CBRN real-time 2D/3D situational awareness

Countering threats with cutting-edge technology

In an increasingly complex global security landscape, the ability to detect and respond to chemical, biological, radiological, and nuclear (CBRN) threats is more critical than ever. Advancements in surveillance technology and situational awareness systems are shaping the future of defence and emergency response, enabling faster, more precise threat identification and management. By combining cutting-edge research with international collaboration, innovative solutions are emerging to enhance safety for military forces, civil protection agencies and the general population.

How it works

Leveraging its expertise in monitoring and surveillance technologies, AIT has led two major European defence initiatives: **CBRN SaaS** (Chemical, Biological, Radiological, Nuclear Surveillance as a Service): As part of the EU's PESCO initiative through the EDA, the project integrates commercial and military components to detect and identify CBRN threats with unmanned air and ground vehicles. It also develops a 24/7 plug-in module, a roadmap for future upgrades, and an operating model compatible with national systems. Launched in 2018 under Austrian leadership, the project includes Croatia, Slovenia, and Hungary. **CBRN RSS** (Reconnaissance and Surveillance System): Funded by the EDIDP, the project expands CBRN SaaS with ISR capabilities. It strengthens the EU's capacity for cooperative, cross-border CBRN threat detection with partners including France, Croatia, Denmark, Slovenia, and Hungary. Both initiatives use RAD-SALs technologies, combining advanced software and sensors for real-time situational awareness. UAVs and UGVs equipped with scanners, sensors, and gamma probes detect and identify threats. 2D/3D visualizations provide continuously updated maps of contaminated zones, enabling rapid decision-making. AI further enhances detection, identifying hazardous materials, underground structures, and unknown threats. Ongoing development adds contamination mapping, sample analysis, and autonomous navigation to stay cutting-edge.

The Big Picture

These CBRN projects enhance safety for military and civilian personnel in contaminated zones and protect the wider public. They also strengthen Europe's strategic autonomy by building multinational defence capacity. Key beneficiaries include armed forces (e.g., NBC protection units), civil protection agencies ensuring emergency response readiness, government authorities responsible for security policy, research and development organizations (RTOs) and universities as well as defence and security industries, including SMEs. Beyond technical innovation, the projects foster EU-wide defence cooperation, accelerate innovation through shared R&D, and strengthen the competitiveness of Europe's defence sector. By integrating stakeholders across borders, they promote a unified European CBRN situational awareness framework—powered by AI and 3D visualisation—for both civil and military use.

Quick Facts

- Solution area: **Organisations, Processes, Social participation and engagement, Technological innovation**
- Administrative level: **State, Federation**
- Solution process: **Digitization and technology, Public service, Science and research, Security and defense**
- Technology: **Augmented / Virtual Reality, Automation and robotics, Information technology, Networks, Sensor technology**

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