

www.search-and-rescue.eu



The Search and Rescue (SnR) project: Introduction and update

Event: 73rd International Commission for Alpine
Rescue Convention - Montreux, Switzerland

Nektarios Parmakis
Hellenic Rescue Team



This project has received funding from the European Union's
Horizon 2020 research and innovation programme under
Grant Agreement No 882897

The Hellenic Rescue Team



Non-profit organization

Rescue group since 1978

Established as association in 1994

2000 volunteers in Greece (approximately)

32 branches across Greece



Certified Organization by the General Secretariat of Civil Protection in Greece



Member of I.M.R.F. (International Maritime Rescue Federation)

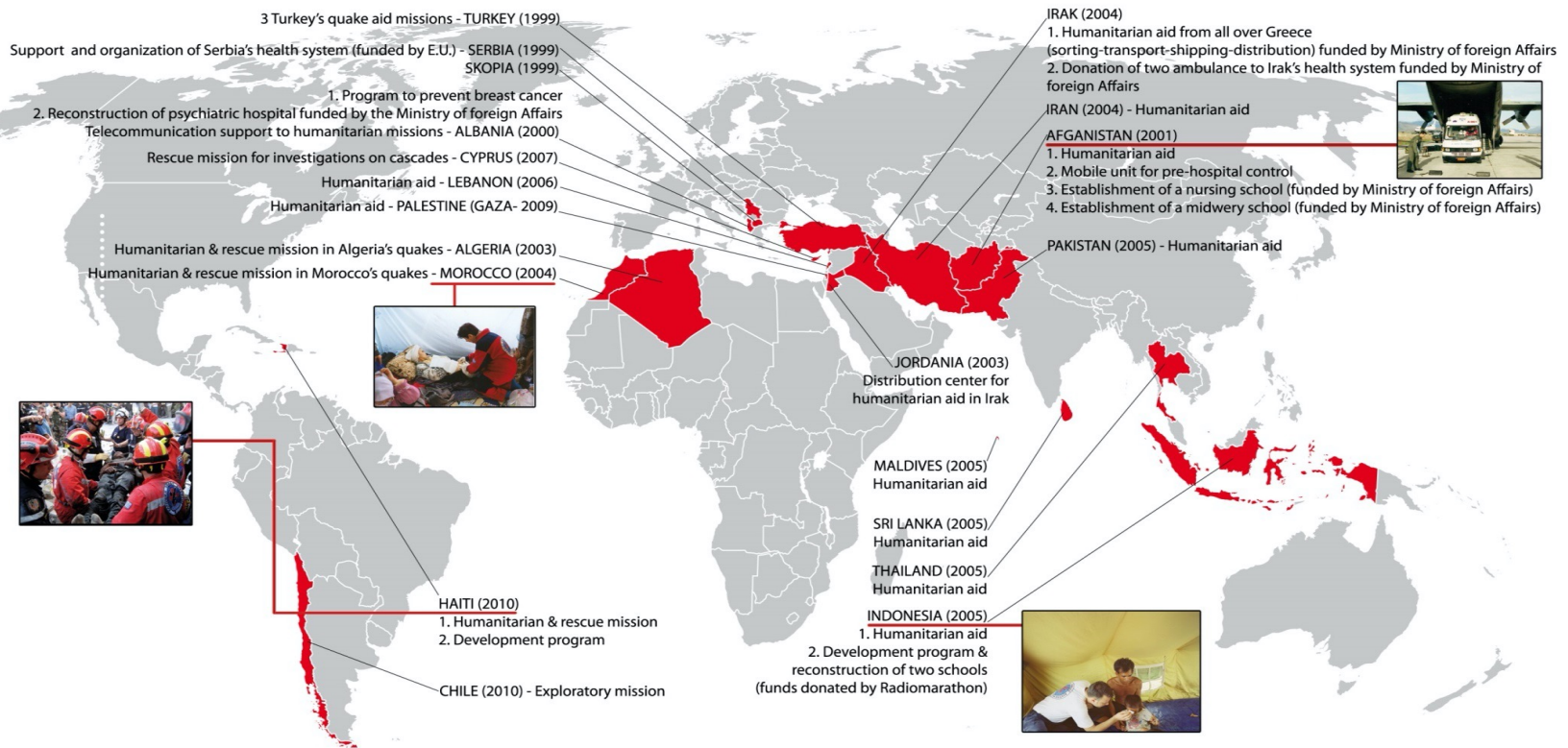


Member of I.C.A.R. (International Commission of Alpine Rescue)



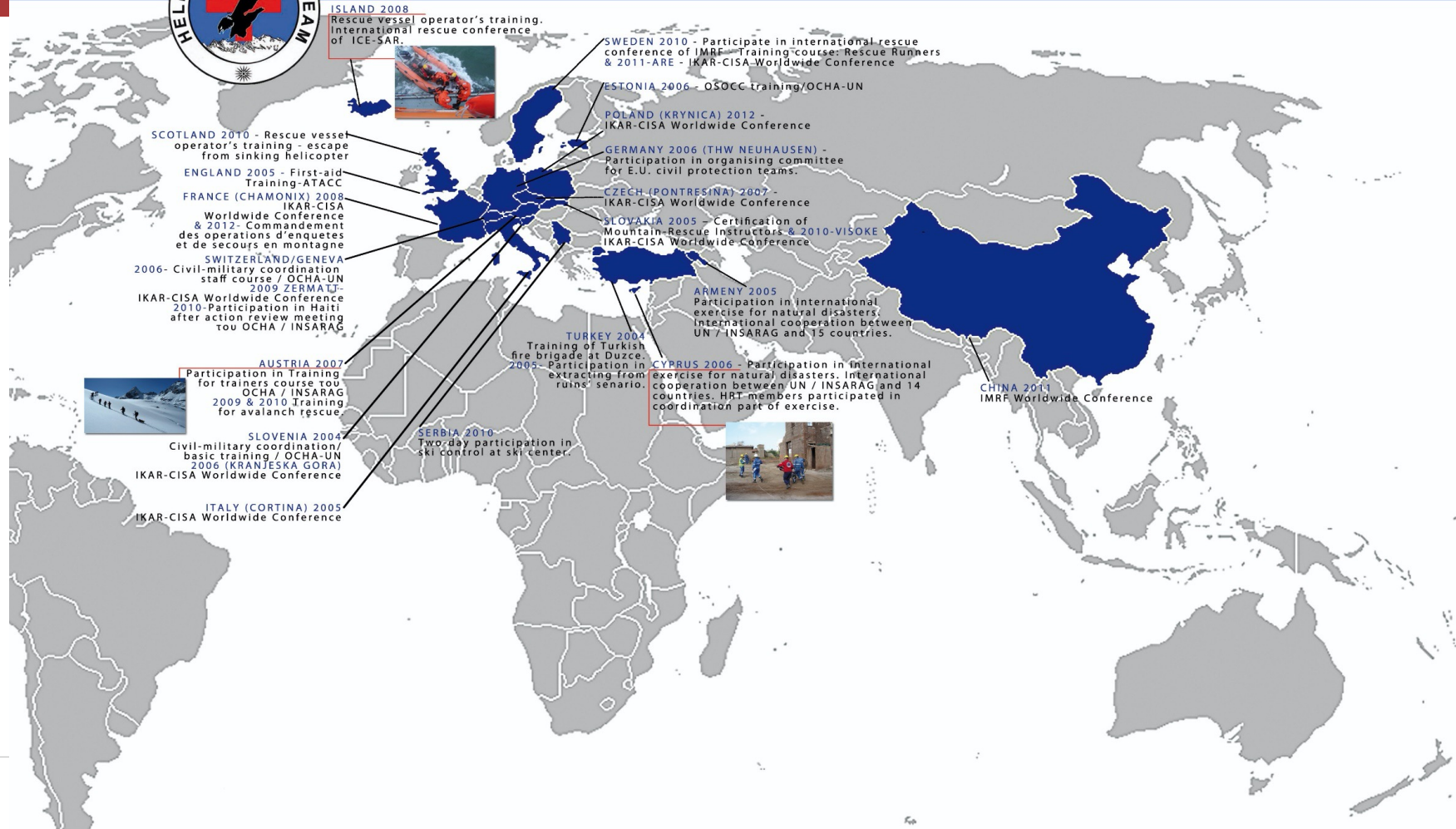
Member of I.R.O. (International Dog Rescue Organisation)

Humanitarian & Rescue missions in 20 countries





PARTICIPATION IN INTERNATIONAL TRAINING COURSES & COOPERATIONS



The Project

The “Search and Rescue” Project is Emerging technologies for the Early location of Entrapped victims under Collapsed Structures and Advanced Wearables for risk assessment and First Responders Safety in Search and Rescue operations



A Research and Innovation Action under SU-DRS02-2018-2019-2020 - Technologies for first responders

The need to carry out the Search & Rescue project

- Climate change, population growth and urbanisation will amplify the impacts of extreme weather with ensuing loss of life; between 1980 and 2016, damage cost EU Member States more than €410 billion, not including losses related to cultural heritage or ecosystems.
- Disaster Risk and Resilience (DRR) are also prominent in the 2030 Agenda for Sustainable Development, and DRR is closely linked to climate change adaptation in the Paris climate change agreement.*



*reference in the Description of Action

The SnR consortium

28 partners from:

Greece, Estonia, Romania,
France, Italy, Ireland,
Spain, Cyprus, Belgium,
Germany, Austria, and
Poland.

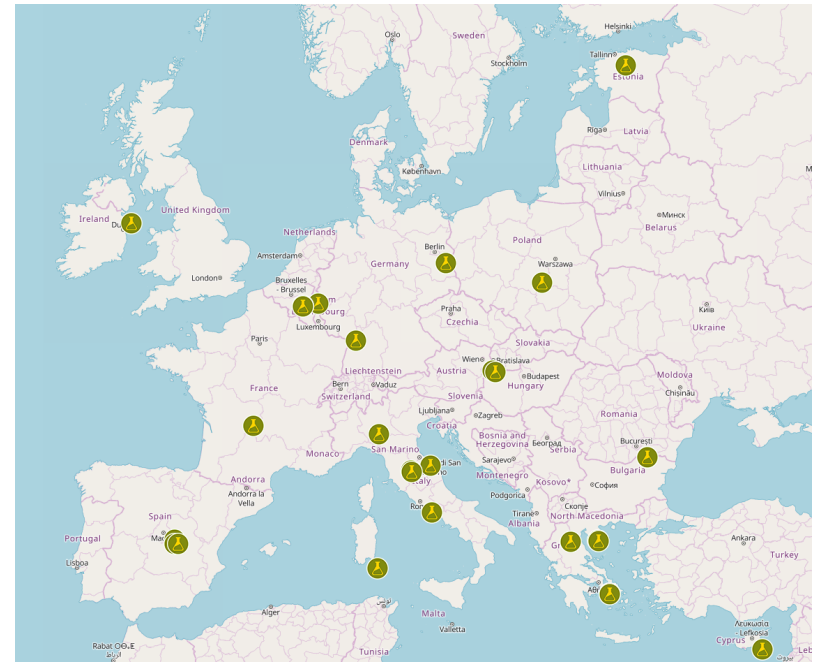
9 research institutes

6 SMEs

5 Large Enterprises

**9 end - users in the S&R
project from:**

Greece, Germany, Austria,
Italy, France, Romania,
Spain.



Search & Rescue Factsheet

The SnR project designs, implements and tests, through a series of large scale pilot scenarios, a highly interfunctional, modular, open architecture platform for first responders' capitalising on expertise and technological infrastructure from both CONCORDE and IMPRESS FP7 projects



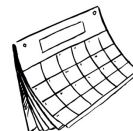
Topic:
Sub-topic 2: [2019] Innovation for rapid and accurate pathogens detection



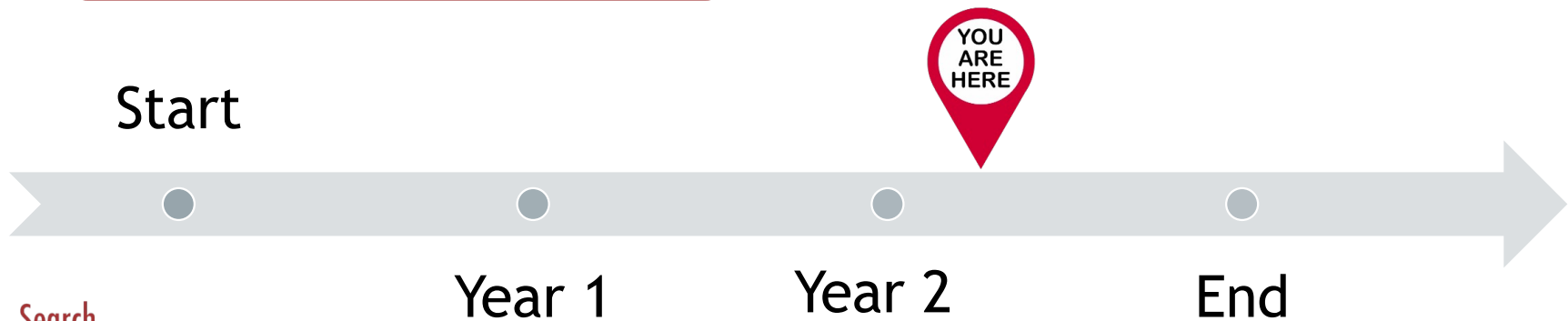
Total Budget:
€ 7,890,585.00



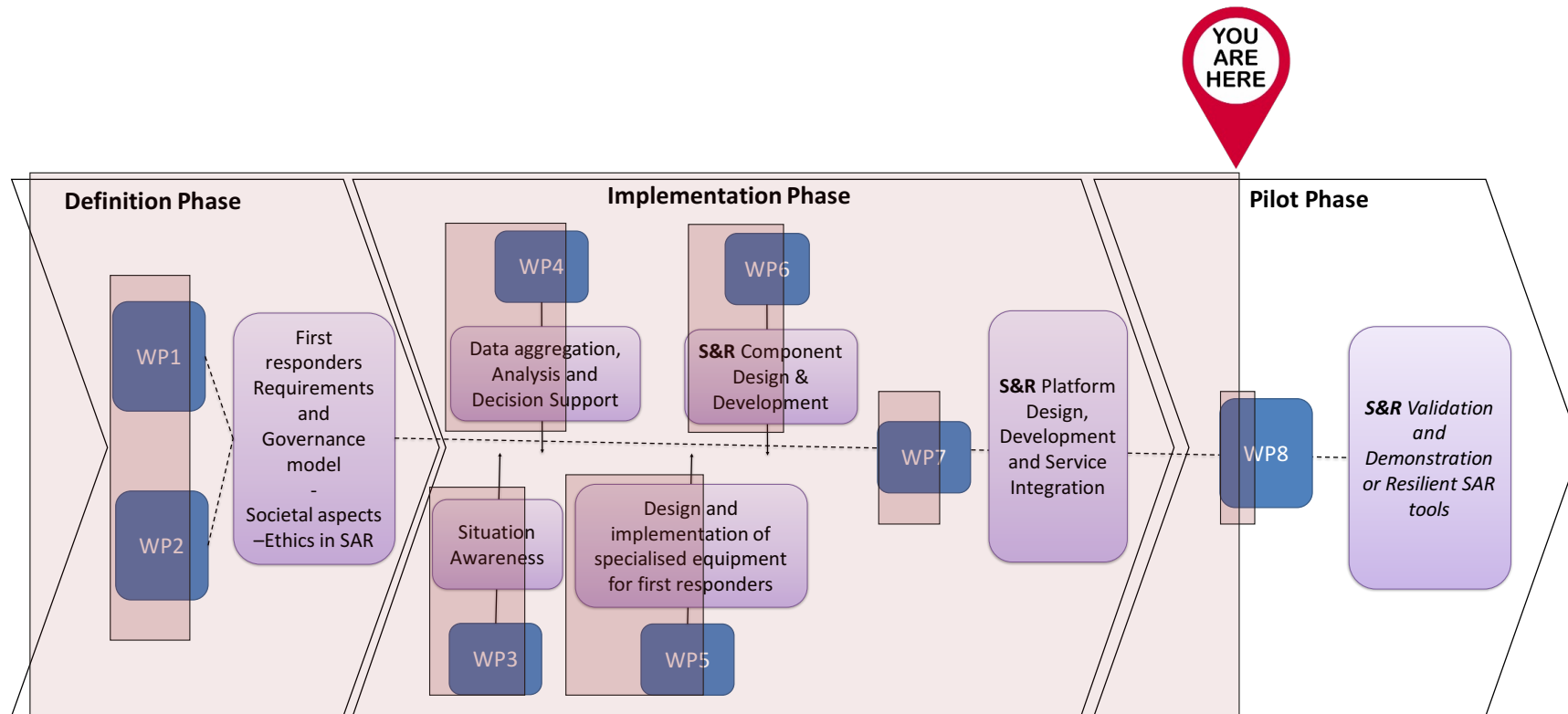
Contract no.:
882897



Duration: 36 months
(July 2020 – June 2023)



Workplan



Project Objectives

The main objective of the S&R is to establish an efficient synchronisation framework managing the data, developed services and information flow between the different authorities involved in emergency management operations.

S&R aspires to build a state-of-the-art framework that will integrate:

1. Advanced sensors, systems and procedures to obtain high level awareness capabilities
2. Secured data collection and information flow between the different authorities and agencies which are involved in the crisis/abnormal events management
3. Fusion of data from different sources and creation of a Common Situational Picture for supporting decisions of emergency and crisis management
4. A multi-tier architecture of information processing, the result of which will be accessible by all the actors involved

End-User's Requirements

The main objective of this task was to gather information on existing technologies used in SAR operations relevant to location of entrapped victims; identification of limitations and gaps, as well as of future needs.

Benchmarking of available commercial products was also included.



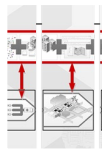
Methods for the collection of User Requirements



Search
& Rescue

- New SAR technologies must add value to SAR actions, being able to accept the requirements of users, for each type of technique, on the realization of the following Key Performance Indicators: ergonomic, power supply, size, weight, easy user interface characteristics, portability, sensitivity, robustness and maintenance.
- Based on this knowledge we discussed the most important technical features for the design of a general collective protective system.
- For the future, the project is expecting progress in the following areas:
 - 1) Standardisation of equipment;
 - 2) Fielding of technology improvements;
 - 3) Potential for full integration into existing operating systems.

SnR Individual Technologies



CONCORDE Emergency Management System



Smart Glasses & AR Helmets



Smartwatches



Emergency communication app



End user mobile application (victim side)



Volunteer mobile application



Emergency response health condition monitoring device and information system



Six Gas HAZMAT monitor



GPS Tracker



ECG, EMG (wearable)



Strain sensors (wearable)



Radiation sensors (wearable)



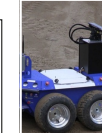
Professional Uniforms



First aid device for kids



Unmanned Aerial Vehicles



Rescue Robots



Rescue Membrane Inlet Mass Spectrometer

The Search & Rescue Pilots

28/04/2022



UC 1

Victims trapped under rubble

Italy

17/06/2022



UC 5

Victims trapped under rubble

France

06/09/2022



UC 6

Resilience Support for Critical Infrastructures through Standardized Training on CBRN

Romania

30/09/2022



UC 3

Heavy storms

Austria-Germany

01/11/2022



UC 4

Forest fire expanded and threat to industrial zone

Greece

11/11/2022



UC 2

Plane crash, mountain rescue, non-urban

Greece

13/12/2022



UC 7

Chemical substances spill

Spain



2

Use-case

UC2-Plane crash, mountain rescue, non-urban (Greece - Thessaloniki)





Mountain Chortiatis

November 11th : Preparation Activities

November 12th : Pilot Day

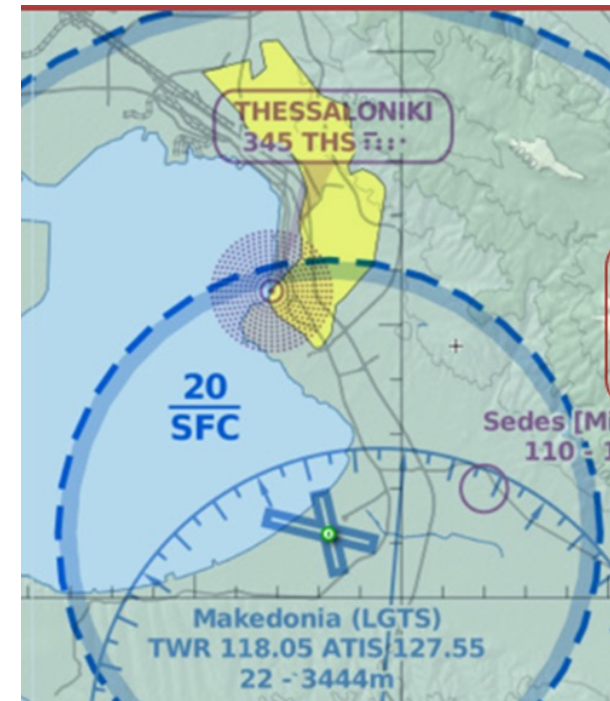


2

Use-case

UC2-Plane crash, mountain rescue, non-urban (Greece - Thessaloniki)

- The incident begins with a forced landing of a passenger propeller aircraft due to mechanical problems upon approaching the airport of Thessaloniki.
- The forced landing takes place in a mountainous area, close to the city of Thessaloniki, on Mt Chortiatis.
- Civil protection dispatch HRT to contribute to the SAR operations. HRT sets up a Command & Control Center close to the area where the plane is expected to have crashed.
- Three Search Teams are ordered to look for the aircraft debris and a Rescue Team is on hold to assist the operations with their specialized equipment.

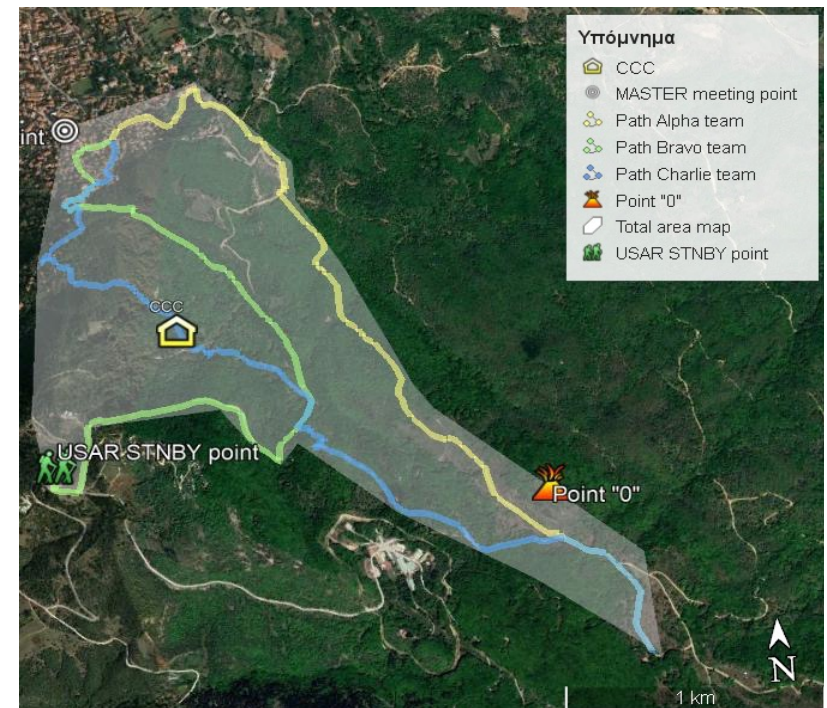


2

Use-case

UC2-Plane crash, mountain rescue, non-urban (Greece - Thessaloniki)

- The Search Team finds the debris and informs the CCC about the location and the needs of the resources.
- The CCC dispatch the Recovery and Rescue Team to offer the initial first aid treatment to the victims and recover one passenger trapped in the debris.
- The victims are transported to the nearest location where the EMS vehicles will transport them to the hospital.



2

Use-case

Technologies to be tested during Pilot

1. Smartwatch
2. Emergency Communication App
3. Situational Awareness
4. 3D Mixed Reality Command Centre
5. Volunteer application
6. Emergency Response Health Condition Monitoring Device
7. E-learning based platform

2

Use-case

Technologies to be tested during Pilot

Emergency Communication App - COncORDE

- COncORDE is a cloud-based platform, dedicated in Crisis management operations. This platform is assigned to enhance the SAR field operations with its EMS features, starting with the incident management service, the user management, patients management among others.
- It divides the emergency response in 5 spaces of work:
 1. The PSAP/112 center managing the initial alert phase
 2. The emergency medical vehicles on their way to the incident scene
 3. The Field/Incident scene
 4. The patient transport vehicles to First Receiver
 5. The First Receiver

2

Use-case

Technologies to be tested during Pilot

Smartwatch

Smartwatch with a dedicated emergency communication app for the first responders that provides messaging, heart rate monitoring, alerting functions and GPS tracking.

- Vibration on the wrist allows instant awareness of incoming messages while keeping hands free.
- Alerts (Call for Assistance / Panic Button) provides the monitoring center with visual and audible alarm showing location of the alert on the map.

Situational Awareness

The purpose of the SA model is to provide general situation awareness services to first responders and notify them about critical events happening in the field.

For this purpose, specific devices and technologies are utilized as providers of real-time data for the model.

According to the received data, situation awareness alerts and notifications are sent to the first responders' teams and involved devices.

2

Use-case

Technologies to be tested during Pilot

3D Mixed Reality Command Centre



A 3D Mixed Reality Command Centre (3D MR CC) was developed with the purpose of visualizing contextually relevant and online spatial information from different data sources to the decision makers.

The 3D MR CC allows the user to experience the virtual world without losing connection to the real world.

This type of experience allows the user to keep the awareness of the real world (what is happening around them) and at the same time use in their benefit the virtual spatially full representation of the S&R data.

2

Use-case

Technologies to be tested during Pilot

Volunteer Application

The App has been developed with the purpose of knowing the human resources availability in case of emergency. Any individual or organization can register to offer their help in any kind of disaster that may occur.

Through the Command Center the App is informing the Command Officer with the total amount of volunteers available and use properly according with their skills and equipment.

Emergency Response Health Condition Monitoring Device

S&R provides an easy to place device equipped with sensors that can measure critical vital signs to be used both in first responders and victims.

The device will be able to measure heart rate, respiration rate, blood oxygen levels, and body temperature and provide an approximate estimate of the blood pressure.

The device will have communication capabilities. The rescuer will be able to read the victims condition on a smartphone and transmit the position of the victim.

2

Technologies to be tested during Pilot

Use-case

E-learning based platform



The role of the e-learning platform is to enhance participants' understanding, knowledge and skills in terms of safety and security management at operational and strategic levels.

The users will be better prepared for field operations also act as security advisors within a response team providing them with the knowledge and skills to act appropriately according to the safety regulations.

Expected Impact

The impact of S&R towards the international crisis management community, which combined with the technological solutions that are developed by the consortium, is related to:

- Production of smaller, lighter rescue tools with increased effectiveness in confined spaces; early detection of toxic environments for the first responders and K-9s.
- Response time; it is the most critical parameter in the recovery of live victims.
- Planning time; it will be reduced by engaging reliable, adaptable technologies for crisis management, wide-area situation awareness and imaging (e.g. UAVs, thermal cameras etc.).
- Lowering the incidence rate of injuries for victims; providing with medical support based on on-site methods.
- Next generation garments; totally textile sensors embedded on first responders' SMART uniform as well as health and safety of the first responders.

Expected Impact

- The enduring impact of S&R on citizen safety and security.
- Re-introduce the citizen as a very important active element in the crisis environment.
- Inclusion of all people in the crisis management cycle; enhancement of the culture of preparedness and readiness capability upon disaster risks for the population.
- Provide a full scale exercises and demonstrations of simulated complex crisis management situations.
- Provide solutions that EU bodies and national organisations may use for testing diverse response frameworks allowing for better operational and societal adaptation to rapidly evolving threats.
- Education of end users in the developed S&R toolbox and holistic approach to European crisis management (impact to policies).

From all the SnR Consortium – Thank you for your attention!



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For more information:

projects@hrt.org.gr



TWITTER
[@SAR_H2020](https://twitter.com/SAR_H2020)



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