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FIRE-IN

D2.1 Methodology for RDI and standardisation screening

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Abstract:

This document, describes the methodology and procedure for organising the screening of available products, promising research, development and innovation (RDI) works, and standards to address the common capability challenges as identified by WP1 of the FIRE-In project.

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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 needs much stronger guidance from practitioners and better exploitation of the technology potentially available for the discipline.

The purpose of this report is to describe the procedure and methodology for organising the screening of available products, promising RDI works, and standards to address the common capability challenges as identified by WP1 of the FIRE-In project. It provides the basis for the implementation of the screening process.



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1. Introduction

Deliverable 2.1 describes the methodology that will be used to screen solutions that may fill the common capability gaps that were identified in WP1 of the FIRE-IN project. It outlines the overall screening framework and fields, responsibilities of the involved partner organisation as well as the screening procedure for the different fields under consideration such as research results, standards and technologies. In addition to providing a framework for the screening process, it identifies specific screening dimensions and levels (international, EU and national), and outlines the responsibilities of all partner organisations. Furthermore, the deliverable discusses how the screening process can be adapted to work with the different type of sources that are investigated, e.g. research results, standards and technologies.

2. Solution screening framework

Initially, a framework was developed to structure the review process (figure 1). It uses the Common Capability Challenges, as identified by WP 1 in the TWG workshops (compare also Deliverable 1.1), as input for the overall review (upper part). Based on the results, a two-step process will be used to conduct the screening. In the first step, different, mainly focused on EU and the international level, dimensions such as R & T publications, projects and technologies will be screened. At the same time, matching solutions and initiatives that can be identified at the national level will be considered wherever possible and with support from the project partners and their networks. In a second step, the solutions' potential to close capability gaps will be evaluated. The dimensions and steps are described in more detail below.

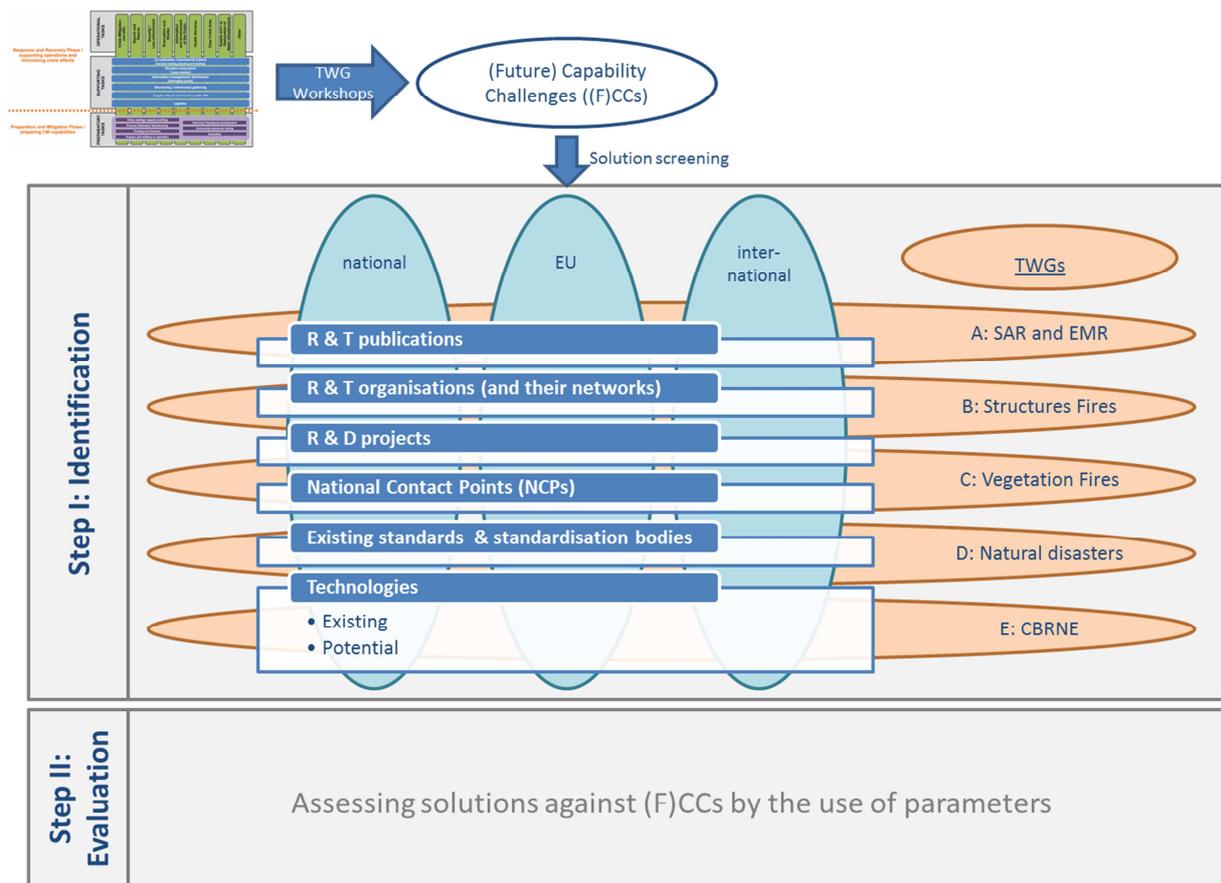


Figure 1: Framework for solution screening process



2.1. Dimensions

The solution screening will look at the following dimensions:

- R & T publications
- R & T organisations and associations (and their networks)
- R & D projects
- National Contact Points (NCPs)
- Existing standards and standardisation bodies at EU and national level, as well as
- Existing and potential technologies

Overall, the screening will respond to all types of identified challenges. This encompasses technological as well as organisational challenges, for example, those related to cooperation and information management (see also Chapter 3 below on the methodology).

2.2. Steps and responsibilities

Overall, the solution screening process will be implemented in two steps: Step I (Identification of solutions) encompasses the screening, documentation and compilation of available solutions. Step II (Evaluation) consists of measuring how well the solutions address the capability gaps and ranking them based on their overall utility for practitioners. Step I will be conducted mainly by the scientific partners while the evaluation will be conducted by the end-user partners who are involved in the task under consideration of the TWGs and the Associated Experts.

The responsibilities for the solution screening implementation process have been arranged according to the Two-Step-process as well as the screening dimensions:

Table 1: Steps, dimensions and responsibilities of the FIRE-IN solution screening process

	Screening dimension	Sub-categories	Responsible and supporting partner(s)
Step I: Identification	R & T publications	Journal articles	FhG (SGSP)
		Books	
		Grey literature	
		Project Deliverables	
	R & T organisations and their networks		CNBOP (SAFE)
	R & D projects	EU	FhG
		national	
		regional	
	National Contact Points		CBSS
	Standardisation efforts	international level	INEDEV
		national level	
		bodies and networks	
		SEREN3 contact	
Technologies	existing	KEMEA (CBSS)	
	potential (adaptation required)	INEDEV (FhG)	
Step II: Evaluation			CNVVF
			GFMC



3. Solution screening process and methodology

3.1. Step I: Identification of solutions

The above described dimensions of the solution identification process can be clustered into two main groups:

- a) Solution categories:
 - Research results (R & T publication and R &T projects)
 - Standardisation efforts and
 - Technologies
- b) Knowledge owner:
 - R & T organisations and their networks
 - National Contact Points

These dimensions encompass areas that the responsible partners will screen. The screening itself will be determined by the Common Capability Challenges (CCCs) as identified by WP 1. All CCCs will be provided in a matrix format (figure 2 below under chapter 3.1.1). They will serve to develop key words for searching the dimensions.

According to this differentiation, the process of identifying solutions (Step I) will consist of an *exploratory phase* (Screening of solution categories) and a *validation phase* (validation and extension of results through knowledge owner).

3.1.1. Exploratory phase

An Excel-Sheet for collecting solutions in the exploratory phase was developed (compare Annex I). It was initially structured according to the Framework used in the first cycle of FIRE-IN workshops to identify the capability gaps. Consequently, the solutions collection sheet was organised as follows:

F1 TWG related tasks

- F1.1 Search and Rescue (SAR) and Emergency Medical Response (EMR) – TWG A
- F1.2 Structures Fires – TWG B
- F1.3 Vegetation Fires – TWG C
- F1.4 Natural Disaster – TWG D
- F1.5 CBRNE – TWG E

F2 Supporting tasks

- F2.1 Coordination, Command and Control (Decision making, planning and tasking)
- F2.2 Situation Assessment (“Sense making”)
- F2.3 Information management/distribution (information portal)
- F2.4 Monitoring/Information gathering
- F2.5 Supply of basic services
- F2.6 Logistics

F3 Operational tasks

- F3.1 Policy making/ capacity building
- F3.2 Procure/Maintain/Warehousing
- F3.3 Training and Exercises
- F3.4 Prepare civil-military cooperation
- F3.5 Doctrine/Procedures development
- F3.6 Community awareness raising
- F3.7 Evaluation



Within the context of evaluating the capability gaps identified by Task 1.4, the common challenges were, however, structured according to the following category matrix (figure 2):

	High flow of responders in hostile environment	High impact and low frequency emergencies	Multiagency environment	High level of uncertainty
Standardization				
Knowledge cycle				
Technology				
Incident command organization				
Community involvement				
Pre-planning				
Information management (Networking)				

Figure 2: Clustering of common capability challenges (Task 1.4)

Consequently, the screening process will make use of this clustering. While standardisation requirements will obviously be addressed by the screening of standardisation efforts, and technology requirements by a screening of technologies, the following categories will be addressed by a screening of projects and publications (research results):

- Knowledge cycle/Information management
- Incident command organisation
- Community involvement
- Pre-planning

The screening will be conducted in four iterations, each of which will relate to one of the following incident characteristics (compare figure 2):

- High flow of respondents in hostile environment
- High impact and low frequency events
- Multiagency environment
- High level uncertainty

The matching solution will be assigned to the category from which it stems (research result, standard or technology). Additionally, the following information about it will be collected in the Excel-Sheet:

- Name of providing organisation
- Organisation type of provider
- Country of origin
- Contact details for solution provider



- Technology readiness level (TRL) (for research solutions)
- Website reference
- Description of solution
- Reason applied/not applied (if available)
- Information about time frame for solution to be mature (for research solutions of lower TRL)
- Potential recommendations for future/additional research

The methodologies applied for solution screening vary between the dimensions of analysis. However, the OpenAIRE platform (<https://www.openaire.eu/oa-overview>) will serve as an essential source for all screening dimensions.

3.1.1.1. Research results

3.1.1.1.1. R & T publications

R & T publications have to be differentiated according to their source. The focus of analysis will be on publications in scientific journals. Therefore, Fraunhofer INT will make use of the **TASP Bibliometric Suite (TABS)** tool. It builds on the Web of Science database and differentiates publications according to the scientific field they stem from (e.g. computer sciences, psychology etc.). Based on a key word search which will build on the capability gaps, it also identifies the top cited publications from the respective scientific field. Additionally, the search results are visualised and give information about the amount of publications per scientific field, and thus their relative importance (figure 2).

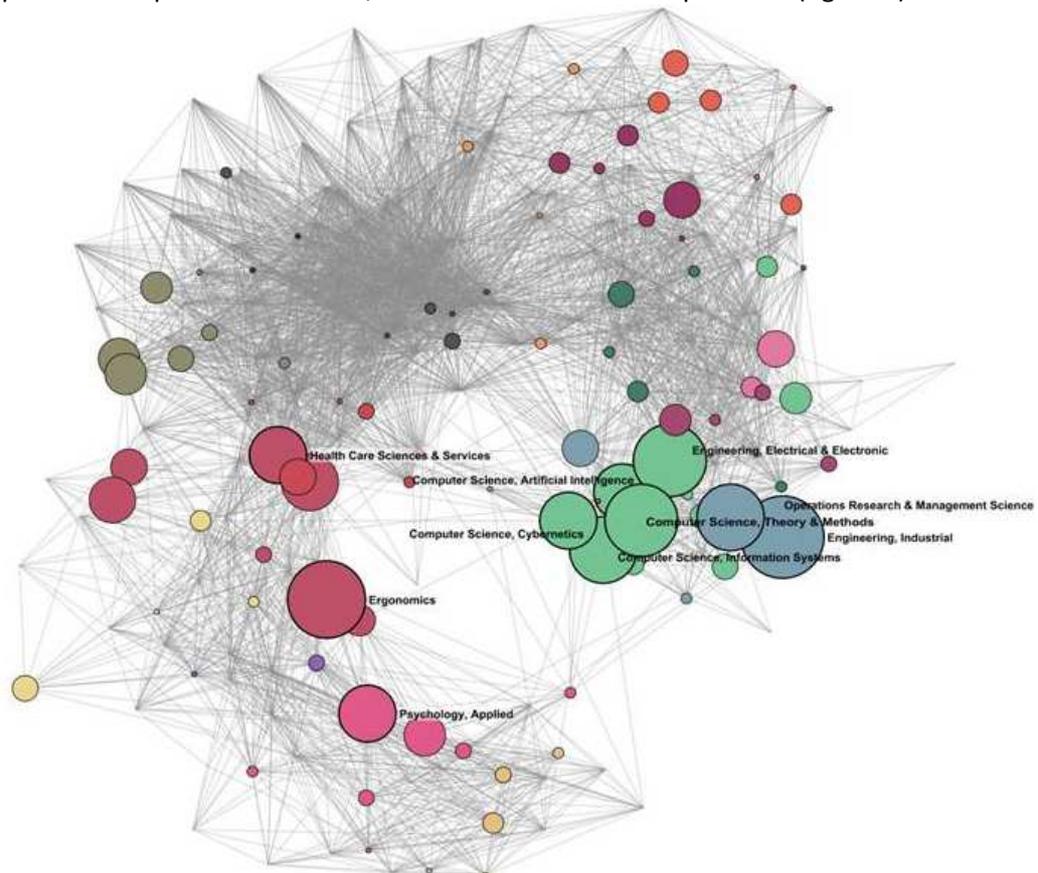


Figure 3: Scientific publications (and their amounts) clustered according to the scientific field they are stemming from based on the TABS tool

This analysis provides a first step in identifying relevant scientific literature. Upon identifying the most relevant articles by the above described method, Fraunhofer INT will closely collaborate with



SGSP on evaluating them and extracting the information that could match the identified capability gaps.

3.1.1.1.2. R & T projects

R & T projects will be screened based on the input by the FIRE-IN project partners. All partners were requested to report the relevant international, EU and national projects that could be of relevance for the project. The complete list can be found in Annex II. The screening will encompass the project websites, including the deliverables. In addition, the CORDIS data base (<https://cordis.europa.eu/>) will be used to identify projects that are of relevance for the capability gaps but have not been mentioned by the project partners before. For the national projects where outputs cannot be identified due to language barriers, the respective partner who reported the project(s) will be asked for support.

3.1.1.2. Standardisation efforts

Standards will be screened based on the review of recent work on standardization activities such as the ResiStand project (<http://www.resistand.eu/>) and the preparatory work carried out by the Security Sector Forum, especially for standards at EU and international level. Contact has already been established with Ms Patricia Compard, chairperson of the CEN TC391 in charge of Societal and Citizen Security. Further contacts will be established with ISO TC223 Societal security and ISO TC292 Security and Resilience.

The European Multi Stakeholder Platform on ICT standardization will be an additional source of information in this procedure as well.

For the identification of relevant national standards, the partners from the consortium will be asked directly. For those national projects where outputs cannot be identified due to language barriers, the respective partner who reported the project(s) will be asked for support to summarize the content of the standards.

3.1.1.3. Technologies

In the literature, technology screening is defined as the identification and pre-selection of suitable technologies for a detailed strategic technology planning, as depicted on the next figure.¹

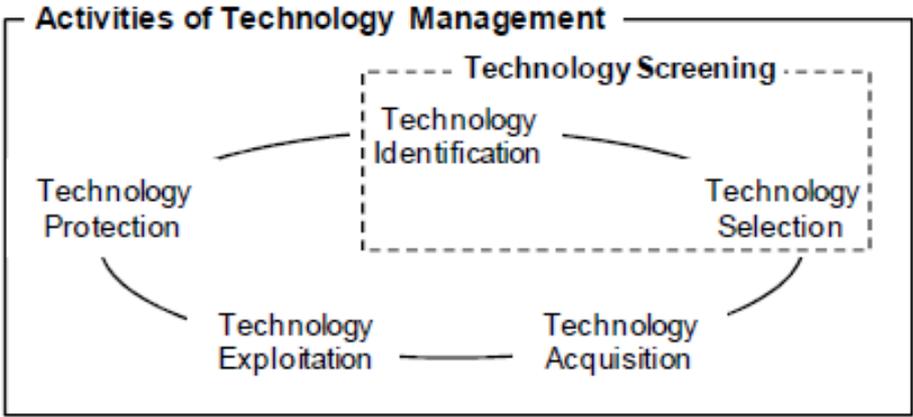


Figure 4 Technology Screening as a Part of Technology Management

¹ Reisen, K.; Greitemann, J.; Rester, N.; Reinhart, G., Production Technology Screening for Innovative Products, IEEE 2014



For the solution screening, desk research based on publicly available resources is conducted. In case not all needed information is publicly available, consortium partners will contact representatives of organizations in a second step. In particular, the partners from T2.1 will interact with the European Technology Platform on Industrial Safety and Security and the corresponding national platforms, in particular in Spain and the Czech Republic. Interaction with the ENCIRCLE project (<http://encircle-cbrn.eu/>) will also provide information on the on-going development of new technologies.

Sources usually used for the screening process are, among others:

1. The EU's innovation radar: <https://www.innoradar.eu/>
2. An innovation website of the U.S White House: <https://www.data.gov/disasters/apps-tools/>
3. The Driver+ project: <http://www.driver-project.eu/library/project-public-reports/>
4. The CORDIS data base: https://cordis.europa.eu/guidance/archive_en.html
5. A list of technologies here <https://homelandsecurityresearch.com/about/technology-knowledgebase/>
6. Free reports which are available here: <https://homelandsecurityresearch.com/downloads/#>

Within the aforementioned methodology, the Innovation Radar² (IR) has been used, which is an initiative supported by the European Commission focussing on the identification of high potential innovations and the key innovators behind them in FP7, CIP and Horizon 2020 projects. IR methodology includes two components: the first is the assessment framework for ranking innovations and the second is an assessment framework for ranking innovators. These will form the basis for the methodology used by KEMEA. This approach will be supported by the use of other relevant state of the art methods and models. For example, the maturity level of innovations will be a major factor in the analysis.

3.1.2. Validation phase

The validation phase is necessary to support, prove and expand the initially identified solutions. It is also a very important step towards the definition and identification of operational and conceptual value of the solutions identified. As the involved R&T organisations identify and provide solutions based on their individual scientific background, it is important to validate the solutions' potential to provide assistance and to expand the fire and rescue capabilities of the involved stakeholders. At the same time, this phase allows for the consideration of existing solutions that have not been identified in Step I (figure 5). Consequently, R&T organisations and their networks (outside the consortium) as well as NCPs (both see chapters below) will be asked to mark those solutions that do not expand fire and rescue capabilities and to add solutions that match the outlined capability gaps and have not yet been captured.

² <https://ec.europa.eu/digital-single-market/innovation-radar>



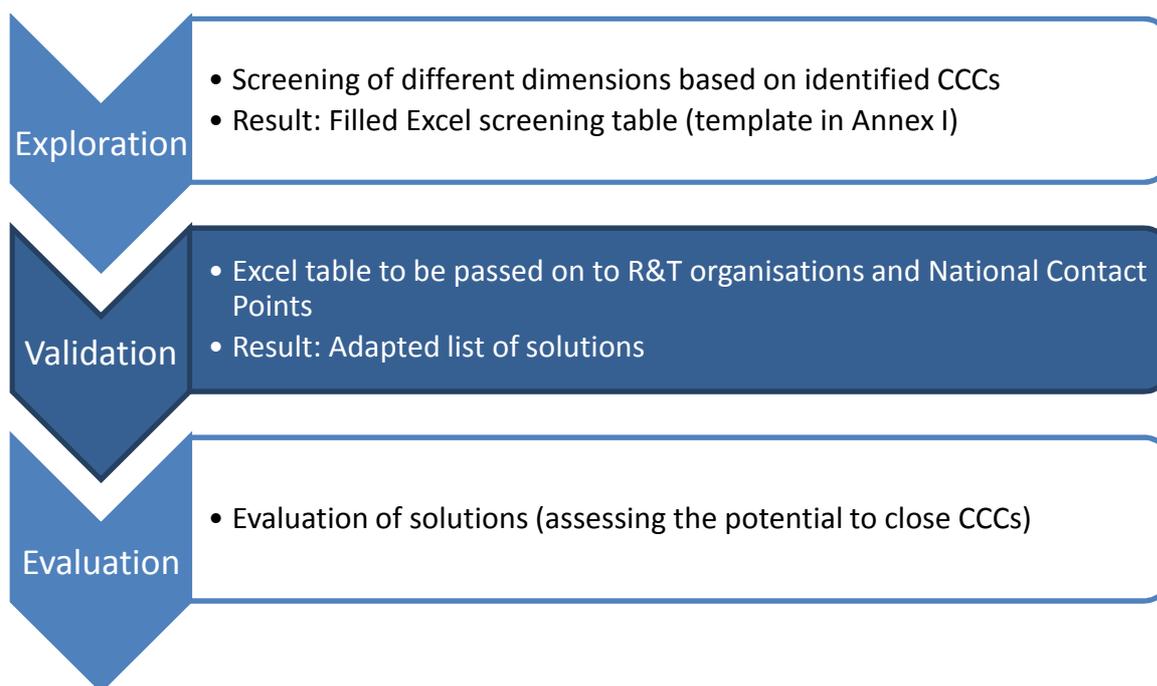


Figure 5: Allocation of the validation phase in the overall screening process

The validation process will start when the initial screening is completed and the Excel screening table is initially filled. The table will be circulated to the R & T organisations and their networks as well as to National Contact Points (NCPs) to review the proposed solutions with respect to their applicability and condense and expand it respectively. Additionally, the whole consortium should use their own contacts to share initial screening results in order to increase the number of responses. This outreach process has to be closely coordinated with WP 4. A separate process will be developed in autumn 2018 to ensure efficient and streamlined communication with external partners. As many contacts established via interacting with existing networks should be integrated into the validation process.

3.1.2.1. R & T organisations and their networks

While the validation process will be coordinated by CNBOP, all partners will use their own contacts with R & T organisations and their networks. Engagement of the whole consortium is necessary to get a broad view on the needs and gaps of all EU countries. Collaboration with existing networks such as the SEC21 networks of practitioners, the Community of Users as well as other R&T organisation associations is an important part in validating and potentially identifying additional solutions.

Cooperation is planned with networks that are created within the framework of the project, especially the SEC21 networks of practitioners such as: NETRisk, DAREnet, ILEAnet, I-LEAD, eNOTICE, ENCIRCLE, IN-PREP, MOBNET and other known to the consortium partners, as well as associations of organizations operating in the field of fire and rescue, e.g.:

- CTIF- International Association of Fire and Rescue Services, which has as its mission to better understand and continuously improve the working conditions of fire fighters through on-going dialogue, analysis and sharing of Lessons Learned from incidents, accidents and fires throughout the world.
- FEU- Federation of the European Union Fire Officer Associations, which expresses the opinion of FEU on any matter associated with disaster management, fire safety, fire service management, firefighting, rescue and other emergency operations.



- SITP- Association of Civil Engineers and Technicians is a polish scientific and technical organization and as a full member of the Federation of Scientific and Technical Associations of the Central Technical Organization (NOT).
- PPBW- The Polish Platform for Homeland Security is a scientific network that was established by the Council of Ministers and the technological platforms initiated by the European Commission, whose tasks are to create advanced, integrated technological and IT tools supporting law enforcement and justice public safety
- FSEU- Fire Safe Europe's mission is to improve fire safety in buildings for European citizens
- ICAR- International Association for Alpine Rescue
- INSARAG- a global network of more than 80 countries and organizations under the United Nations umbrella. INSARAG deals with urban search and rescue (USAR) related issues, aiming to establish minimum international standards for USAR teams and methodology for international coordination in earthquake response
- CEFIC- The European Chemical Industry Council is the voice of the chemical industry in Europe and a committed partner to EU policymakers, facilitating dialogue with industry and sharing our broad-based expertise.
- EAPFP- European Association for Passive Fire Protection as a "European" voice on behalf of national associations representing manufacturers, contractors and other institutions involved in fire protection to steelwork, timber, and other passive fire protection applications, including penetration seals and ductwork.
- EFSN- European Fire Sprinkler Network is a coalition across the fire safety, political and other relevant communities which encourages the greater use of fire sprinklers to save lives and protect property and the environment
- NFSN- the National Fire Sprinkler Network comprises of representatives from every Fire & Rescue Service operating within the United Kingdom. In addition, it includes representatives within Local Government Agencies, Politicians and MP's within the English, Scottish and Welsh Parliaments
- DKKV- German Committee for Disaster Reduction is the national platform for disaster prevention in Germany, intermediary to international organizations and initiatives active in the field of disaster prevention and a competence center for all questions of national and international disaster risk management
- PDC- Pacific Disaster Center is global network which participate in a worldwide community committed to reducing disaster risk through the development and application of the highest quality information, science, and technology
- PURE- is a Knowledge Exchange Network and Research Programme whose aim is to be the leading national (uk) network bringing together researchers, industrialists, and policy-makers in uncertainty and risk for natural hazards, through collaborative working, knowledge exchange, and the development of best practice. It will help to shape the direction of future research and provide valuable information to practitioners in environmental risk management.
- UR- Understanding Risk is a global community of experts and practitioners with interest in the field of disaster risk identification, specifically risk assessment and risk communication.

Contacts for R & T organizations and their networks will be expanded using tools such as thematic internet platforms, e.g. PreventionWeb, the knowledge platform for disaster risk reduction or SERIT-Security Research in Italy (<http://www.piattaformaserit.it/?lang=en>)



3.1.2.2. National Contact points (NCPs)

CBSS will prepare a standard enquiry form with a project description, methodology and sources used in the exploratory phase and send it to all the NCPs, according to the list of the National Contact Points for research and innovation of the Member States, which can be found on the EU Commission website:

https://ec.europa.eu/research/participants/portal/desktop/en/support/national_contact_points.html

The categories of NCPs relevant for the project are: 1. National NCP Coordinator; 18.'Security'; 21.Spreading excellence and widening participation.

The relevant NCP (for example, in case of Sweden it is VINNOVA agency and MSB – Swedish Civil Contingencies Agency) will receive an email with the enquiry form with an Excel Annex and a request to validate/expand the list of the solutions. In case an NCP is not available or relevant for this enquiry, CBSS will contact the National NCP coordinator with an enquiry to suggest a relevant institution in the country.

Often national key contact points for UCPM are the same institutions as NCPs for Research and Innovation. A mapping of the relevant NCP will be done before contacting them.

Upon receiving the results from the NCPs, CBSS will combine them into a document and submit them for evaluation to CNVVF and GFMC.

3.2. Step II: Evaluation of identified solutions

The identified and validated solutions will be evaluated by the end-user partners (see also figure 5 above). This process is coordinated by CNVVF and GFMC who will liaise with the TWG leads (and potentially associated experts) to ensure that each of the solutions is rated according to a 5-point scale (0 = not at all; 5 = fully) by making use of the following criteria:

- Solution matches the capability gaps
- Solution can be applied
- Solutions is likely to improve capabilities

Consequently, each of the solutions will receive between 0 (no potential to close CCC) and 15 points (very high potential to close CCC) points that allows for their ranking.

Future work will show whether the evaluation can best be achieved in a joint workshop or rather by iterative work on the Excel-Sheet.

4. Visualisation of results

The highest ranked solutions (useful solutions) will be translated from the Excel-Sheet to a *Solution Fiche* that gives a precise overview of the solution and areas of applications. The exact threshold in the ranking for being classified as a useful solution will have to be determined by the end-user partners.

In close collaboration with ENSOSP, it will be elaborated how these Solution Fiches can be integrated into the FIRE-IN e-platform.

