H2020 – Secure societies - Protecting freedom and security of Europe and its citizens

SU-DRS02-2018-2019-2020– Technologies for first responders – Research and Innovation Action (RIA)

Emerging technologies for the Early location of Entrapped victims under Collapsed Structures & Advanced Wearables for risk assessment and First Responders Safety in SAR operations

D1.7 Definition, evaluation and refinement of the SnR CM governance model, V2

Work package:	WP1 – First responders Requirements and Governance model
Authors:	PUI
Status:	Final
Due Date:	30/06/2022
Version:	1.00
Submission Date:	30/06/2022
Dissemination Level:	PU

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Search and Rescue Project Profile

Grant Agreement No.: 882897

Acronym:	Search and Rescue
Title:	Emerging technologies for the Early location of Entrapped victims under Collapsed Structures & Advanced Wearables for risk assessment and First Responders Safety in SAR operations
URL:	https://search-and-rescue.eu/
Start Date:	01/07/2020
Duration:	36 months

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Document History

Version	Date	Author (Partner)	Remarks/Changes
0.10	31/01/2022	Iliana Korma, Philippe Besson (PUI)	ToC
0.11	24/02/2022	Alexandru Dumitrascu (PROECO)	Minor correction ToC
0.11	28/02/2022	Pia Ferner (Johanniter)	Agree with ToC
0.11	04/03/2022	Marco Guerri (Thales)	Agree with ToC
0.11	05/04/2022	Marta Maini (UNIFI)	Agree with ToC
0.12	10/05/2022	Lorenzo Nerantzis (HRT)	Minor Corrections to HRT part
0.12	11/05/2022	Svenja Bertram (Johanniter)	Minor Corrections in EU Modex
0.13	19/05/2022	Marta Burgos (ESDP)	Content for ESDP
0.14	19/05/2022	Birgit Schilcher (Johanniter)	Minor Corrections
0.15	19/05/2022	Alexandru Dumitrascu Radu Andriciuc (PROECO)	Minor Corrections
0.16	22/05/2022	Cristina Horrillo (SUMMA 112)	Minor Corrections to SUMMA logo
0.20	23/05/2022	Iliana Korma Philippe Besson (PUI)	Ready for review
0.21	25/05/2022	Alexandru Dumitrascu Radu Andriciuc(PROECO)	Technical review
0.21	01/06/2022	Katarzyna Wodniak Waleed Serhan (SAN)	Technical Review
0.22	06/06/2022	Iliana Korma Philippe Besson (PUI)	Ready for Quality Control
0.30	09/06/2022	Christodoulos Santorinaios (NTUA)	Quality Control
1.00	30/06/2022	Christos Ntanos (NTUA)	Final version to be submitted

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Executive Summary

The specific deliverable D1.7 is the updated version of D1.3 (M12) and its main purpose is to define and include the SnR Governance model in the 7 use cases that will take place in SnR project.

In this second version of the deliverable related to the Definition, evaluation and refinement of the SnR CM governance model, we will try to include the specification of the SnR Governance model to the SnR use cases.

The vision of EU will be as well described in details together with the common framework assessing the users' needs and integrating the responses.

Furthermore, we will present the Interoperability framework between emergency organizations with common, accepted and validated updated Standard Operating Procedures, that will promote more efficient, multinational and multi-organisational disaster response actions, and will be fully compatible with (i) the actual (updated) existing SOP within the organisations – end users included in the project, EU MS and International Organisations (ii) technological framework and (iii) interoperability concepts.

Nine end – users from various EU countries have come together to describe once again their Standard Operating Procedures that will be used in their countries during their pilot phases and the results are well described in the following sections.

The respective questionnaire has been answered once again by the partners, helping us compare the procedures of each end-user.

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Table 0-2: List of abbreviations

Abbreviation	Explanation
AR	Augmented reality
BoO	Base of Operation
COTS	Commercial off-the-shelf
CM	Crises management
CRYSIS	Critical Response in Security and Safety emergency
EUMODEX	UE Module Exercises
ECPP	European Civil Protection Pool
EUCPM	EU Civil Protection Mechanism
GAP	Hiatus
ICMS	Incident & Crisis Management System
LEMA	Local emergency management authority
MEDEVAC	Medical evacuation
MIMS	Membrane Inlet Mass Spectrometer
OSSOC	On-site Operations Coordination Centre
INSARAG	International Search and Rescue Advisory Group
RDC	Disaster Resource Centre
SOP	Standard Operating Procedures
S&R	Search and Rescue
UC	Use Case
UNDAC	UN Disaster Assessment and Coordination
USAR	Urban Search and Rescue
VOC	Volatile organic compounds
VR	Virtual Reality

1 Introduction

1.1 Purpose & Scope

The SnR crisis governance model will be linked to existing databases to provide functionality for capturing Risk Assessment (e.g., comparable functions for disaster type, location, radius, impact and threats).

The component will be based on a library of terms, business rules and methods to support these types of analysis identified and implemented in WP3 (T3.1 and T3.2).

The content of the library reflects unified community definitions of risk and other parameters utilized to characterize a disaster or crisis event.

The SnR CM will allow for increased situational awareness and early warning of major disaster incidents with ad-hoc, innovative and dynamic solutions.

The common operating framework will also support wider training and education activities for emergency responders.

In fact, the majority of emergency responders are not overtly involved in EU response through the Mechanism but may become either direct beneficiaries of EU aid or have to face event consequences that have already been experienced, a 'lessons learnt' programme delivered online.

The SnR CM concept will allow for a wider definition which includes the capability to (a) collect static and dynamic data on the basis of standards and protocols and (b) all relevant static and dynamic data suppliers that are relevant to various disaster types.

Nine end users of SnR project have been invited to complete a questionnaire developed for the purposes to identify and register the operational procedures of these end users from 6 EU countries (Greece, Romania, Spain, France, Italy, Austria) that are involved in this project.

It has to be mentioned that 70 questions were prepared related to these procedures that will be analyzed in the specific section below.

1.2 Structure of the Document

In this deliverable we intend to give an updated version of the deliverable D1.3 definition, evaluation and refinement of the SnR CM governance model as defined in Task 1.4 of SnR project. This deliverable is part of WP1 called First responders Requirements and Governance model which covers the whole period of the project's duration.

We will give a short description of the users' needs in research and technical issues, use case scenarios and user perspectives, additionally with a short gap analysis.

Great emphasis will be given in the specifications of the SnR Governance model regarding its operational model and its emergency management system integrated solutions.

All the above-mentioned will be developed according to the updated existing Standard Operating Procedures (SOP) from EU MS and International organisations and the accountabilities and responsibilities of all the organizations involved the crisis management domain.

One more important task that will be analyzed in this document refers to the Interoperability framework between the emergency organisations.

In order to clearly understand the clear concept of this framework, we are going to analyze the updated common, accepted and validated Standard Operating Procedures, that will be used in the use cases promoting more efficient multi-national and multiorganizational disaster response actions, fully compatible with (i) the actual existing SOP within specific organizations, EU MS and International Organizations (ii) technological framework and (iii) interoperability concepts.

The EU common vision will close this document as in the first version.

The end users – partners of SnR project have once again collaborated closely in the development of this deliverable in order to contribute to the SnR Governance Model and the Interoperability framework between emergency organizations.

2 First Responders' Requirements & Gap Analysis

The conclusions and proposals as described in the D1.6 "Report on the Functional specifications of SnR, V2" refer to the current state of the process of defining end-user requirements for chemical sensors (Six Gas HAZMAT monitor with VOC Detection and RESCUE MIMS (wear First Responders uniform, in hand, as backpack or on the platform of a RESCUE ROBOT) as foreseen by the SnR project in WP1 (First responders Requirements and Governance model) at T1.2 (End User Requirements for SAR equipment and tools) and the results obtained so far in the scientific research activity of the prototypes referred to.

This activity, completed in M12, included the study of equipment and technologies already on the market, a multitude of technical meetings and coordination between the partners of the SnR project, the organisation of a workshop ("End-user requirements and Beyond "of April 14, 2021), and a permanent online exchange of ideas and possible technical and operational solutions necessary to achieve the purpose and objectives mentioned in deliverable D1.6, as a continuation of the achievements mentioned in deliverable D1.2 "Report on the Functional specifications of SnR" (M4).

The fundamental conclusion of the gap analysis, complemented by a series of partial conclusions specific to each subchapter, is that the minimum technical and operational characteristics proposed by end users in D1.6, but also the continuation of those proposed in D1.2, constitute a solid working basis. and complete for scientific research and, in the future, testing and validation within 7 UCs (User Cases) of the SnR project of the prototypes of equipment proposed to be realized.

A concrete example in favor of this fundamental conclusion is already the future optimization proposals, within the SnR project, mentioned in subchapter 8.2" Proposals for optimization of a future version of RESCUE-MIMS (TRL 7-9)" of the deliverable 5.1" Design & development of the RESCUE MIMS".

In this context, the end-users' proposal is that, together with the partners in the SnR project, they should continue their efforts to achieve the equipment and technologies referred to in T1.2 in deliverables D1.2 and D1.6, in particular due to the fact that there are chances reasonable to obtain a higher added value than initially forecast.

Another conclusion concerns the issue of gap analysis for resilience of the community, the results of which help end users to ensure a managerial act in crisis situations that takes into account the development gaps between local communities of their critical infrastructure, so as to ensure optimal use of equipment and technologies used in rescuing people trapped under the rubble.

This conclusion, discussed and summarized in detail in Chapter 3 "GAP analysis for community resilience" of deliverable D1.6, concludes with the recommendation that SnR project partners use the prioritization resulting from the analysis (see subchapter 3.5 "Conclusions and recommendations", figure 3-14) and GAP processing feedback to identify the most relevant issues for their scope.

It is recommended that the concerned partners use the prioritization that resulted from the GAP analysis and feedback processing in order to identify the most pertinent issues for their scope.

3 Specifications of SnR Governance Model

3.1 SnR Operational Model

The specifications of SnR Operational Model are the core concepts that have started to be developed since the first day of the project's start being one of the main subjects of task 1.4 of SNR project. The definition and deep analysis of CRISYS (Critical Response in Security and Safety emergencies FP7-SEC-2010.4.1-1) operational model as its architectural structure in D1.3 allowed us to easily incorporate next generation R&D and COTS solutions.

The Model supported also a unified vision of the EU role and provided a common framework to assess needs and integrate responses. The framework enabled a pro-active approach using a wider range of decisional support features and monitoring systems and gave to the crisis responders an effective and unified vision of (a) the dynamic changes going on during event's lifetime and (b) the capabilities and resources currently deployed in the field.

The partners managed to define the differences between CRISYS and SnR projects and the **innovation SnR brings** in the Crisis Management sector:

1) **Citizens and local communities will be introduced at the center of the crisis management process.**

Training and education are utmost importance in crisis management involving both citizens and first responders. The citizens must be aware of the risks of the disasters, act and assist when necessary. The first responders have to be trained on a regular base in order to be able to respond immediately in every type of disaster.

A two-way process must be ensured whereby citizens also have the opportunity to contribute and integrate their local knowledge into the disaster management cycle. The core idea behind each training module is the simulation of the situation that will present itself and, depending on each scenario that will take place during the project, how it evolves and what decisions need to be made.

The aim of SnR project is the well-trained citizens which is a fundamental requirement for a high-quality disaster response. The closer involvement of citizens in information and preparedness activities could reduce significantly the defect level in cases of emergency and at the same time improve the quality of disaster response measures.

For that reason, volunteering groups will be involved in the pilots, citizens as well as young people. Before the pilots, training courses, joint simulation exercises and an exchange programme will take place, where experts can learn first-hand about similar responsibilities under different national systems. It has to be mentioned that VR first responder training modules will be integrated in SnR. Additionally, special Glasses and Helmets using Advanced Augmented Reality technologies will be developed for training and operational purposes.

There are many advantages for the citizens to integrate into the crisis management:

Develop a risk-awareness culture in order to raise public awareness and invest more for their own safety.

Promote cooperation between the citizens and first responders in order to be more efficient and reduce the delays in emergency response.

Train the citizens in rescue management in order to be involved in their own safety, because during a major disaster, the rescue teams will not be able to face all the requests of the citizens who will have to carry out an initial rescue phase by themselves for their families, their neighbors and other citizens.

Ensure a two-way learning process whereby citizens and local communities also contribute and integrate their local knowledge into the disaster management cycle.

Understand the value of crisis management and then contributing to avoid disaster emergency caused by human errors.

The new AR/VR technologies will allow for the development of interactive and distance training modules; these scenarios are also fun, which allows for an easier diffusion between the citizens.

2) A holistic framework will be promoted, where prevention and preparedness are linked to response, thus moving into a proactive system.

Disaster preparedness consists of a set of measures undertaken by governments, organisations, communities or individuals to better respond and cope with the immediate aftermath of a disaster, whether it be human-made or caused by natural hazards. The objective is to reduce loss of life and livelihoods.

Simple initiatives can go a long way, for instance in training for search and rescue, establishing early warning systems, developing contingency plans, or stockpiling equipment and supplies. In the case of early warning systems, both warning systems present among local communities, for example through repeated experiences in disaster-prone areas, and professional warning systems can be coordinated to ensure higher levels of effectiveness in disaster preparedness. Disaster preparedness plays an important role in building the resilience of communities.

The training activities that will take place within SNR project will raise people' preparedness and their response capacities. Emergency Management is about managing risks to communities and the environment. It is the core business of Emergency Services but every individual and organisation have a part to play.

Emergency Management, as formulated within the United Nations' Yokohama Strategy (1994), includes the following four phases:

- Prevention/Mitigation
- Preparedness
- Response and
- Recovery.

Leaders in organisations need to know their roles and responsibilities in each phase of the emergency management cycle and lead their organisation through them.

Prevention/Mitigation: any action or sustained effort aimed at reducing risk, undertaken in advance. Prevention or mitigation can be structural or non-structural. Examples of structural mitigation include resistant construction, structural modification and creation of barriers among others. Non-structural mitigation includes regulatory measures, design of education programme and non-structural physical modification. Examples can range from back-burning or constructing sea walls to protect from tidal waves, to having alternative sources of electricity or alternative communication systems in place. Prevention activities should be happening all the time.

Preparedness: making arrangements, creating and testing plans, conducting training, educating and sharing information to prepare communities should an emergency eventuate. These are also ACTIONS and they are happening all the time.

Response: the assistance and intervention during or immediately after an emergency. Focus is on saving lives and protecting community assets (buildings, roads, animals, crops, infrastructure). Usually measured in hours, days or weeks.

Recovery: the coordinated process of supporting emergency-affected communities in reconstruction of physical infrastructure and restoration of emotional, social, economic and physical wellbeing. Usually measured in months and/or years.

3) SnR governance model

The investigation regarding the Standard operating procedures of the end-users made us understand the differences and the commons methods that are used within the various teams. The SnR governance model will give (maybe enable or allow) the emergency organisations to work in common structures, use a common equipment and cover the gap which exists especially in the methodology used by the EU end-users. The SnR platform that will be developed during this project, will provide easy integration connectors with other command and control software solutions. The Model is built on the existing SOP investigated and, on the accountabilities, and responsibilities of all the organisations involved in the crisis management domain. Its architectural structure adopted will make it operate more effectively in the future disaster management systems.

Today, the rescue teams do not have all the same standards. Therefore, it is important and necessary to suggest a common doctrine in order to make the work and the interoperability easier for the different teams in the following sectors:

- Engagement procedure (preparedness, mobilization, deployment, e.g.)
- SOP
- Logistics and materials
- Operations management platform
- SnR project will allow for the development and suggestion of operational standards which the rescue teams will manage to adapt. This common basis will allow for a better collaboration and exchange of information in the intervention field.

Additionally, SnR provides:

- New technology tools shared between the teams: by adapting identical tools for the teams, the interoperability has been reinforced, the principle of subsidiarity has been strengthened, allowing the team to share its equipment and communicate it to other stakeholders. The efficiency in finding victims and the safety of rescuers will be more important.
- New operational platform to coordinate the operations: The communication and the share of information are prioritized during the rescue operations. By adopting a common platform, the exchange of information between the teams and on the field will permit to anticipate the evolution of complex situations. The radio communications will be shared in order to assure a direct communication between the teams on site with the structure of the management (EMS).

A deployment procedure will be equally adopted by the teams: the SOP will be able to guide the teams in the use of INSARAG guidelines or European modules on civil protection. These two systems are relatively close and compatible with the deployment of the rescue team.

4) Advanced mixed reality (AR & VR), simulation engines, curricula will be used

As it has already been indicated above, training and education are very important in crisis management. The lack of training and education leads to the loss of human lives.

Education in emergencies provides immediate physical and psychosocial protection, as well as life-saving knowledge and skills (for example, with respect to disease prevention, self-protection and awareness of rights) (Education in emergencies - UNHCR Emergency Handbook). If children and youth receive safe education of good quality during and after an emergency, they will be exposed less frequently to activities that put them at risk.

They will also acquire knowledge and mental resources that increase their resilience and help them to protect themselves. Inclusion in national education systems enhances these protection benefits. VR first responder training modules will be integrated in SnR.

New innovative methods of training will be applied into the project in order to attract the first responders and citizens, offering them an easy and security training curriculum based upon agreed training material and practical exercises built on the five complimentary methodical approaches:

- Modern, didactically refined lectures and seminars, emphasizing interactive learning and including self-tutoring possibilities
- Documented in open-structured, user friendly, based on state-of-the-art software tools in data and knowledge management
- Computer-based interactive models and virtual reality with biofeedback, simulating threat scenarios and the resulting consequences without and with appropriate countermeasures
- Realistic field exercises
- Evaluation of 3D computer-models during the practical field exercises.

The model will be based on the principles of 're-use, before buy, before make' and in this way, seeks a maximal reuse of existing legacy systems and solutions and beyond state-of-science, S&R and COTS tools and technologies.

For the training of the citizens, it is necessary to provide learning tools which will be compatible with people with disabilities (deaf, blind, paralyzed...).

These «fun» learning tools would give the chance to the children to receive more easily the message of training.

5) Access to end-users, certification, harmonization and standardization

The SnR platform contains a wealth of existing mature / near mature technological solutions, which have been developed by partners COTS products or fully demonstrated in FP7 and H2020 projects.

The SnR solutions which will be employed throughout the field demonstrations' will be also tested by the legacy systems of the responders' organisations which will participate in the demonstrations. All technologies, will be fully operational during SnR duration.

- Smart Glasses & AR Helmets
- Emergency communication app

- Six Gas HAZMAT monitor
- Advanced Augmented Reality (AR) technologies
- Wearable GPS Tracker (wearable)
- Wearable ECG, EMG (wearable)
- Wearable Strain sensors (wearable)
- Emergency response health condition monitoring device
- Radiation sensors (wearable)
- Rescue drones
- AI services on top of rescue drones
- Rescue Robots & Autonomous vehicles with Obstacle Detection System
- Chemical sensors
- CONCORDE EMS & Associated module / services
- Decision Support System (DSS)
- Training through AR/VR
- Smart textile professional uniform
- Rescue system for children
- 3D Mixed Reality Command Centre

These different tools of new technology will make easier the work of the rescue teams who have as a priority to save lives. However, we must not forget that this equipment includes field tools and this includes many advantages:

- They are robust, resistant, with a good autonomy, usable in unfavorable weather conditions (rain, cold, heat, etc...).
- Their cost is adapted to the teams in order to be easy to buy it in big quantity.

6) Test-bed and open the final two demonstrations to technology provides outside the consortium

Seven use cases will take place during the SnR project including end-users, first responders, volunteers, training centers and relevant stakeholders. Seven relevant scenarios have already been developed which will give the opportunity to the relevant parties to test the system under real conditions and provide their feedback for further improvements. The preparation of the use cases has started from month 6 of the project and will last for 6 months since the final Use Case will take place in December 2022. During this time, the use case environments have been identified for each responsible use case partner.

The UC requirements have already been specified by the end-users with the aid of the technical partners who will be involved in the relevant use cases as well. The specific UC will run from month 13 of the project start until month 33. During this time, SnR platform will be developed and the actual execution of the pilots will take place under realistic conditions and data through a series of trials with end-users who will evaluate the demonstrators and apps and assess the quality and usability of the SnR Platform in collaboration with technical partners who will closely monitor throughout the pilot the operation.

3.2 Standard Operating Procedures within SnR Use Cases

In this chapter, we are going to introduce the standard operating procedures in EU and International Organisations and the standard operating procedures that will be used within SnR seven use cases.

3.2.1 European Standard Operating Procedures

The **European Civil Protection Pool (ECPP)**[1] forms part of the EUCPM for enhanced European disaster response, with a focus on increased coordination and efficiency. When the EUCPM is activated, member states and participating states offer their assistance to the requesting country. This assistance may be provided in the form of qualified personnel (rescue or medical teams, experts) or equipment, which all represent resources made available through the ECPP. The common pool enables better planned and organised, more predictable, coherent EU operations. Capacities committed to the pool need to meet common high standards, validated through an EC certification and registration process.

Such certification includes participation of registered capacities in disaster simulation exercises to train emergency response jointly with peers and other teams, further preparing the European response capacities to reliably operate during international deployments, in close coordination with authorities of the host nation and other deployed capacities. In case the EUCPM and its related ECPP get activated, the Emergency Response Coordination Centre (ERCC) will coordinate the deployment of relevant capacities. The resources of the ECPP should generally be self-sufficient for several days as well as interoperable in terms of procedures and technical infrastructure.[2] It should be noted, however, that criteria on interoperability are not clearly specified. In the guidelines on the 'Certification and Registration of Response Capacities in the ECPP' interoperability is broadly defined as 'i.e. in how far the response capacity is interoperable with other deployed capacities' (EC, 2019, p.6). Interoperability is referenced as a key criterion in the certification process, further elaborating that

'The capacity should be capable to work efficiently with other mobilised response capacities and contribute smoothly to common operations. This implies a common understanding of basic principles in disaster response operations, flows of communication and communication equipment, technical complementarity of equipment, etc.' (EC, 2019, p.14)

As briefly mentioned, participation in the ECPP requires prior certification by the European Commission, ensuring compliance with the quality requirements for each of the modules. One of the points in getting certified is for a module to participate in an international field exercise. Among other things, this is supposed to enhance the capability of interoperability between modules from all over Europe, as their only chance to train and work with other modules from all over Europe is during these exercises.

One example for exercises of this scale is **EU MODEX**, a short for European Union Module Exercises, conducted for the European Commission. As the name implies, these are table top exercises as well as full-scale field exercises for all the module types registered in the ECPP. Their goal is to "enhance the coordination of civil protection assistance interventions by ensuring improved compatibility and interoperability between the intervention teams and other intervention support as well as by developing

[1] https://ec.europa.eu/echo/what/civil-protection/european-civil-protection-pool_en
[2] https://erccportal.jrc.ec.europa.eu/CP-Pool#/

the competence of the experts involved" [3]. During an exercise, modules from all over Europe come together, as they would in a real disaster, and not only have to work as a team themselves, but also with the other modules in order to work as efficient as possible and therefore being able to safe as many lives as possible. Having this in mind, they are not only useful for working on interoperability, but also they are a good example for a way to strengthen the EUCPM and therefore whole Europe.

3.2.2 International Standard Operating Procedures – International USAR Response Cycle

An international USAR response has the following phases (see Figure 3-1):

Figure 3-1: The International USAR Response Cycle

3.2.2.1 Preparedness

The preparedness phase is the period between disaster responses. In this phase USAR Teams undertake preparatory measures to ensure that they are at the highest level of readiness for deployment as possible. Teams will conduct training and exercises, review lessons-learnt from previous experiences, update Standard Operating Procedures (SOPs) as required, and plan future responses.

a) Management Team:

- Responsible for the staffing, training and deployment of the USAR Team over the entire USAR response cycle
- Responsible for following and training to INSARAG minimum standards
- Ensure proper identification of USAR Team functions.
- Ensure all personnel are trained in safety and security
- Ensure that safety and security function is assigned to (a) team member(s)
- Responsible for maintaining coordination with national (team's governing body) and international stakeholders (i.e., INSARAG) and being active on the VOSOCC

[3] https://etendering.ted.europa.eu/cft/cft-documents.html?cftId=4618 – Tender specifications

- Ensure the readiness of the USAR Team all the times, and that a mobilization organisation maintains an up-to-date immediate call-up system
- Responsible for the registration of the USAR Team in the INSARAG USAR Directory

b) USAR Team Search

- Responsible for having in place physical search, canine and/or technical search structures and methods, and their regular training and constant readiness
- Responsible for canine handlers having the possibility to train with the other members of the USAR Team (e.g., technical search, rescue and medical)
- Responsible for ensuring that all appropriate documentation for border-crossing for canine (e.g., microchip, vaccination) is ready

c) USAR Team Rescue

- Responsible for rescue structures and methods being in place, regularly trained and in constant readiness
- Responsible for ensuring that rescue teams have the possibility to train with the other members of the USAR Team (e.g., canine and technical search and medical)
- Responsible for ensuring industry best practices are maintained and implementing new rescue methods, standards and technical equipment accordingly

d) USAR Team Medical

- Maintain a constant state of mission readiness and comply with all other general requirements as determined by USAR Team policy
- Develop and maintain an appropriate immunizations/vaccination/inoculation for working in the affected country recommended by the USAR Team's national health authorities
- Maintain the medical cache stored in clearly labelled containers with attached inventory list for deployment and border-crossing
- Prepare processes to efficiently medically screen all personnel at the time of international deployment

e) USAR Team Logistics

- Maintain logistical readiness for training and international deployment and equipment/staff to set up and maintain a BoO (technical equipment and supplies for entire deployment)
- Have appropriate documentation for border-crossing for the USAR Team staff and equipment (i.e., passport, visa, certificate of vaccination, labelling of equipment, cargo manifest, shippers' declaration of dangerous goods)
- Maintain up-to-date transportation arrangements for international deployment
- Maintain communications equipment always ready for deployment (interoperable)
- Maintain a system to be self-sufficient (food, water, fuel) for the duration of deployment.

3.2.2.2 Mobilisation

a) USAR Team Management

- Ensure departure within ten hours after the request for assistance
- The USAR Team Leader has the overall responsibility of personnel, equipment, and operations from the team's activation until its return home
- Collect and analyze information about the disaster and the actual situation in the affected country (i.e., the VOSOCC and/or ICMS)
- Await the request for international assistance by the affected country or offer assistance via diplomatic channels
- Through the designated channels in the home country, collect the relevant disaster and affected country information to formulate (additional) recommendations for the deployment of the USAR Team
- Through the designated channels in the home country collect relevant disaster and affected country information from the affected country authorities to be able to plan USAR Team deployment according to the needs and requirements of the affected country
- Obtain log on information for the ICMS from the VOSOCC
- Provide and update planning and deployment details and team capacity and exchange information with the international community through VOSOCC and ICMS (coordination with the LEMA and other teams)
- For planning, have Ministry of Foreign Affairs liaise from the beginning on with the affected country if and what support is required
- Prepare meetings with RDC/UCC and the LEMA (information about the teams' capabilities and the needed support by local authorities)
- Brief the USAR Team on the disaster, the engagement and the affected country's cultural and political sensitivities and reinforce the ethics considerations
- Prepare to establish and to run an initial RDC and UCC and to support UNDAC, if needed

b) USAR Team Search

- Ensure that the readiness of physical search, technical and/or canines (health, fitness, hygiene, diet, etc.) for travel, including all specialized gear and equipment (including microchips), are ready for USAR operation (respect international standards and procedures)

c) USAR Team Rescue

- Ensure readiness of equipment cache and necessary documentations for restricted items

d) USAR Team Medical

- Conduct remote information gathering to include the receiving country specific hygienic, health and medical risks.
- Through the designated channels in the home country, verify that medical personnel with licensure have appropriate permission to practice their discipline within the scope of USAR operations in the affected country
- Assess the local medical system to determine if it can effectively cope with the impact of the situation or if the system is extended beyond its capabilities
- Conduct the medical screening process for USAR Team personnel and search dogs as well as a review of the required international documentation
- Coordinate with safety and hazardous materials (hazmat) functions to clarify overlapping concerns
- Determine medical plan for in-transit phase and be prepared to adjust on route

e) USAR Team Logistics

- Ensure availability of transportation (air or ground; to/within country)
- Provide team members' lists and equipment manifest and shippers' declaration for dangerous goods and prepare for international border control processes
- Ensure self-sufficiency for the duration of deployment (pre-packed dedicated equipment cache so as not to deplete domestic capacity)
- Check compatibility of VHF and UHF radio equipment with local systems
- Identify local support needs required by the team and forward these through the management to the UCC

3.2.2.3 Operation

a) USAR Team Management

- The LEMA of the affected country is the overall responsible authority for the disaster response: USAR Teams must adhere with the policies and procedures of the affected country regarding incident operations
- Team management is responsible for managing all aspects of team operations and ensuring all functional areas within the team coordinate operations. They are also responsible to assess the progress of operations. Team management must ensure ongoing coordination and communication between other response entities.
- Coordinate with the LEMA, RDC and UCC during the entire operation: all planning must be done in close cooperation and information exchange with UCC and the LEMA
- Ensure that all ICMS and paper-based documents are processed and shared according to INSARAG USAR coordination

- Monitor and approve ICMS and paper-based information from field staff to external parties for quality control
- Ensure that the USAR Team efforts are integrated into local operations
- If first USAR Team in place, and RDC and UCC are not in place, establish and operate provisional RDC and UCC
- Ensure that operations can start with priority (assignments) and set up the BoO simultaneously
- Organize reconnaissance missions to identify worksites, based on INSARAG triage method
- Establish a work cycle to ensure a sustainable work at worksite(s) and rest periods (maintain a reserve)
- Establish an information cycle to brief home base, USAR Team members, UCC and the LEMA.
- Keep a detailed operations log
- Assess and respect permanently the safety and security situation and procedures
- Establish and enforce rules and regulations for safety and security on worksite(s) and BoO
- Managing and coordinating the media together with the LEMA/UCC. A guide to managing relationships with the media can be found in the Guidance Notes
- Conduct contingency planning from beginning of the operation (safety/security, medical evacuation (medevac), demobilization etc.)

b) USAR Team Search

- Perform physical, technical and/or canine search in collapsed or failed structures of heavy wood/reinforced masonry with structural steel in close coordination with the USAR Team Rescue
- Continually conduct a risk/hazard analysis of the assigned work area for USAR Team members and canine and take appropriate mitigation action
- Assess and respect permanently the safety and security situation and procedures

c) USAR Team Rescue

- Perform rescue (breaching, extrication and transport) in collapsed or failed structures of concrete, heavy wood/reinforced masonry with structural steel (rigging and lifting) in close operation with USAR Team Search and USAR Team Medical
- Assess the collapsed structure and local failures to identify void size, location and configuration for potential live victims, and for determining access possibilities
- Interview the public for information on victims, building lay-out and use
- Decide access points, escape routes, safe havens and assembly points
- Set up of a staff accounting system, building monitoring system and safety and security system.

- Perform cutting, breaching, lifting, lowering, moving, shoring, rigging and other rescue operations
- Continually conduct a risk/hazard analysis of the assigned work area for USAR Team members and take appropriate mitigation action
- Assess and respect permanently the safety and security situation and procedures
- Establish worksite perimeter control procedures

d) USAR Team Medical

- Coordinate with the LEMA/UCC/OSOCC/Health Cluster:
  - ✓ Availability of local and international medical resources
  - ✓ Local medical procedures such as; casualty handover, casualty transport, fatality management, and medical waste disposal
  - ✓ Methods of regular communications with local health authorities
- Provide medical input into USAR Team decision making/planning process
- Coordinate with Safety, hazmat, and Logistics functions to promote safe health and hygiene practices (BoO and work sites)
- Provide continuous health monitoring and medical care to USAR Team members (to include canines)
- Evaluation, care, and stabilization of individuals entrapped in rubble (in some instances providing advanced medical care for many hours as other USAR disciplines work to free the patient)
- Initial evaluation, care, transport or referral of individuals with medical conditions encountered while the USAR Team is on reconnaissance missions
- Assistance with medical care during transportation of patients from field to a care facility, if required
- Assistance with recovery of deceased in the collapsed structure environment with attention to cultural sensitivities and to retrieving remains without further trauma and with managing risk for workers, if necessary
- Advice as part of multi-disciplinary input through the UCC into the LEMA decision making on when emergency response to the collapsed structure incident transitions to a recovery effort (i.e. when the potential for survivability for those still entrapped)

e) USAR Team Logistics

- Establish BoO. The BoO serves as the USAR Teams' site for headquarters, communications hub, sleeping/resting/eating/health areas, equipment stock set-up and refuge from the elements while operational in a disaster-affected country
- Run and organize the BoO over all of the operation, including perimeter control procedures

- Support the work on the worksites (e.g., transportation, food, equipment)
- Ensure that all team personnel have reliable means of communications
- Coordinate transportation requirements
- Perform contingency planning for relocation of BoO and the demobilization phase
- Support the management on the contingency planning (e.g., transportation for medevac)

3.2.2.4 Demobilisation

a) USAR Team Management

- Demobilization must be planned and coordinated from the beginning of the operation. All players, including the UCC and the LEMA must be involved in the planning from the beginning
- Ensure proper hand-over is conducted to USAR Teams that take over the tasks of the departing team
- Teams are required to update their Team Fact Sheet in ICMS and notify the UCC, who - based on the team's request - should provide the team with an estimated stand-down date and time
- Teams are required to complete and submit the documentation to the UCC
- Plan and communicate possible donations to the LEMA and/or affected community
- Prior to leaving the area, the USAR Team Leader is expected to meet with the UCC, the LEMA, and political leaders of the community, as appropriate, to complete the team's participation
- If appropriate: communicate to the media the finishing of their work and the departure (in coordination with the LEMA and UCC)

b) USAR Team Search

- Cease work and prepare handover to the organization taking over the tasks
- Prepare canines and equipment for return transportation

c) USAR Team Rescue

- Cease work and prepare handover to the organization taking over the tasks
- Prepare and pack equipment for demobilization and departure

d) USAR Team Medical

Coordinate demobilization with local relevant health authorities (i.e., through UCC/Health Cluster) Healthcare infrastructure assessments (USAR is often in country early in the post-impact phase and/or may have more mobility to assess remote outlying locations.

An additional benefit may be found in structural engineering personnel who may accompany the USAR medical personnel on the assessment), if required.

- Health needs assessments (for same reasons as above), if requires.
- Provide advice on or facilitate health and medical donations.
- Provide handover to relevant medical organizations.
- Identify appropriate medical cache donations through UCC/Health Cluster.

- Assess potential exposures and need for follow on medical care.
- Maintain in-transit medical care for team to home base.

e) USAR Team Logistics

- The BoO site should be restored to its original state in so far as possible
- Prepare the BoO equipment for return transportation
- Ensure that the dangerous goods are prepared, packed and labelled according the International Air Transport Association regulations
- Provide resources for logistics requirements during demobilization (preparing of manifests, packing and loading, shippers' declaration of dangerous goods etc.)
- Plan and ensure the required transportation

3.2.2.5 Post-Mission

a) USAR Team Management

- The after-action process includes compiling a Post Mission Report documenting administrative issues and operational concerns which should be forwarded to OCHA within 45 days of returning home
- Lessons-learnt must be included in planning and training

b) USAR Team Search

- The canine group prepares and delivers a report on the mission to their USAR Team

c) USAR Team Rescue

- Provide inputs to the team report and identify lessons-learnt

d) USAR Team Medical

- Coordinate immediate and long-term medical follow-up with USAR Team Management (including mental health)
- Restore USAR medical cache within timeline prescribed by USAR Team policy
- Provide input into USAR Team post mission operations report

e) USAR Team Logistics

- Safety equipment and supplies must be restored and restocked for next deployment

3.2.3 Standard Operating Procedures (SOP) within SnR Use Cases

3.2.3.1 Preparedness: planning for major emergencies including training exercises

The preparedness phase is the period between disaster responses. In this phase USAR Teams undertake preparatory measures to ensure that they are at the highest level of readiness for deployment as possible. Teams will conduct training and exercises, review lessons-learnt from previous experiences, update Standard Operating Procedures (SOPs) as required, and plan future responses.

All the Search and Rescue end users participated in the completion of the SOP **questionnaire have a training plan for their team**. The only exception is PROECO, whose members are used as trainers for other administrative entities (e.g., the National Institute for Administration).

More specifically, HRT recruits attend the first level/basic training program and after joining the department of their choice (mountain rescue, water rescue or USAR), they follow a more expertise training, divided in two levels.

Additionally, whenever there is an opportunity, members of HRT participate in exercises abroad. PUI training conform to the INSARAG procedure of deployment. The regular training working with dogs for ESDP is mandatory in order to make sure that K9 teams are ready to act in case of disaster.

All the end users **organize simulation exercises**. In the RESIST Project (REsilience Support for Critical Infrastructure's through Standardized Training on CBRN), PROECO organizes within 2022, 5 field exercises (Bucharest and Magurele, Tuzla private airport). In the SnR project, PROECO is organizing a field exercise at Tuzla Private Airport, on the use of CBRN means by terrorists. HRT frequently organizes internal simulation exercises for practicing mountain, water and urban search and rescue procedures, which in some cases are joint between our departments. These are not conducted, however, under an existing plan. Each department organizes an average of two or three exercises annually. The organization of simulation exercises for EPAYPS is a frequent procedure which is conducted in properly selected locations in proportion to the existing risk. At least 5 major exercises per year for Natural, Technological and NaTech Disasters. JUH organizes simulation exercises 1–2-year focus on medical and logistics for their own Emergency Medical Team 1 (EMT 1), as well as full-scale field exercises called EU MODEX for USAR capacities (Lot 3) and EMTs (Lot 5), which were already mentioned in 3.2.1. JOAFG organizes approximately 5 exercises of different sizes (internal or with other organisations) - EMS focus, S&R rescue dogs. For PUI, there is 1 simulation every 2 months, management (command-post, ICMS, UCC), medical, search and rescue and logistics. PUI also participates in 1 or 2 international exercises during the year. SUMMA within the Summa112 training program there are: 1.- mandatory practical courses on multi-victim incidents with a final simulation. 2.- Periodical but continuous training (on/off doing PPE practice two hours every 15 days in total, which means each group attends a practice every 2 months, because we are 4 groups) for the professionals that integrate the Biological Risk Transportation Group (which is volunteer). 3.- Periodical training for assembly and disassembly of the SUMMA 112 Sanitary Decontamination Station. 4.- ERICAM (USAR Team) training and reviewing the material monthly. The ESDP organises training exercises twice a week in different search disciplines, as well as theoretical/practical courses throughout the academic year, where knowledge and techniques of search and rescue are updated.

It is worth mentioning that all the end users **organize special sessions – debriefing** in order to analyze the lessons learnt. Most of the end users **use the social network** for their exercises and other public information such as websites, conferences, press releases, newsletters and communication departments inside the teams. HRT's **Operational Manager** is handling and monitoring the whole operational procedure followed by the organization's team members. In that frame, he is strongly collaborating with our telecommunications experts and the head of each department, who initially activate and, then, contact our members in the field.

The operational management of EPAYPS follows every exercise's handbook. The field operational manager, which controls the activities, communicates with the team supervisors for every new progress. The management team members of PUI are members of the fire department and experienced

in management of special operation. The operational management of the team members is based on the IMV protocol of the Community of Madrid, which is based on the PLATERCAM protocol. ESDP is under PLATERCAM protocol too. The protocols used in collapsed structures, especially when it comes to international search and rescue work, are those developed by INSARAG, and as dog rescue is often carried out in collapsed structures, the triage and marking system used by the ESDP is the one included in these protocols.

It may be important to note that the INSARAG field manual only refers to work in collapsed structures, although the OSSOC aspect may be applicable to other types of catastrophes.

All the end users are well informed for the safety and security of their teams within their pilots. More specifically, their members are intensively and strictly trained in self-protection and properly equipped for each incident that will take place according to every exercise handbook. In case they do not have the necessary equipment, they do not participate to all the emergencies. Of course, all their volunteers are insured by the organization for body injuries that may occur during trainings or rescue missions. CNR is conformed to the Decree of Chief of the National Department of Civil Protection of January 12th, 2012 and decree of November 25th, 2013. All the team members of PUI have the training "BSAFE" from UN and during simulation they are working different scenario about the security and safety issues. The information received inside SUMMA is by the coordinating center. Firefighters secure the area and remove the victims from the hot zone. The safety elements used by the team is the individual PPE without being monitored or communicated between us, only through the coordinating center.

The end users collaborate mainly with their National Authorities (Fire Service, Coastguard, local civil protection offices). JUH is working closely with the German EMT National Focal Point, WHO Regional Office Europe & EMT Secretariat, EMT classification processes in different countries. PUI collaborates with International Authorities (INSARAG, WHO, International Office for Migration, CARITAS etc). The actions of the regional authorities and SUMMA are contemplated in PLATERCAM (Madrid Civil Protection Plan). More information can be found in https://www.comunidad.madrid/transparencia/sites/default/files/plan/document/acuerdo_de_30_de_abril_de_2019.pdf. They algo belong to ESP USAR Team ERICAM, so they are updated with the circumstances of international catastrophe on behalf of Global Disaster and Coordination System GDACS https://vosocc.unocha.org/. ESDP has a MoU with the National School of Civil Protection and they are members of ERICAM as well working under INSARAG guidelines and PLATERCAM protocol. All the end **users use K9 research activities** and techniques except for JUH and PROECO which is not part of their team. All dogs are trained for searching in open air and debris, using the air scenting technique completed with electronics devices (scanner, sensors). Additionally, the K9 teams **share information with the other members of the team**.

Health certificates and dogs' passports and all the **transport documentations for the dogs** are updated. The teams have **various methods in case of disasters**. In cases of large-scale disasters, HRT organization is alarmed and invited to support the search and rescue operation by the General Secretariat for Civil Protection or by the local civil protection offices. Their operational manager, in collaboration with the board and the head of the USAR department, examines their operational capacity in accordance with the severity of the disaster, the available rescue equipment and their human resources. At the same time, there is a call for support to all HRT rescue stations in Greece. The respective authorities are relatively informed and the on-field focal points from their side are indicated.

During the operation the volunteers work under the command of the indicated state representative. EPAYPS aims at: 1) Performing rescue (breaching, extrication and transport) in collapsed or failed structures of concrete, heavy wood/reinforced masonry with structural steel (rigging and lifting) and 2) assessing the collapsed structure and local failures to identify void size, location and configuration for potential live victims, and for determining access possibilities. JOAFG uses Manchester and Triage. The rescue efforts are usually executed by the fire brigade. After the assessment phase of the structures, PUI has the process to decide the priorities of search: the K9 team is deploying on the field, always 2 K9 teams for the security. If the result is positive with 1 dog, the second dog confirm or not. The rescue method inside SUMMA is the one established by the IMV protocol of the Community of Madrid. It determines the functions of each resource on a first-come, first-served basis, and also depends of the circumstances of the catastrophe, for example, we have a biological unit for transport patients with this type of risk, and they use PPE adapted to it, also the type of incident influent into the type of rescue. They have available baby safe tool, Fernokit, Pelvic belt, spinal board, blade stretcher, hip aligner for femoral head fractures, stiffness for adults and babies (cervical collars of Laerdal), and immobilizer of head called" dama de elche".

The protocols used in collapsed structures, especially when it comes to international search and rescue work, are those developed by INSARAG, and as dog rescue is often carried out in collapsed structures, the triage and marking system used by the ESDP is the one included in these protocols. It may be important to note that the INSARAG field manual only refers to work in collapsed structures, although the OSSOC aspect may be applicable to other types of catastrophes.

The training of the rescue teams is mostly common with the other members of the teams.

In HRT, the members are initially and basically trained commonly. This training program is held internally, however, they also join external training sessions, held by the Fire Service, the Coastguard, the Hellenic Airforce and the National Emergency Service or by corporations. When joining a specific department, their volunteers follow a more specialized training, though they are all trained commonly in First Aid. Regular exercises with K9 and medical teams take place in JOAFG and also with other organizations. The basic response team training is common and each unit has specialization training (e.g. communications, EMS etc.) except for the rescue dog unit, which is separate. The personnel of SUMMA who belongs to ERICAM make trainings together K9 and firefighters. They also receive the accreditation by UNOCHA together as well. ESDP trains the dogs and the dog handlers twice every week and perform training activities into the ERICAM team, as member of this emergency unit.

Not all of the **end users have a monitoring system for the vaccination of their team**.

All the team members of PUI have a connected card ID1 to register all the information medical or not; they also follow a process for the vaccinations. Regarding SUMMA, there is a control system for the vaccination of ERICAM rescue teams that are candidates for international sorties. The unit for international trips of HIGH-LEVEL Carlos III is in charge of this issue for all the professionals of ERICAM. All team members and dogs in ESDP have vaccination documentation.

There are some differences between staff who work in national or international level. For national teams, hepatitis and tetanus vaccine. For International typhus fever and more diseases in addition. **Only some end users have a medical system.**

Most of them follow their National Health System. All the end users have a **list of the necessary medical equipment for the transportation** and a list of medicines with the signature of the medical

team leader except CNR who, during the COVID-19 pandemic they had a close link with the National Health Service. All the end users have **a way of maintenance of their equipment**. There are volunteers in each HRT department appointed for the equipment status, who are responsible for the maintenance and keeping track of it. Their equipment is maintained either by their members or by professionals, who collaborate with HRT. EPAYPS uses the Outsourcing (mainly). They have technicians only for basic support of the systems. JUH uses a software-based quality management system. JOAFG follows the medical product law (Medizinproduktegesetz). PUI disposes a complete list of equipment, limit date of use for medicines, dates of control of the batteries. PROECO uses individual first aid kits. Within SUMMA, the expiry dates and defects in equipment are checked monthly by the ERICAM team and the teams of the mobile uvis carrying the disaster backpack. ESDP has all equipment stored and they do maintenance work. Staff on call checks the equipment, but some kind of equipment needs in depth review. ESDP has two health kits, one for guides and one for dogs, with the necessary equipment to provide first aid assistance to all members of the team, which are checked monthly so that they are ready in case of an intervention.

Equipment used in high interventions as safety harnesses and roped need special maintenance (its use is registered with data as resistance and time of use) in order to determinate the equipment useful life. This is done for security reasons. Veterinary Material is checked with a registration and expiry control too.

All the teams of the **end users are autonomous enough to go for a mission**. JOAFG team is already supporting in transnational actions as support forces. Sometimes under the flag of other organisations. But there are international missions (Mozambique, Nepal, Haiti etc.) The **greatest gap** for HRT is the absence of a logistics software, that could facilitate the whole operational procedure and provide an overview about our equipment. For EPAYPS, the gaps depend on the size of the incident and the number of the units that participate. JOAFG organizes relief convois for Ukraine, deliveries for Rumania, for international organ transport, the team was the dominating organization for decades in Austria. But for shipping K9 or to mobilize large numbers of people, they are relying on international missions from other entities and participate there. They have experts for logistics in different areas. The declaration of IATA, the control of the inventory, the charge of the battery and the control of the date of the medicines are some of the gaps faced by PUI. ESDP, as non-profit organization working with volunteers, faces budget issues in some cases. In the case of a catastrophe, where ESDP is called, volunteers have to take some days off from their own companies, being difficult in some cases. Their team are volunteers and it is not always easy to take some days without previous notice in the case that they have to move to international operations. For SUMMA, it is sometimes difficult get the adequate transport when all the infrastructure has down. The bureaucracy of Governments sometimes is another difficulty. There are possibilities to meet hazard circumstances with special or specific resolution. CNR and JUH do not have any gaps in their teams in relation to the logistics.

The **most usual procedure of transport for an immediate deployment** is vehicles (ambulances, trucks), air transport (airplanes, helicopters) and sea transport. In HRT, mostly is the organization's vehicles and the air transport (via Hellenic Air Force).

3.2.3.2 Mobilization: response and travel, coordination with national and international authorities, transport and logistics

The mobilisation phase is the period immediately following the occurrence of a disaster. International USAR Teams prepare to respond and travel to assist the affected country.

The end users **have a real-time monitoring system for disasters** either national or international. For example, PUI, SUMMA & ESDP as INSARAG members, they use GDACS system to receive alarm and other applications on smartphone. HRT uses seismographer network of the Greek organization of ant seismic planning and protection. They also use a privately owned meteorology radar. JUH has internal operations center and collaboration with Johanniter Alert and Information Centre and German Joint Information and Situation Centre (GMLZ).

All the teams **organize a briefing for the team before the deployment**, one is about the disaster situation and the organization of the mobilization, before the medical screening and the loading of the equipment, and one about the security, safety, the deployment and the presentation of the country (culture, religion etc...) just before the travel to the airport. The end users with K9 have various ways to **ensure that their K9 team is ready for the deployment (health, hygiene…) and the whole trip.** HRT volunteers who are responsible for the rescue dogs, take care of such matters. JOAFG K9 is a unit for national actions. PUI has a veterinarian to check the capability of the K9 team for a deployment (veterinarian screening). All the end users follow **procedures to check the documentation concerning the materials to be transported**.

The documentation is prepared by HRT secretariat and checked by the Board and the Operations Manager. JOAFG has inventory lists. The team leaders of PUI & ESDP have all the documents about the material on paper and on a USB stick. All the end users **have official documents related to the practices of the medicine** except for HRT who provide only First Aid. EMAK teams of EPAYPS have the related documents. JOAFG disposes official documentation of education and training of EMTs and paramedics. PUI has all the attestation for the doctor, nurses and veterinarian. PROECO uses instructions regarding the intervention of professional emergency services in search - rescue actions – ISU 02.

HRT team does not **check the medical status of the personnel and dogs participating in the mission**, but it is their family doctors who check it. CNR neither. All the other teams do this check. More specifically, before a deployment, just after the first briefing, PUI's medical team organizes a medical screening to be sure all the members should go on mission (temperature, blood pressure, sticker in case of accident, and COVID test PCR if necessary). In SUMMA, there is an annual checking for all personnel, furthermore, the professionals receive a medical check focus on the medical status, previously to participating in a mission, and after it. The medical team which **follows up on hazardous materials** are JUH, CNR, PROECO, SUMMA & ESDP. PUI team has HAZMAT specialist in the USAR team. All the end users are **able to prepare their own transportation plan** by organizing their equipment to be transported by each one, but is needed to value the type of catastrophe and mission to reply adequately to this question.

There is specific **preparation by the teams regarding the transport of passengers and hazardous materials including the equipment**. Especially when there is air transportation, HRT secretariat makes all the arrangements. With regard to hazardous materials, HRT does not use any. JOAFG uses transport of Power Generator and transport of field kitchen. PUI has to prepare the IATA declaration for the flight, the logistics team leader has is trained in IATA procedure. PROECO follows the instructions related to the intervention of professional emergency services in search - rescue actions – ISU 02. Last month, for example, SUMMA and ESDP did a simulation to work inside a Covid+ environment. Thee organized the preparation of the component, and the movement of the professionals and the work inside the camo with specific PPE against this hazard.

3.2.3.3 Operations: in the country, K9, medical, management, coordination, reporting

The operations phase is the period when international USAR Teams are performing USAR operations in the affected country. It starts with arrival of a USAR Team at the Reception/Departure Centre (RDC) in the affected country, registration with the UCC/OSOCC, reporting to the Local Emergency Management Agency (LEMA) (or National Disaster Management Authority (NDMA)), and performing of USAR operations. The phase ends when the USAR Team is instructed to cease operations.

The management teams coordinate with the local authorities in the disaster area, depending of course on the operational plans. Before a deployment takes place, in PUI, they have to wait the international call for assistance from the country affected, and when PUI is the first team arrived in the disaster area, they have to coordinate with the LEMA (local emergency management authority).

For all the teams, **there is a pace of work in the area**. They work in rotation scheme, depending on the operation, their physical condition and their level of experience and training. The mission duration is normally below h24 for standard duty. In disaster response, 5h-6h shifts with rotation to next 6h shift (role change). Actually, it is mandatory for the maintenance of the team. The **safety and security conditions** for most of the teams are part of the National Civil Protection Authorities or local emergency management authorities. In PUI, in the Base of operation and on the field, there is a "security officer" to control the Personal Protective Equipment, the security area, covid process, use of equipment in security etc. More specifically, PUI, SUMMA and ESDP use the INSARAG procedures. The teams have to do the ASR 2, which is the Assessment Search and Rescue level 2, victim confirm yes or not, time of work 12 hours or more 12 hours, the site will be in category A, B, C or D and after the priorities, the USAR team is deployed on the work site with the priority A, and the K9 team is deployed to search trapped victims; we use 1 dog, and minimum 1 more to confirm. In the case of an assessment of the situation for a SAR operation, HRT uses the ICAR/IMRF/INSARAG guidelines, depending on the situation and the competencies of their volunteers.

The **risk assessment carried out for the teams during the research** is done by the team leader or a security officer. SUMMA nowadays has added a drones' group to Fire fighters of Madrid Community for this issue. Moreover, PUI uses the drones for reconnaissance and evaluation something that will be done during Use Case 5 as well (UC5).

Regarding **the evaluation of the situation in order to locate the victims**, most of the teams need only to evaluate whether dogs can take part (division of responsibilities with other rescue organisations). To complete the localization of the victim with K9, the teams can use electronic devices and scanner (extended Wi-Fi). There **is a security perimeter established during the site operation** for all the teams.

The **capacities of the teams are mostly satisfied to cut, pierce and extract a victim** except for medical first responder and K9 units (e.g. JOAFG, JUH e.V.).

Additionally, ESDP may localize the victim but not extract him since the risk assessment is carried out by the most suitable professional, normally they are firefighters. Until the area is not safe, neither the medical teams nor the K9 can intervene in zone 0.

JUH does not have a procedure to follow regarding **the assessment of the work site in order to define priorities**. HRT will take into consideration factors like amount of work needed to be carried out, number of volunteers, equipment, building material and structural hazards in the case a rescue takes place in a building, weather conditions (especially in the case of mountain and sea rescue) are

that needs to be covered. For EPAPYS the steps to follow are: 1) Determine the scope and magnitude of the incident, 2) Identify scope, location and types of damage. 3) Estimate the urgent resource needs 4) Develop a sectorisation plan 5) Establish priorities, 6) Identify general hazards, 7) Identify infrastructure issues. All steps are usually accomplished by; vehicle, helicopter, waterborne craft, uas, on foot or from reports from others. Teams carrying out this level of assessment must remain mobile, not engage in rescue operations and report the results as quickly as possible. JOAFG will identify the safety issues, secure own position, check personal safety, check team safety, move forward, redo. For CNR, this procedure is under the responsibility of the Fire Department. PUI, PROECO, SUMMA and ESDP follow the INSARAG procedures. All the **teams have an evacuation and regrouping point set up for the team safety during the search**.

The medical teams permanently monitor the USAR team at work except for HRT. Regarding the **role of the medical team in taking care of the victims**, HRT provides only first aid treatment. Specialized medical care is provided by the authorities. The medical team of JUH offers basic health care but is not involved in rescue operations. EPAYPS, JOAFG, CNR, PUI, PROECO, SUMMA & ESDP provide triage/assessment and the role of their medical teams is to go into the victim in the confined space to do the first medical assessment and to supervise the extrication and evacuation. The **medical teams of HRT, JUH, PUI and ESDP do not advice the USAR teams in the area of chemical hazards**. All **the teams have a base of operations installed**.

USAR operations are monitored by the logistics teams (equipment, food, water, etc.) in various ways. More specifically, for HRT, the person who is in charge of logictics monitors the operation, in relation to equipment and supplies. Food, water and equipment are listed beforehand, weighted and placed into boxes. Food and water is provided to team members, according to the alimentation plan. EPAYS has set up a base of operations. Logistics team of JUH monitors EMT operation according to SOPs. JOAFG logistics are based on the use of material and equipment. Basic set is laid out for support of 24h operations self-sustainable. Logistic team is always present during operations for CNR. PUI has 1 logistics team is in the BoO to monitor the equipment and the Base of operation and 1 part of the logistics team on the field, in a "Advance logistics". SUMMA and ESDP by controlling the stock of material, anticipating the needs that may arise.

3.2.3.4 Demobilization: process with local and international authorities, travel, logistics

The demobilisation phase is the period when international USAR Teams have ceased operations, commence withdrawal, coordinating their departure through the UCC/OSOCC, depart from the affected country through the RDC, and travel to their home country.

All **the teams organize a meeting with the local authorities and the teams in charge of the coordination, before leaving the area**. Whenever the teams participate in an operation, they always communicate beforehand with authorities to define their role and level of involvement. For PUI, there is a meeting organized by UCC (Usar Coordination Cell) with the LEMA before the end of the operation, and the LEMA decide to continue or stop the operation.

For the teams which participate **in international missions, there is no donation of equipment made to local teams**. There is also donation of equipment by authorities.

In most of the cases, **there is a communication plan organised with the media before the disengagement**. In case of emergencies there is a plan being the communication with the media. Especially for SUMMA, if the mission is international, the government is informed and is responsible for

communicating with the media. If the incident is in the Community of Madrid, SUMMA has a press department that is in charge of informing the media. All the teams **organize a transport operation for the K9 teams and equipment** by the dog unit who is in charge regarding both and search and rescue units. All the medical teams ensure an assessment of the local needs of medical structures before disengaging, except for HRT, JOAFG and ESDP who are not involved in medical activities. For the other teams, it is an ongoing process during the whole mission. Sometimes, during the phase "beyond the rubbles", the medical team could do an assessment of the local needs in hospital or dispensary for a next project or program.

Most of the **teams usually donate medical equipment before the return**, such as medical drags and supplies. Regarding to the COVID risk, all the teams have taken the appropriate measures whenever participating in a mission, use the rapid tests, there are protocols regarding COVID 19, use of mask, collaboration with WHO, EODDY (Greece), German Robert Kock Institute (Germany).

PUI who participated in the explosion in Beirut last August, used FFP2 and hydroalcoholic solution during the transport and all the mission, change every 4 hours, PCR test or vaccination in France before deployment, the results are sent to the country, PCR test in the affected country if necessary at the arrival, PCR test in France for the go back, the medical team continue to monitor the team until the result of the PCR test - on the field, mask FFP2, disinfection of the equipment after using, in the BoO, disinfection of the dog and the team members before entry in the BoO.

Mostly, all of the **teams take into account the transport of hazardous materials for the return**, except for those who do not handle hazardous material, such as HRT and JOAFG. PUI follows IATA procedure and PROECO goes according to the ORDER of the Minister of Interior No. 1184 of February 6, 2006 for the approval of the Norms regarding the organization and assurance of evacuation activities in emergency situations. All the **teams have a transport plan**.

3.2.3.5 Post-missions: actions taken after a disaster to restore services and reconstruct communities, after action, review, lessons to learn

The post-mission phase is the period immediately after a USAR Team has returned home. In this phase the USAR team is required to complete and submit a post-mission report and conduct a lessons-learnt review to improve the overall effectiveness and efficiency for response to future disasters. The post-mission phase continuously merges into the preparedness phase.

The **teams prepare a mission report** except for the Greek teams, HRT and EPAYPS who prepare a debriefing session after the mission. HRT, EPAYPS and ESDP do not **have a «lessons to learn» document prepared** as these lessons are identified during the debriefing. JOAFG neither even though it is considered to be very important. The other teams use a «lessons to learn» document whose synthesis includes:

- conclusions regarding the evolution of the emergency situation, its consequences on the institutions population and assets and their influence on the development of the mission
- the executed actions and the ones being executed, by categories and localities
- planned and unexecuted actions: causes and measures
- other data requested by the upper echelon

Each part of the teams CNR, PUI, PROECO, SUMMA & ESDP prepare a mission report from USAR, management, medical, K9, logistics and drones (PUI). The above-mentioned related to the **«lessons**

to learn» document prepared in Search are valid for the «lessons to learn» document prepared in Rescue. HRT, EPAYPS and PROECO do not **have a medical and psychological monitoring system for team members**.

JUH provides psycho-social support and after-care, incl. defusing + debriefing. Expert for psycho-social support is part of the team. JOAFG uses the PEER system. There is debriefing and possibility for psychological follow-up upon request. There is a team particularly dedicated to emergencies (emergency psychologists) in CNR.

The medical team monitor all the team members in PUI during the mission every time, every day, and if necessary, we can have assistance by phone with a psychologist specialist in France during the mission and after. SUMMA has an occupational risk prevention department for the medical follow-up of SUMMA workers. At the psychological level, it also has a department of psychologists who monitor SUMMA workers. In ESDP, SUMMA checks. Regarding psychologist team, it is not mandatory a check, however, team member can decide to ask for an appointment.

The leader **team must complete a mission report** describing the intervention and finally outlining the points for improvement. PUI has to prepare a complete report of the mission and send it to INSARAG secretariat in Geneva. HRT and EPAYPS do not prepare such a report but is it included in the main report.

All the teams have **a plan for restoring equipment and preparing for a new mission**, only for EPAYPS it is not obligatory. But there is a procedure of restoring the equipment through the typical procedures of everyday preparedness for the team at the Base. The logistics team leader of PUI organizes the cleaning, charge of battery, control etc. Each PROECO volunteer is responsible for restoring equipment and preparing for a new mission. On arrival at the base (Las Rozas Fire Station, Madrid) the material used is checked. The material is duplicated in case there is a new departure or mission. There is a Equipment Manifesto and a Vet Manifesto too for ESDP. All **the teams prepare a mission report**.

3.3 Conclusion

During the preparedness phase all USAR Teams **have a training plan for their team**. The only exception is PROECO, whose members are used as trainers for other administrative entities (e.g., the National Institute for Administration). All the end users **organize simulation exercises** within SnR project or other projects they are involved in with **special sessions – debriefing** in order to analyze the lessons learnt. Most of the end users **use the social network** for their exercises and other public information such as websites, conferences, press releases, newsletters and communication departments inside the teams. All the end users are well informed for the safety and security of their teams within their pilots.

The end users collaborate mainly with their National Authorities (Fire Service, Coastguard, local civil protection offices). All the end **users use K9 research activities** and techniques except for JUH and PROECO which is not part of their team. All dogs are trained for searching in open air and debris, using the air scenting technique completed with electronics devices (scanner, sensors). Additionally, the K9 teams **share information with the other members of the team**.

Health certificates and dogs' passports and all the **transport documentations for the dogs** are updated. The teams have **various methods in case of disasters**.

During the operation the volunteers work under the command of the indicated state representative. **The training of the rescue teams is mostly common with the other members of the teams**. Not all of the **end users have a monitoring system for the vaccination of their team** and **Only some end users have a medical system.**

Most of them follow their National Health System and all the end users have a **list of the necessary medical equipment for the transportation** and a list of medicines with the signature of the medical team leader except CNR who, during the COVID-19 pandemic they had a close link with the National Health Service. All the end users have **a way of maintenance of their equipment**.

All the teams of the **end users are autonomous enough to go for a mission**. The **most usual procedure of transport for an immediate deployment** is vehicles (ambulances, trucks), air transport (airplanes, helicopters) and sea transport.

During the mobilisation phase International USAR Teams are prepared to respond and travel to assist the affected country. The end users **have a real-time monitoring system for disasters** either national or international. All the teams **organize a briefing for the team before the deployment**, one is about the disaster situation and the organization of the mobilization, before the medical screening and the loading of the equipment, and one about the security, safety, the deployment and the presentation of the country (culture, religion etc...) just before the travel to the airport. The end users with K9 have various ways to **ensure that their K9 team is ready for the deployment (health, hygiene…) and the whole trip.** All the end users follow **procedures to check the documentation concerning the materials to be transported**.

All the end users **have official documents related to the practices of the medicine** except for HRT who provide only First Aid. All the teams with the exception of HRT and CNR **check the medical status of the personnel and dogs participating in the mission**. The medical team which **follows up on hazardous materials** are JUH, CNR, PROECO, SUMMA & ESDP. PUI team has HAZMAT specialist in the USAR team. All the end users are **able to prepare their own transportation plan** by organizing their equipment to be transported by each one, but is needed to value the type of catastrophe and mission to reply adequately to this question.

There is specific **preparation by the teams regarding the transport of passengers and hazardous materials including the equipment**.

During the operations phase the **management teams coordinate with the local authorities in the disaster area**, depending of course on the operational plans.

For all the teams, **there is a pace of work in the area** working under the rotation scheme, depending on the operation, their physical condition and their level of experience and training. The **safety and security conditions** for most of the teams are part of the National Civil Protection Authorities or local emergency management authorities.

The **risk assessment carried out for the teams during the research** is done by the team leader or a security officer. Regarding **the evaluation of the situation in order to locate the victims**, most of the teams need only to evaluate whether dogs can take part (division of responsibilities with other rescue organisations). To complete the localization of the victim with K9, the teams can use

electronic devices and scanner (extended Wi-Fi). There **is a security perimeter established during the site operation** for all of the teams.

The **capacities of the teams are mostly satisfied to cut, pierce and extract a victim**. JUH does not have a procedure to follow regarding **the assessment of the work site in order to define priorities**. All the **teams have an evacuation and regrouping point set up for the team safety during the search**.

The medical teams permanently monitor the USAR team at work except for HRT. Regarding the **role of the medical team in taking care of the victims**, HRT provides only first aid treatment. The **medical teams of HRT, JUH, PUI and ESDP do not advice the USAR teams in the area of chemical hazards**. All **the teams have a base of operations installed**. **USAR operations are monitored by the logistics teams** (equipment, food, water, etc.) in various ways.

During the demobilisation phase, all **the teams organize a meeting with the local authorities and the teams in charge of the coordination, before leaving the area**. For the teams which participate **in international missions, there is no donation of equipment made to local teams**.

In most of the cases, **there is a communication plan organised with the media before the disengagement**. In case of emergencies there is a plan being the communication with the media. All the teams **organize a transport operation for the K9 teams and equipment** by the dog unit who is in charge regarding both and search and rescue units.

Most of the **teams usually donate medical equipment before the return**, such as medical drags and supplies. Mostly, all of the **teams take into account the transport of hazardous materials for the return**, except for those who do not handle hazardous material, such as HRT and JOAFG. All the **teams have a transport plan**.

During the post-mission phase, the **teams prepare a mission report** except for the Greek teams, HRT and EPAYPS who prepare a debriefing session after the mission. HRT, EPAYPS and ESDP do not **have a «lessons to learn» document prepared** as these lessons are identified during the debriefing. The above-mentioned related to the **«lessons to learn» document prepared in Search are valid for the «lessons to learn» document prepared in Rescue**. HRT, EPAYPS and PROECO do not **have a medical and psychological monitoring system for team members**.

All the teams have **a plan for restoring equipment and preparing for a new mission**, only for EPAYPS it is not obligatory. Last but not least, all **the teams prepare a mission report**.

4 Interoperability Framework

4.1 Interoperability Framework within SnR

The definitions of all the tasks related to WP6 and the meetings that took place with the technical partners MAG, KT, SIMAVI and THALIT, have led to the design of SnR interoperability framework (see Figure 4-1). The main database (data lake) will contain data from sensors / modules /UAVs and historical data from all sources that participate in SnR. Below, the responsible tasks are explained in details.

Task 6.1 is responsible for the video and data interoperability. All the necessary records can also be transferred to the data lake and from there and from there distributed to SnR modules that need these records (e.g., DSS).

Task 6.2 is responsible for the implementation of the data model in the data lake, so the syntactic interoperability of the data will be maintained.

Also, Task 6.2 will implement the connection to the European civil protection initiatives.

Task 6.3 will implement the Internet services interoperability framework. All web services that need to read or write data to the data lake will first communicate with the T6.3 framework and then T6.3 will forward the corresponding data to or from the data lake.

Task 6.4, in addition to designing the main interoperability framework, is responsible for designing and implementing specific "use case tailored" web services.

Prior to that, MAG distributed a questionnaire to all end users to determine what information is important to them during use cases. All data that will be provided by these services is in the data lake, therefore, this task will communicate with the web services interoperability framework (T6.3) to retrieve these data as described above (see Figure 4-2).

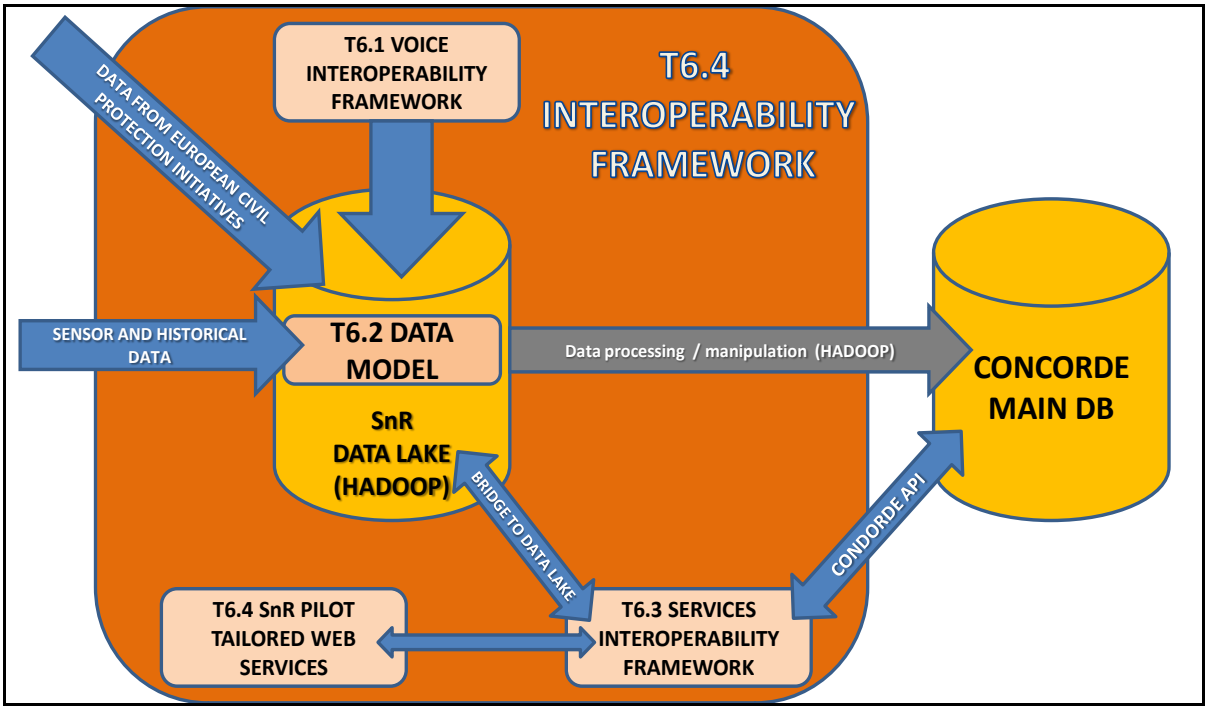

Figure 4-1: SnR Interoperability Framework

Data from the data lake after processing, and filtering by using internal Hadoop tools (Apache Spark) is forwarded to the main CONCORDE database (FP7-SEC-2013-1). COncORDE is a system of systems software platform that supports and enhances the existing coordination and decision processes during small or large-scale crises and medical emergencies, at local, regional and cross-border level.

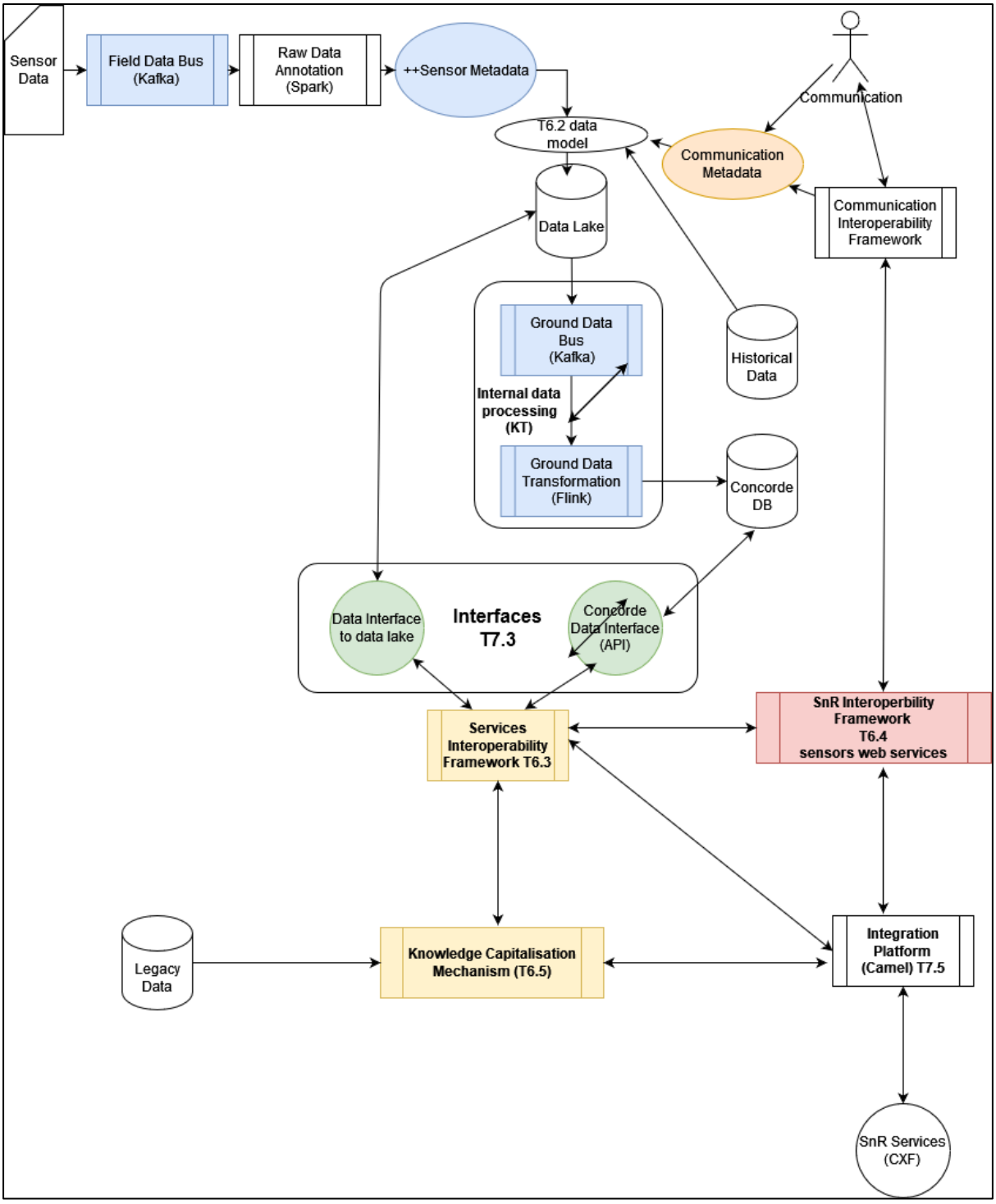

Figure 4-2: SnR Main Architecture (First Draft)

5 Common Vision

The new **European Interoperability Framework (EIF)** that was adopted on 23 March 2017, aims to the creation of a single digital market in Europe for public sector, businesses and citizens[4]. Before attempting to provide an analysis on the EU Common Vision on Interoperability and how it can affect Search and Rescue missions, we need to provide a definition of the term "interoperability" and the EIF.

According to EIF, **Interoperability** is "*the ability of organisations to interact towards mutually beneficial goals, involving the sharing of information and knowledge between these organisations, through the business processes they support, by means of the exchange of data between their ICT systems".* Additionally, The **European interoperability framework** is "*a commonly agreed approach to the delivery of European public services in an interoperable manner. It defines basic interoperability guidelines in the form of common principles, models and recommendations*"[5] (see Figure 5-1).

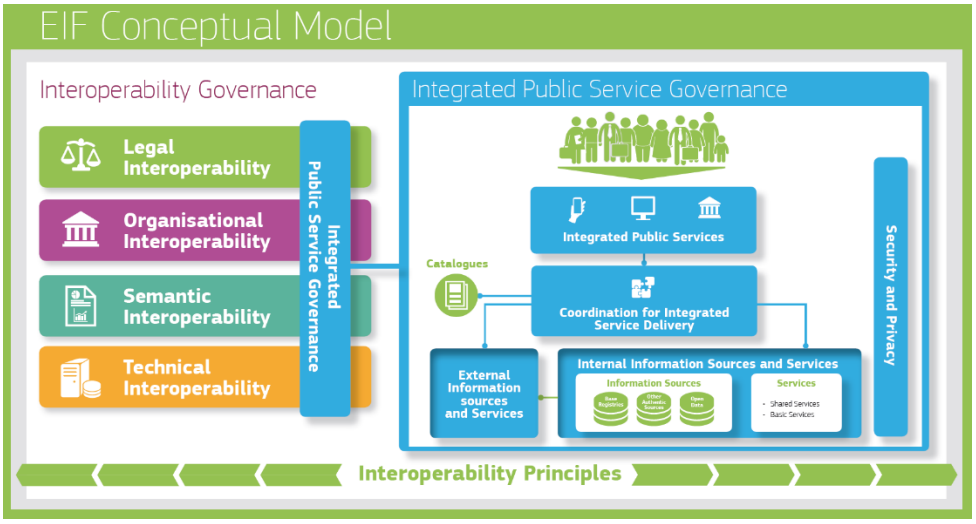

Figure 5-1: EIF Conceptual Model [6]

Moreover, the overall goal of EIF can be summarized as follows:

- To remove barriers between services, IT systems and data
- To support the development of open and commons standards in order to create meaningful connections

Furthermore, the SnR project aims to develop a highly interoperable platform for first responders and to support the unified vision of EU role. In terms of search and rescue operations, the EU role is expressed through the EU Civil Protection Mechanism (EU CPM) and the creation of the RescEU reserve. Thus, the SnR platform will potentially require to be operated in the framework of the EU CPM and the interoperability framework of the platform will be required to support the interconnection across EU and the RescEU mechanism. Therefore, we also need to provide a short presentation of the EU CPM

[4] https://ec.europa.eu/isa2/eif_en
[5] https://ec.europa.eu/isa2/sites/default/files/eif_brochure_final.pdf
[6] https://ec.europa.eu/isa2/eif_en

and the RescEU mechanism explaining the importance of the interoperability of the SnR platform in such an environment and how it can function towards a common EU vision.

According to the EU CPM website, "*the overall objective of the **EU Civil Protection Mechanism (EU CPM)** is to strengthen cooperation between the EU Member States and 6 Participating States in the field of civil protection, with a view to improve prevention, preparedness and response to disasters*"[7]. In simpler terms, it is an EU mechanism that supports a country in need to request for assistance when the scale of an emergency exceeds its response capabilities.

Disaster sees no borders and there are cases where the capabilities of a single country cannot meet the challenges of a crisis. This is the reason behind the importance of EU CPM, which promotes the collective action during a major crisis and allows all members states to have support when managing a major event and have access to expertise from various countries, to provide a more efficient and coherent response.

Furthermore, the mechanism supports the exchange of lessons learned among experts, promoting at the same time a common approach and understanding when managing a major crisis.

In the Figure 5-2, there is a representation of how the EU CPM works.

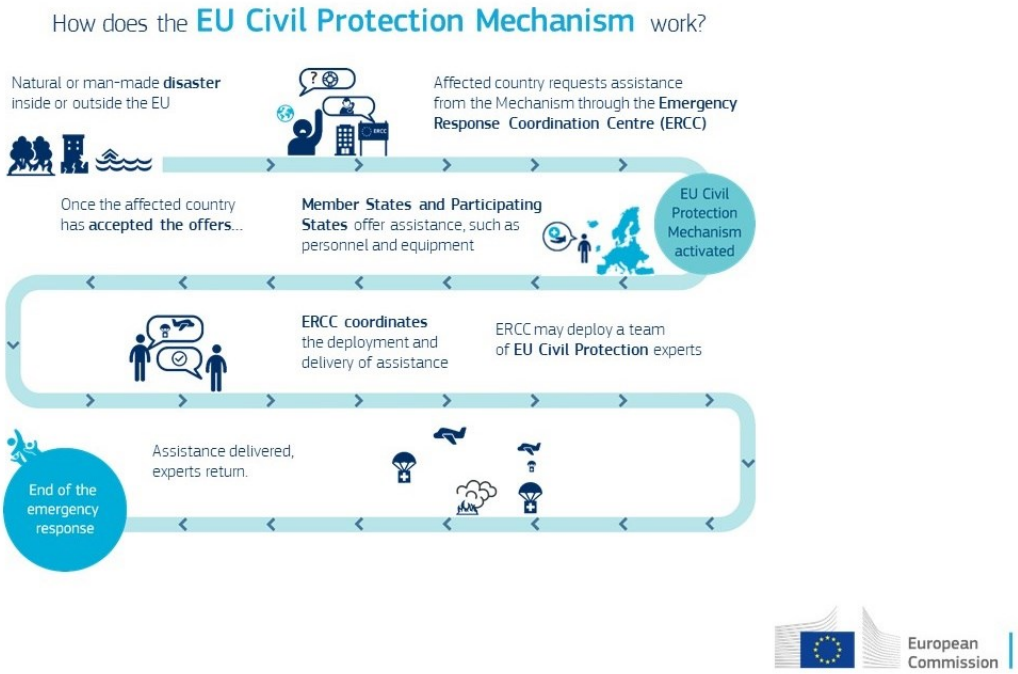

Figure 5-2: How EU CMP works[8]

As shown in the figure, in order for the EU CPM to be activated, the affected country needs to request assistance through the **Emergency Response Coordination Centre (ERCC)**.

[7] https://ec.europa.eu/echo/what/civil-protection/mechanism_en#
[8] https://ec.europa.eu/echo/what/civil-protection/mechanism_en#

Moreover, in March 2019, EU upgraded and enhanced its Civil Protection Mechanism by creating the **RescEU reserve** (DECISION (EU) 2019/420)[9], which initially was a fleet of airplanes and helicopters to support fighting forest fires, but in time it transformed to address other threats as well[10].

It is worth mentioning that in 2018, President of EC at the time, Jean-Claude Juncker said, *"A Europe that protects citizens has to be there in times of need. When there is a dangerous forest fire or a flood overwhelming national response, our citizens want action not words. RescEU will ensure concrete solidarity with our Member States hit by disasters."* [11].

It is easily to understand from the above, that the importance of interoperability in Crisis Management systems is very high. Since the view and the intent of EU is for member states to be able to support each other, especially though the EU CPM and RescEU mechanism, for that to be feasible and productive, different organisation from different states that work with different systems need to communicate and to exchange and combine various kinds of information.

The Technical Interoperability, as shown in figure 5-2, is the key to that, since it will allow different systems to interconnect, supporting at the same time different first responder organisations to work together, increasing the level of efficiency when managing a major crisis, promoting at the same time the overall vision of EU for a unified community.

[9] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019D0420&from=EN
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Annex II: Standard Operating Procedures Questionnaires

Standard Operating Procedures (SOP)	
Column Requested Information	**Explanation/Fill in Guidance**
Organization:	**Please include your organization's name**
Website:	**Please include your organization's web address**
Disaster expertise:	**Please indicate as many as relevant**
Country:	**Please indicate your country of origin**
Current State:	**Please briefly reply if you have standard operating procedures**
Do you have a SOP? If yes, please indicate the start date:	**Please indicate your Standard Operating Procedures and the start date**
Compliance/Condition Status:	**Please indicate the status**
Identified Gaps:	**Please briefly list the major identified gaps**
A. PREPAREDNESS	
A1. Training / Exercices	1) Do you have a training plan for your team?
	2) Do you organise simulation exercices? If yes, how many and under which topics?
	3) Are there any sessions organised in order to analyse the lessons learnt?
	4) Is there any public information from you side?
A2. Management	1) Do you have any particular information about the operational management of the team members?

	2) Do you have any particular information for safety and security of the team?
	3) Is there any collaboration between your team and the National, European or International Authorities?
A3. Search	1) Do you use K9 research activities and/or techniques?
	2) Does the K9 team share information with the other members of the team?
	3) Are all the transport documentations for the dogs updated?
A4. Rescue	1) What is your rescue method in case of a disaster?
	2) Is the training of your rescue team common with the other parts (medical, USAR, K9)?
A5. Medical	1) Do you use a monitoring system for the vaccination of your team?
	2) What is your medical system?
	3) Do you have a list of the necessary medical equipment for the transportation?
A6. Logistics	1) What is the way of maintenance of your equipment?
	2) Is your team autonomous enough to go for a mission?
	3) What are the gaps of your team in relation to the logistics?
	4) What is the usual procedure of transport for an immediate deployment?
B. MOBILISATION	
B1. Management	1) Do you have a real-time monitoring system for disasters?
	2) Do you organise a briefing for the team before the deployment?
B2. Search	1) How can you ensure that your K9 team is ready for the deployment (health, hygiene…) and the whole trip?
B3. Rescue	1) Do you have a procedure to check the documentation concerning the materials to be transported?
B4. Medical	1) Do you have official documents related to the practices of the medicine?
	2) Do you check the medical status of the personnel and dogs participating in the mission?
	3) Does the medical team follow up on hazardous materials?
B5. Logistics	1) Is the team able to prepare its own transportation plan (road, air ..)?

	2) Is there any preparation by the team regarding the transport of passengers and hazardous materials including the equipment?
C. OPERATIONS	
C1. Management	1) Does the management team coordinate with the local authorities in the disaster area?
	2) Is there a pace of work in the area (team rotation)?
	3) How does the team monitor the safety and security conditions?
C2. Search	1) In what procedures does the team assess the situation to locate the victims ?
	2) How is the risk assessment carried out for the team during the research ?
C3. Rescue	1) What is the procedure followed by the team for the evaluation of the situation in order to locate the victims?
	2) Is there a security perimeter established during the site operation?
	3) What are the capacities of the team to cut, pierce and extract a victim?
	4) How does the team conduct an assessment of the work site to define priorities?
	5) Is there any evacuation and regrouping point set up for the team safety during the search?
C4. Medical	1) Does the medical team permanently monitor the USAR team at work?
	2) What is the role of the medical team in taking care of the victims?
	3) Does the medical team advice the USAR team in the area of chemical hazards?
C5. Logistics	1) Is there a base of operations installed?
	2) How do USAR operations are monitored by the logistics team (equipment, food, water, etc.) ?
D. DEMOBILISATION	
D1. Management	1) Is there a meeting organized by the team with the local authorities and the teams in charge of the coordination, before leaving the area?
	2) In international missions, is there a donation of equipment made to local teams?

	3) Is there a communication plan organised with the media before the disengagement?
D2. Search	1) Is there a transport preparation organised for the for K9 teams and equipment?
D3. Rescue	1) Is there a transport preparation organised for the for K9 teams and equipment?
D4. Medical	1) Does the medical team ensure an assessment of the local needs of medical structures before disengaging?
	2) Is there a donation of medical equipment made before the return?
	3) What monitoring has taken place in relation to the COVID risk?
D5. Logistics	1) Does the team take into account the transport of hazardous materials for the return?
	2) Is there a transport plan for the return of the team?
E. POST-MISSION	
E1. Management	1) Does each part of the team prepare a mission report?
	2) Is there a document «lessons to learn» prepared?
E2. Search	1) Does each part of the team prepare a mission report?
	2) Is there a document «lessons to learn» prepared?
E3. Rescue	1) Does each part of the team prepare a mission report?
	2) Is there a document «lessons to learn» prepared?
E4. Medical	1) What medical and psychological monitoring system for team members is being used?
	2) Does the team prepare a mission report?
E5. Logistics	1) Is there a plan for restoring equipment and preparing for a new mission?
	2) Does the team prepare a mission report?