two ways, first as an exhibitor and secondly as a workshop presenter.

The first element was the most straightforward, with a series of information and dissemination materials that Encircle consortium members handed out to delegates and answered their questions. More information on the results of the workshop can be found on Page 6 but the audience for the Slido poll was very active (Photo below). Clive Goodchild and Thierry Pollet first gave an overview of the project, explained the aims of the poll and then took the delegates through the process. The discussion was lively, and despite the differing knowledge levels in the room there was an engaging group, keen to understand the role of standards in CBRN development more as well as the role that Encircle could provide in a more robust European CBRN industry.

CBRN symposium, WIS 20-23 May 2019 Munster, Germany.
Around 150 participants from 20 countries attended despite the fact that the Nantes conference was at the same time. Lectures were scientific and at a high level. The dissemination activity was through direct contact, and oriented around the Encircle project. The presentation focused on the dynamic catalogue and there was interest from practitioners and industrials companies in joining this European CBRN ecosystem.

Toxi-Triage Project Field Trials May 22nd, 2019, Mikkeli. On May 22nd we attended the field trials held by the Toxi-Triage project and discussed Encircle, as well as undertaking survey work in order to improve the CBRN marketplace.

ENCIRCLE Robotics workshop, 5th June 2019, Manchester.
The month after Nantes the Encircle consortium showcased some of the leading work that European Commission projects have been doing to a spellbound audience. The day before the inaugural Asymmetric Stadium Threats event, held at the Old Trafford Stadium in Manchester, UK, was a half day workshop looking at the use of robotics in CBRN. Unmanned ground vehicles (UGVs) and unmanned aerial vehicles (UAV) are the zeitgeist of CBRN response, with many forces utilising commercial off the shelf technology. What Encircle was able to do was bring a group of 50 responders together and brief them on what they might be able to do tomorrow! (photo above)

As such four projects that had received European funding provided speakers to explain how they would be able to benefit European response. First to present were Ludek Kuhr, Jiri Kadlcak, and Jiri Janicek from the Audros project. Audros (Autonomous Drone Services in CBRNe Operations) is a feasibility study funded jointly by the European Space Agency (ESA) and European Defence Agency (EDA). Next to speak was Professor Paul Thomas about the TOXI-Triage project, which has done some great work and demonstrated the possibilities available using robotics and AI in CBRN response. Thirdly was Rocsafe, presented by Peter Daly, who explained that Rocsafe (Remotely Operated CBRNe Assessment and Forensic Investigation) will fundamentally change how CBRNe events are forensically investigated. The final project was Terriffic (Tools for early and Effective Reconnaissance in CBRNe Incidents providing First responders Faster Information and enabling better management of the Control zone) delivered by Bruno Steux of Nexter Robotics. Bruno outlined the objectives of the project, which is to utilise robotics to enable a change in the first hour's response to an incident. The event was started by Encircle's Gwyn Winfield, who provided an overview of the project, and then acted as chairman and provocateur – walking through the audience and getting them to debate the issues that had been brought up. The delegates found the whole array of CBRN robotics research amazing, and many said that they didn't realise so much work was being done. For Encircle it was a great opportunity to place themselves in the center of this research and to provide the various members of the consortiums with a wider customer base.

Notice

Olga Vybornova, Coordinator of the European Network Of CBRN Tralning CEnters (Enotice) programme, talks to Zoe Rutherford about improving links between responders

ZR: eNOTICE has now been running since 2017. How do you feel the project is progressing?
OV: This is a five year project, scheduled to run until August 2022. We have just completed two years, so as yet we are not even halfway through. The project is progressing well thanks to the very active involvement of all the partners. Not everything is easy, but we are optimistic that the ultimate goal of the project, building a successful, sustainable network, is feasible because the CBRN training centres want it.

ZR: The main goal of eNOTICE is to establish a European network of CBRN training, testing and demonstration centres. How has this progressed, how many training centres have agreed to collaborate with the project?
OV: There are two parts to the project, mapping existing capabilities and building a network of training centres. When conducting the first part of the work, the mapping and identification of existing training capabilities, we found 219 training centres. This, of course, does not mean that they will all be part of the network, just that we have identified them.

The second part of the work is to build a solid network of those training centres that see the practical value of joining, and would like to increase their visibility, exchange knowledge and practices, and participate in projects. We do not pretend that all training centres are eager to join this European network, it's not that straightforward, of course. The process takes time and we did not expect it would be easy when we were preparing the proposal for eNOTICE three years ago.

When writing that proposal we discovered there was probably a good reason why such a network of CBRN training centres did not exist at that point. Some centres are very difficult to find, some do not have a web presence, others are part of another organisation eg military, government, civil protection, and it is difficult to discover that they even exist. I am not talking about the large, established and well known training centres such as Gurcy in France, Campus Vesta in Belgium, or Vught in the Netherlands. I am referring to those that are less visible, or have simply been acting for their own organisation, region, or nation, without any European dimension. Many of these training centres have never participated in any European project, the whole process is completely new to them, which presents us with a host of challenges.

The work of finding these centres, approaching them, explaining what we are doing and the benefits, is very challenging. Some training centres are happy with their current role, needs and status, and see no reason to join any European initiative, it is not their core business. There are those that are not interested at all and close the door, and others keep the door open saying, 'If you are successful then perhaps we will join.' On the other hand, there are centres that are very enthusiastic about the network and we work well with them.

Centres that decide they want to move forward complete a comprehensive questionnaire developed by the training centres within the eNOTICE project consortium. These are both civil and military training centres, so they know the questions to ask. The questionnaire is rather long, but it provides a complete overview of the applicant's capabilities: is it chemical, biological, radiological or a combination of them? Do they provide practical training, theoretical or both? Is the training for a single discipline, eg only for firefighters, or multidisciplinary? How big is the training area, how many trainees can they take, what type of organisation and what type of trainees can they accept, and what about accommodation and accessibility? We know a lot of these training centres are not easily accessible from city centres, but are on the outskirts somewhere. All this information is important; and are just a few of the questions asked.

Partly because of the comprehensive nature of the questionnaire we have only had 40 training centres complete and return it to us. Out of 219, 40 might not seem that many but as we have come to understand what difficulties and obstacles these centres have to address in order to complete a questionnaire like this it is not such a small number! For example, a military or governmental centre will have to gain permission from its superiors to even begin to answer the questionnaire and share information, a process that can take quite some time.

We don't ask for confidential information, and ensure the training centres know this and that they should only share information that is public, as the project does not have any mechanism to deal with confidential data. Our policy is that we share only public information, but once a centre has joined the network, it can create agreements and share information bilaterally if it wishes to.

period

ZR: Do you think the process of collecting information from the identified training centres and adding them to the catalogue will take the life of the project?
OV: That will depend how many of them agree to complete the questionnaire and be visible in the catalogue.

ZR: One aspect of these projects that can sometimes prove challenging is the needs and gap analysis. Have you found that people have been willing to participate, and have been forthcoming in answering questionnaires and attending workshops etc?
OV: Right from the beginning, even when writing the proposal, the essence of eNOTICE was not to prioritise paperwork and workshops in meeting rooms. Instead it is to invite stakeholders to numerous joint activities and exercises hosted by consortium training centres. We want people to see with their own eyes what the training centre has to offer and meet representatives from other training centres, from here conversations flow very easily. eNOTICE does not organise any of these exercises, consortium member training centres open up their planned exercises for the project and we invite stakeholders.

ZR: You've worked on other projects where there is a lot of sitting around talking in meeting rooms. Have you found that you get better participation from invitees as they are attending practical exercises, not just sitting in a room all day?
OV: Yes, we have had a lot of interest from people wanting to be observers at these exercises. Of course, we sit and have discussions afterwards, debriefing the exercise as well as discussing the project and network. But using the format of attending an exercise first and then having discussions makes the conversation flow more easily, with greater participation.

Not only are we able to accommodate observers who just come to watch, we also prioritise practical, active participation in the exercise scenarios. We invite current research and development projects to participate in the exercise scenario. Initially, this was difficult as other projects did not yet know about eNOTICE, and those projects that were already established, and had their planned exercises fixed in their grant agreements, could only attend as observers and not as active players. Once eNOTICE became better known, new projects were putting the collaboration with eNOTICE in their grant proposals and using eNOTICE training grounds.

A good example of this is a new H2020 project called PROACTIVE (PReparedness against CBRNE threats through cOmmon Approaches between security praCTItioners and the VulnerablE civil society), which started in May 2019. PROACTIVE included three exercises held with eNOTICE training centres in their grant agreement, which is great. We have also been collaborating with the ENCIRCLE part b project TERRIFFIC, which played in the exercise held in Gurcy. This was TERRIFFIC's first exercise and they have reported that they were happy with the feedback they received from the practitioners involved. It is good for their development, and we, of course, will be happy to welcome them for a second exercise if they are interested.

ZR: Part of the project has been to run joint multidisciplinary exercises, 16 in total. So far you have completed seven, what types of exercises do you plan to hold next?
OV: The next one is due to be held in Dortmund in September 2019, and will be a large, multidisciplinary CBRN exercise hosted by our partner, Fire Department of Dortmund (FDDO). This activity will be interesting as on top of the exercise we have also organised a policy meeting with the participation of German and Polish policy makers, as this exercise was organised by both German and Polish partners as a cross-border scenario. After the policy meeting there will be the first active network building meeting. We have invited external training centres to join us at this exercise. They have been to different exercises before when we were developing our methodologies, mapping, and needs and gaps analysis. This time they have been invited with the aim of discussing what their expectations are of the network and how eNOTICE can be of use to them. As a project we are willing to be open, flexible, and adapt and change to meet the expectations of the centres that join, and build a network according to their wishes.

ZR: Have you been receiving positive feedback from them so far?
OV: Yes, some centres have already attended exercises and have fedback that they think the network is a great initiative and want to be involved. When centres attend these exercises we always explain the benefits that joining the network, and being visible, could bring them. They will be visible to the Commission, meaning not only the Commission but also the Directorate General for Migration and Home Affairs (DG HOME), the Directorate General for International Cooperation and Development (DG DEVCO), and the Directorate General for European Civil Protection and Humanitarian Aid Operations (DG ECHO), people who also organise CBRN training. Being visible means these DGs can collaborate with the training centres and utilise their capabilities.

The collaboration with DG DEVCO is one that is important and eNOTICE has entered into an official collaboration with them. They approached us as part of their CBRN Centres of Excellence (COE) initiative, as they have similar objectives to eNOTICE in regard to mapping CBRN capabilities and training centres, but outside of the EU. DG DEVCO is now using the eNOTICE questionnaire to conduct its mapping and information gathering exercises primarily in their partner countries in Africa, Middle East and Central Asia, due to the fact it is so thorough, and those that want to be visible will go into the eNOTICE catalogue. This is a great as it means training centres from both inside and outside the EU can see what capabilities are available and create international training links.

ZR: The EU CBRN CoE initiative running at the same time as eNOTICE must be of great benefit to the project in terms of networking and creating links. Have you found it easy to link with the CoEs, which CoEs have you been working with, and to what end?
OV: We have not been dealing with the COEs directly, DG DEVCO has been doing its part in parallel with us. We learned recently that DG DEVCO does not have the resources to contact training centres one by one, as eNOTICE did, instead, it goes through its national contact points, which does not always prove to be efficient. So far only three DG DEVCO centres have completed the questionnaire, others are still in the process, but they are not there quite yet. Well established DG DEVCO COEs have good contacts, and have set up collaboration between training centres. For example the COE in Morocco has very good collaboration with the Joint Chemical, Biological, Radiological and Nuclear Defence Centre of Excellence (JCBRN COE) in Vyškov, Czech Republic. Through DG DEVCO they have been exchanging training and collaborating for the past several years.

ZR: The last time we spoke to Prof. Jean-Luc Gala (See Encircle Magazine Volume 2, project coordinator for Encircle and eNotice) we discussed the links between eNOTICE and ENCIRCLE as the visions of the two are complimentary. How has work been progressing on embedding ENCIRCLE into the network of training centres that eNOTICE has gathered?
OV: The Encircle partners, cluster part b projects, and members of ENCIRCLE communities are most welcome to participate in eNOTICE exercises and TERRIFFIC already has. To those involved in eNOTICE the ENCIRCLE project is very well known, they love the project and know all about it, some eNOTICE practitioners have, in fact, registered in the ENCIRCLE catalogue. Whenever the ENCIRCLE budget allows, eNOTICE organises ENCIRCLE sessions at our activities, such as in Gurcy with members of the French fire service, and exercise Bio-Garden organised by UCL at the military base in Peutie-Vilvoorde.

ZR: One idea we discussed last time with Jean-Luc involved eNOTICE arranging an exercise and ENCIRCLE locating industry partners via the dynamic catalogue that would be able to provide the required equipment for the exercise. Is this still something the eNOTICE project sees as a possibility?
OV: It is a possibility as the technologies are in the catalogue and mature enough to be used. eNOTICE is definitely open to this, we just need to collaborate and plan for it. Technology suppliers registered in the ENCIRCLE catalogue who are willing to provide their tools for exercises, and who want the opportunity to test or validate their technologies are most welcome to contact us at any time. There is one condition though, they will need to contact us very early prior to the exercise they wish to participate in as planning for the training centres to include them in the scenario can take several months. I would advise them to contact us at least eight months in advance.

ZR: What are the next steps for eNOTICE?
OV: Right now, we have completed all the preparatory work, identification of training centres, methodologies, and key performance indicators, for example. The next step is to make the network members, both the eNOTICE core training centres and the new external centres, feel like a network. That means meeting together -

they can use the eNOTICE joint activities and communication centre for this or talk bilaterally - and building partnerships for projects, combining training, exchanging expertise, trainers, trainees etc. This active part of the network is now starting. Dortmund will have an event specifically for representatives of the training centres.

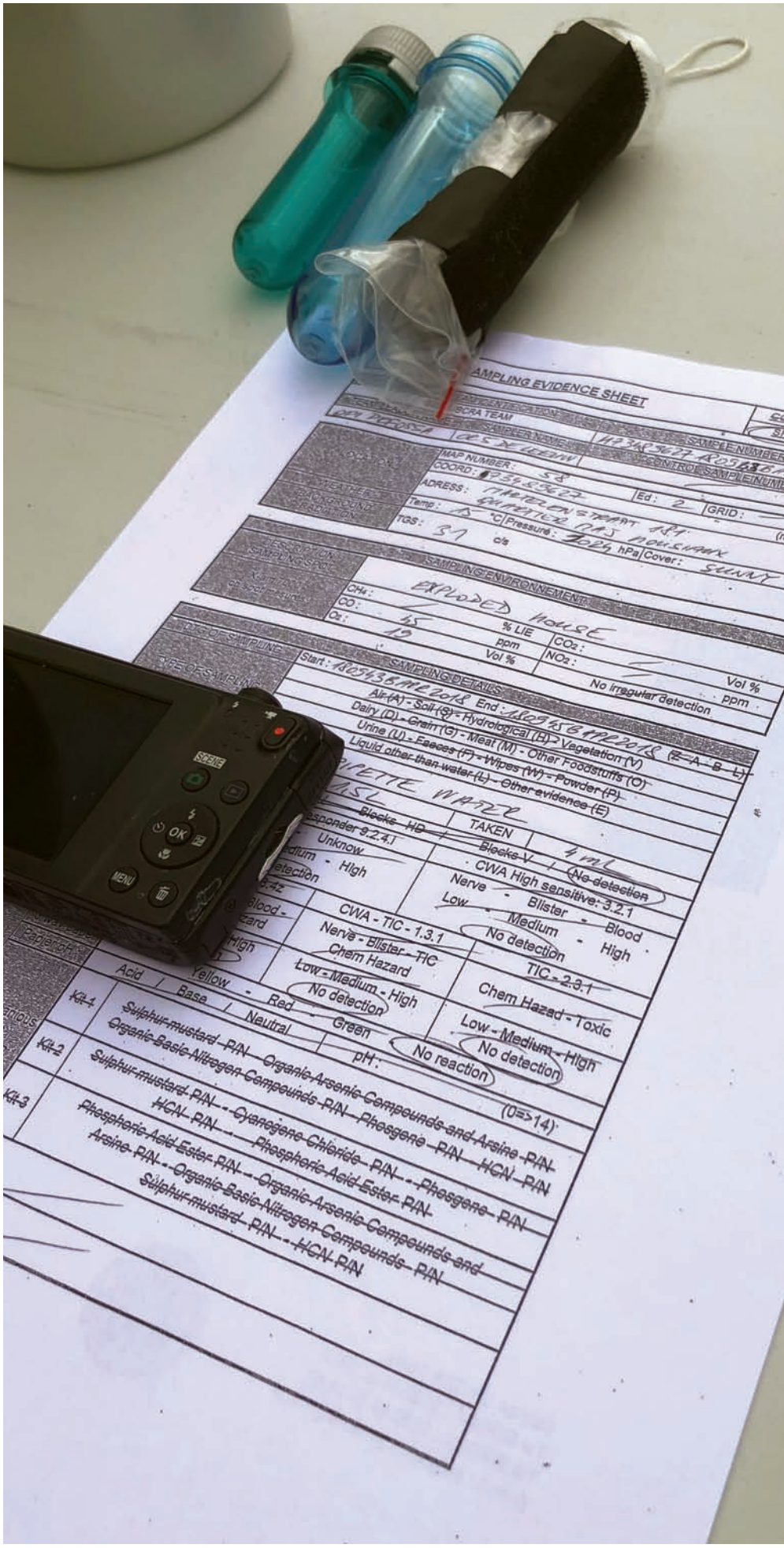
Sustainability is a crucial part. Much better to discuss and plan sustainability now than to leave it until the very end of the project. I will have more precise answers in the future, but right now we are working very actively towards sustaining the network. We have developed all of the criteria for network acceptance and we are comparing and discussing a lot with other networks. We are monitoring progress of new and similar projects that involve networks of practitioners such as FIRE-IN, NO-FEAR, ILEAnet, and looking at other successful and established networks to learn from them.

There is a big discussion as to what extent we should or should not count on the European Commission for support in the future. The Commission is supporting and funding us now, as a project, but it is looking at us, and all other SEC-21 networks, to see if we succeed or not. If we prove to them that we are successful, and sustainable, then I think there will be all kinds of stakeholders, including the Commission, that will be very interested, and it will support the network in the future.

As the coordinator of the project I am very optimistic we will succeed. We have lots of training centres that are very interested, who really want to make the network work. I think we have all of the prerequisites to succeed.

ZR: What are your hopes for the legacy of eNOTICE?
OV: We aren't targeting a huge number of training centres, but if we see that there are 25 centres, for example, that are a solid network, who communicate, collaborate and establish partnerships, then that network will continue beyond the life of the project.

The entire community of stakeholders, practitioners, policy makers, and the Commission, will see that this network is working and be interested as well, they will see the benefit for the whole CBRN community. For eNOTICE the main thing is to provide this mechanism of collaboration between the centres, to ensure they clearly understand the added benefit for them, and for them to continue to work at it in the future.



Totally Terriffic!

Rob Munro, Communications and Event Consultant from Arttic on providing faster information to improve management of the RNe control zone

The TERRIFFIC project brings together 10 European organisations, all working together to deliver an important step change in the effectiveness of first responders during the first hours of a Radiological, Nuclear, explosive (RNe) incident.

This will lead to reduced response times, less health and safety risks for the response teams and less human intervention in the operation, due to a higher number of automated processes and extended mobile detection capabilities.

The individual technological components needed for a significant improvement in this respect have progressively emerged over the past decade and include new detectors, drones, robots, dispersion models, information management and decision support software (DSS) packages.

The dynamically updated information made available by the TERRIFFIC system and its components will enable the response team to intervene immediately, as adequate safety measures can be rapidly implemented. It is anticipated that the TERRIFFIC solutions will have a significant impact for CBRNe responders in the early hours of an incident.

Just over one year into the project, some of the many questions that have been addressed with practitioners include:

- How can we better optimise the intervention of practitioners during the first 30 minutes after an RNe incident?
- How can we limit the exposure of first responders?
- How can we better anticipate the evolution of the hazard flows?

As a result of the many discussions, we have been able to start defining the specifications of the TERRIFFIC system, as well as those of each of its components in terms of robustness, endurance, performance, but also the maintenance of operational capability.

In addition to numerous bi-lateral interviews, an interactive workshop was successfully held in Paris on 6th-7th November 2018 with a total of 30 participants. Bringing together experts, consortium members and CBRNe practitioners, the over-arching objective was to discuss practitioners' needs during the first hours of an RNe incident and to define the specifications of the TERRIFFIC system, based on a set of pre-defined scenarios.

As a result of the workshop and subsequent development work, the first TERRIFFIC Trial – an initial assessment of the existing technologies in the TERRIFFIC components – was hosted by Lt. Col Denis Giordan and his team of firefighters from SDIS 73, in April 2019 in Chambéry, France. During the three-day assessment and training field trial, several radiation scenarios were utilised to challenge the components in both indoor and outdoor environments. This provided a strong baseline against which to evaluate the effectiveness and the potential of the various TERRIFFIC technologies – UAV, UGV, detectors, drone-mounted camera, Augmented Reality app and plume software modelling.

Against the background of these specifications, partners have worked hard to develop their respective technologies. The first working prototype of the beta handheld detector, able to detect beta contamination in a high gamma background, was available and functional during the first trial.

"This is ahead of the initial schedule and the beta handheld detector even proved capable of discriminating the two different contamination sources tested in Chambéry", explained Vincent Schoeff of the French Alternative Energies and Atomic Energy Commission (CEA).

Mike Griffin of the Luxembourg Institute of Science and Technology added: "This was an excellent first trial. We were able to really test the version one AR system in a challenging environment and gained a lot of hugely useful learning, which we are applying into the v2 system."

This first year has also been the opportunity to start working on the integration of the different components into an integrated System. In May 2019, AERACESS and Nexter Robotics participated in the eNotice trial at the SDIS77 training and education centre. Indoor and outdoors inspections using drones (AER Q800X/ NanoHawk) and robots (Nerva-XX) were performed and provided a good opportunity to test the communication relay capacity between the UAV and the UGV. A proof of concept of the integration of the CEA's miniaturised gamma camera (called nanopix) into the robot developed by Nexter was also successfully tested.

Following on from what was learnt during this first year of the project, the technical teams will of course continue to develop and evolve their technologies – both independently and as an integrated system. Subsequent trials, with the ongoing involvement of practitioners, will help to ensure that TERRIFFIC can really make a difference to first responders involved in the initial response to a Radiological, Nuclear, explosive (RNe) incident.

Further information about the project is available from **www.terriffic.eu**


POLICE
POLICE

Everything's Cosmic!

David Yaish, CEO from Lingacom on CBRNE Detection in Containers: COSMIC

The COSMIC project started in October 2018, in response to the call for improved detection capabilities, and will be focussing on the security gap in the flow of containers and inspection that can be exploited to smuggle CBRNE materials. The project is progressing according to the plan with eight deliverables submitted on time.

The COSMIC project is developing six CBRNE sensors and system analytics software as described below.

The sensors are:

- NA-NOSE for chemical and biological.
- DMA-MS and GC-DMA- F-DMA for chemical, biological and explosives.
- Muon scanner for shielded radioactive and nuclear.
- PDA for biological in liquids and solids.
- ES-CR-DMA-CPC for virus detection.
- GC-DMA-F-DMA for explosives primary detection.

COSMIC has firstly completed the work of defining the requirements and specifications for each one of the sensors along with an extensive process to determine the CBRNE threat materials that need to be supported by each one of the sensors and that will be used through the project development and field trials. Secondly, the technology developers have purchased the necessary simulant CBRNE materials and have started to test them in their development labs. To date the project has held two consortium meetings, in Rotterdam (December 2018) and in Tel Aviv (June 2019).

Due to the complexity of the field trials in CBRNE materials, preparations began early in order to verify that all the appropriate processes, procedures and licences will be in place.

During the meetings the consortium also visited the field tests sites where COSMIC will conduct the trials in the seaports of Rotterdam and Haifa.

For further information COSMIC has designed and launched the project website: https://www.cosmic-cbrne.eu/ and has prepared a marketing package that includes a presentation, brochures about the project itself and all the sensors, and a video of the project.

Interactions and discussions with the ENCIRCLE project have involved the baselining of the business maturity model, inclusion of the project in the catalogue and promotion of the project at workshops and conferences.

It makes total EU-Sense

Mateusz Oleś, Researcher, from ITTI Sp. z o.o. on the European Sensor System for CBRN Applications: EU-SENSE

EU-SENSE is a research and innovation project launched in May 2018, with a time duration of 36 months. The crucial innovation of the project is the development of a novel network of chemical sensors consisting of heterogeneous sensor nodes supported with cutting edge machine learning and dispersion modelling.

In December 2018, the project entered the stage concerned with sensor node development. The device is based on STM32F4 microcontroller, which is responsible for the configuration, supervision and operation of the sensor instruments, as well as functioning as a bridge between the network controller and the actual sensors. The sensor node can operate with the following sensors.

- AIRSENSE GDA-P + EC (electrochemical cell).
- AIRSENSE GDA-P + PID (photoionisation detector).
- SRD metal oxide detector.
- Proengin AP4C flame photometric detector.

The node configuration is stored on an SD card. After the node startup, the device connects to the individual sensors, runs the measurements and begins to receive data. This data is collected, verified, preprocessed and transmitted to the network controller every second. The sensor node can wirelessly connect to the sensors controller network as well as store raw data on the SD card.

After this, the next step is for the consortium to conduct a data fusion development that will include classification, identification, concentration estimation and alarm algorithms.

Work package five's main objectives are to develop a solution for false alarm rate reduction based on machine learning of the environmental noise, and to perform sensor measurements in various environments and prepare a database of sensors data. The

Figure 1 – Sensors used in EU-SENSE - AP4C, two GDA-P and SRD instruments

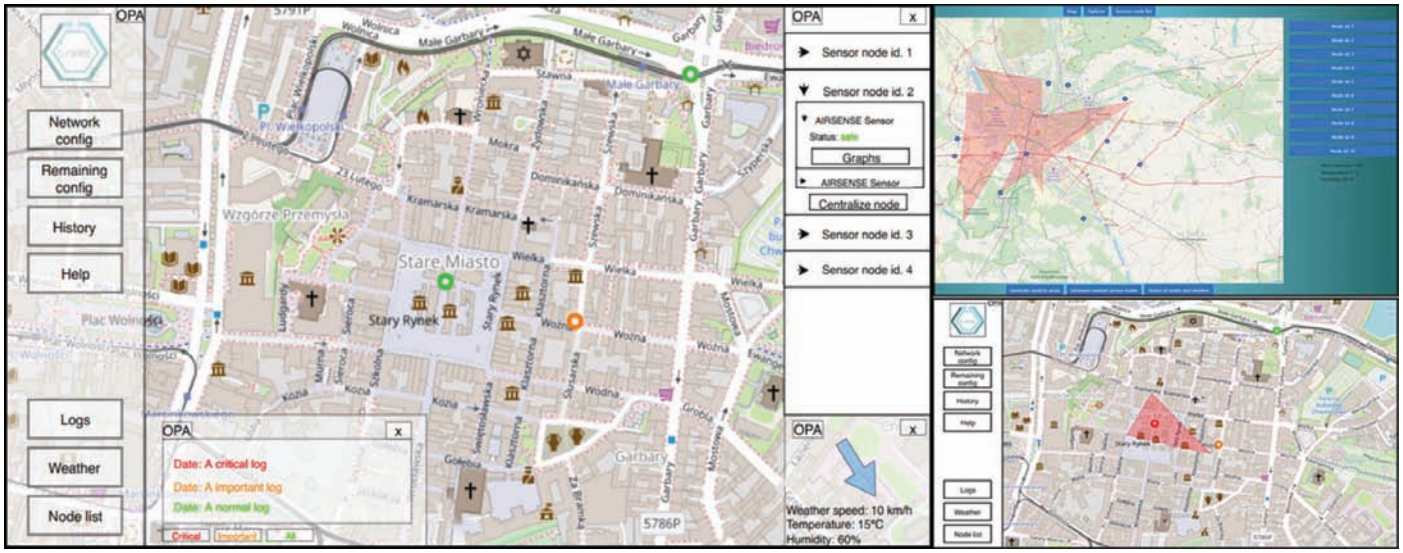


Figure 2 – Early interface of the situational awareness tool

consortium determined the schedule and the localisation of data collection. Laboratory and outdoor measurements will be performed in three iterations. The results of the sessions will be used in sensor model development and the anomaly detection algorithms. Because the measurement sessions are to be performed in Norway, an export license is needed for the dual use sensors. The application has been already submitted to the ministry of entrepreneurship and technology in Poland.

The first iteration of the situation awareness (SA) tool has been already implemented. This application has a functional graphical user interface with sensor node visualisation and a map download mechanism. The SA tool database structure has already been designed, and the next step will be to integrate the SA tool with computational tools for dispersion modelling and threat source estimation.

Recently, the project coordinator (ITTI) raised awareness of the EU-SENSE project and its innovations as well as highlighting the need to improve European CBRNe capabilities and cover first responders' existing technology gaps. All this took place during the following events:

- 25 - 29 March 2019 – 13th Meeting of the Community of Users on Secure, Safe, Resilient Societies.
- 20 - 23 May 2019 – 3rd International Conference, CBRNE - Research & Innovation in Nantes.

The project coordinator will also participate in the following events in order to demonstrate the EU-SENSE prototypes:

- 24 – 26 September 2019 – 13th CBRNe Symposium, Malmö.
- 12 – 14 November 2019 - CBRN Symposium, Farnborough.

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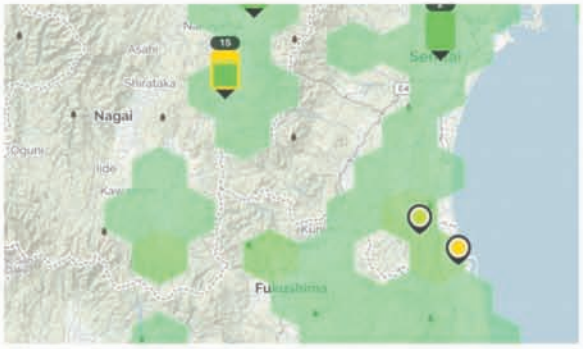

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For more information visit our website or call us for an informed discussion on how CQC can solve your CBRN PPE issues.

CQC Ltd | CQC House | 2-3 Brannam Court | Brannam Crescent
Roundswell | Barnstaple | EX31 3TD | T: +44 (0)1271 345678