



740575	FIRE-IN	D1.2 Report on current and future common capability challenges (CCCs and FCCCs) #1	Ref. Ares(2018)6674043 - 30/12/2018
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## Project Deliverable

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<b>Instrument:</b> COORDINATION AND SUPPORT ACTION	<b>Thematic Priority</b> H2020 SECURITY
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<b>Title</b> D1.2 Report on current and future common capability challenges (CCCs and FCCCs) #1
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<b>RE</b>	Restricted to a group defined by the consortium (including the Commission)	
<b>CO</b>	Confidential, only for members of the consortium (including the Commission)	





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FIRE-IN

D1.2 Report on current and future common capability challenges (CCCs and FCCCs) #1

**Abstract:**

In the first cycle of the project the associated experts of each task working group, i.e. “search & rescue & emergency medical response”, “structural fires”, “vegetation fires”, “natural disasters” and “CBRNE”, have identified the main challenges currently associated to their field of crisis response.

This document presents the commonalities in the challenges. They are arranged in capabilities related to four main common challenges:

- High flow of effort in hostile environment;
- Low frequency, high impact events;
- Multi-agency/multi-leadership environment;
- High level of uncertainty.

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## Executive Summary

The FIRE-IN project is an initiative funded by the European Commission and initiated on the 1st of May 2017. FIRE-IN has been designed to raise the security level of EU citizens by improving the national and European Fire & Rescue (F&R) capability development process. FIRE-IN addresses the concern that capability-driven research and innovation in this area need much stronger guidance from practitioners and better exploitation of the technology potentially available for the discipline.

The purpose of this report is to present the commonalities in the challenges identified by the experts in different fields of fire and rescue in Europe during the first cycle of the project. These common capability challenges will guide the screening of solutions and will found the research and development agenda to be developed at the European level in next programs.

**Table 1.** FIRE-IN partners

Participant No.	Participant organisation name	Part. short name	Country
1	Pôle de compétitivité SAFE CLUSTER (ex Pôle Pégase)	SAFE	France
2	Ecole Nationale Supérieure des Officiers de Sapeurs-Pompiers – French National Fire Fighter Officers Academy	ENSOSP	France
3	Italian Ministry of Interior	CNVVF	Italy
4	Bundesanstalt Technisches Hilfswerk	THW	Germany
5	Global Fire Monitoring Center	GFMC	Germany
6	INERIS Développement	INEDEV	France
7	Fraunhofer INT	FhG-INT	Germany
8	Fire Ecology and Management Foundation Pau Costa Alcubierre	PCF	Spain
9	Catalonia Fire Service Rescue Agency	CFS	Spain
10	Scientific and Research Centre for Fire Protection	CNBOP	Poland
11	The Main School of Fire Services	SGSP	Poland
12	Council of Baltic Sea States	CBSS	Sweden
13	Swedish Civil Contingencies Agency	MSB	Sweden
14	KEMEA	KEMEA	Greece
15	Czech Association of Fire Officers	CAFO	Czech Republic
16	inno TSD	inno	France





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## 1. Introduction

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FIRE-IN has been designed to raise the security level of EU citizens by improving the national and European Fire & Rescue (F&R) capability development process. The project addresses the concern that capability-driven research and innovation in this area need much stronger guidance from practitioners.

In a first cycle of the project's process, expert practitioners in the different fields of F&R were registered<sup>1</sup> throughout Europe. In February and March 2018, these experts participated in five thematic workshops:

- a. Search and Rescue (SAR) and Emergency Medical Response (EMR).
- b. Structure fires crisis mitigation, prevention and protection.
- c. Vegetation fires crisis mitigation.
- d. Natural Disasters crisis mitigation.
- e. CBRNE crisis mitigation.

These workshops followed a structured method so that the experts identified the capability gaps from crisis scenarios established by the workshops facilitators<sup>2</sup>.

When considering the results of the workshops, commonalities appeared; they are called Common Capability Challenges (CCCs). As these CCCs are expected to pave the way for the next stages of FIRE-IN, i.e. the existing solution screening and the request for ideas to research and industry, their wording has to fit with commonly accepted challenges. Therefore, we looked at linkages between CCCs identified in FIRE-IN and challenges already pointed out by other structuring initiatives such as the Sendai framework<sup>3</sup> or the International Forum to Advance First Responder Innovation (<https://internationalresponderforum.org/>).

The first part of this deliverable displays the results of the five thematic workshops. The second part of the deliverable presents how we organized the results in Common Capability Challenges (CCCs). The third part establishes the linkages with other structuring initiatives.

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<sup>1</sup> Sébastien Lahaye, 'Fire-In D4.2 Annual Report on Interaction with Practitioners and Existing Networks and Dissemination Conference #1' (Safe cluster, 30 April 2018).

<sup>2</sup> Isabel Linde-Fresh et al., 'Fire-In D1.1 FIRE-IN Framework' (Fraunhofer INT, 28 February 2018).

<sup>3</sup> UNISDR (United Nations International Strategy for Disaster Reduction), 'Sendai Framework for Disaster Risk Reduction 2015–2030.', 2015.





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## 2. First cycle thematic workshops results

In February and March 2018, the thematic working group leaders of FIRE-IN organized five thematic workshops with associated experts to gather capability gaps. The framework<sup>4</sup> used the *World Café Method* ([www.theworldcafe.com/key-concepts-resources/world-cafe-method](http://www.theworldcafe.com/key-concepts-resources/world-cafe-method)) and the ACRIMAS project terminology<sup>5</sup>.

This part describes the results of the workshops.

### 2.1. Search and Rescue and Emergency Medical Response

12 associated experts, supported by 8 moderators and 6 observers met in this workshop, organized by the Catalan Fire Service (CFS) in Barcelona on 21<sup>st</sup>-23<sup>rd</sup> March 2018. The full results are presented in Appendix 1.

The two scenarios built by CFS to induce gaps assessment were:

- An air crash with multiple victims in a remote location near the border of two countries,
- Search and Rescue in a cave and for lost people in a mountainous area.

For the first scenario, the experts decided to discuss difficulties regarding i) *Coordination, Command and Control* (with a focus on civil-military co-operation); ii) *Logistics*; iii) *Training and Exercise*.

For the second scenario, the experts focused on i) *Coordination, Command and Control*; ii) *Situation assessment*; and iii) *Training and Exercise*.

### 2.2. Structure fires crisis mitigation, prevention and protection

14 associated experts, supported by 13 FIRE-IN partners' representatives, met in this workshop, organized by the Italian Ministry of Interior, Corpo Nazionale dei Vigili del Fuoco (CNVVF) in Roma on 12<sup>th</sup>-14<sup>th</sup> February 2018. The full results are presented in Appendix 2.

The two scenarios built by CNVVF to induce gaps assessment were:

- A high rise building fire,
- A tunnel fire.

For the first scenario, the experts decided to discuss difficulties regarding i) *Coordination, Command and Control*; ii) *Situation assessment*; iii) *Training and Exercise*.

For the second scenario, the experts focused on i) *Coordination, Command and Control*; ii) *Doctrine / Procedures development*; and iii) *Training and Exercise*.

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<sup>4</sup> Linde-Fresh et al., 'Fire-In D1.1 FIRE-IN Framework'.

<sup>5</sup> Dirk Stolk et al., 'ACRIMAS D5.1 Approaches and Solutions' (TNO, 23 April 2012), [https://www.acrimas.eu/attachments/article/5/D5-1\\_ACRIMAS\\_report\\_Approaches\\_Solutions.pdf](https://www.acrimas.eu/attachments/article/5/D5-1_ACRIMAS_report_Approaches_Solutions.pdf).





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## 2.3. Vegetation fires crisis mitigation

13 associated experts, supported by 12 FIRE-IN partners' representatives, met in this workshop, organized by the Global Fire Monitoring Center (GFMC) in Berlin on 28<sup>th</sup> February – 1<sup>st</sup> March 2018. The full results are presented in Appendix 3.

Prior to the workshop, GFMC requested that all the attendants provide national data on landscape fires mitigation policies. Accordingly to the results, the two scenarios built to induce gaps assessment were:

- A complex and aggressive wildfire in a peri-urban area,
- Landscape vulnerability mitigation (policy, prevention and preparedness).

For the first scenario, the experts decided to discuss difficulties regarding i) *Coordination, Command and Control*; ii) *Community Awareness Rising*; iii) *Situation assessment*.

For the second scenario, the experts focused on i) *Supply of basic services to enable crisis management*; ii) *Policy making*; and iii) *Capacity building and Training and Exercise*.

## 2.4. Natural disaster crisis mitigation

14 associated experts, supported by 13 FIRE-IN partners' representatives, met in this workshop, organized by the Bundesanstalt Technisches Hilfswerk (THW) in Berlin 26<sup>th</sup>-27<sup>th</sup> February 2018. The full results are presented in Appendix 4.

The two scenarios built by THW to induce gaps assessment were:

- Floods,
- Flash floods.

For the first scenario, the experts decided to discuss difficulties regarding i) *Situation assessment, Monitoring / Information gathering*; ii) *Doctrine / Procedure development*; iii) *Training and Exercise*.

For the second scenario, the experts focused on i) *Coordination, Command and Control*; ii) *Doctrine / Procedures development* (with a special focus on first responders safety); and iii) *Community Awareness Rising*.

## 2.5. CBRNE crisis mitigation

13 associated experts, supported by 7 FIRE-IN partners' representatives and one observer from the eNOTICE European Project, met in this workshop, organized by the Czech Association of Fire Officers (CAFO) in Rome on 14<sup>th</sup>-16<sup>th</sup> February 2018. The list of attendants is presented in Appendix 5; the full results are not presented there to preserve confidential issues.

The two scenarios built by CAFO to induce gaps assessment were:

- Accident of CBRNE substances during their transport,
- Use of CBRNE substances in a terrorist attack.

For the first scenario, the experts decided to discuss difficulties regarding i) *Coordination, Command and Control*; ii) *Situation assessment*; iii) *Training and Exercise*.





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For the second scenario, the experts focused on i) *Situation assessment*; ii) *Information management and distribution*; and iii) *Monitoring / Information gathering*.

## 3. Common Capability Challenges (CCCs)

### 3.1. Commonly chosen tasks

Although the methodology suggested 13 different supporting and preparatory tasks to investigate<sup>6</sup> throughout the 10 scenarios in the 5 workshops, the experts focused on a common set of these tasks (Table 2).

**Table 2.** Tasks investigated

Task from the framework	Number of selection in the 10 scenarios
Coordination command & control	7
Situation assessment	7
Training & exercises	6
Doctrine, procedures development	3
Community awareness raising	3
Supply of basic services to enable crisis management	1
Policy making	1
Information management & distribution	1
Logistics	1

As a result, we can state that the tasks mentioned in the upper part of Table 2 are at the basis of Common Capability Challenges.

### 3.2. Matrix of CCCs

Integrating the full results of the five workshops (cf. Appendix 1-5), it appeared that the common points could be organized in four generic challenges and seven main capabilities.

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<sup>6</sup> Linde-Fresh et al., 'Fire-In D1.1 FIRE-IN Framework'.





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### 3.2.1. Four generic challenges

The challenges identified in the workshops were all related to one of the following themes:

#### **High flow of effort in hostile environment**

- ✓ A fast arrival and the capacity of sustaining efforts in time is key.
- ✓ There is a need to work inside a hostile environment, and to organize efforts from outside.
- ✓ A bottleneck is to maintain operative effort in time.

#### **Low frequency, high impact events:**

- ✓ These events are emergencies that exceed firefighter's capacities and have a high impact on the society.
- ✓ Low Frequency means very few opportunities to acquire and maintain the needed expertise. Fragmentation of fire services reduces expertise.
- ✓ A bottleneck is to develop capabilities in fire services and in the society.

#### **Multi-agency/multi-leadership environment:**

- ✓ There are often multiple decision-makers (=leaderships) at different levels and from various agencies, with overlapped competences. Sometimes there are also unknown and unclear stakeholders.
- ✓ There are complex integration of interests, decision-making levels, communication system, cultures, languages...
- ✓ A bottleneck is to integrate the decision-making in short time at different scales and levels focusing on strategic objectives.

#### **High level of uncertainty**

- ✓ Dynamic, unexpected risks and opportunities are emerging in a large area.
- ✓ High flow of new incidents that overcome the available resources; changes in situations exceed the communication capacities.

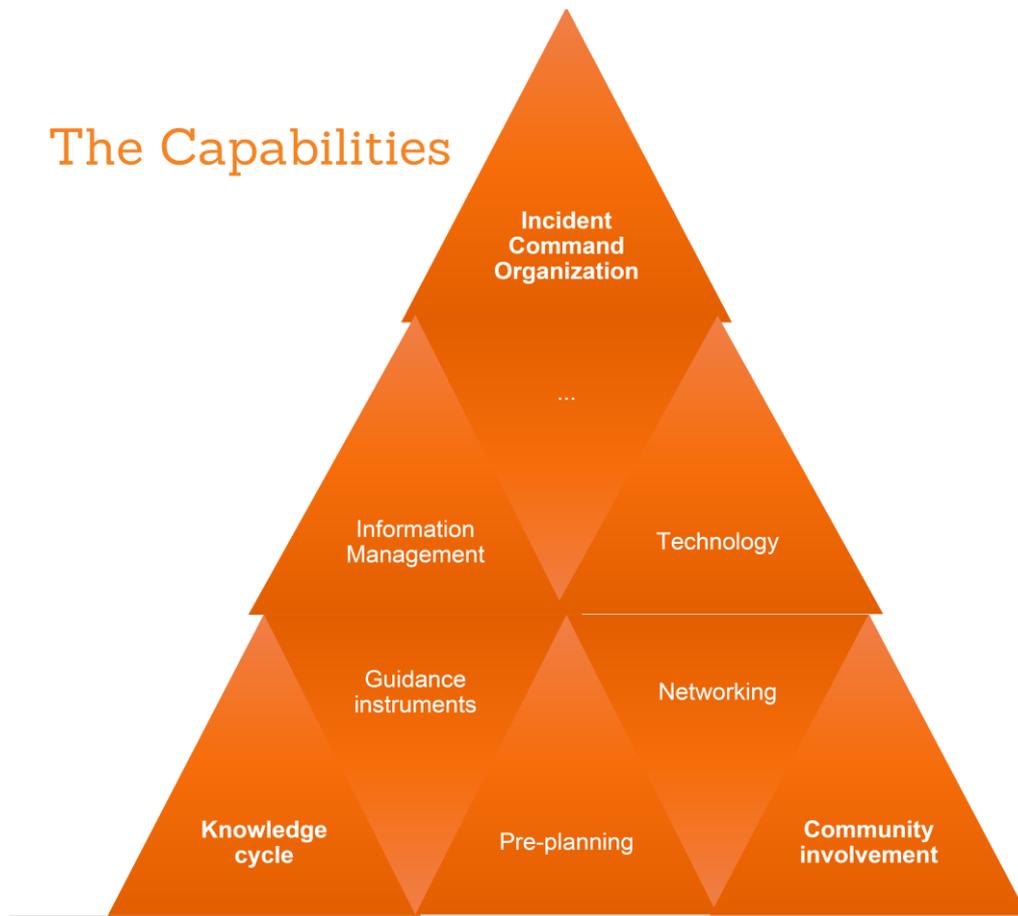
### 3.2.2. Seven main capabilities

The challenges also refer to one (or several) of the seven following capabilities:

- Pre-planning
- Guidance instruments
- Incident Command Organization
- Knowledge cycle in the fire service
- Information management
- Community involvement
- Technology

These seven capabilities interact in several ways. Figure 1 suggests that the interactions are in a triangle.





**Figure 1.** Capabilities interactions organised in a triangle. The lacking capability to close the triangle may be “Human factors”.

### 3.2.3. Simplified matrix of CCCs

Crossing the generic challenges with the main capabilities produced the generic matrix (Table 3).



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**Table 3.** Simplified matrix of Common Capability Challenges

	High flow of effort in hostile environment	Low frequency, high impact	Multi-agency / multi-leadership environment	High level of uncertainty
Incident Command Organization	Focus on sustainability of safe operations	Prioritize the reduction of vulnerability and increase interactions with the public	Distribute decision-making	Strategies choosing safe scenarios, and maintaining credibility
Pre-planning	Pre-plan a time-efficient, safe response	Negotiate solutions with stakeholders for anticipated scenarios	Plan interoperability and enhance synergies	Focus on governance and capacity building towards more resilient societies
Guidance instruments	Establish procedures and guides	Standardize capabilities in front of pre-established scenarios.	Establish an interagency framework	Build doctrine for resilience in emergency services and societies
Knowledge cycle	Train specific roles	Learn about possible scenarios focusing efforts in key risks and opportunities	Build a shared understanding of emergency and train interagency scenarios	Focus on integral risk management
Information management	Information cycle.	Manage key information focused on decision-making	Define common information management processes between agencies.	Provide an efficient, flexible flow of information for a shared understanding
Community involvement	Develop public self-protection to minimize responders exposures	Prepare population for the worst scenario before it happens.		Cultural changes in risk tolerance and resilience
Technology	Use technology to assess risks and minimize responder's engagement	Simulate complex scenarios	Technological tools to support data sharing	Get a clear picture of the risk evolution





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### 3.2.4. Full matrix of CCCs

A detailed description of each CCCs defined in the generic matrix (Table 3) is given in Appendix 6. There are also keywords used by the experts in the workshops as illustration of these CCCs.

## 4. FIRE-IN CCCs in regard of other perspectives

Whereas the CCCs described above have been worded by European experts, i.e. responders, other international initiatives have already established challenges related to Fire and Rescue capabilities. We investigate here the relation between the CCCs described in FIRE-IN and:

1. The Sendai framework for disaster risk reduction;
2. The International Forum to Advance First Responder Innovation.

### 4.1. The Sendai framework

The Sendai framework for disaster risk reduction was adopted at the Third UN World Conference in Sendai, Japan, in 2015<sup>7</sup>. It defines the main challenges and goals to achieve to reduce both natural and man-made hazards at different levels, from local to international.

Within the 50 articles comprised in the document, the following ones particularly refer to CCCs identified in FIRE-IN:

- Article 6 mentions “poor land management”, “weak institutional arrangements”, “improving preparedness and national coordination”;
- Article 7 mentions “Governments should engage with relevant stakeholders”;
- Article 8 mentions “transboundary cooperation”;
- Article 19 mentions “all-of-society engagement”, “coordination mechanisms”, “open exchange and dissemination of disaggregated data”, “strengthening of international cooperation”;
- Article 24 mentions “promote the collection...of relevant data...and ensure its dissemination”, “communities...education and training”, “strengthen technical and scientific capacity to capitalize”;
- Article 25 mentions “strengthen the utilization of media, including social media”;
- Article 27 mentions “urban planning, building codes”;
- Article 33 mentions “disaster preparedness and contingency”, “emergency communications mechanisms”, “response and recovery exercises, including evacuation drills”;
- Article 34 mentions “coordinated regional approaches”, “standards, codes, operational guides and other guidance instruments”, “common exercises and drills”.

It is worth noting that this list of nine articles and the wordings associated are not exhaustive. Although other articles also refer to the FIRE-IN CCCs, the nine above might cover all the spectrum.

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<sup>7</sup> UNISDR (United Nations International Strategy for Disaster Reduction), ‘Sendai Framework for Disaster Risk Reduction 2015–2030.’





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## 4.2. The International Forum to Advance First Responder Innovation (IFAFRI)

The International Forum to Advance First Responder Innovation (IFAFRI) is an organization of international government leaders from 13 countries and the European Commission, focused on enhancing and expanding the development of new technology for first responders worldwide (<https://internationalresponderforum.org/>). The term “first responders” refers to agents who respond in the early stages of an incident and includes firefighters, policemen and emergency services staff.

IFAFRI has currently defined four key challenges:

1. The ability to know the location of responders and their proximity to risks and hazards in real time
2. The ability to detect, monitor and analyse passive and active threats and hazards at incident scenes in real time
3. The ability to rapidly identify hazardous agents and contaminants
4. The ability to incorporate information from multiple and non-traditional sources (for example, crowdsourcing and social media) into incident command operations

## 4.3. Matrix of CCCs / Sendai framework and IFAFRI

Wording to describe the same thing can be different from one community to another, i.e. the same challenge here. Therefore, the following matrix (Table 4) relates CCCs with Sendai framework articles and IFAFRI challenges when it is relevant.





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**Table 4.** Common Capability Challenges / Sendai framework and IFAFRI. *Sendai XX refer to articles of the Sendai framework and IFAFRI X refer to one of the four IFAFRI challenges.*

	High flow of effort in hostile environment	Low frequency, high impact	Multi-agency / multi-leadership environment	High level of uncertainty
Incident Command Organization	Focus on sustainability of safe operations	Prioritize the reduction of vulnerability and increase interactions with the public <b>Sendai 7, 19, 33</b>	Distribute decision-making	Strategies choosing safe scenarios, and maintaining credibility
Pre-planning	Pre-plan a time-efficient, safe response <b>Sendai 6, 8, 19, 24, 27, 33, 34</b>	Negotiate solutions with stakeholders for anticipated scenarios <b>Sendai 6, 7, 19, 24, 27, 33</b>	Plan interoperability and enhance synergies <b>Sendai 8, 19, 34</b>	Focus on governance and capacity building towards more resilient societies <b>Sendai 7, 24, 33</b>
Guidance instruments	Establish procedures and guides <b>Sendai 34</b>	Standardize capabilities in front of pre-established scenarios. <b>Sendai 34</b>	Establish an interagency framework <b>Sendai 8, 19, 34</b>	Build doctrine for resilience in emergency services and societies
Knowledge cycle	Train specific roles	Learn about possible scenarios focusing efforts in key risks and opportunities <b>Sendai 24</b>	Build a shared understanding of emergency and train interagency scenarios <b>Sendai 8, 19, 24, 33, 34</b>	Focus on integral risk management <b>Sendai 33</b>
Information management	Information cycle. <b>Sendai 24</b> <b>IFAFRI 4</b>	Manage key information focused on decision-making <b>IFAFRI 4</b>	Define common information management processes between agencies. <b>Sendai 19, 24</b>	Provide an efficient, flexible flow of information for a shared understanding
Community involvement	Develop public self-protection to minimize responders exposures <b>Sendai 27, 33</b>	Prepare population for the worst scenario before it happens. <b>Sendai 7, 24, 25, 33</b>		Cultural changes in risk tolerance and resilience <b>Sendai 7, 19, 24, 33</b>
Technology	Use technology to assess risks and minimize responder's engagement <b>IFAFRI 1, 2, 3</b>	Simulate complex scenarios <b>IFAFRI 4</b>	Technological tools to support data sharing	Get a clear picture of the risk evolution <b>IFAFRI 1</b>





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## Appendix 1: TWG A, Search and Rescue and Emergency Medical Response



**Participants**

### Associated Experts

Name	Organization
Sebastien Mayrgündter	Alpine Safety of IDM Südtirol
Alberto Ayora	Spanish army
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Asencio Renaud	Nimes Hospital
Oscar Lopez	Firefighters of Andorra
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Agavi Christina Kousouraki	Hellenic Air Force 384 Search and rescue (SAR) Squadron
Iñigo Ayllon Navarro	AD MONTEM
Elías Bayarri García	Firefighters of Cantabria

#### Moderators

Name	Organization
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Sebastien Lahaye	SAFE
Anna Fontcuberta	CFS
Mathilde Julie Meyer	ENSOSP
Joaquim Boigues Firth	CFS
Giorgio Basile	CNVVF
Andrea Bonetto	CNVVF
Marta Miralles	CFS

#### Observers / Others

Name	Organization
Siscu Carola	CFS
Guillem Amorós	CFS
Sylvie Jouve	ENSOSP
Mariona Borràs	PCF
Òscar Santos	Firefighters of Andorra
Rafel Prades	PC





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### FIRE-IN WP 1 Workshop Implementation Reporting Template

Title:	Workshop TWG A (2 <sup>st</sup> topic)
Document version:	e.g. v0
Workshop dates and location:	Barcelona, 21 <sup>th</sup> -23 <sup>th</sup> March 2018
Workshop participants and affiliation	See page 1
Submission date:	
Submitted by:	Claudi Gallardo I Jordi Pagès (CFS)
Reviewed by:	Carles Garcia (CFS) i Marta Miralles (CFS)

#### Background

##### “AIR CRASH” Scenario.

##### Performing a big search & rescue operation in natural environment

In the event of a huge emergency situation with multiple victims (such a plane crash in the mountains) in a remote/difficult accessible place and near the border of two countries logistic becomes a key factor for the emergency management. This scenario offers a wider range of logistic opportunities counting on two countries to be the suppliers, while in the other hand makes the language and the fact of having different communication system/network issues become a problem.

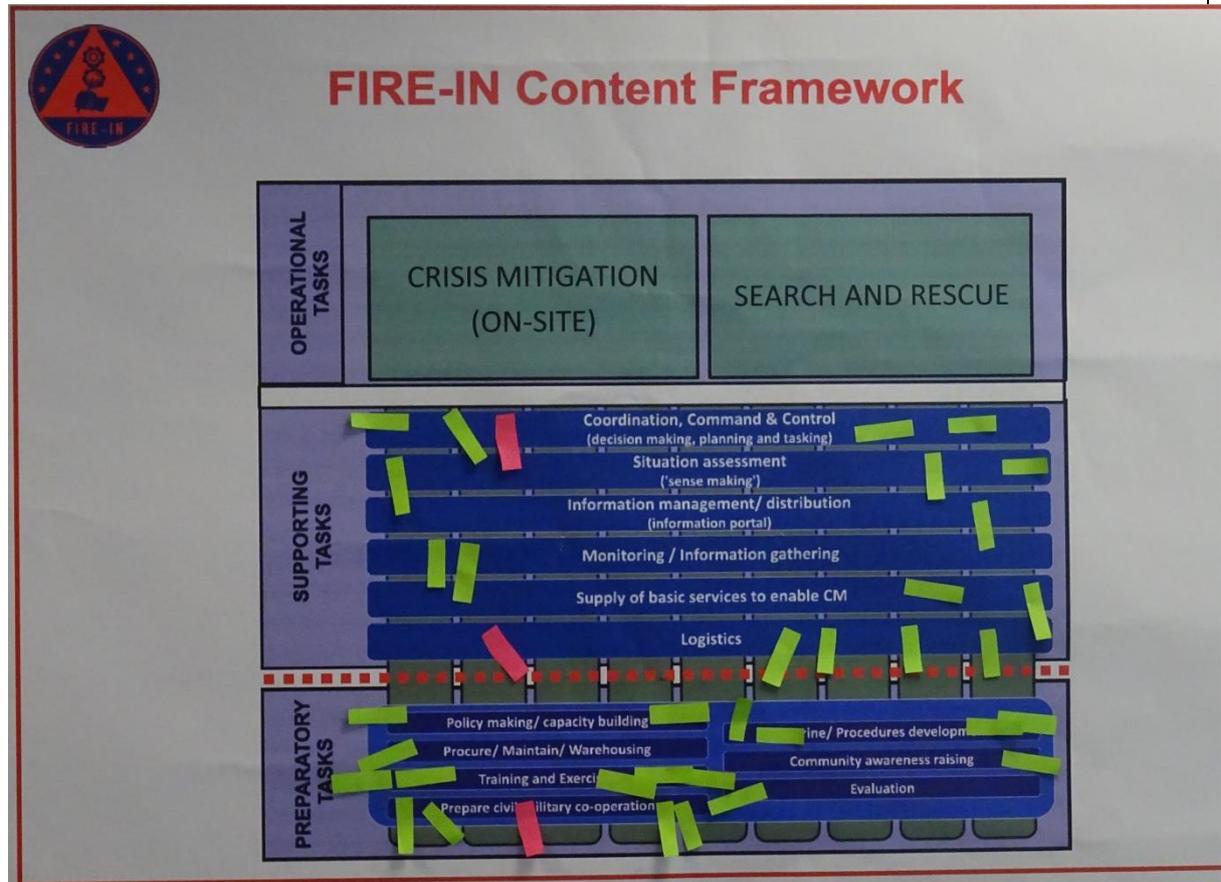


Figure 1: Framework

The following items have been selected:



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### Supporting/Preparatory

- Operational Task #1: Crisis Mitigation on site
- Operational Task #2: Search & Rescue S.A.R.
  
- **Supporting task– Coordination, Command & Control + (preparatory task) Prepare civil-military co-operation**
- **Supporting task– Logistics**
- **Preparatory task -Training and Exercises**

Operational tasks		Crisis Mitigation (on-Site)	Search and rescue	and
Supporting tasks	Coordination, Command & Control		3	2
Supporting tasks	Situation assessment		1	2
Supporting tasks	Information management / distribution		0	1
Supporting tasks	Monitoring / Information gathering		2	0
Supporting tasks	Supply of basic services to enable CM		0	2
Supporting tasks	Logistics		1	4
Preparatory tasks	Policy Making / Capacity building		1	1
Preparatory tasks	Procedure /Maintain / Warehousing		1	0
Preparatory tasks	Training and Exercises		2	3
Preparatory tasks	Prepare civil-military co-operation		3	2
Preparatory tasks	Doctrine / Procedures development		2	2
Preparatory tasks	Community awareness raising		0	1
Preparatory tasks	Evaluation		1	0

### Improvement opportunity / Capability Challenge:

#### Operational Task: Crisis Mitigation on site and S.A.R.

#### Preparatory task “Training and exercise”

- Local resources can't be specialized in this kind of incident. But they must have the capacity to integrate themselves under a complex structure.
- Because of the number of accidents are little it will be difficult to have enough experts in this kind of resource
- Perform drills and exercises:
  - Simulations must be carried out to train the flow of information between the airport and the responders.
  - Difficult to train in this kind of incidents it's very expensive.
- Training to:
  - Different steps of the crisis to train separately





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- Localization of the place of incident
- Give information to the press
- Bring the medical system to the place of the accident PMA
- Knowledge:
  - Of persons and flight
  - Of equipment
- A very quick response is needed to minimize the number of victims:
  - You need to quickly making a “big picture” of the scenario
  - To reserve the airspace
  - To have a weather forecasts
- Cooperation between different agencies
  - Liaison officer
  - Training together to coordinate the act zones
  - Cooperation with different agencies (military) sharing exercises
- Medical training:
  - The medical team has to be the included in the training. They are a necessary crew of these teams.
  - Pre-hospital procedures have to be knows to the all agencies
  - Training incident with members of the victims to understand the long of the cycle of the evacuation. Most causality in a mountain
- 3 levels for the natural of accidents
  - Simple first command
  - Complex officer + chain
  - Director of firefighters

#### **Training of command & control organizations (multi-level, cross-agency and/or Cross-border)**

- Training of specialised rescuers who have to be skilled in :
  - Triage system
  - Locating systems (quick location of the Aircraft is very important)
  - Speaking the same language with a unified terminology
  - Understanding which info is (or not) important
- Finding proper training scenarios or drills:
  - Using tools (Apps, reality games, ...)
  - « Table » drills to help understanding and training the info and orders flow; to train decision making, ...)
  - That can help preplanning programs
- Bring medical systems into the drills:
  - Share medical information in preplanning different scenarios
  - Share medical knowledge about the hospital needs and limitations
  - Training pre hospital delivering
  - Specific medical training is required for very long and very slow evacuations
- Interagency training and inventory (not everyone is prepared to rescue others at 2200 m. high)

#### **Supporting task "Coordination Command & Control (Supporting) + Prepare Civil-Military cooperation (preparatory)"**

- Interoperability among all stakeholders
  - Coordination of cross border team rescue.
  - Translator for best communication (Common Vocabulary)





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- Location:
  - The plane. It is so difficult.
  - The dead with this kind of situations.
- Deploy the responders
  - Safety operations for team rescue
  - Timing ( fast answers )
  - Medical assistance
  - Rescuer
  - Info from medical team to alert the pertinent hospital
  - Military medical coordination
  - To use Triage System.
  - Different level of Command Control
- Preparing and positioning:
  - Bring the equipment in advance in an available point of support (example a "Chalet")
  - Bring the medical system to the place of the accident PMA
- Legal Aspect:
  - (Civil/Penal investigation – black-box)
  - Legal regulation to transport body victims across different countries ( military would be best choice - major equipment )
- Media relation / Media plan ( understanding )
- Company call centre for victims family
- To made the Pre-plan for different scenarios and different agencies (police, hospital, rescue team, fire service, civil protection...).
  - Airplane company procedure
  - Prepare procedure accepted before
- Interoperability
- Aero space supervisor (example by drones)
- Leadership and Cooperation Multi-Agency of different agencies in different countries
- Coordination procedures each country
- Area Assessment
- Program landing and take-off zone

#### **Supporting task– "Logistics"**

- Identify 3 scales of logistic needs:
  - Local on the emergency's site (advanced camp/shelter for rescuers, victims and for medical dispatching).
  - Regional (hospital network availability, accommodation for victim's families and management of the media).
  - National/international (solve bureaucratic issues such insurances, costs)
- Long-lasting emergency management needs accurate weather forecast for preparing the logistics.
- The commandment roles, figures and chain should be agreed in advance, standardized and clear.
- Different languages spoken and not compatible communication systems for the agencies impede fluent exchange of information between agents and communication rescuers-victims.





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- Extra emergency-trained personnel and material needed, may need to rely on the army or civil agencies such as Red Cross

#### **Constraints / Best practices**

- Use real environment for the exercises (on site) with associated partners (official teams, volunteers agencies)
- Procedures should ensure the maximum safety for fire-fighter and rescue team response.

#### **Supporting task– "Logistics"**

- Need of pre-prepared logistics in order to build a camp on the scenery for working agents, victims and medical dispatching in the fastest possible way.
- Crucial transportation needs (by helicopter) of heavy equipment and personnel to the site and victim evacuation.
- Use of helicopters is conditioned to weather conditions, daylight and amount of weight to be transported. Commanders may want to get help from the army on that issue. Have a flight coordinator out of flying supervising the helicopter's work.
- Commander must have a B plan if flying on the area is not possible
- 
- Need for a translator (translating technological tools discarded) to ease communication between agencies, working teams and victims, or must have multi-lingual acting personnel.
- 
- Need of the availability of psychological support on site for rescuers and victims and for the families wherever needed it.
- 
- Have pre-prepared logistic packs ready to be picked up and used for this kind of emergency situation spread over the territory in strategical locations.
- 
- Contention of the media and outside observers out of the emergency area
- Need for standardized chain of commandment(protocols) for the event of an emergency requiring the intervention of more than one country

#### **Training & exercises**

##### **Training of Command & control organizations (multi-level, cross-agency and/or cross-border)**

#### **Best practices:**

- Red cell to train flexibility
- Every agency has to stay focus in its own expertise
- **Creating not only national Learning schools in disaster management , but European SCHOOL**
- Virtual training / simulation training / self-training (computer aided training)
- Supervising the exercises (overview) (trained evaluators)

#### **Added during the presentation :**

- To design exercises with evolved transfer of command scenario: bottom-up and top-down
  - Multiple European Schools dedicated to disaster management (University) with :
  - Different countries / skills / agencies stakeholders / Creation of a network of experts that know each other

#### **Constrains:**





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- Time & money for exercises / Dealing with different nationalities & culture/ national sovereignty / Standardization & harmonization

### **The opportunity from different perspectives**

#### *Procedures and Organisation:*

#### **Preparatory Task: Supporting/Preparatory Task #1+Task#2**

#### **"Coordination Command & Control (Supporting) + Prepare Civil-Military cooperation (preparatory)"**

- Interoperability
- International Coordination and Cooperation Multi-Agency
- Identify who gives orders at the different level and specific situation
- Clear and shared procedures, reachable goals (Know How/What )
- Specific training of the operating room staff (protocols)
- Continue Reevaluation decision process at each level
- Collection information format (database sharing) and Info-management

#### **Logistics**

Develop joint strategies, and standardized procedures among bordering countries. Commandment chain to be clear.

Create a unified communication system for all UE rescue organizations. If it's not possible all across the EU, at least for bordering countries.

Have standardized packs of logistics prepared and ready to be transported for this kind of emergency stored in key locations of every country. Rely on army and civil agencies' logistics capacity also.

Drills, simulations, joint training between bordering countries will improve the understanding of different working methods and procedures.

#### **Training & exercises**

#### **Training of Command & control organizations (multi-level, cross-agency and/or cross-border)**

- Harmonized procedures & cooperation during services & drills (tests)
- New technology procedures
- Leadership of the organization of trainings, (UE)
- Writing down guidelines for different level of exercises :
  - Local, regional, national, international
  - Different stakeholders

#### *Personnel:*

#### **Preparatory Task: "Coordination Command & Control (Supporting) + Prepare Civil-Military cooperation (preparatory)"**

- Command standardized international level (course, exercise, training)
- Glossary of command & control
- Different level - different number of personnel involved
- Every member and agency should have an appropriate goal to reach
- Specific dressing identification
- Ability to find information (simulation)
- Task certification (level operations)
- Checklists evaluations





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### **Logistics**

This opportunity is essentially about efficiently improving personnel skills and abilities.

### **Training & exercises**

#### **Training of Command & control organizations (multi-level, cross-agency and/or cross-border)**

- Specialists in lessons learned procedures & dissemination
- Social skills to interact between different agencies
- Liaison officers
- End listing roles in drills
  - Advisers, observers, experts, victims
- Safety officers (risks management)

### *Equipment & Tools / Technologies:*

#### **Preparatory Task: "Coordination Command & Control (Supporting) + Prepare Civil-Military cooperation (preparatory)"**

- Translator
- European main channel network (Radio) (as in the aviation field)
- Technology Equipment for searching in extensive areas (Geo-Localization, GPS, drone)
- Personal Camera

### **Logistics**

Create opportunities for distributed joint training

### **Training & exercises**

#### **Training of Command & control organizations (multi-level, cross-agency and/or cross-border)**

- Inter-operability of specialized equipment
- New technological Tools
  - Mapping
  - Sensors
  - AI (Artificial Intelligence)
  - Google glasses
  - Virtual basic system

### **Related/Other opportunities:**

- Solving rescue team communication
- Radio network innovation
- Leadership responsibility

### **Further questions:**

As identified by your TWG.

### **Keywords:**

- Interoperability
- Shared procedures
- International Coordination and Cooperation Multi-Agency
- Command standardized international level (courses, exercises, trainings)
- Appropriate and realistic T&E
- Communication





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- New technologies
- Training
- Unified communication
- Network
- Joint trainings
- Collaboration
- Cross-border cooperation





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<b>FIRE-IN WP 1 Workshop Implementation Reporting Template</b>	
<b>Title:</b>	Workshop TWG A (1 <sup>st</sup> topic)
<b>Document version:</b>	e.g. v0
<b>Workshop dates and location:</b>	Barcelona, 21 <sup>th</sup> -23 <sup>th</sup> March 2018
<b>Workshop participants and affiliation</b>	See page 1
<b>Submission date:</b>	
<b>Submitted by:</b>	Claudi Gallardo I Jordi Pagès (CFS)
<b>Reviewed by:</b>	Carles Garcia (CFS) i Marta Miralles (CFS)
<b>Background</b>	
<p><b>“CAVE” Scenario and “S.A.R” Scenario.</b></p> <p><b>Planning a campaign of search &amp; rescue in a mountain area.</b>  The workshop was focused in preparing, coordinating and responding to a season of search &amp; rescue operation in natural environment. Emergencies are time-constrained, require highly specialized skills, materials, logistics; the most important issues are the difficulty to access and the bad communication. Environmental conditions are hostile for rescuers and victims. More specifically, in the Workshop we described a rescue and medical emergencies operations in a cave and a search of lost people in the countryside...</p> <p>Situation assessment in the framework of a search and rescue emergency is quite difficult to be defined as a clear and specific task due to the existence of many variable/changing assessment issues that can influence the evolution of the scenario such as:  Weather conditions/evolution, technical difficulties reaching the victims, time constraint/duration of the emergency, ongoing change in logistic needs.  Due to the remote location of the scenario it may also be probable that the commander can't get there and therefore needs to rely on the information provided by the rescue team.  The chief commander has to accept that a clear picture of the situation is difficult to be made.</p>	





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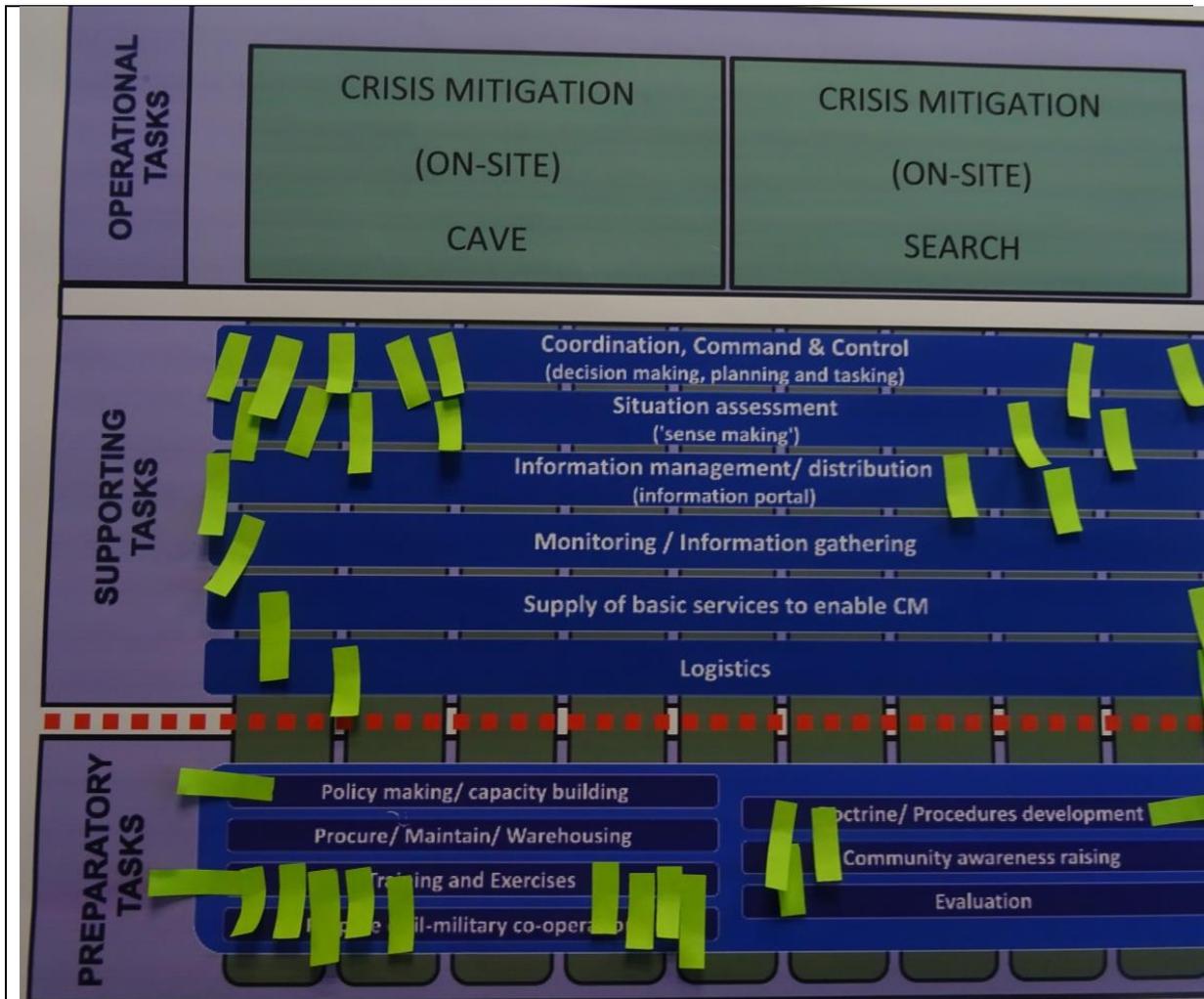


Figure 2: Framework

The following items have been selected:

- Supporting task #1 – Coordination, Command & Control
- Supporting task #2 – Situation assessment
- Preparatory task #3 -Training and Exercises

Operational tasks	Crisis Mitigation (on-Site)	Search and rescue	
Supporting tasks	Coordination, Command & Control	5	2
Supporting tasks	Situation assessment	4	2
Supporting tasks	Information management / distribution	1	2
Supporting tasks	Monitoring / Information gathering	1	0
Supporting tasks	Supply of basic services to enable CM	1	1
Supporting tasks	Logistics	1	1
Preparatory tasks	Policy Making / Capacity building	1	0
Preparatory tasks	Procedure /Maintain / Warehousing	0	0





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Preparatory tasks	Training and Exercises	6	4
Preparatory tasks	Prepare civil-military co-operation	0	0
Preparatory tasks	Doctrine / Procedures development	2	1
Preparatory tasks	Community awareness raising	1	0
Preparatory tasks	Evaluation	0	0

**Improvement opportunity / Capability Challenge:**

**Supporting task #1 – Coordination, Command & Control**

Decision-making, planning and tasking activities at different coordination and command levels involved in managing a crisis event;

Main challenges

- Team's CAPABILITIES (are FR (first responders) correctly trained?)
- Having COORDINATING PROCEDURES (among agencies or institutions)
- Common language (is there a unified TERMINOLOGY?)
- PERSON IN CHARGE clear communication of what has to be done: (orders, procedures...)
- LEADING different agencies
- Experts Network DATABASE (contacting experts, initial FR, ... ?)
- ANTICIPATION (having an idea about what, when .... we need resources)
- Making a «big picture» of the situation & dispatching teams
- MAPPING reporting & Command TRANSFER
- POLITICAL management (do politicians know what's needed to do ?)
- Mass Media & Legal advice (do we know what to say and when to report it?)

Improvement opportunities

- Must be established:
  - a Common commanding post (coordination)
  - Communication «awareness»
    - Special Communication techniques
    - Reliability communication
- Operational procedures STANDARDIZATION
- Dedicated + inter-organisation training programs
- Dedicated + inter-organisation logistics programs

**Supporting task #2 – Situation assessment**

- Need to optimize the first call response to the emergency 112 (must collect and give out the right information). Make sure this information gets to all the agents involved.
- Need for an optimum information sharing between agencies involved by the creation of a common coordination centre where they can work together on the situation assessment.
- Crucial to have a good database accessible to all agencies involved.
- Important to have a good network of local specialized agents/contacts.
- Need for a Good communication network between commander/rescue team.





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- Create two approaches of the scenario, thinking of the most possible scenario and of the most dangerous scenario and how to undertake each one.

### **Preparatory task #3 -Training and Exercises**

#### **"CAVE" Scenario**

- Communication (between team members inside and coordinator outside)
- Different level of training and exercises:
  - Operational (more specialized technique)
  - Management (coordination approach)
- Training on Real site (Cave) with less people
- Knowledge and Training about different kind of Caves
- Equipment specialized for different kind of Caves

#### **"S.A.R." Search and Rescue Scenario:**

- Communication (between teams and coordinators)
- Different level of Training and Exercises:
  - Operational (more knowledge about search)
  - Management (Coordination approach)
- Training on real site with more people
- Knowledge of Geographic site
- Technology Equipment for searching in extensive areas (Geo-Localization, GPS, drone)

#### **BOTH "Cave + S.A.R." Scenarios:**

- Human Factors ( Human resources management)
- Guide Lines & Procedures + Standardization
- Briefing and Debriefing
- Lesson Learned
- Risk evaluation assessment
- Assessment of victims
- The training of the medical personnel must be the same as the training of the rescuers => To be able to be included in the rescue team.

### **Constraints / Best practices**

#### **Supporting task #1 – Coordination, Command & Control**

- There are very important differences in the distribution of rescue competences in the natural environment, in each one of the regions of Europe.

#### **Supporting task #2 – Situation assessment**

- Communication network may not be good due to the characteristics of the terrain or to bad weather.
- Have clearly standardized procedures for each emergency scenario.
- Good communication network needed between commander/rescue teams
- The commander needs continuous feedback/information from the rescue team in order to decision-making.
- Commander needs to rely on and trust the decision-making capabilities of the rescue team.
- Legal constrains:





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- Need regulations to compel companies to provide mobile location data from devices (not all companies have the obligation to provide such data)

#### **Preparatory task #3 -Training and Exercises**

- Organized information between all rescue teams
- Procedures
- Overview chief management
- The organizations can't afford accidents in the exercises

#### **The opportunity from different perspectives**

##### *Procedures and Organisation:*

#### **Supporting task #1 – Coordination, Command & Control**

- Human resources inventory + planning (availability)
- + Turn overs
- Legal constraints:
  - Telecom
  - Google data
  - Facebook data
  - Satellite users
- Logistics:
  - Delivering team: food supplies (ICS-100 form)
  - Media info procedures

#### **Supporting task #2 – Situation assessment**

- Develop an international (European) database of relevant information for emergency solving (maps, topographical information, previously solved emergencies, relevant contact information...)
- Create opportunity for the different agencies involved to interact and work together easily.
- Create specific communication systems to be used in specific kind of emergencies such in caves..

#### **Preparatory task #3 -Training and Exercises**

- T&E
  - in different organization between different regions/countries
  - for Command and Control
- Methodology, procedures, check lists, guide lines, protocols for each scenarios
- A database procedures
- Briefing and Debriefing, Historical / Log Book, Lesson Learned
- Simulation Programs
- Definition of:
  - minimum level of Training
  - minimum standard of training quality
- Media plan, Safety Training/Plan (especially for Cave)
- Volunteers Association Management
- Awareness of the equipment (features and limits)
- Specificity of the instructor and teaching skills





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- Logistical Aspects
- Interoperability

*Personnel:*

**Supporting task #1 – Coordination, Command & Control**

- Psychological support : « keeping the mood up in difficult situations»
- Human resources planning (dimensionate respecting resting periods )
- Having logistics skills
- Coordination call centres & command post : personnel skills
- Leadership skills (supervision, knowledge)
- Safety (tasks supervision)
- Communication skills
- Mind-set
- Media communication training

**Supporting task #2 – Situation assessment**

- It is essential to improve the interaction and information sharing of different agencies involved in a rescue.

**Preparatory task #3 -Training and Exercises**

- Team leader management skills about leadership and relationship
- Pressure during simulations
- Physical/Psychics conditioning
- High specialized staff
- specificity of medical knowledge suitable for the rescue level
- A minimum of practices must be guaranteed per year of each type of rescue. To maintain the qualification of each rescuer.

*Equipment & Tools / Technologies:*

**Supporting task #1 – Coordination, Command & Control**

- Mandatory Tools list needed (eg.):
  - thermic cameras
  - Night vision google glasses
  - Localisation & Geolocalisation ( data)
  - Drones ...
- Proper Equipment / vehicles
- Special apps's devices
  - Debriefing follow-up
  - Decision-making
  - Safety standards accomplishment
  - Communication
- Interoperability (in communication)

**Supporting task #2 – Situation assessment**

- Improve existing communication systems for the rescuers
- Improve/implement/spread out new "geolocalisation technologies" for general users.





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### Preparatory task #3 -Training and Exercises

- Communications systems
  - Tesla radio for Caves
  - Wireless for Caves
- New mobile technologies to search and coordinate (ex. Geo-localization, especially for SAR)
- Awareness of the equipment (features and limits)
- Standard equipment, Compliant Equipment (periodical checks)
- Use Virtual Reality 3D for training (Training facilities)
- Medical assistance with specified equipment
- Specialized Care Giver for Cave scenario

### Related/Other opportunities:

### Preparatory task #3 -Training and Exercises

- Special training and exercises between different kind of rescue teams
- Find smart solution with radio in CAVE with less signal noises
- Maintenance level of physical efficiency
- Evaluation of
- Stressor factors
- Safety training

### Further questions:

As identified by your TWG.

### Keywords:

- Interoperability
- Appropriate and realistic T&E
- Communication
- New technologies
- Shared procedures





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## Appendix 2: TWG B, Structure fires crisis mitigation, prevention and protection



**Participants**

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		Marcin PATER	(State Fire Service Poland)





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## FIRE-IN WP 1 Workshop Implementation Reporting Template

Title: High rise buildings fires	Workshop TWG B (1st topic)
Document version:	e.g. v 1.0
Workshop dates and location:	Rome, 12 <sup>th</sup> -14 <sup>th</sup> Febraury 2018
Submission date:	30/03/2018
Submitted by:	Giovanni Fresu (CNVVF)
Reviewed by:	Andrea Bozzo (CNVVF)

### Background

High-rises contain a wide variety of occupancies including assisted living facilities, hospitals, business offices, apartments/condominium units, and hotels. Common features in such buildings include: community rooms, restaurants, gymnasiums, swimming pools, parking garages, trash rooms and chutes, compactors, dumpsters, and mercantile occupancies. Typically, these areas/rooms are located on the lower floors. Restaurants, bars, or clubs may also be located on the top floor of any high-rise. Depending on the occupancy, personnel may encounter a floor with many compartments, or in the case of an office setting, several thousand square meters of open area with cubicle workstations.

Furthermore, if the high-rise building is typically as a block of flats and compartments, there will be always a danger of what people living such compartment can leave in the basement. During basement fires we can suppose even gas cylinders or old tires which can produce either explosion hazard or a lot of toxic gases. In such high-rise buildings, international fire statistics indicate that the basement fires should be of great interest both for emergency planning as well as for trainings of fire service responders.

Due to their height, high-rise building are beyond the reach of aerial apparatus.

Further, there is the potential for stack effect, reverse stack effect, and stratification related to the movement of smoke and heated gases.

Personnel must be aware of the time needed to assess the situation upon arrival of the first units, gather information from the annunciator panel or fire control room and building personnel, identify and confirm fire floor, proceed to that floor, locate the fire on the floor, and prepare to operate.

The operational plan for high-rise fires must consist of five basic points:

1. Determine fire floor.
2. Verify fire floor.
3. Control occupants.
4. Control of building systems.
5. Confine and extinguish the fire.

Each of these five issues must be considered in advance and planned in order to avoid lack of organisation and mess on the field of operations.

And this requires time to train firefighters, before the outbreak of a high rise fire.

### Improvement opportunity / Capability Challenge:

Supporting Task #1 Coordination command and control

- Standardisation (tools, terminology and tactics must be the same for all units responding to and operating at a high rise fires)
- Ability to locate Firefighter
- Basic recommendations (guidelines e.g. establish the command post (CP), the advanced command post (ACP), identification of ACP SCBA bottle logistics, Equipment logistics, R&R area for resting





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Firefighters, Firefighter accountability board, staging area for incoming apparatus and utility companies, liaison area for cooperation with outside agencies, press conference area).

- Categorization of buildings (according to height classes and main use)

#### Supporting Task #2 Situation assessment

All of the below should be organized before a high rise fire and be part of the preplanning stage.

- Collecting data and information from different agencies about building structures, detectors and technologies
- Information management
- To find way how we can gain and validate information, eg. safety information about FF and transfer to data flow
- To have decision how split data flow we use in advance and also during operations
- Compile dynamic data flow and also data in advance and find way to use data during the intervention as a support for fire rescue units
- To find decision how to validate incoming data and transfer this data flow into the interface

#### Preparatory Task #3 Training and exercise

- Training, drills and exercises are the only way to accumulate needed knowledge, skills and experience in infrequent emergencies.
- Specific tools and techniques, specific scenarios of mitigation measures and vulnerable elements, specific fire behaviour, specific flow of firefighter effort and tools have to be maintained in time and space, specific information managements and decision-making structures, specific response structure with different, unknown and sometimes unclear stakeholders such as building managers, specific chained emergencies risks, specific prioritization issues... all of them arise during any emergency and all of them have to be solved in very short time. And all of them impact on the final scenario.

Ground exercises and training on standards and on flexibility, and use exercises and incidents to improve SOP:

- Standard operation procedures and operational guidelines for the incidents in HRB are needed. The procedures and the operational guidelines have to help to understand the logic of fire behaviour and fire operations, and to standardise parts of the response for all the different park stations, agencies and stakeholders involved. Standard operational procedures have to be trained, drilled and exercised.
- Training and exercises are part of a knowledge cycle, and have to be grounded on:
  - ✓ SOP
  - ✓ Flexibility
  - ✓ Assessment
  - ✓ Feedback in order to get better the SOP and the guidelines.
  - ✓ Modification to the SOP's subsequent to training and actual firefighting operations to become the new SOP.
  - ✓ Catalogue of fire scenarios in high-rise buildings at national or regional level, including basement fires.
- Adaptability is the key in the firefighter's operations in the HRB. A certain amount of autonomy in decision-making allows to adapt quickly to a dynamic scenario. Operational guidelines may give criteria, but adaptability has to be trained and exercised.
- Drills and exercises are good tools not only to know the procedures and operational guidelines, but also to test them, assess them and know when and how to modify them.





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<ul style="list-style-type: none"><li>• After that, procedures and guidelines have to be changed if something doesn't fit properly.</li></ul> <p>Pre-plan and understand the building</p> <ul style="list-style-type: none"><li>• Preparing of the incident response before it takes place is the key of the success. It improves the awareness of the incident and its possible implications and consequences. The experts identified the comprehension of the building as a safety item: prevention equipment, elevators, pumps and dry columns.</li><li>• Increasing the knowledge of the establishment was one of the highlight aspects which the experts identified. From their point of view, it is necessary to carry out specific visits, drills and exercises in order to improve the capacity of response and the efficiency of the firefighters. Not only should these exercises involve all the agencies, but also the building managers and the inhabitants.</li><li>• Pre-planning for types of incidents and for specific incidents would be another important item of improvement. It would raise the level of awareness of the hazards and vulnerabilities to firefighters. Associated with this pre-planning, visits, drills and the exercises supervised by experts and assessors.</li><li>• As far as the tools are concerned, the improvement's opportunities identified by experts, point at ways to increase the knowledge about the facilities and the awareness of incident when they have to fight it. Due to the difficulties that they find in order to do exercises in real life in the singular facilities, the main solutions which the experts brought up, are around the software and simulators. However, they identified little solutions that correspond to little issues, such a ropes and chariots or carts</li></ul> <p>Train, drill and exercise specific roles and skills</p> <ul style="list-style-type: none"><li>• Defining clear roles and training specific knowledge and skills. This would be done in different levels for every different skill and people. Then, drills and exercises with specific actors to train specific skills, as well as the ability to work together. The levels identified were:</li><li>• LEVELS:<ul style="list-style-type: none"><li>✓ Operational level. Boots</li><li>✓ Tactical level. Related to command post</li><li>✓ Chain of command. Incident Commander, other agencies, stakeholders.</li></ul></li><li>• STEPS:<ul style="list-style-type: none"><li>✓ Drill basic skills based on standards. Drill manoeuvres in the building. Visit the building to understand the building.</li><li>✓ Exercises between fire-fighters and the command post. An important objective is to train flexibility, to make think. Should involve all that involve the flow of efforts in time and space (sectorization, logistics) and understanding the building (flow of information and decision-making). May involve building manager</li><li>✓ Chain of command exercises. Involving chain of command of different agencies and key stake holders (building manager). An important objective is improving the skills on working together.</li><li>✓ Table exercises, to improve the flow of info between agencies</li><li>✓ Big exercises with all the actors, even with the inhabitants: Flow of information, Coordination between agencies.</li><li>✓ Practical, "hands on" exercises using the specific tools and implementing the actual tactics utilized in fighting high rise fires.</li></ul></li></ul>
<b>Constraints / Best practices</b>
<ul style="list-style-type: none"><li>• Organize the response between them, for the main following topics:<ul style="list-style-type: none"><li>✓ Avoid the fire or mitigate it if as it starts,</li></ul></li></ul>





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<ul style="list-style-type: none"><li>✓ Evacuate the people,</li><li>✓ Extinguish or control the fire,</li><li>✓ Keep the building “alive” (stability)</li><li>• Distribute (and control) the responsibilities between the different persons in charge of all or a part of the fire safety:<ul style="list-style-type: none"><li>✓ People working or living in the building,</li><li>✓ Building manager and staff (safety private team if it’s exist),</li><li>✓ Fire fighters</li></ul></li><li>• Share a common vision of the risks and how to treat them:<ul style="list-style-type: none"><li>✓ Standardize the philosophy of risk management,</li><li>✓ Standardize the laws.</li></ul></li><li>• Improve the coordination (and control) between the different stakeholders.</li><li>• Improve the coordination (command and control) of intervention teams (private or public services).</li><li>• Every building has different prevention equipment, elevators, etc. and this means that firefighters have to know them and develop the necessary procedures. The procedures have to be as simple as it possible and they have to be flexible in order to allow the freedom and the adaptability of firefighter’s manoeuvres and tactics.</li><li>• Exercises in a specific high-rise building presents difficulties, since the owners and the inhabitants are not very often interested in it. On the other hand, the training should be done with the real equipment, which the firefighters will use in case of incident.</li><li>• Experts were also worried about the procedures and guidelines; if were too much detailed that it causes the firefighters to be unable to get their goals, when the scenery changed.</li><li>• Also about drills and exercises, it’s important to avoid the “shows”, where all is written and the firefighters actions don’t flow freely. This may happen in high-level exercises, when politicians are involved.</li><li>• Exercises and simulations have to be done in different levels: boots, command, all agencies together, as well as the owners. These will permit to check if the procedures give the suitable answer to the incident and to detect where it doesn’t fit and how to change it.</li><li>• The main constraint, which the experts detected, was the difficulty to carry out exercises in the high-rise building. It would be a good policy if by law, the owners had to organize and pay the exercises. These exercises must be done by the inhabitants as well as all the possible agencies</li></ul>		
<b>The opportunity from different perspectives</b>		
<i>Procedures and Organisation:</i>		
<p>Supporting Task #1 Coordination command and control</p> <ul style="list-style-type: none"><li>• Involving public in risk preparations (acculturation)<ul style="list-style-type: none"><li>✓ Procedures</li><li>✓ Evacuation training</li></ul></li><li>• People participation in:<ul style="list-style-type: none"><li>✓ Elaboration of the safety organization</li><li>✓ Exercises</li></ul></li><li>• Improve safety habits (inform the building manager in case of safety problems)</li><li>• Check compliance with safety rules</li><li>• Alert fire fighters and public services (standardization of a special phone line)</li></ul>		





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<ul style="list-style-type: none"><li>• Staff management (emergency team if it exist) for all the tasks needed to:<ul style="list-style-type: none"><li>✓ Keep the fire into its original box,</li><li>✓ Make a first response (attack),</li><li>✓ Welcome and guide the fire fighters,</li><li>✓ Help the fire fighters in moving equipment to the ACP and all the related tasks</li></ul></li><li>• Improve global knowledge about High Rise Buildings</li><li>• Standardization of procedures</li><li>• Facilitation the relocation of the inhabitants</li><li>• Implementation a safety zone</li><li>• Imposition of a regular control of the buildings</li></ul> <p><i>Supporting Task #2 Situation assessment</i></p> <ul style="list-style-type: none"><li>• Sharing information in advance</li><li>• Representation of information</li><li>• Handover information from the scene</li><li>• Extraction information, detectors</li><li>• Establish staff</li></ul> <p>Preparatory Task #3 Training and exercise</p> <ul style="list-style-type: none"><li>• The procedures have to respond to the need to know the facility for the firefighters. This knowledge has to contain from the way to access to the high-rise building to the little details of building that could be important just in case of fire. To know the building, the best way is visiting the building in real.</li><li>• Starting with SOP (Standard Operating Procedures) that have to be flexible and focusing to the goals of the incident.</li><li>• The aim is to increase the global awareness of firefighters in a major emergencies and the knowledge of the different facilities where it could happen. From the point of view of the experts, it would be a good solution if the owners must pay and do exercises regularly and this have to involve different agencies to increase the trust between them.</li></ul>
<p style="text-align: center;"><i>Personnel:</i></p> <p><i>Supporting Task #1 Coordination command and control</i></p> <ul style="list-style-type: none"><li>• Public and inhabitants could be involved in risk preparation and trained in procedure and evacuation</li><li>• Building manager and staff</li><li>• Fire Services</li><li>• Public services (medical, municipality services)</li></ul> <p><i>Supporting Task #2 Situation assessment</i></p> <ul style="list-style-type: none"><li>• Safety officer of building</li><li>• Fire engineer</li><li>• Information officer</li><li>• Affected people building</li><li>• Command and control centre (ACP and CP)</li><li>• Staff</li></ul>





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<p>Preparatory Task #3 Training and exercise</p> <ul style="list-style-type: none"><li>• Unmanaged press could be a problem in an incident, as a source of misinformation and extra pressure. Because of this, it could be a good practice training to manage the journalists. Establish a fixed press information area outside the building assign a fire Officer as official spokesman to keep press informed.</li><li>• Controllers/evaluators should be evaluating what works and what doesn't during the exercise with a check-list, and assessors/experts with a more open view, who should be also supervising and analysing the way to do exercises. They are key roles for later adding or changing training, exercises and operational procedures, when necessary. They must have guidelines to describe their function and the operating method.</li><li>• Other possible actors to involve in exercises:<ul style="list-style-type: none"><li>✓ safety officer, who should watch over in compliance safety regulations the exercises</li><li>✓ Police, EMS representative, ecc.</li><li>✓ actors in the role of the victims,</li><li>✓ politicians and journalist participation has to be handled, in a separate part of the exercise.</li></ul></li><li>• Not only should the firefighters from the closer station be involved in training/visits/drills/exercising, but also the one's that will help them in a major incident should be involved in part of these process.</li></ul>
<p><i>Equipment &amp; Tools / Technologies:</i></p>
<p><i>Supporting Task #1 Coordination command and control</i></p> <ul style="list-style-type: none"><li>• Coloured jackets, stickers on the doors (helping First responder during the action - evacuation)</li><li>• Mandatory regular control of equipment (by external agencies)</li><li>• Appropriate coordination room outside the building</li><li>• Elevator reserved for FF (classic ladder trucks aren't usable)</li><li>• Electronic device (3D software).</li><li>• Software (device) to share coordination informations : localization, team position and action</li><li>• Communication equipment throughout the building</li><li>• SCBA bottle flow/stock</li><li>• Develop special search and rescue tools for this kind of intervention (classic ladder trucks aren't usable)</li></ul> <p><i>Supporting Task #2 Situation assessment</i></p> <ul style="list-style-type: none"><li>• Maps</li><li>• Tablets</li><li>• Handbooks</li><li>• Communication tools</li><li>• Special solutions</li><li>• Drones</li><li>• Helicopters</li><li>• Detectors</li></ul> <p>Preparatory Task #3 Training and exercise</p> <ul style="list-style-type: none"><li>• To improve the response and to get a better feedback of the exercises and drills, it would need a camera team in order to film the reality of the manoeuvres. It helps identifying the gaps between the reality and the perception of the firefighters.</li></ul>





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<ul style="list-style-type: none"><li>• In case of incident, this tool is essential for the safety and the success of firefighter's operations.</li><li>• The experts identified another little solution to a logistic issue that could appear such a chariot or cart already in the high-rise to move the material.</li><li>• The experts identified as a good practice that the elevators of all buildings in the city had the same key, since they had the key to control it and they hadn't lost time searching for the responsible of the building.</li><li>• Another opportunity identified were the prevention measures such a technical floor, special and dedicated pumps, dry columns, rollers and ropes to carry the material, furthermore, they looked as a good solution the positive pressure to control the smoke movement.</li><li>• Use virtual reality trainings and simulators to improve fire and rescues techniques and other skills</li></ul>
<b>Keywords:</b>
Drill, exercises, agencies, pre-planning, command, liaison officer, procedures, awareness, high-rise building





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## FIRE-IN WP 1 Workshop Implementation Reporting Template

<b>Title:</b> Road tunnel fires	<b>Workshop TWG B (1st topic)</b>
<b>Document version:</b>	e.g. v 1.0
<b>Workshop dates and location:</b>	Rome, 12 <sup>th</sup> -14 <sup>th</sup> February 2018
<b>Submission date:</b>	
<b>Submitted by:</b>	Giovanni Fresu (CNVVF)
<b>Reviewed by:</b>	Andrea Bozzo (CNVVF)

### Background

Underground metro, road tunnels, rail systems are all complex infrastructures of considerable importance for their communities and users. They create a situation in which many users share a relatively limited area at the same time. This creates considerable risks, with the tunnel fires that have occurred in recent years showing clearly that a fire can have both major and deadly consequences due to very high temperatures and heavy smokes.

A lack of confidence in the firefighting procedures is devastating for both society and mass transport companies. Knowledge of the consequences of a fire incident in such systems is therefore of utmost importance.

Egress situations are usually complicated for the users and the rescue teams may have difficulties in organizing the rescue operations due to the complexity of such egress situation. It is mainly due to the large number of persons, differences in levels, long escape routes, etc., which all complicate evacuation and rescue efforts. The speed at which a fire develops, and the resulting conditions inside carriages and in the tunnel, is decisive in determining whether passengers can escape safely.

The incidents in the tunnels are in fact singular, since are really infrequent, and the evolution of a little incident to a major emergency could be a reality in a really short period of time. The difficulties grow quickly when the fire shows up and suddenly, the users of the tunnel and the firefighters have to face up to the heat of the combustion and the enormous quantity of smoke that cannot go anywhere and put them in jeopardy.

The experts identified as the main fears, the quick evolution of the smoke layer and the reduce capability to see all the scenery. It would be an improvement, a system which permits to get the awareness of the evolution and the risks. Also the coordination in tunnels between two countries or regions with different responsible agencies.

The experts have or are going to have tunnels in their work area, therefore, they are interested in tunnels incidents.

From the point of view of the doctrine, procedures and development, the experts identified several points to solve or to standardize. The main issues were the important of the communication flow in order to keep the awareness of the whole incident, the coordination between agencies and the clear responsibility and the chain of command.

Departing from the point that an incident in a tunnel can be a major incident in a relative short period of time, an important worry of operative teams is to maintain the control of the safety and the awareness all the time.

### Improvement opportunity / Capability Challenge:

Summarise the aspects mentioned in World Café round 1 (Step 2 of the Workshop Methodology) → Differentiate according to the tasks discussed

*Supporting Task #1 Coordination command and control*

- Training program
- Communication
- Coordination capabilities
- Safety of personnel
- Rescue equipment for victims (breathing masks etc.)
- Ability to command effectively (in various administrative regions)





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*Preparatory Task #2 Doctrine / Procedures development*

- Lack of clear responsibilities among stakeholders.
- Responsibilities should be clear.
- Responsibility assignement should be linked to:
  - ✓ Competence development, linked to resources, training, tests and exercises plan
  - ✓ Information management among stakeholders
  - ✓ Affordable and locally applicable solutions
- Specific per types of tunnel need different responsibilities and procedures:
  - ✓ Old versus new (different prevention measures)
  - ✓ Short versus long
  - ✓ Road versus train (many new problems, accessibility, hazards, smaller section...)
  - ✓ Different ownerships
- Priorities are not the same as order of execution, in many cases, first operations then rescue, but depending on the scenary.
- Firefighters should know enough about facilities and scenario to take autonomous decisions, based on general objectives.

*Preparatory Task #3 Training and exercise*

- Knowledge about tunnel specificities
- Time is the most important factor to win the fight
- Training is the best way to win time
- For most FF, tunnels fires aren't the daily job
- Knowledge about tunnel specificities
- Ability to choose and use the right procedures and dedicated materials
- Developp appropriate attitude (resistance/ breating)
- Use real people (users of the tunnel) for training exercices
- Test the efficiency of the procedures
- Evaluate/ identify the human and technical limits
- Developp evaluation and decision making
- Coordination between partners.

**Constraints / Best practices**

Summarise the aspects mentioned in World Café round 1 (Step 2 of the Workshop Methodology) and additional aspects as mentioned in the plenary (Step Four of the Workshop Methodology)

- Traffic planning is the best strategy to reduce risk of tunnels accidents. It should be evaluated in an integral way in a territory.
- Doctrine should provide clear standards for roles and responsibilities, so there is unity of command and a unique flow of decisions, integrating all agencies involved. In a tunnel, often firefighters should work together, sometimes from different entrances without seeing each other.
- Use real environment for the exercices (on site) with associated partners (users, private teams)





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<ul style="list-style-type: none"><li>• Use tunnel simulator for drill reproducing: High temperatures, visibility, Alternative breathing conditions and systems</li></ul>		
<b>The opportunity from different perspectives</b>		
<i>Procedures and Organisation:</i>		
<p>Summarise the aspects mentioned in World Café round 2 (Step 3 of the Workshop Methodology) → Differentiate according to the tasks discussed</p> <p><i>Supporting Task #1 Coordination command and control</i></p> <ul style="list-style-type: none"><li>• Understanding procedures and point of view on the other end of the tunnel</li><li>• Common objectives, terminology</li><li>• Agree on how ventilation will be operated</li><li>• Procedures are needed for tunnels with no equipment</li><li>• Good guidelines depending on the type of the tunnel</li><li>• Procedures should include various types of fire brigades (e.g. voluntary etc)</li><li>• European guidelines are needed</li></ul> <p><i>Preparatory Task #2 Doctrine / Procedures development</i></p> <ul style="list-style-type: none"><li>• Doctrine should point to the objectives to achieve, answering why to intervene, what is the firefighter's aim. Before putting firefighters lives at risk, a bigger risk should exist.</li><li>• Specific procedures for specific tunnels can provide specific responses types for specific incidents. And should provide parameters to evaluate safe entrance of vehicles, firefighters,... So that firefighters can read them and decide autonomously.</li><li>• Flow of information and decisions involving stakeholders (tunnel managers, etc) should be clearly stated for every infrastructure. From the presence in the command post, to liaison officer in tunnel facilities or other specific tools.</li></ul> <p><i>Preparatory Task #3 Training and exercise</i></p> <ul style="list-style-type: none"><li>• Organise exercises with partners</li><li>• Respect real conditions (timing for deployment/ materials/...)</li><li>• Use every little event to test deployment and first response</li><li>• Identify the aim of the exercise before mobilizing services and people</li><li>• Define the skills to improve before choosing the appropriate equipment/ tool</li><li>• Standardize in Europe the training course of the teams (by level of responsibility)</li><li>• Create european processes to improve good habits</li></ul>		
<i>Personnel:</i>		
<p>Summarise the aspects mentioned in World Café round 2 (Step 3 of the Workshop Methodology) → Differentiate according to the tasks discussed</p> <p><i>Supporting Task #1 Coordination command and control</i></p> <ul style="list-style-type: none"><li>• Exercise, training – all services separately and together</li><li>• Communication between services</li><li>• Training for commanders in the control room</li><li>• Training of the tunnel personnel</li><li>• Increasing knowledge on tunnel systems, installations etc.</li><li>• Prepare also for low tech situations</li></ul>		





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<ul style="list-style-type: none"><li>• Increase international collaboration</li></ul> <p><i>Preparatory Task #2 Doctrine / Procedures development</i></p> <ul style="list-style-type: none"><li>• Fire-fighters should be involved in the legal aspects of the doctrine. A doctrine should protect fire-fighters and public, not constraint them.xxx</li></ul> <p><i>Preparatory Task #3 Training and exercise</i></p> <ul style="list-style-type: none"><li>• Everyone concerned by the risk (users and services)</li><li>• Fire Fighters with other services (private and public)</li><li>• Fire Fighters (teams)</li><li>• Team leader (FF)</li><li>• Every Fire Fighters (Individually)</li></ul>
<p><i>Equipment &amp; Tools / Technologies:</i></p> <p>Summarise the aspects mentioned in World Café round 2 (Step 3 of the Workshop Methodology)→ Differentiate according to the tasks discussed</p> <p><i>Supporting Task #1 Coordination command and control</i></p> <ul style="list-style-type: none"><li>• Communication should be made more reliable (radio, wired)</li><li>• Control rooms can serve a number of tunnels</li><li>• Minimum standard of equipment for fire engines serving tunnels</li><li>• Air management solutions are very important (for breathing)</li><li>• Simulators for training commanders</li></ul> <p><i>Preparatory Task #2 Doctrine / Procedures development</i></p> <ul style="list-style-type: none"><li>• Procedures should ensure the maximum safety for firefighter response:</li><li>• Thermal cameras, both inside the tunnel and in firefighter vehicles.</li><li>• Double bottles, rebreathers.</li><li>• Intelligent clothes for self-assessment of health parameters, such as temperature accumulation.</li><li>• Radiant cable to ensure communications.</li><li>• Robotics to evaluate the presence of people at risk</li></ul> <p><i>Preparatory Task #3 Training and exercise</i></p> <ul style="list-style-type: none"><li>• Exercices:<ul style="list-style-type: none"><li>✓ with traffic (real condition)</li><li>✓ without traffic (« safe » condition)</li></ul></li><li>• Create international feedback tools / lessons learned</li><li>• Make a list of equipment or tools linked with the skills to develop</li><li>• Visit / Knowledge of the infrastructure</li><li>• Training simulator (using virtual environment or not)</li><li>• Define a specific course training by FF for new drivers</li><li>• Share the experience</li></ul>
<p><b>Keywords:</b></p>
<p>Training simulator, lessons learned, communications, Guidelines</p>





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## Appendix 3: TWG C, Vegetation fires crisis mitigation



This project has received funding from the European Union's Horizon 2020 Coordination and Support Action programme under grant agreement No 740575.



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<b>FIRE-IN WP 1 Workshop Implementation Reporting Template</b>	
<b>Title:</b>	<b>Workshop TWG C: Scenario 1 – Landscape Fire Crisis Mitigation</b>
<b>Document version:</b>	v1
<b>Workshop dates and location:</b>	Date: 28 February – 01 March 2018 Venue: Federal German Agency for Technical Relief (THW) Soorstr. 84, D-14050 Berlin, Germany
<b>Workshop participants and affiliation</b>	Workshop Co-Chair & Co-Moderator: Mr. Lindon Pronto (GFMC) Workshop Co-Chair: Mr. Johann Georg Goldammer (GFMC) World Café Group I Moderator: Mr. Lindon Pronto (GFMC) World Café Group II Moderator: Ms. Marta Miralles(CFS) World Café Group III Moderator: Mr. Georgios Eftychidis Workshop Note Takers: Mr. Sébastien Lahaye (FIRE-IN Coordination), Ms. Mariona Borrás (PCF), Mr. Ilias Gkotsis, Mr. Carles Garcia, Mr. Juan Caamaño
<b>Submission date:</b>	10.04.2018
<b>Submitted by:</b>	The Global Fire Monitoring Center
<b>Reviewed by:</b>	Lindon Pronto, Marta Miralles, and Georgios Eftychidis
<b>Background</b>	
<p>The following scenario was chosen, as well as the supporting and preparatory tasks elaborated below: A complex, aggressive wildfire breaks out at the peak of the dry season in a peri-urban area, threatening life and property. The fire shows explosive growth and overwhelms local response efforts. There are many settlements in the fires path in the so-called wildland urban interface (WUI); additionally, the forest cover is generally dense plantation forests of flammable non-native species (e.g. pines and eucalyptus). There are many values at risk including life, property and infrastructure. Communication is limited as are evacuation routes. Loss of life is a high probability and the need for resources is greater than what is locally or even regionally available. The first part of the workshop was to identify the challenges in responding to this common scenario. The participants chose to further examine “Coordination, Command and Control” (10 votes), “Community Awareness Raising” (8 votes), and “Situation Assessment” (6 votes).</p>	
<b>Improvement Opportunity / Capability Challenge:</b>	
<p><b>Supporting/Preparatory Task #1: Coordination, Command and Control</b></p> <ul style="list-style-type: none"> <li>• <b>Critical challenges:</b> Lack of resources (money, equipment, personnel), baseline decision-making tools needed; politics and decision-making mixed sometimes</li> <li>• <b>Incident management:</b> ICS lacking, clearly defined roles lacking or multiple incident commanders, lack of SOPs, unified command procedures needed; initial attack chaos needs prioritization, resources allocation, also prioritize response between common/private values; challenge of “black hole” of resources into WUI (less focused on other areas of the fire)</li> <li>• <b>Situation awareness:</b> anticipating fire behaviour, growth potential, values at risk</li> <li>• <b>Cooperation:</b> Improve interoperability / inter-agency cooperation</li> <li>• <b>Other:</b> Resource typologies; daily briefings, transfer of command protocols; jurisdiction issues like forest vs private properties etc.</li> </ul>	
<p><b>Supporting/Preparatory Task #2: Community Awareness Raising</b></p> <ul style="list-style-type: none"> <li>• <b>Cause and effect:</b> arson issue; negligence; lack of fuel management; fire-use culture (agricultural...); mental health issues; tourists; rural-urban migration; WUI; suppression vs prevention challenge.</li> </ul>	





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- **Awareness raising:** population needs to be engaged through information /awareness campaigns (address schools, churches, transport operators, tourists etc.); raising awareness should be preventative (before fire) and include fuel management, preparedness plans and disaster plans for pre-disaster, during, and post; raising awareness should consider different target groups – i.e. urban vs. rural citizens and consider how lifestyle choice influence fire occurrence.
- **Dissemination:** Common dissemination tools are needed, e.g. a European mobile multi-language application or European-wide symbol for fire prevention (e.g. Smoky bear in US); liaison intermediates should be identified to disseminate in local communities with messages of fire risk and mitigation through leaflet distribution, social media etc.
- **Self-defense:** Self-protection of humans and properties in WUI; training for the elderly / vulnerable is lacking
- **Engagement:** More stakeholder round tables or multi-stakeholder activities are needed
- **Prioritizing:** Fuel management (people involvement), prevention over suppression
- **Knowledge Management:** Awareness of fire history; dissemination of European project findings (e.g. Fire Paradox) is lacking or obscured
- **Legislation:** Laws and enforcement for cleaning around buildings, regulated fire use etc.

#### **Supporting/Preparatory Task #3: Situation Assessment**

- **Critical challenges:** More simultaneous emergencies than capacity to manage them and resources to respond; timely verification of (too much) intel a challenge; many simultaneous decisions and emergencies are being handled in a dynamic environment highly challenging; centralized decision-making is always late / delayed, and hindered by bureaucracy.
- **Information management:** Manage complex information focusing on the multiple levels of decision-making in dispatching centers, chains of command, transfers (e.g. from one IC alone to a command post with lots of inputs / functions), handovers etc.; information overload can create confusion, 'noise' or simply be bad intelligence
- **Strategy / Prioritizing:** Shift of focus needed from reducing surface area burnt, to minimizing potential damages to main values (people, property, etc.). Balance needed between reacting to the now, and maintaining initiative pro-actively to probable scenarios of future. Priority doesn't translate into order of actions; need for pre-plans based on forecasted scenarios of patterns of spread, opportunities and trigger points; build from past events, other countries lessons and adapting to new realities
- **Standards:** Standardize assessment and planning (for public and journalist, chain of command, policy-makers and agencies involved...)
- **Engagement:** Involve the whole cycle of emergency management

#### **Constraints / Best practices**





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### **Supporting/Preparatory Task #1: Coordination, Command and Control**

#### Constraints

- Lack of synergy + communication between EU coordinating bodies (DG Echo/RD, European commission vs Eastern Europe monitoring centers...); no common database of previous project results
- Limitation of “USA model” fire behavior analysis in ICS (some participants felt fires behaved differently – e.g. more quickly, than in US context)
- Inability to gather fire experience (e.g. practitioner from small country)
- Due to climate, entire Mediterranean Basin will experience crisis all at once
- Information overload
- Insufficient budgets
- Multiple languages across EU
- Trust limitations
- Lack of standardization of fire weather indexes, of fire types (wind-driven, plume dominated...); need to generalize knowledge on fire typology
- Lack of general SOPs / procedures and inter-operability measures across agencies

#### Best Practices:

- Internet repository in progress to store all European projects, publications, etc.
- After FFs died in Esperanza fire (US) defending a non-defendable building, FFs can now decide to go or not (SOP/ framework for “properly refusing risk”)
- Black Saturday Victoria (179 dead) resulted in change of paradigm for fire services from responding to fires with resources to engaging the population (preparedness & during crisis)
- Use fire history, lessons learned to inform practice and develop new approaches
- Greece: Annual review of cross-agency operational plans

#### Further Coordination Command and Control / Situation Assessment Best Practices:

- Study tour for vegetation fire “experts” (e.g. analysts)
- Expert community across Europe that know themselves, share experience, travel.
- Common technical training of people from different agencies
- Fire analyst profiles for both coordination center and fire (incident).
- Cross border cooperation especially with aerial resources
- Involving stakeholders in pre-planning scenarios
- Common trainings (techniques)

### **Supporting/Preparatory Task #2: Community Awareness Raising**

#### Constraints:

- Complacency
- Public perception of role of fire in ecosystem (limited, misinformed etc.)
- There are different types of communities: urban, rural, peri-urban
- Communities fail to take responsibility for their self-defense, rely only others
- Changing landscape characteristics (abandoned and overgrown!)
- Prevailing policy (e.g. suppression attitudes)
- In some countries, lack of targeted information for certain groups (e.g. farmers, other)
- Need for fuel management
- Need for appropriate public policies and legal frameworks





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#### Best Practices:

- Integrated prevention teams in Spain target fire user communities to teach safe burning practices: good for the farmer, also good practical training for firefighters (e.g. esp. for more technical firing ops like backfires etc.)
- GFMC involved in courses in South Caucasus to engage communities with alternative farming methods (for soil integrity, etc.)
- UK/ES stakeholders' roundtables to discuss the prioritization of landscape values and appropriate planning; considers fire history, modelling potential fire behavior among other
- Green economy: Funding activities that support rural land management
- Establishment and support of volunteer fire associations / societies
- Taking the tragic "opportunities" in other countries and using national media to raise awareness that "that could happen here also"
- Designing fire smart territories.
- Subsidizing activities that benefit fire prevention
- Fire prevention communication strategy (esp. agriculture sector!)
- (low budget) round tables with local stakeholders
- conciliation of local interests on fire-use (e.g. social issue -> help people burn safely!)

#### **Supporting/Preparatory Task #3: Situation Assessment**

##### Constraints:

- Agency fragmentation (i.e. of responsibilities)
- Information overload (verification needed)
- No shared understanding across decentralized levels
- Lack of standardization regarding risk information (e.g. types of fires – e.g. plume-dominated)
- Lack of local-to-regional pre-assessment: lacking for operational planning
- Lack of general procedures across agencies (e.g. evacuation)
- Jurisdictions impeding actions
- Need to generalize knowledge on fire typology

##### Best Practices:

- Advanced fire behavior assessments w/ relation to e.g. climate change / extreme fires
- Aggregate fire information (e.g. fire behavior) – int'l examples
- Spain: Simplify decision-making inputs /process (e.g. pre-defined strategies, location-based strategies = anticipate fire course); fire analyst function with modelling; use of fire classification, lesson learned from previous fires and fires from other regions
- Localized risk (pre)assessment, include scale of fire
- Scenario planning w/ multiple stakeholders and especially localized scenarios
- Detailed/location-based planning as an argument for funding
- Landscape approaches
- Fire behavior database (ES) [e.g. fuel types, size, behavior, weather, etc.]

#### **The opportunity from different perspectives**

##### ***Procedures and Organization:***

#### **Supporting/Preparatory Task #1: Coordination, Command and Control**

##### Information Gaps

- Data collection and analysis insufficient (e.g. weather)
- Unverified crowd-sourced data; best available data should be used





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- Generate situation maps
- Standardization (European) of mapping standards (symbols...) needed

#### Operations Gaps

- Shared responsibilities during briefing where the incident commander identifies the values to defend and ask the stakeholders to be included in the prioritization
- Undefined at European level how policy makers should be appraised in ICS structure
- Interoperability between agencies and across borders lacking
- Limited legal parameters for action/non-action
- Too few meetings/activities to help policies articulate challenges
- Risk vs. gain framework missing

#### Organization Gaps

- No certification system (needed to build trust)
- Not enough decentralized responsibilities; poor agency structures
- ICS system potentially too complex
- Insufficient relationships to policy players (e.g. through round tables etc.)

#### **Supporting/Preparatory Task #2: Community Awareness Raising**

- Legislation (fuel management and self-protection); clear boundaries and jurisdictions needed
- Fire groups (stakeholder's establishment) needed
- Risk assessment-based landscape planning needed
- Certification of locals' capacity to burn (advisable)
- Volunteers should be embedded into processes
- Careful design of prevention message (symbol, campaign etc.) needed
- Insurance schemes related to WUI and peri-urban areas lacking

#### **Supporting/Preparatory Task #3: Situation Assessment**

- Need exercises based on pre-planning
- Need a shared understanding concerning scenario and strategy across responders to synchronize simultaneous decision-making (flow of information)
- No criteria of when to use specific information tools based on proactive vs reactive scenarios

#### **Personnel:**

#### **Supporting/Preparatory Task #1: Coordination, Command and Control**

##### Information Gaps

- Need for Fire Behavior Analysts (both on and off-site)
- Information managers or similar capacity is lacking
- Different types of specialists (meteorologists, etc.) need to be involved
- Insufficient Public Information Officers (PIOs)
- Local knowledge lies with local public and responders – and is not exploited

##### Operations Gaps

- Stakeholders; policy makers need to become more involved
- Liaison officers are needed between agencies and stakeholders
- On-site fire behavior analyst; civil protection engineers are needed

##### Organizational Gaps

- Baseline training lacking
- Not enough experts





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- Lacking trust and shared responsibility; common value system needed
- Decentralization of knowledge and skills (e.g. ICS) needed
- Not enough fire managers with humility, flexibility, baseline training (ICS...)
- Need on-site fire behavior analyst, both in operations (opportunity trackers) and in planning

**Supporting/Preparatory Task #2: Community Awareness Raising**

- Fire prevention specialists needed
- Fire risk communication and social media experts lacking
- Local authorities need fire prevention liaison (on fuel management)
- Insurance company involvement lacking
- Opinion leader from the community desired
- Volunteers to support fire prevention (preferable autonomous organization) desired
- Civil protection units should be informed / involved in fire prevention efforts

**Supporting/Preparatory Task #3: Situation Assessment**

- Need more stakeholder involvement: Critical infrastructure, prevention and FF, land management, locals etc.
- Trained profiles for triage, for analysis and support needed
- Pre-plan involving critical infrastructure managers, locals, forest and landscape managers, etc. needed
- Insufficient training in information management
- More specialized personnel gathering training and experience desired

**Equipment & Tools / Technologies:**

**Supporting/Preparatory Task #1: Coordination, Command and Control**

Information Gaps /needs

- UAV / Drones
- Satellites imagery
- Sensors (on board drones, on FF equipment)
- Social media (related effective /reliable tools)
- Standardized information dissemination system
- Assessment tools vs. Command tools (differentiation needed)
- GIS

Operations Gaps /needs

- Analysis software for decision-support analysis
- Maps + metrics missing
- Resource tracking

Organization Gaps /needs

- SOPs
- Training framework
- Standardization system
- Manuals

**Supporting/Preparatory Task #2: Community Awareness Raising**

- Design of fire smart structures needed
- Fire protection norms (WUI) lacking
- Prescribe burning insufficient
- Fire risk communication and application lacking





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- Training (practitioners-community) needed
- Workshop with local community and Authorities on prevention and RX burning, trainings desired
- Budget challenges severely impair
- Social and mass media should be utilized more fully
- Need EU fire mobile app (incl. prevention, risk maps, alert system, response guidelines)

**Supporting/Preparatory Task #3: Situation Assessment**

- Need pre-plan including shared balance on values
- Registry for key information; included shared understanding and lessons learned desired
- Apps/tools to verify specific info key for all decision-makers (e.g. info from drones, helicopters, tablets, phones, GPS etc.) desired /needed
- Insufficient interoperability of communication capabilities between agencies

**Related/Other opportunities:**

**Further questions:**

“Community Awareness Raising” applies to which “community”? [consider community type: policy, rural, peri-urban, other?]

**Keywords:**

Fire behavior analysis; communication in multi-stakeholder fora; value definition; interoperability and cooperation; prescribed fire; self-defense; training; standards, guidelines and certifications; preparedness and preplanning; information management and dissemination; experts and liaisons





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<b>FIRE-IN WP 1 Workshop Implementation Reporting Template</b>	
<b>Title:</b>	<b>Workshop TWG C: Scenario 2 – Landscape Fire Vulnerability Mitigation</b>
<b>Document version:</b>	v1
<b>Workshop dates and location:</b>	Date: 28 February – 01 March 2018 Venue: Federal German Agency for Technical Relief (THW) Soorstr. 84, D-14050 Berlin, Germany
<b>Workshop participants and affiliation</b>	Workshop Co-Chair & Co-Moderator: Mr. Lindon Pronto (GFMC) Workshop Co-Chair: Mr. Johann Georg Goldammer (GFMC) World Café Group I Moderator: Mr. Lindon Pronto (GFMC) World Café Group II Moderator: Ms. Marta Miralles(CFS) World Café Group III Moderator: Mr. Georgios Eftychidis Workshop Note Takers: Mr. Sébastien Lahaye (FIRE-IN Coordination), Ms. Mariona Borrás (PCF), Mr. Ilias Gkotsis, Mr. Carles Garcia, Mr. Juan Caamaño
<b>Submission date:</b>	10.04.2018
<b>Submitted by:</b>	The Global Fire Monitoring Center
<b>Reviewed by:</b>	Lindon Pronto, Marta Miralles, and Georgios Eftychidis
<b>Background</b>	
<p>The following scenario was chosen, as well as the supporting and preparatory tasks elaborated below: A region/sub-region has suffered simultaneous rural exodus of the working farming class – and luxury development by the often-wealthier urban citizen; the resulting impact on the landscape and people/infrastructure is on the one hand uncultivated and overgrown rural and peri-urban areas which are more vulnerable to fire. On the other hand, there are more developments and transient (tourists, seasonal) often urbanite populations who bring with them a higher risk of fire incidents. Hence, landscape vulnerability is determined by a) the people and their activities (human factors) and b) the multiple human and natural (including climate-determined) factors shaping the flammability, vulnerability or fire resilience. Now more than ever, does the intensity / severity and thus the ability to cope with wildfire crises depend largely on proactive measures such as prevention (reducing the source of wildfires as well as the wildfire hazard, which determines the intensity, spread and size of fires) and preparedness. Integrated Fire Management Policy to address the (wildfire) vulnerabilities of natural, cultural and industrial landscapes is greatly lacking across the region. The second part of the workshop was to identify the challenges in addressing this increasingly common scenario. The participants chose to further examine “Supply of Basic Services to Enable Crisis Management”, “Policy Making”, and “Capacity Building + Training and Exercises”.</p>	
<b>Improvement Opportunity / Capability Challenge:</b>	
<p><b>Supporting/Preparatory Task #1: Supply of Basic Services to Enable Crisis Management</b></p> <ul style="list-style-type: none"> <li>• <b>Mapping:</b> Risk mapping (including assets); link risk level with measures/actions; fuel mapping; resource mapping (e.g. water reservoirs)</li> <li>• <b>Infrastructure:</b> Coordination with critical infrastructure operators; road network maintenance and signs; viability of power services / supply of water (both linked); power cut can result in water shortage</li> <li>• <b>Engagement:</b> Interaction between population and firefighters</li> <li>• <b>Training:</b> Specific training of FF for WUI</li> <li>• <b>Cooperation:</b> Civil/military cooperation in medium to large fires</li> <li>• <b>Self-defense:</b> Shelters for community &amp; for firefighters, tourists (including air conditioned to protect from smoke)</li> </ul>	





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- **Other:** Interoperability of telecommunication services

#### **Supporting/Preparatory Task #2: Policy Making**

- **General:** Basic perception of landscape including fire ecology/science; basic philosophy / approach between emphasis on prevention or suppression; culture of fire-use should be recognized / validated and supported where ecologically appropriate
- **Critical challenges:** Rural vacuum, jurisdiction issues, enforcement; fuel buildup; planning, zoning, land-use, landscape change (fuel); “city folk” make rural policy, resulting in disconnect between decision-makers and farmers or other rural stakeholders: Policy vs practice gap; overcoming cultural practices / norms and changing public perception
- **Stakeholder involvement:** “Unaware stakeholders” may not know their roles/relationship to fire issues (e.g. conservation actors); inter-sectoral coordination needs; (distribution of) responsibilities/tasking; support of the rural economy by engaging with tourists, youth, etc.
- **Policy development:** Windows of opportunity (must “use” tragedies; consider policy may follow a 2-4 year’ process between elections); consider “entering” at the right level; policies that allow safe fire-use lacking;
- **Knowledge utilization:** Reporting and data generation provide an argument for action (knowledge = responsibility); include fire ecology knowledge
- **Other:** Policy framework needed for RX fire; no policy framework for house construction in WUI

#### **Supporting/Preparatory Task #3: Capacity Building + Training and Exercises**

- **Self-defense:** Improve knowledge on self-defense; build and maintain self-protected communities & landscape; addressing what does preparedness mean, and how can one be better prepared? (before big blow-up / event)
- **Training and education:** Training and exercise cooperative between all EU countries, and at international level; train all the involved agencies/ interagency authorities thereby enabling working together and to understand each other better (currently lacking); training for local governments on how to assess safe “fire smart areas”; trainings on how to maintain fire prevention structures; develop guidelines for stakeholders and share them; raise awareness for politicians
- **Best practices:** share best practices; exchange of best practices and adapt them to each territory; keep aware of new knowledges & best practices (e.g. FIREWISE and English “FireWorks”)
- **Trust and confidence:** Build trust between actors
- **Networking:** Build a network of research/responders
- **Cooperation:** Planning with local stakeholders, population end-users; cooperation between scientists managing data and Forest Service (include legislative part); top-down meetings / seminars (from policy community, w/ chiefs and FFs); annual local / regional meetings before summer – campaigns involving all stakeholders (emphasis trusting relationships) including municipalities, FRS, agricultural sector / activities; define the gaps and refine plans/ SOPs
- **Legislation and frameworks:** Common agricultural policy with strategic fire prevention measures and associated considerations

#### **Constraints / Best practices**





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### **Supporting/Preparatory Task #1: Supply of Basic Services to Enable Crisis Management**

#### Constraints:

- Temporal scale of events difficult to grasp / plan for
- Geographic scale – some areas that need ‘servicing’ are huge
- Lack of standardization: guidelines, fuel models, (e.g. informed by case studies)
- Language barriers

#### Best Practices:

- Volunteer involvement
- Replicating examples of successes (also from other sectors or countries)
- Establishing written guidelines
- Self-protection declarations or certifications at community level (e.g. FIREWISE)

### **Supporting/Preparatory Task #2: Policy Making**

#### Constraints:

- Lack of will: short-term vs long-term priorities (e.g. election cycles)
- Lack of education about fire management, ecology etc.
- Absence of public pressure: awareness vs. responsibility
- Policy too reactive, not proactive
- Experts (scientific) disagreements hinder policy making (paralysis)
- Media framing setbacks: misinformation, oversimplification, uncontrolled messaging
- Lack of Science-Policy-Practitioner Interface (SPPI)

#### Best Practices:

- Lessons identified and lessons learned + implemented!
- Targeted round tables – national and regional
- Train reporters (on how to ask ‘right’ questions or how to cover a story...)
- (Aiming for) Fire Smart Territories + communities

### **Supporting/Preparatory Task #3: Capacity Building + Training and Exercises**

#### Constraints:

- Tunnel vision
- Lack of funding for capacity building – a lot of funding is focused on emergency phase only
- Lack of legal and institutional mandates
- Boundaries/jurisdictions hinder response or landscape-level planning
- Culture of dependency on fire and CP authorities mean much less individual responsibility is assumed by individuals / civil society
- Lack of recognition, valuing and partnering of existing civil-society initiatives which are assuming responsibility and addressing critical issues

#### Best Practices:

- Integration of local community concerns/needs
- Frequent (e.g. annual) interagency meetings
- Cross-exchanges in training (cross-border)
- Regional consultations (at all stakeholders’ levels)





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### The opportunity from different perspectives

#### **Procedures and Organization:**

#### **Supporting/Preparatory Task #1: Supply of Basic Services to Enable Crisis Management**

##### Risk Mapping:

- Standardization (fuel models, fuel types); association of EU forests types w/ fuel models
- Mapping Services (also relating to above point)
- Risk Assessment, also for localized areas
- Risk Communication to public (guidelines, evacuation protocols, regarding protection and prevention etc.)

##### Sheltering:

- Protection guidelines: From fire itself or from direct or dispersed / transported smoke
- Identification of proper / appropriate shelters (consider also smoke dispersal)
- Training local trainers: support is needed especially during evacuation phase

##### Essential services:

- EU coordinated procedure on supply chains especially in cross-border or ERCC module assistance

#### **Supporting/Preparatory Task #2: Policy Making**

##### Limitations:

- Bureaucracy hinders progress
- More field visits and reporting needed to inform policy process
- Law: Conflict of laws in themselves; implementation time / difficulty; enforcement
- Underlying socio-economic challenges at the root of some wildfire issues
- Policies are too general to address certain (esp. local) challenges
- Fire is not/ hardly considered in international conventions
- More reporting (also targeted) is needed for public vs. political or internal processes
- Policies/ laws not implemented to encourage the planting of species which are more conducive for sustainable landscapes; or, deal with issue of unused land

##### Stakeholders Involvement:

- Subsidies for beneficial practices
- Penalties where applicable and appropriate
- Public education which included clear examples; measures to build trust and awareness
- Focus on agricultural sector
- Protect vulnerable groups
- Build capacity to help respond to fire (to help FFs)
- Inclusion (e.g. of volunteers)

##### “Rural Vacuum”:

- Research/Knowledge lacking; apply knowledge directly at landscape level; “reallocate” experts/expertise
- Motivation (esp. for volunteers)
- Prevention activities at community level needed
- Unused land a hazard
- Payment for ecosystems services desired
- Valuation of resources desired
- Policies needed to stimulate rural economy

#### **Supporting/Preparatory Task #3: Capacity Building + Training and Exercises**

- Policy needed to enable:



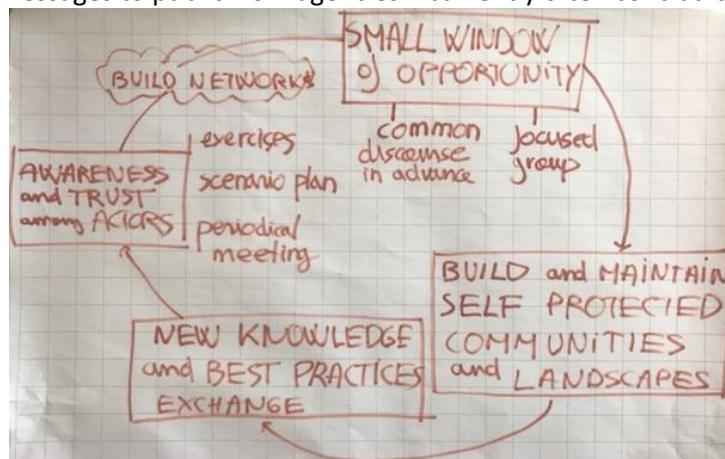


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- Exchanges
- Knowledge generation / application
- Interagency cooperation
- Training/education: raise awareness
- Networks need connecting with local communities
- Empowered communities needed to lead to motivation
- Local volunteer groups needed to implement prescribed fire
- Personal communication lacking
- Recognition of roles of different stakeholders lacking
- Involve sociologists to help with society
- Identify synergies (too many parallel or under supported efforts)
- Standardize levels of risk and measures to change risk level needed
- Clarify messages to public from agencies – currently often contradictory



Flow chart illustrating important capacity building processes

#### **Personnel:**

#### **Supporting/Preparatory Task #1: Supply of Basic Services to Enable Crisis Management**

##### Risk Mapping:

- Public or private sector should develop risk mapping plans if standards exist

##### Sheltering:

- Local administration; forest agency needs to assume responsibility for considering this
- Local Public services need to be included
- Volunteers from local community should gather, guide and evacuate or train others in WUI

#### **Supporting/Preparatory Task #2: Policy Making**

##### Limitations:

- Experts: general lack of FM knowledge and integrated land management
- Gap: Policy vs Practice
- Conflict of interest (for land use)
- Lack of will, lack of knowledge generation
- Policy legacy issues: policies attached to people (who leave/change posts)
- Bureaucracy and fragmentation as obstacle

##### Stakeholders Involvement:

- Experts (e.g. to inform local decision-makers) needed
- Who are they? (do they know they are stakeholders?); are they motivated, interested?
- Trust of decision-makers a problem





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- Volunteerism under-appreciated resource
- No recognition of 'social agriculture' in FM

"Rural Vacuum":

- Experts lacking, training too narrow, or
- Too specialized
- Lack of resources, economic and personnel (e.g. volunteers)

**Supporting/Preparatory Task #3: Capacity Building + Training and Exercises**

- Important stakeholders: Fire service, police, land management authorities, conservationists, farmers, rural residents, ecologists, civil protection authorities, team for fire prevention (include sociologist and communication specialists), insurance companies

**Equipment & Tools / Technologies:**

**Supporting/Preparatory Task #1: Supply of Basic Services to Enable Crisis Management**

Risk Mapping:

- Training, simulation, dissemination of self-protection emergency plan to citizens needed

Sheltering (needs):

- Analysis software
- Maps
- Resource tracking
- Training local WUI communities to gather to safe spot (train the trainers)

Essential Services (needs):

- Backup ICT and power system – e.g. generators (F&RS should establish links to the critical service providers; adhoc networks)
- Food supply
- Health/ Hygiene
- Wildland fire engines (not only structure)
- Create 'autonomous enclaves' with versatility to respond to fire

**Supporting/Preparatory Task #2: Policy Making**

Limitations:

- Simulations needed to enhance understanding of situation for decision-makers
- High costs of land ownership/rent acts as disincentive for production / use
- Insufficient reporting & data collection to pass to decision-makers; recommendations need to be included
- Involvement of civil society (e.g. public comment) insufficient

Stakeholders Involvement:

- Subsidies lacking
- Penalties; liability as leverage – needs improvement
- More simulations
- Reporting lacking
- Programs to educate / communicate to/with stakeholders lacking
- Insurance rather than tax (suggestion)
- Local policy needs to be formulated by locals
- Recommendations from outside policy actors

"Rural Vacuum":

- Incentives (for communities) direly needed
- Laws needed to govern /protect agricultural activities





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- Subsidies/grants needed (for research tools)
- Lack of education or stakeholder cooperation such as through roundtables
- Need to involve interdisciplinary actors to explore various solutions

**Supporting/Preparatory Task #3: Capacity Building + Training and Exercises**

- Need interagency shared strategies (e.g. goals, budgeting etc.)
- Guidelines/show examples of best practices needed
- Include universities and schools! (lacking involvement of schools, education programs, youth and academic: potentially huge and free/low cost resources)

**Related/Other opportunities:**

**Further questions:**

**Keywords:**

EU support; extreme fire events; holistic fire management; EU community; “fire-use” stakeholder inclusion and innovation needs; experts; rural population; rural economy





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## Appendix 4: TWG D, Natural disaster crisis mitigation



Name	First Name	Institution	Country
Beyer	Ralf	Stadt Siegburg	Germany
Biscay	Jean-Frederic	Valabre	France
Bosenbecker	Veith	BF Frankfurt	Germany
Chouvardas	Konstantinos	Civil Protection	Greece
Esteban	Rafel	ISPC	Spain
Liska	Igor	ICPDR	Hungary
Marzell	Lawrence	SERCO	UK
Riva, Prof.	Paolo	University Bergamo	Italy
Palsson	Anders	City of Kristianstad	Sweden
Ulbrich, Prof. Dr.	Uwe	FU Berlin	Germany
Zinelis	Kostas	Civil Protection	Greece
Vedel	Vincent	SDIS 57	France

Project Partners			
Gkotsis	Illias	KEMEA	Greece
Eftychidis	Georgios	KEMEA	Greece
Miralles	Marta	CFS	Spain
Eriksson	Tore	MSB	Sweden
Andersson	Bo	MSB	Sweden
Fresu	Giovanni	CNVVF	Italy
Gnecchi	Gianmario	CNVVF	Italy
Schneider	Iris	THW	Germany
Lahaye	Sébastien	Safecluster	France
Pronto	Lindon	GFMC	Germany
Goldammer	Johann	GFMC	Germany
Illing	Christian	THW	Germany
Markus	Christian	THW	Germany
Observer			
Frecenon	Pierre- Eduard	INERIS	France





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<b>FIRE-IN WP 1 Workshop Implementation Reporting Template</b>	
<b>Title:</b>	Workshop TWG D (1 <sup>st</sup> Flash floods )
<b>Document version:</b>	V 2 20.03.2018
<b>Workshop dates and location:</b>	26.02.2018
<b>Workshop participants and affiliation</b>	See attached list
<b>Submission date:</b>	
<b>Submitted by:</b>	Iris Schneider
<b>Reviewed by:</b>	Ilias Gkotsis, Gianmario Gnecci, Georgios Eftychidis
<b>Background</b>	
<p>Flash floods are more and more common due to extreme weather conditions which Europe is prone to, thus becoming an increasing risk as a consequence from climate change. Flash floods are to be found “among the most devastating natural hazards worldwide”<sup>8</sup>. Around 8% of damaging events worldwide were flash floods<sup>9</sup>.</p> <p><i>Here is a short definition of flash floods:</i></p> <p><i>“A rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). However, the actual time threshold may vary in different parts of the country. Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters.”<sup>10</sup></i></p> <p>Why else is it interesting to look into flash floods from an end user’s perspective? Flash floods need to be handled specifically and require different ways of preparation compared to river or basin floods. The time frame for prediction is very short, and so far, it is very difficult to forecast a precise location of flash floods following heavy rains - unknown variables which are not foreseen in traditional flood management. A very fast raining tide and a very heavy current might also cause severe damage and are different in handling from the other flood types, since there is no chance to run an overall protection program for e.g. critical infrastructure. And it is just land based infrastructure, electricity networks and the telecommunication network that are specifically vulnerable.<sup>11</sup> Additionally, structural prevention measures and strategies like dykes etc. might not be the key answer since the cost benefit ratio is rather low due to difficulty in predicting when and where</p>	

<sup>8</sup> “A cascading flash flood guidance system. Development and application in Yunnan Province, China”, Ziyue Zeng,

Guoqiang Tang, Di Long, Chao Zeng, Meihong Ma, Yang Hong, Hui Xu Jung Xu, 29 December 2015, Springer Science Business Media Dordrecht 2016, Introduction.

<sup>9</sup> “Flash Flood Awareness and Prevention in Germany”, D.B. Bung, M. Oertel, A. Schlenkhoff, and T. Schlurmann, Franziskus Institute for Hydraulic, Waterways and Coastal Engineering, Leibnitz Universität Hannover

<sup>10</sup> See for details: [http://www.met.ed.ucar.edu/communities/hazwarnsys/ffewsrsg/FF\\_EWS.Chap.2.pdf](http://www.met.ed.ucar.edu/communities/hazwarnsys/ffewsrsg/FF_EWS.Chap.2.pdf)

<sup>11</sup> “Increasing frequencies and changing characteristics of heavy precipitation events threatening infrastructure in Europe under climate change”, Katrin M. Nissen, Uwe Ulbrich, Freie Universität Berlin, Institute of Meteorology 14 July 2017





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they will occur<sup>12</sup>. Last but not least, the safety of first responders on-site is particularly at stake due to the heavy current and debris taken with the tide of the flash floods.

**Improvement opportunity / Capability Challenge:**

***Supporting/Preparatory Task #1 Coordination, Command & Control***

- Flash floods require a clear concept
  - The concept needs to be generic in order to be quickly to memorize
  - Joint trainings with all actors involved in operations are necessary on a regular basis
  - A handbook with clear terminology and an explanation should be available with clear definitions of roles, capacities and information sharing channels for all involved agencies, under a unique command and control framework/ system

***Supporting/Preparatory Task #2 Doctrine/ Procedures Development special focus Safety of First Responders***

- Generally doctrines for flash floods rarely exist or are not accurate enough, precision can be done via:
  - Preparedness of flash floods should mandatory involve clear mandates of all actors, building codes and urban planning with regards to the risky areas as well as ITC systems to alert the citizens
  - History of flash flood events specifically cities should be included in the preparedness phases
  - It should be made mandatory that all actors have their own risk management in place a general advice when it is not possible to operate at all should be developed
  - A clear guide who to gather adequate information on social media without falling into the trap of fake news should be developed and
  - Doctrines should go down to identification of high risk areas, safe areas, safe routes on a tactical and local level
  - Clear safety and operational standards should be implemented in the interagency work on local level

***Supporting/Preparatory Task #3 Community Awareness Raising***

- *Generally shifting the awareness to living with a risk acceptance from “We (the Authority) protect YOU (citizen)” to “YOU (citizen) need to be fully involved” This can be done by:*
  - Access of the public to emergency plans
  - Information on risks like flash floods, dyke breaches compulsory if a person buys a property or builds a house
- Involvement of the private sector into the planning process to use synergies between governmental institutions, other public authorities and the private sector via:
  - Training of all groups involved and hit by the flash flood in the same language (on operations) and a simple way to read data

<sup>12</sup> See “Flash Flood Awareness...”, p. 2





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<b>Constraints / Best practices</b>
<p><b>Best practice</b> examples involve:</p> <ul style="list-style-type: none"><li>- Three dimensional simulations with a 10 days range (prior and after the first day of the event) as well as</li><li>- a clear information of the public via a letter to relevant house hold with basic information and a pre stamped post card to fill in with requests for further information</li><li>- Further best practice exchanges worked on exchange of technical solutions for water rescue operations</li><li>- Exchange of understanding who to call, where to go what to do</li><li>- Clear definition of the situations that can trigger the pre-activation of standardized resources according to local plans (e.g. at which point, during an active or forecasted emergency, a country will decide to ask for help at the EU Civil Protection Mechanism)</li></ul> <p><b>Constraints</b> are:</p> <ul style="list-style-type: none"><li>- The lack of forecast understanding of diverse actors</li><li>- The trust of the citizens and actors in processes</li><li>- The not everywhere clear regulations to free volunteers from jobs in emergencies</li><li>- The resilience and time response ratio in this scenario</li><li>- The lack of awareness and reluctance of individuals to inform themselves of risks</li><li>- The taxonomy and terminology that is differently used</li><li>- The lack of knowledge of the structures and responsibilities on other EU countries</li></ul>
<b>The opportunity from different perspectives</b>
<p><i>Procedures and Organisation:</i></p> <p><b>Supporting/Preparatory Task #1 <i>Coordination, Command &amp; Control</i></b></p> <ul style="list-style-type: none"><li>- A generic crowd sourcing concept should be developed out of best practice</li><li>- A guideline/ concept showing which are indicators and sensors for secondary problems should be developed</li></ul> <p><b>Supporting/Preparatory Task #2 <i>Doctrine/ Procedures Development special focus Safety of First Responders</i></b></p> <ul style="list-style-type: none"><li>- Scenario- based and regular training and exercises on different levels with all stakeholders involved should be mandatory on all levels</li><li>- Development of decision support systems including tools (intelligent data analysis, decision support tools, personnel and procedures e.g. tactics for simultaneous management of different tasks</li><li>- Enhancing preparedness and mitigation procedures e.g. with non parking zones, 24 hrs in advance flood forecast probabilities as well as traffic management guidance</li><li>- Update doctrines via lessons learned and feedback after an event</li><li>- Standardized feedback process for the end users on the doctrine Procedures/legislation for citizens involvement in preparedness phase (e.g. clearance of the upstream near to their properties, starting from the bottom)</li><li>- Economical support for preventive actions implementation</li></ul> <p><b>Supporting/Preparatory Task #3 <i>Community Awareness Raising</i></b></p> <ul style="list-style-type: none"><li>- Information of the public with concrete risks broken down on the area of affected households and companies is required with advise how to mitigate risks</li></ul>





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<p><i>Personnel:</i></p> <p><b>Supporting/Preparatory Task #1 <i>Coordination, Command &amp; Control</i></b></p> <ul style="list-style-type: none"><li>- Technical experts should be mandatory in a crises management team when politicians are in lead to advise on risks and potential solutions</li><li>- A mandatory regular training of the leaders with focus on a multidimensional scenario e.g. involving cascading effects</li><li>- Liaison officers on various levels should be implemented</li><li>- The public should be engaged into pre disaster awareness projects such as river cleanings and liaison persons in case of disaster should be identified within the community</li></ul> <p><b>Supporting/Preparatory Task #2 <i>Doctrine/ Procedures Development special focus Safety of First Responders</i></b></p> <ul style="list-style-type: none"><li>- <i>Define clear roles and responsibilities</i></li><li>- <i>Translate probabilities of occurrence of events into where, when and how many resources should be pre-positioned or localized and who does what</i></li><li>- <i>Training of the response personnel on various levels with the following perspectives: emotional management, critical thinking and behaviour</i></li><li>- <i>Have a guideline at hand when operations are no more possible since they are to risky for first responders</i></li></ul> <p><b>Supporting/Preparatory Task #3 <i>Community Awareness Raising</i></b></p> <ul style="list-style-type: none"><li>- The requirement to engage the citizens in prevention measures like cleaning rivers</li><li>- Social media specialists should be part of the crises response team</li><li>- Training of the public and awareness raising projects with children since they are a good as multipliers within their family</li><li>- Training of peers to support the neighbourhood with information on risk mitigation</li></ul>
<p><i>Equipment &amp; Tools / Technologies:</i></p> <p><b>Supporting/Preparatory Task #1 <i>Coordination, Command &amp; Control</i></b></p> <ul style="list-style-type: none"><li>- VP/AC should generally be used down to the tactical level</li></ul> <p><b>Supporting/Preparatory Task #2 <i>Doctrine/ Procedures Development special focus Safety of First Responders</i></b></p> <ul style="list-style-type: none"><li>- <i>Pre position equipment close to high risk areas to save time</i></li><li>- <i>Use also on local level early warning systems with real data acquisition such as flow dynamics</i></li><li>- <i>Use VR/AR tools for training of procedures</i></li><li>- <i>Provide training manuals for different levels and different actors online as well as educational tools online</i></li><li>- <i>Procedures should include organizational accountability systems to allow for a clear management of the rescuers sent in the disaster area.</i></li></ul> <p><b>Supporting/Preparatory Task #3 <i>Community Awareness Raising</i></b></p> <ul style="list-style-type: none"><li>- <b>Standardization of public information throughout Europe. This can be done by:</b></li></ul>





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- Via private mobile phone e.g. apps with standardized information and advice on risk mitigation measures
- Via a specific channel on the radio and TV for crises with similar information

**Related/Other opportunities:**

- A guardian/ custodian for best practice and lessons learned should be established
- Generic scenarios for flash floods with various aspects involved should be made available to diverse levels of operations
- Have more 4x4 vehicles prepositions in areas prone to flash floods since most first responder vehicles can not operate in mud on 5 cm and above on roads
- Tactical maps should be part of the briefing of incoming personnel since mobile devices might not work due to black holes in the communication
- GPS trackers and cameras might be interesting to use if it works according to personality laws still a geolocalization of all rescue teams would be mandatory to ensure the monitoring and activation of further support if needed

**Further questions:**

- A handbook and standardized signs specifically designed to flash floods
- A guidance who to train the decision making skills of leaders on political as well as operational level since they are key to success or failure of the operations

**Keywords:**

Training with all involved, Safety of first responders, clear concept and doctrine, social media guideline, crowd sourcing, taxonomy and terminology, involvement of citizens and private sector





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<b>FIRE-IN WP 1 Workshop Implementation Reporting Template</b>	
<b>Title:</b>	Workshop TWG D (2 <sup>nd</sup> Floods )
<b>Document version:</b>	v01 20.03.2018
<b>Workshop dates and location:</b>	27.02.2018
<b>Workshop participants and affiliation</b>	See attached list
<b>Submission date:</b>	
<b>Submitted by:</b>	Iris Schneider
<b>Reviewed by:</b>	
<b>Background</b>	
<p>Not only flash floods but also floods still require attention despite countless initiatives on all levels already taken. The latest study from the Potsdam Institute for Climate Impact Research (PIK) indicates <i>“Rainfall changes caused by global warming will increase river flood risks across the globe”</i>. Already today, fluvial floods are among the most common and devastating natural disasters. Scientists have now calculated the required increase in flood protection until the 2040s worldwide, breaking it down to single regions and cities. They find that the need for adaptation is greatest in the US, parts of India and Africa, Indonesia, and in Central Europe including Germany.<sup>13</sup> Thus there is an overall challenge, that the floods are not a repeated phenomenon with the same level but climate change is likely to change flood levels and thus asks for a check of the existing measures and the approach taking new potential higher flood levels into consideration. Thus “...prepare for potential events beyond expectations. The theoretical maxim of combined multi-hazard effects must be considered in community, national and regional risk management.”<sup>14</sup></p>	
<b>Improvement opportunity / Capability Challenge<sup>15</sup>:</b>	
<p><b>Supporting/Preparatory Task #1 CCC, Situation Assessment, Monitoring/ Information Gathering</b></p> <ul style="list-style-type: none"> <li>• Situation specific information is needed such as real time flood data</li> <li>• A general situation overview needs to be available for end users such as evacuation routes, recommendations, overview who works where on what</li> <li>• The involvement of media needs to be taken into account (e.g. to avoid panics) and respective press work is an essential part of the crises management team</li> <li>• Specific aspects should be part of standardized situation assessment: like considering not only shelter for humans but also life stock and taking the health risks caused by floods into consideration e.g. water contamination</li> <li>• Standardized situation boards between the various command posts in a large area will facilitate communication and a better understanding of the ongoing emergency.</li> </ul>	

1 <https://www.pik-potsdam.de/news/press-releases/adaptation-now-river-flood-risks-increase-around-the-globe-under-future-warming>

14 Statement of the 5th International Conference on Flood Management (ICFMS) „Floods: From Risk to Opportunity“, 27-29 September 2011, Tokyo Japan, p. 3

15 It was decided that Coordination, Command and Control as well as Situation Assessment and Monitoring/ Information gathering should be regarded as one point





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### ***Supporting/Preparatory Task #2 Doctrine/ Procedure development***

- The creation of a European Monitoring system for flood data is necessary to inform on a broader scale
- Inter-organizational cooperation and centralized communication should be mandatory
- Integration of specific functions in the joint crises management team such as liaison officers and experts e.g. for critical infrastructure issues needs to be established
- The public should be regularly informed on situation updates. For this a European wide “112 type” mobile application, providing information on the event as well as instructions for citizens, should be installed.

### ***Supporting/Preparatory Task #3 Community awareness raising***

- The concept of community awareness raising should address/ involve the following stakeholders:
  - LEAs (Fire Brigade, Civil Protection etc.) in local/regional/national level
  - CI (critical infrastructure) owners/operators (especially those of SEVESO type, which do have their own plans)
  - Citizens, whom need to be aware of risks that apply on every change and choice they make (e.g. house construction in an area)
  - “Specific” communities such as moving groups (tourists/drivers/immigrants) and difficult to reach groups (elder/disabled)
  - Insurance companies, in order to make citizens more aware from their point of view
- It should be clear prior to communicate who the risk owner is, especially clarified between public authorities and private operators (who might operate with different policies and emergency plans according to their requirements)
- Flood risk maps should be basis for the awareness raising in terms of clearly indicating to the community the risks and possible impacts
- Risk acceptance (“face-accept-explain”) needs to be taught, not only on how to eliminate the individual risk, but also making the citizens part of risk mitigating strategies
- Evacuation route signals/indications are good means of community awareness. In general they lead to a reduced evacuation time when flooding occurs
- Information sharing should be run both ways public to authorities and vice versa. Those channels should be used also to provide instructions, recommendations etc.

### **Constraints / Best practices**

#### **Best practice** examples involve:

- The use of social media for quicker dissemination of information directly from the press office of the authorities
- EENA 112 application
- 10 days flood risk maps (Kristianstads Commune in Sweden)

#### **Constraints** are:

- LEAs can not reach/ inform everyone
- Intermediates are obligatory in some cases and towards specific groups e.g. disabled





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### **The opportunity from different perspectives**

#### *Procedures and Organisation:*

##### *Supporting/Preparatory Task #1 **Coordination, Command & Control etc.***

- A survey on areas and buildings at risk should be mandatory and subsequent measures taken
- Flood risks should be communicated down to the household level
- A systematic and standardized regular training on command and control level is necessary
- Data on HAZMAT should be available for first responders to plan and act accordingly

##### *Supporting/Preparatory Task #2 **Doctrine/ Procedures Development special focus Safety of First Responders***

##### *Supporting/Preparatory Task #3 **Community awareness raising***

- Guidelines for better use and handling of media are needed to have the quickest possible dissemination rate
- Affected citizens should be addresses with information on event, actions implemented, impacts, insurances etc.
- Target group focussed campaigns should be developed and run in order to issue first information and instructions on mitigation until first responders arrive
- Points of contacts for communities and most vulnerable should be established as information hub such as for elderly, disabled etc.
- Establish information hubs in the communes additionally to the LEAs such as in hospitals for visitors or patients
- Centralized news media management during crises situations should be mandatory to disseminate standardized information
- Increase the capability of Authorities to deal with social media directly through an Official Profile

#### *Personnel:*

##### *Supporting/Preparatory Task #1 **Coordination, Command & Control***

- The role of specialists in social media needs to be implemented
- as well as liaison officers and
- also specific liaison officers or POCs to critical infrastructures

##### *Supporting/Preparatory Task #2 **Doctrine/ Procedures Development special focus Safety of First Responders***

- Spatial data should be made interoperable and usable in different GIS

##### *Supporting/Preparatory Task #3 **Community awareness raising***

- Social media training for end users to reduce the time to disseminate information and create trust of the citizens
- Establish the role of POC (point of contact) for the public in each crises management team of the authority to deal with questions from the public





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- Volunteers should be trained as personnel for community awareness issues
- Reporter workshops to train them for basic understanding of the floods are needed to ensure a proper dissemination of information

**Equipment & Tools / Technologies:**

**Supporting/Preparatory Task #1 *CCC, Situation Assessment, Monitoring/ Information Gathering***

- UAVs should be used to support search, inspect embankments and potential failures (pre-planned flights)
- Ad hoc mesh networks (mesh networks are **local network topology** in which the infrastructure **nodes** (i.e. bridges, switches and other infrastructure devices) connect directly, dynamically and non-hierarchically to as many other nodes as possible and cooperate with one another to efficiently route data from/to clients) should generally be used in case of telecommunication failure
- Crowd sourcing (data from different sources e.g. public and authorities) and earth observation data should generally be part of the information gathering process. This includes also social media groups that are used to monitor locally the meteo conditions

**Supporting/Preparatory Task #2 *Doctrine/ Procedures Development special focus Safety of First Responders***

**Supporting/Preparatory Task #3 *Public awareness raising***

- Optoacoustic equipment e.g. mobile phones, cameras, UAVs can be used from the first responders to directly disseminate news related to the disaster if they are trained accordingly
- Frequently issued TV and radio spots as well as leaflets should be distributed in areas highly prone to floods to inform about the floods
- Younger people should be made aware via video games and applications of the risks and possible mitigation strategies
- Massive Open Online Courses (MOOCs) should be produced for flood awareness

**Related/Other opportunities:**

-

**Further questions:**

-

**Keywords:**





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## Appendix 5: TWG E, CBRNE crisis mitigation

### Associated Experts

Nr.	Organisation	Name, Surname	Country
1.	Fire Rescue Brigade of Olomouc Region	Martin Danis	Czech Republic
2.	Fire Rescue Brigade of Moravian - Silesian Region	Ruzena Pavlikova	Czech Republic
3.	General directorate of civil protection- Headquarters of the french military civil protection	Ingrid Richard	France
4.	Service Départemental-Métropolitain d'Incendie et de Secours (SDMIS)	Stephane Clerc	France
5.	Military and civil CBRN national center	André Chevallier	France
6.	CENTRE NATIONAL CIVIL ET MILITAIRE DE FORMATION ET D'ENTRAINEMENT NRBCE	laurent Hugues	France
7.	Branddirektion Frankfurt am Main	Laura Tandela	Germany
8.	CBRN Knowledge Center of International CBRNE Institute Charleroi	Ioannis Galatas	Greece
9.	US Navy, Fire & Emergency Services, NSA Naples Italy.	Paolo Mandara	Italy
10.	Szkoła Główna Służby Pożarniczej	Zdzislaw Salamonowicz.	Poland
11.	Institut de Seguretat Pública de Catalunya	Xavier Sabaté Vallvé	Spain
12.	Fire Brigade Valencia	Miguel Basset Blesa	Spain
13.	Toledo Fire Brigade	Francisco Velamazan	Spain

### Project Partners /moderators, representatives of project partners/

Nr.	Organisation	Name, Surname	Country
1.	ENSOSP	Bertrand Domeneghetti	France
2.	ENSOSP	Mathilde Meyer	France
3.	CAFO	Petr Oslejsek	Czech Republic
4.	CAFO	Vladimir Vlcek	Czech Republic
5.	CAFO	Martin Nekula	Czech Republic
6.	CNVVF	Luigi Palestini	Italy
7.	SAFE Cluster	Sebastien Lahaye	France
8.	SGSP	Rafal Porowski	Poland
9.	SGSP	Piotr Tofilo	Poland

### Observers

Nr.	Organisation	Name, Surname	Country
1.	University of Tor Vergata (eNOTICE project)	Daniele Di Giovanni	Italy





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### Summary of conclusions

We need to improve the sharing of “best practise” / “lessons learn”/ researches between researchers and practitioners from different services. Supporting of inter-agency /civil-military platforms and networks.

- Development of decontaminations standards/substances and equipment for mass decontamination, decontamination of people with handicap or injured.
- Uniform concepts / designations / definitions within CBRN and HAZMAT interventions must be defined. Without uniform interpretation of individual concepts, it is not possible to develop common procedures. Within the group of experts, it was clear that the perception of the terms CBRN and HAZMAT interventions is not uniform in individual countries and languages.
- Need for standardizations:
  - o Terms
  - o SOPs
  - o Limits (dose, exposition limits)
- Competencies maps of individual components / organizations
  - o Different competencies of individual rescue teams and other organizations involved in solving extraordinary events related to the use of a dirty bomb are different within countries. From a European scale, it is necessary to describe the individual national systems and procedures and to find interference relations between them. There is the need of competition maps/charts for standardizations.





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## Appendix 6: Full matrix of CCCs

### High Flow of Responders in Hostile Environment

#### INCIDENT COMMAND ORGANIZATION

##### Focus on sustainability of safe operations.

- Identify quickly, zone and plan safe access in hostile environment, and maintain situation awareness.
- Adapt efforts and tempos to forecasted available capacities, forecasted changes in the scenario, and to sustainability of operations.
- Build trust inside crews with different specialties, between crews and with commanders.
- Appoint a safety officer at highest level of decision.

[#windowofopportunity](#) [#commandpost](#) [#timeofarrival](#) [#integralcontrolofresources](#) [#restwork](#) [#extendcommunicationcoverage](#) [#medicalcare](#) [#mobilelocation](#) [#SafetyOfficer](#)

#### PRE-PLANNING

##### Pre-plan a time-efficient, safe response in hostile environments.

- Plan mobilization, communications, logistics and legal issues for specific scenarios. Understand possible help from outside the regional system.
- Gather and share relevant information of local hostile scenarios, and its pre-planned response measures.
- Package and preposition modules of resources, equipment and logistics for quick transport, and easy tracking. Plan its mobilization.
- Focus efforts on passive prevention for safe access.
- Identify who can perform the key specific roles.
- Create networks of experts that exchange knowledge, experience and best practices.
- Coordination between cross-border crews.

[#communicationtools](#) [#accessibilitytools](#) [#specificSOP](#) [#recognitionofexpertise](#) [#minimizeexposition](#) [#equipmentnests](#)

#### GUIDANCE INSTRUMENTS

##### Establish specific procedures and guides facilitating operativity.

- Procedures and guides for fast response to minimize total damages in a time-efficient way (mobilization, arrival, command, transfers and turn-overs, work-rest balance, briefings, documentation, logistics, communication, coordination, cross-border procedures...)
- Standardize response in front of specific hostile environments (zonification, safety, techniques...)
- Build techniques for planning and adjusting the use of resources with time, to maintain the work effort sustainability for long periods of time.

[#Europeanguides](#) [#safetystandards](#) [#mobilization](#) [#transferofcommand](#) [#mandatorydrills](#) [#SOPdecontamination](#) [#ResourcesTrackingBoard](#) [#StagingAreas](#)





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KNOWLEDGE CYCLE	<p>Train specific roles in hostile environments.</p> <ul style="list-style-type: none"><li>• Develop, evaluate and maintain skills of responders involved, specialists and non-specialists, and their knowledge of the local scenarios and techniques.</li><li>• Differentiate operational, tactical and strategic, and chain-of command training, including courses, visits, drills and exercises. Courses to learn, visits to acquire local knowledge, drills to acquire individual and crews' skills and SOPs, exercises to train/evaluate flexibility, team building and performance, and lessons learned explanations to raised awareness.</li><li>• 'Command post' tactical training to maintain a sustainable flow of responders, tools and equipment, in-out communications of information and orders...</li></ul> <p><a href="#">#pre-hospitalprocedures</a> <a href="#">#onsitevisits</a> <a href="#">#exercisesevaluatorsandassessors</a> <a href="#">#tabletopexercises</a> <a href="#">#virtualreality</a> <a href="#">#onlinetraining</a> <a href="#">#selftraining</a> <a href="#">#redcells</a> <a href="#">#HRBcategorization</a></p>
INFORMATION MANAGEMENT	<p><b>Information cycle</b></p> <ul style="list-style-type: none"><li>• Compile and validate dynamic data flows. Focus on having a big-picture view, on a timely verification of too-much information, on distinguishing noise from useful information, and identifying targets and representations of key information.</li><li>• Specific communications with responders, stakeholders, politicians and media.</li><li>• Provide clear instructions to potential victims.</li><li>• Improve the ability to extract useful information from crowd-sourcing (distinguish useful information from noise).</li></ul> <p><a href="#">#technicalexpert</a> <a href="#">#informationmanager</a> <a href="#">#mobilejurisdiction</a> <a href="#">#laboratories</a> <a href="#">#fakenews</a> <a href="#">#alarmsystem</a> <a href="#">#weatherforecast</a> <a href="#">#legalaspectsofsocialmedia</a> <a href="#">#112infotodispatchers</a> <a href="#">#EuropeanRelevantInformationDatabase</a> <a href="#">#checklists</a></p>
COMMUNITY INVOLVEMENT	<p>Develop public self-protection to minimize responders' exposure.</p> <ul style="list-style-type: none"><li>• Focus on prevention, self-protection and risk awareness of population.</li><li>• Pact with public and private stakeholders on accepted risk and self-protection measures. Mandatory exercises funded by owners of high risk activities.</li><li>• <i>Train</i> general population from 0 and with basic language, exercise with those more exposed. Address all phases of emergency.</li><li>• Disseminate instructions in case of risk, in order to strengthen the appropriate reactions from population.</li></ul> <p><a href="#">#voluntaryinvolvement</a> <a href="#">#PressConferenceArea</a></p>
TECHNOLOGY	<p><b>Use technology to assess risks and minimize responders engagement.</b></p> <ul style="list-style-type: none"><li>• Locate responders anytime, anywhere and know how long they can sustain efforts.</li><li>• Unmanned terrestrial and aerial tools to assess the risk</li><li>• Unmanned tools to transport equipment on the field.</li></ul> <p><a href="#">#language#location</a> <a href="#">#drones</a> <a href="#">#sensors</a> <a href="#">#InteractiveEquipment</a></p>





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## High Impact, Low Frequency Emergencies

INCIDENT COMMAND ORGANIZATION

### Prioritize the reduction of vulnerability and increase interaction with public.

- Boost the public information function. Develop a specific communication strategy to maintain credibility, including social media.
  - Shift of focus needed, to minimizing potential damages to main values. Focus on key, relevant information. Anticipate relevant changes. Anticipate alternative scenarios, and contingency plans.
  - Psychological support for rescuers.
  - Integrate feedback from community.
- #informationofficer #riskanalyst #decisionmaking #psychologicalcare #forensics #credibility #callcenters #predictivetools

PRE-PLANNING

### Negotiate solutions with stakeholders for anticipated scenarios.

- Pre-plan based on predicted probable scenarios and negotiate accepted level of risk based on them.
  - Involve risk owners, control owner, technical experts and other stakeholders
  - Change focus towards prevention, self-protection and risk mitigation.
  - Exchange of experts in large events in other places when timely possible.
  - Build communities of practice of experts.
- #standardizedriskmap #mobilizationprocedures #planningscales #communityofusers #certifyselfprotection #vulnerablepopulation #urbanism #landuse #communicationstrategy #unawarestakeholders #enforcement #communityofpractice

GUIDANCE INSTRUMENTS

### Standardize capabilities in front of pre-established scenarios

- Standardize competences to respond and prevent those risks, and the exchanges, lessons learned, drills and evaluations processes to maintain them.
  - Involve firefighters in establishing doctrine and build a proactive approach to risk. Doctrine and procedures should protect firefighters and public, not prevent legal conflicts. They should be simple and support real-time adaptability.
  - Legal framework and requirements of prevention and self-protection of infrastructures and activities. Plan the implementation of laws and plans.
  - Build specific SOP and doctrine for specific scenarios with high impact.
  - Standardize symbology and tools to raise public awareness
- #EuropeanPolicyFramework #whopays #CommonTrainingAllAgencies #EuRiskMobileApp

KNOWLEDGE CYCLE

Learn about possible scenarios focusing efforts in key risks and opportunities.

- Towards a complete cycle of knowledge. Based on feedback from real incidents and from exercises, adjust SOPs, doctrine and pre-plans, and identify main gaps in training, procedures, personnel and equipment.
- Study and learn also from incidents in other times and places, from research, from private enterprises....
- Optimize lessons learned (=implemented) processes inside the organization and





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	<p>between organizations. Look for specialists in those areas.</p> <ul style="list-style-type: none"><li>Widen the focus of learning, involving situation awareness at all levels, and specially prevention and self-protection. Focus on rapid recognition of the scenario; on anticipation of behavior of the fire/water/chemical/radiation; on anticipation of opportunities and risks.</li><li>Combine experts and specialist who accumulate knowledge, with an increase in knowledge and skills of firefighters, with involvement of stakeholders in prevention visits and exercises.</li></ul> <p>#organizationallearning #knowkedg=responsibility #disseminatedexpertise #capitalization #bestpractices #trainedevaluators #EuropeanTrainersGuides #SpecificOperationalGuides #cost-efficienttrainings #learningoutcomes #science-policy-practitioner-interphase</p>
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#### INFORMATION MANAGEMENT

##### Manage key information focused on decision-making.

- Build systems (persons-tools-processes) to integrate and analyze information from different channels, to manage information overload, to anticipate probable scenarios. Build them with comparative results. The aim is to provide a shared understanding of the scenario and operations focusing on anticipated risks and opportunities, and on tracking resources, actions and damages.
  - Circulate information to develop legal standards for prevention and response
  - Extract useful information from crowd-sourcing.
- #avoidnoise #analyst #socioculturals #commondatarepository

#### COMMUNITY INVOLVEMENT

Prepare population for the worst scenario before it happens.

- Clearly disseminate that responders cannot protect everybody in case of major incident.
- Involve communities and stakeholders in pre-planning scenarios, in safety preparing and verification, and in drills and exercises.
- Change of paradigm. From 'We, authorities, will protect you' To 'You, citizen, should be actively involved'.
- Communication campaigns targeted to specific communities, with messages, exchanges and media carefully studied. Generate multi-language apps, with standardized symbology.
- Plan and prepare the involvement of volunteers and other civil society in the emergency.
- Manage and involve mass media. Training on means for mass information (social media, smartphones...).
- Be prepared for massive alerts to population
- Educate kids and young ones.

#EuropeanPolicyFramework #TrainJournalists #trainlocalstakeholders #educatekids

#### TECHNOLOGY

##### Simulate complex scenarios

- Virtual reality to train responders
- Crowd-sourcing and multiform data integration tools.
- Tools to massively alert population in real time.

#autodownloaded #mobile





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## Complex Multiagency/ Multileadership Environment

### INCIDENT COMMAND ORGANIZATION

#### **Distribute decision making**

- Identify roles and capabilities of different agencies and stakeholders in the emergency.
- Build a shared understanding concerning scenario and strategy across responders to synchronize simultaneous decision-making. Manage complex information focusing on the multiple levels of decision-making.
- Management by objectives, giving flexibility and autonomy in decision making. Lower decision making. Distributed decision-making based on assigned missions, on common objectives and a shared understanding on situation.
- Identify points of coordination in the different zones: from local (hot zone, warm zone, ...) to regional to national. Establish different levels of liaison officers, translators, communication and infrastructures as needed.

#ICS #EuropeanInteragencyFramework #cross-borderaids #liasonofficer #interoperability #eucpm

### PRE-PLANNING

#### **Pre-plan interoperability and enhance synergies.**

- Agreed chain of command, specifying roles and capabilities beforehand.
- Pre-plan shared by all agencies and stakeholders
- Legal framework for cross-border help, emergency support, victim transportation, recognition of qualifications, ...
- Enhance synergies between experts and agencies at regional, national and international level. Share specialists and experts.
- Emergency preparedness should integrate an international & European perspectives.
- European interagency round tables for lessons learned processes and the generation of new standards.

#communication #jointexercise

### GUIDANCE INSTRUMENTS

#### **Establish an interagency framework.**

- Establish standards for roles, capabilities, competencies and processes for a multi-agency framework, and the mechanisms to certify them. Nowadays under similar names there are different capabilities, competencies and processes.
- Integrate specialists and non-specialists in operations, in the command post and in the chain of command
- Regulate cross-border plans and aids, and jurisdiction responsibilities. Mandatory unified communication system at least in cross-border scenarios.
- Standardize fluxes of information and decision-making between private, civil and military environments, reducing bureaucracy.

#terminology #informationmanager #Eruoepancommunicationsystem #EuropeanPolicyFramework





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KNOWLEDGE CYCLE	<p>Build a shared understanding of emergency, and train interagency scenarios.</p> <ul style="list-style-type: none"><li>• Provide a shared understanding of the emergency behavior, roles, terminology, capabilities, decision-making and other specific processes, before, during and after the emergency to all involved. Liaison officers as ‘translators’ (language, cultures...) in different decision levels.</li><li>• Standardize competences for specific positions at European Level, and its certification processes.</li><li>• Once the standard roles of different actors have been trained during table top exercises, organize joint drills (e.g. cross-border) where the focus is on decision-making, coordination and interactions between agents. Train on overlapped competences, and limits of competences.</li><li>• Train values such as empathy, adaptability, proactivity, collaboration and leadership, and promote trust building.</li><li>• Map existing networks and stakeholders at national, regional and local level.</li><li>• Engage network of experts on in-site based activities.</li></ul> <p><a href="#">#EuropianSharingKnowledgePlatforms</a> <a href="#">#EuropeanDisasterManagementSchools</a> <a href="#">#scales</a> <a href="#">#buildingmanager</a> <a href="#">#CommonInteragencyTraining</a> <a href="#">#skilledtrainners</a> <a href="#">#jointtraining</a></p>
INFORMATION MANAGEMENT	<p><b>Define common information management processes between agencies.</b></p> <ul style="list-style-type: none"><li>• Define the information to be shared among agencies, and share a database (cartography, plans, lessons learned...). Share needs and limitations from different agencies</li><li>• Define the evaluation process and each agency paper on it.</li><li>• Relevant procedures and terminology should be known by all responders.</li><li>• Standardize the shared information between the Call Center and the Command Post.</li></ul> <p><a href="#">#EuropeanCommunicationSystem</a></p>
COMMUNITY INVOLVEMENT	<p>Nothing identified.</p> <p><a href="#">#xxx</a></p>
TECHNOLOGY	<p><b>Technological tools to support data sharing</b></p> <ul style="list-style-type: none"><li>• Multiagencies/multi sources data integration tools</li><li>• Remote distance / interconnected training tools</li><li>• Automatic translation tools</li></ul> <p><a href="#">#IntegrativeSystems</a> <a href="#">#VirtualReality</a></p>

## High Level of Uncertainty

INCIDENT COMMAND ORGANIZATION	<p><b>Strategies choosing safer scenarios, and maintaining credibility.</b></p> <ul style="list-style-type: none"><li>• Strategies shift from minimizing damages towards increasing resilience, choosing scenarios where efforts will work safely, reducing potential chain events, involving safely stakeholders and reducing complexity.</li></ul>
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- Adapt warning systems and strategies to probabilistic forecasted scenarios.
- Focus on maintaining or restoring initiative in decision-making, on providing a predictable environment for operations. Build an organizational structure to overcome uncertainty, based on anticipating the scenario probable evolution and strategies and tactics to deal with them.
- Include experts outputs in the decision making
- Maintain credibility and reach affected population specifically and all the public.  
[#costofopportunity](#) [#decisionlag](#) [#simultaneity](#) [#missioncommand](#) [#leadership](#)  
[#commandsintent](#) [#EUWarningSystem](#) [#crowdcontrol](#) [#protecthospitals](#)  
[#proactivepolicies](#) [#FireBehaviourAnalysts](#)

#### PRE-PLANNING

##### **Focus on governance and capacity building towards more resilient societies**

- Involve key stakeholders (risk owners, control owners, ...) in action-based strategies, considering integral risk management opportunities.
  - Promote quick adaptation to changes in scenario through situation assessment and decision-making structures.
  - Pre-plan communication management for specific scenarios. Include post-accident procedures.
  - Focus on small window of opportunities to change policies and governance processes.
  - Identify and reduce bureaucracy and other inhibitors slowing progress.
  - Pre-plans should be flexible, focusing on indicators of key changes and providing tools for alternatives and contingency plans
  - Promote the growth of sustainable, risk-decreasing activities via policies, certifications, insurance companies,...
- [#transdisciplinarytables](#) [#Insuranceincentives](#) [#fundingcapacitybuilding](#)

#### GUIDANCE INSTRUMENTS

##### **Build doctrine for resilience in emergency services and societies**

- Ensure doctrine give space for safe decisions towards solving the incident in unexpected scenarios.
  - Change national policies to promote the key position of experts in decision making and to enable decision makers to operate sacrifices in order to enhance post-crisis resilience
- [#simultaneity](#) [#StandardWarnigSystem](#)

#### KNOWLEDGE CYCLE

Focus on integral risk management.

- Study integral risk management at a large scale, involving stakeholders, and focus on the interphase between different incidents, changes of behavior, domino effects and uncertainties.
  - Train crews and commanders in decision-making and communication in uncertain, dynamic, unexpected scenarios, adapting tempos and synchronizing activities with other agents. Facilitate the improvement of existing doctrine.
  - Understand probabilistic forecast of different scenarios, compare alternatives and have contingency plans.
- [#dominoeffects](#) [#ptsd](#) [#decisionlag](#) [#humanfactors](#) [#simultaneity](#)





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#### INFORMATION MANAGEMENT

##### **Provide an efficient, flexible flow of information for a shared understanding.**

- Identify the uncertain scenario, and sources of uncertainty.
- Share key information to facilitate synchronized actions and to maintain initiative on a changing scenario.
- Manage information in domino effect scenarios, which are time-constrained.

[#dominoeffectcommunication](#)

#### COMMUNITY INVOLVEMENT

##### Cultural change in risk tolerance

- Communication in uncertain events (chained events, dynamic environments...) is crucial; it has to be prepared, trained and stakeholders involved.
- Focus on credibility.
- Use all opportunities for cultural changes in risk awareness and policies.
- Empower communities and stakeholders. Recognize and partner with existing civil-society initiatives addressing critical issues.

[#panicmanagement](#) [#understandsocioeconomicchallenges](#) [#awarenessofhistory](#)

#### TECHNOLOGY

##### **Get a clear picture of the risk evolution**

- Real time picture of the situation thanks to satellite / drone processed imagery
- Integrated multiagent simulators to support expert prevision of risk evolution
- Artificial Intelligence to help finding fake news and to simulate behavior of a large amount of people

[#satelite](#) [#drone](#) [#simulator](#) [#IntegrativeSystems](#)

