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Pre-standardization activity on wildfire tactical situation symbology: The SITAC CEN/CENELEC workshop agreement

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Abstract

During the onset of a crisis, a wide range of local, regional, national and sometimes international authorities generate maps using proper symbols to support coordination and communication during a potential disaster, such as a large forest fire. In this context, it is essential that all stakeholders can readily understand the information shown on these maps to respond in a prompt and adequate manner. The standardization of a set of symbols, which could facilitate the efficiency of the operations in the field and at the same time optimize the coordination between all the command chain levels during the fire crisis, is conducted in context of the European research project STRATEGY, which aims to build and implement a Pan-European pre-standardisation framework for improving the interoperability of crisis management solutions.

The pre-requisite for standardization is a concrete pre-standardization activity aiming to describe and document the subject of the standardization as well as the purpose and the context of use. This is achieved through a properly organized pre-standardization procedure known as CEN/CENELEC Workshop Agreement (CWA), with the active involvement of interested organizations. In the envisaged case of wildfires, the organization is represented by the entities involved in the fire operations and the service provided is firefighting. In this direction, the relative pre-standardization initiative further described in this paper, aims to introduce a standardized set of tactical symbols that can be used by the responsible public safety agencies across EU and worldwide for the graphical presentation of mission critical operational information, based on SITAC approach. SITAC is a set of tactical symbols for wildfire managers, initially developed by the French Fire Service, used since 2000, further adopted and operationally used by the Fire Services in Italy and other EU Member States. SITAC, consists of tactical symbols, displaying graphic and textual information about an object at a single geographic position at a particular point in time.

The SITAC CWA shall deliver clear, concrete, and adequate instructions and guidelines for the visual description of the field operations during forest fire incidents in a predefined, formal way. Information related to the characteristics of the affected area, the evolution of the fire, the intervention measures as well as current or planned actions, are encompassed by the proposed symbology. This will play an important role during large and very large fire events where several organizations and actors need to cooperate and exchange information in common, such as incident commanders, fire officers, forest managers, personnel of the civil protection agencies and emergency services. Furthermore, in the case of cross-border incidents the use of a standardized symbology, familiar and known to international firefighting teams and modules, will facilitate to overcome the language barrier and to optimize the response to the crisis. Finally, such standardization will push the EU security industry, dealing with the development and deployment of related Command & Control systems and solutions, to follow formal visual communication guidelines, enhancing the communication and cooperation of the organizations in charge of managing wildfires and the organizations supporting the field operations.

1. Introduction

Conveying spatial information plays a very important role in efficient emergency response where maps are the most solid basis for direct representation of this spatial information. During the onset of a crisis, a wide range

of local, regional, and national authorities need to generate maps using proper symbols to help communicate information, respond to, and recover from a potential disaster such as a large forest fire. In this context, it is essential that all stakeholders (national and potentially international according to the incident) can readily understand the information shown on these maps to respond in a prompt and adequate manner. In this regard, a concrete symbology, in the sense of a visual language displayed on the map, is needed to share the operational message in a concise and clear way to all responsible decision makers.

The standardization of a set of symbols, which could facilitate the efficiency of the operations in the field and at the same time optimize the coordination between all the command chain levels during the fire crisis situation, is conducted in context of the European research project STRATEGY (https://strategy-project.eu/). STRATEGY aims to build and implement a Pan-European pre-standardisation framework to improve the interoperability of crisis management solutions, based on a gap analysis initially implemented within the project, given the expertise of involved end-users.

Base on the gaps identified, a standardized approach for visually communicating operational messages, using a commonly agreed and understood symbology among the actors of wildfire management is currently missing. This fact limits the effectiveness of coordinating the response effort of the resources involved in the incident. Having each organization in the various EU member states to use diverse processes, procedures, and symbols for communicating situational information during large fire incidents and crisis management operations can't be effective. This is more evident in case of cross-border crises where such peculiarities and differences may cause confusion among the first responders, often wasting the assistance offered between the Union's Member States. More specifically, in the case of large-scale forest fires in a cross-border context and with multiple authorities and modules from foreign countries engaged, the sharing of operational information and the common understanding of the situation becomes crucial. Therefore, establishing a common symbology which can be used by the fire services and the public safety agencies involved in wildfire management, is essential for the efficient and effective management of situations as mentioned before.

2. Methodology

2.1. Standardization and CWA

Standardization is a framework of agreements to which all relevant parties in an industry or organization must adhere to ensure that all processes associated with the creation of a good or performance of a service are performed within set guidelines. In the envisaged case of wildfires, the organization is represented by the entities involved in the fire operations and the service provided is firefighting. The pre-requisite for standardization is a concrete pre-standardization activity aiming to describe and document the subject of the standardization as well as the purpose and the context of use. This is achieved through a properly organized pre-standardization procedure known as CEN/CENELEC Workshop Agreement (CWA).

A CEN/CENELEC Workshop is considered as a body with a short-term task specified in its project plan. If the proposed scope calls for a long-term activity, the possibility to propose a Technical Committee should be explored. A CWA is a deliverable, which may take various forms such as text file or computer code, developed and agreed by the participants in a temporary working group (CEN/CENELEC Workshop). It is designed to meet an immediate need, can be quickly developed and can be used as fast track to future standardization activities. The stakeholder involvement is limited to those directly interested in the subject. The direct participation of interested parties, the possibility to indicate the participants and their organizations in the foreword and the rapid development process offered by a CWA, are particularly attractive for European research and innovation projects, which must deliver results within the limited duration of their project lifetimes.

In the case of the CWA presented in this paper, which concern the pre-standardization of the wildfire management symbology for mapping purposes during large scale fire crises the participants comprise representatives from fire and forest organizations, industry, research and technology organizations and standardization bodies. The standardization community is represented in the SITAC workshop by the National Romanian Standardization Organization (ASRO), which acts as the link with the European Standardization Committees and Technical Groups.

2.2. SITAC CWA

The CWA mentioned in this paper refers to SITAC (Standardization of Firefighting Tactical Situation Management), a set of tactical symbols for wildfire managers, initially developed by the French Fire Service (Sapeur Pompiers) being in use since 2000. The set of symbols that was originally developed included all type of hazards. SITAC literally stands for SITuation TACtique, an acronym corresponding to a schematic representation of an intervention of the Fire Brigades. It is part of the Operational Management and Command tools, which are implemented during a disaster to best organize the return to initial conditions or in a preeminent situation, a way out of the crisis.

The last decade, the original set was adopted by the "Corpo Nazionale dei Vigili del Fuoco (CNVVF)" in Italy and several other fire service agencies in EU Member States and the part of the symbology related to exclusively to wildfire management was marked out to be used operationally. This specific set is the focus of the respective CWA mentioned in this paper.

SITAC, as any set of tactical symbols, can be used by the respective agencies across EU and worldwide for the graphical presentation of mission critical operational information during operational missions. A tactical symbol displays graphic and textual information about an object at a single geographic position at a particular point in time. The graphic displayed is typically a screen icon with supplemental text and graphics surrounding the icon. In general, the graphic displayed depends on the symbology set a tactical symbol belongs to. Information related to the characteristics of the affected area, the evolution of the fire, the intervention measures as well as current or planned actions, are encompassed by the proposed symbology.

The CWA focuses on a specific set of symbols that can be used by public safety agencies for the depiction of operational information against a cartographic background during forest fires incidents. In this context, information related to (among others) the characteristics of the affected area, the advancement of the fire, the intervention measures / available equipment and actions that need to be taken, will be encompassed by the proposed set of symbols. Given its simplicity, its operational maturity and its acceptance in several EU countries, the SITAC set of symbols (known as) sets the basis for delivering a standardized way to share forest fire management information in paper and electronic maps during fire response operations. Its use in training sessions can further facilitate familiarization and efficiency during real operations.

The use of the graphics makes it possible to schematize using a normalized code, the main operational information related to an ongoing crisis. The objective is to facilitate the collection, transmission and understanding of information exchanged by the different levels of the command chain. Saving time and being aware of the real operational situation is essential for the wildfire managers when lives or property are threatened by an active fire. In addition, the standardization of means and actions considerably reduces the risk of misunderstanding and improves the accuracy of actions.

This paper presents the approach and the expected results of the standardization of the SITAC set of symbols, incorporating the feedback on several countries approaches deriving from the CWA members, to generalize its use by the EU public safety agencies for depicting operational information against a cartographic background (either digital or paper based) during forest fires incidents. The SITAC CWA aims to gain consensus from many of the EU wildfire management organizations for using a common approach to graphically symbolize the elements (means, operations, assets) of wildfire management operations, in an agreed manner building on the SITAC approach. It should be kept in mind that firefighting is a particular case of operations, where a variety of organizations are involved (not exclusively the fire brigade but forest services and forest fire fighting organizations as well). Due to the large extent of the incidents and the large number of the organizations involved (services and agencies), specific equipment and operations are used, and the coordination is often challenging. In case of large wildfires, it is a common practice that civil protection modules are deployed from one EU country to another. In such case the use of standardized symbols for planning, monitoring, and coordinating cross-border operations in the field will be even more beneficial for the effectiveness of the coordination.

Hence, this document is intended to benefit the cooperation among the EU and global wildfire management community, comprising incident commanders, fire officers, forest managers, personnel of the civil protection agencies and Emergency services. At the same time such standardization will push the EU safety and security industry dealing with the development and deployment of related Command & Control systems and solutions.

In this direction, the document will provide formal visual communication guidelines to support the communication and cooperation of the organizations in charge of managing wildfires and the organizations supporting the field operations (e.g., police, ambulance services, coast guard, etc.).

The SITAC symbology organizes the information to be shared in several groups depicting a. the environment i.e., the wind, the vegetation type and the slope b. the fire i.e. the type of the fire and its current and expected progression c. the operating area i.e. landscape type and infrastructures such as lifelines, water sources, helispots d. fire operations (ground, aerial and special e.g. backburn) and the forces (ground and aerial) deployed or planned to be in the field.
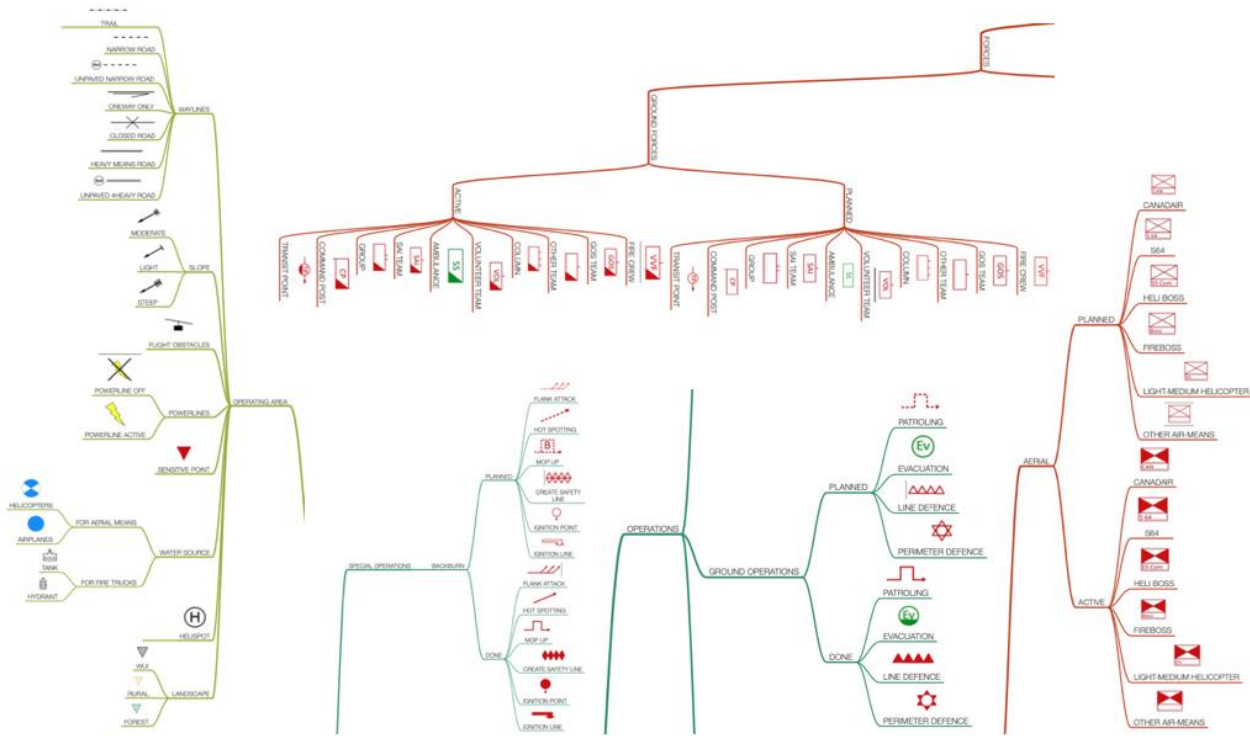

Figure 1- Groups of SITAC symbols for wildfire management information sharing

The SITAC symbols are kept simple to be easily drawn on paper maps in the field while semantic to be easily perceived and interpreted in the command post.

3. Results

The SITAC CWA shall deliver clear, concrete, and adequate instructions and guidelines for the visual description of the field operations during forest fire incidents in a predefined, formal way. This will allow to organize efficient and effective information sharing among all the operational actors involved in the fire management command chain. This will be important during large and very large fire events where several organizations need to cooperate and exchange information in common. Furthermore, in the case of cross-border incidents the use of a standardized symbology, familiar and known to international firefighting teams and modules will facilitate to overcome the language barrier and to optimize the response to the crisis.

4. Discussion

The outcome of the work presented here shall benefit the cooperation among the EU and global wildfire management community, comprising incident commanders, fire officers, forest managers, personnel of the civil protection agencies and Emergency services. At the same time such standardization will push the EU security

industry, dealing with the development and deployment of related Command & Control systems and solutions, to follow formal visual communication guidelines, enhancing the communication and cooperation of the organizations in charge of managing wildfires and the organizations supporting the field operations.

5. Acknowledgments

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