

#### AN INTRODUCTION TO TERRIFFIC H2020 - RESEARCH AND INNOVATION ACTIONS

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Tools for early and Effective Reconnaissance in cbRNe Incidents providing First responders Faster Information and enabling better management of the Control zone

> Start Date: 01/05/2018 36 months – 6 months extension request End Date: 30/04/2021 – extended to 31/10/2021

# **PROJECT OBJECTIVES**

#### WHAT HAVE WE SET OUT TO ACHIEVE?

- Develop a comprehensive system of complementary, interconnected and modular components
- Substantially enrich the European response to CBRNe events with the focus on R, N and e
- Enable a step-change in the response during the first 30–60 minutes
- Higher number of automated processes and extended mobile detection capabilities
- Comprehensive data feeds into central incident management system
- Technologies reduce human involvement during period of highest risk



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#### TERRIFFIC Project

# **INTEGRATED TERRIFFIC SYSTEM**

#### AVAILABLE TO EU PRACTITIONERS IN THE ENCIRCLE CATALOGUE

- MODES tactical response vehicle
- New mobile and handheld detectors
- Miniaturised gamma camera
- UAVs
- UGVs
- Dispersion plume modelling
- Augmented Reality solution
- Incident management system

















**TERRIFFIC** Project

### **GOING FROM SENSOR DATA TO TACTICAL ADVICE**



#### Continuous, fast & automatic command intervention

# **BRINGING IT ALL TOGETHER**

#### WHAT WILL THE TERRIFFIC SYSTEM LOOK LIKE?





#### **RADIATION DETECTORS**





- Real-time gamma radiation monitoring
- Silicon Plastic Readout technology (not PMT-based)
- Modular, small (20 cm x 10 cm x 4 cm), low-weight (800g)
- applications: from handheld contamination monitoring to RPMs



**Embedded in UAV and UGV** 



- Superimposes a gamma image on a visible image
- Gets information on hotspot intensity
- Small (8x4.5x5 cm3)
- Lightweight (268 g)



#### **RADIATION DETECTORS**



- Detect beta contamination in a high gamma background (up to tens of µGy/h)
- Embedded display for beta count information
- Handheld device



Embedded in UAV and UGV





- Increased sensitivity compared to conventional neutron detectors
- Increased gamma rejection ratio
- Helium (4He) used as detection material

### **TERRIFFIC BRICKS**

#### UGV AND UAV





- Autonomous exploration and automatic **3D mapping**
- Automatic measurement and detection of contaminated areas (integrated radiation detectors)
- Improved modularity and robustness





- Fully automated operation mode Improved ruggedisation for operation in highly contaminated area
- Water resistant (for compatibility with decontamination techniques)
- Improved data transmission of complete data to C&C

### **TERRIFFIC BRICKS**

INFORMATION PROCESSING





Plume dispersion models

- Direct dispersion model to characterise the plume and its impact
- Indirect dispersion model to characterise the source (position, release rate and radionuclide type)
- Optimised algorithms

### **TERRIFFIC BRICKS**

#### MANAGEMENT AND DECISION MAKING (SOFTWARE)





- User-friendly Command and Control (C&C) System to visualise the current situation and the planned tasks
- Interoperability
- Effective in crisis situation



- Visualisation of the "invisible" (e.g. contamination levels, vision through a wall)
- Visual cues provided (e.g. floor boundaries indicating safe distance from the source)

# **CURRENT STATUS OF THE PROJECT**

- Semi-Public Workshop 1 held in Paris, November 2018
  - 35 CBRNe practitioners over two days
    - WG1: Best available technologies and employment concepts or combined use
    - WG2: Evaluation criteria for sensors and analysis tools
    - WG3: Definition of useful information both in the field and the Command & Control Unit
- Semi-Public Virtual Workshop 2 in December 2020
  - 42 participants CBRNe practitioners, experts, other projects and European Commission
  - Partners presented current status of project plus interactive Q&A
- Trial 1 held in April 2019 with support from SDIS73 in Chambéry, France
- Participated in the eNOTICE exercise in May 2019
- Integration and testing (F2F and remotely) in March and Sept 2020 plus March 2021
- Requested a six month extension as Covid restrictions have delayed F2F integration meetings

# FIRST TRIAL, APRIL 2019

#### EVALUATION OF TERRIFFIC COMPONENTS

- Firefighters from SDIS73 Savoie in Chambéry, France
- Realistic conditions genuine radiation sources in a secure environment
- Information gained and lessons learnt develop individual components further
- Bring components together in a powerful integrated TERRIFFIC solution
  - Handheld detectors
  - Augmented Reality app
  - UAV and UGV
  - Gamma camera and sensors





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### PLANS FOR THE 6 MONTHS REMAINING IN THE PROJECT

- Conclude System integration and testing
- Final Trial
  - Hosted by SDIS73 with participation of CBRN practitioners
  - Real radiation sources in different scenarios
  - June/July 2021 Chambéry, France
- Tabletop and Field Exercise
  - Police, Fire, Military CBRN practitioners from at least 5 Member States
  - July 2021 Slovakia
- Public Workshop
  - Presentation of project results to senior CBRN practitioners and policy makers
  - Brussels September 2021

#### THANK YOU ANY QUESTIONS?



### CONTACT REACH US

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