D955.11 – REPORT ON EXISTING STANDARDS AND STANDARDISATION ACTIVITIES IN CRISIS MANAGEMENT

SP95 - IMPACT, ENGAGEMENT AND SUSTAINABILITY

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The DRIVER+ project

Current and future challenges, due to increasingly severe consequences of natural disasters and terrorist threats, require the development and uptake of innovative solutions that are addressing the operational needs of practitioners dealing with Crisis Management. DRIVER+ (Driving Innovation in Crisis Management for European Resilience) is a FP7 Crisis Management demonstration project aiming at improving the way capability development and innovation management is tackled. DRIVER+ has three main objectives:

1. Develop a pan-European Test-bed for Crisis Management capability development:

    a. Develop a common guidance methodology and tool, supporting Trials and the gathering of lessons learnt.
    b. Develop an infrastructure to create relevant environments, for enabling the trialling of new solutions and to explore and share Crisis Management capabilities.
    c. Run Trials in order to assess the value of solutions addressing specific needs using guidance and infrastructure.
    d. Ensure the sustainability of the pan-European Test-bed.

2. Develop a well-balanced comprehensive Portfolio of Crisis Management Solutions:

    a. Facilitate the usage of the Portfolio of Solutions.
    b. Ensure the sustainability of the Portfolio of Solutions.

3. Facilitate a shared understanding of Crisis Management across Europe:

    a. Establish a common background.
    b. Cooperate with external partners in joint Trials.
    c. Disseminate project results.

In order to achieve these objectives, five Subprojects (SPs) have been established. **SP91** *Project Management* is devoted to consortium level project management, and it is also in charge of the alignment of DRIVER+ with external initiatives on Crisis Management for the benefit of DRIVER+ and its stakeholders. In DRIVER+, all activities related to Societal Impact Assessment are part of **SP91** as well. **SP92** *Test-bed* will deliver a guidance methodology and guidance tool supporting the design, conduct and analysis of Trials and will develop a reference implementation of the Test-bed. It will also create the scenario simulation capability to support execution of the Trials. **SP93** *Solutions* will deliver the Portfolio of Solutions which is a database driven web site that documents all the available DRIVER+ solutions, as well as solutions from external organisations. Adapting solutions to fit the needs addressed in Trials will be done in **SP93**. **SP94** *Trials* will organize four series of Trials as well as the final demo. **SP95** *Impact, Engagement and Sustainability*, is in charge of communication and dissemination, and also addresses issues related to improving sustainability, market aspects of solutions, and standardisation.

The DRIVER+ Trials and the Final Demonstration will benefit from the DRIVER+ Test-bed, providing the technological infrastructure, the necessary supporting methodology and adequate support tools to prepare, conduct and evaluate the Trials. All results from the Trials will be stored and made available in the Portfolio of Solutions, being a central platform to present innovative solutions from consortium partners and third parties, and to share experiences and best practices with respect to their application. In order to enhance the current European cooperation framework within the Crisis Management domain and to facilitate a shared understanding of Crisis Management across Europe, DRIVER+ will carry out a wide range of activities. Most important will be to build and structure a dedicated Community of Practice in Crisis Management, thereby connecting and fostering the exchange of lessons learnt and best practices between Crisis Management practitioners as well as technological solution providers.

Executive summary

This deliverable reports on the research and analysis of standardisation activities in the field of crisis management. It belongs to *SP95 Impact, Engagement and Sustainability* and shows the results of task **T955.1** updating the analysis of existing standards and standardisation activities within **WP955** Standardisation activities.

Standards are one way to make the results of DRIVER+ useable after the project ends. But they are also an input for the work of every Subproject because standards present a state-of-the-art and the outcomes of DRIVER+ should be compatible with the current state-of-the-art in the field of crisis and disaster management. To get an overview of what standardisation is, how standards are developed, and how DRIVER+ results can contribute and/or use standardisation, the international, European and national standardisation landscape is presented in section 2 .

The main goal of **T955.1** was to give an overview of the state-of-the-art in the field of crisis management by researching relevant standardisation documents. About 1000 documents were initially identified as possibly relevant for the field and decreased by an assessment of the **WP955** members on 54 documents that are relevant for the DRIVER+ project. The methodology of this research and analysis of standardisation documents is presented in section 3.

The results of this assessment are presented in section 4. The 54 as relevant identified standardisation documents are separated regarding to their relevance for every Subproject within DRIVER+. The most relevant ones are:

- For **SP91** *Project Management*, especially the terminology standards are important for the development of the DRIVER+ terminology e.g. *ISO Guide 73 Risk management – Vocabulary*, as well as *ISO 22300 Societal security – Terminology*, in which more than 270 terms are included.
- For **SP92** *Test-bed*, the standards series of *ISO 223xx on Societal security (Guidelines for exercises, Emergency management – Requirements for incident response, Organizational resilience – Principles and attributes)* is of relevance for the Guidance Methodology, Guidance Tool, and Test-bed infrastructure.
- For **SP93** *Solutions*, the standards series of *ISO 223xx on Societal security* is relevant. Additionally, the list of identified standards can support the selection of the solutions to be included in the Portfolio of Solutions as there might be standards related to specific solutions.
- For **SP94** *Trials*, the *ISO 22398 standard on Societal security - Guidelines for exercises*, is relevant to support the preparation, conduction and follow up of the Trials. Also the terminology standards are of relevance within this Subproject because it is important to have a common understanding on the most important terms within the Trials.
- For **SP95** *Impact, Engagement, and Sustainability*: only a few standards are related directly to the work of the Subproject but the complete list of standards will be used to raise awareness at project level on existing standards and ongoing standardisation activities and will support the initiation of new standardisation activities.

Some of the 54 documents are relevant for more than one Subproject. A more detailed interpretation of the results with focus on each of the Subprojects of DRIVER+ is given in section 5.

Additionally, this report provides in section 6 an overview on the relevance of terminology in crisis management for the project and related standardisation activities already conducted in the project. This document concludes with an outline of the next steps within **WP955**; including references to the upcoming identification of standardisation potentials and gaps based on the project results (**D955.21**) as well as to the initiated standardisation activities (**D955.31**).

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List of Acronyms

Acronym	Definition
AC	French standard (by AFNOR - French Standardization Association)
ANSI	American National Standards Institute
ASME	American Society of Mechanical engineers
ASTM	American Society for Testing and Materials
BS	British Standard (by BSI - British Standards Institute)
CCMC	CEN-CENELEC Management Centre
CEN	European Committee on Standardisation
CENELEC	European Committee on Electrotechnical Standardisation
CWA	CEN Workshop Agreement
DIN	German standard / German Institute for Standardization
EFTA	European Free Trade Association
EN	European Standard
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
ITU	International Telecommunication Union
NEN	Dutch Norm / Netherlands Standardization Institute
NF	French standard (by AFNOR - French Standardization Association)
NFPA	National Fire Protection Association
OENORM	Austrian Standard (by ASI - Austrian Standards International)
prEN	Draft European Standard
SAE	Society of Automotive Engineers
SANS	South African National Standards
SDO	Standards Developing Organizations
UL	Underwriter Laboratories

1.   Introduction

This deliverable reports on the research and analysis of standardisation activities in the field of crisis management. It belongs to *SP95 Impact, Engagement and Sustainability* and shows the results of the first task within **WP955 *Standardisation activities***. Standards are one way to make the results of DRIVER+ useable after the project ends. But they are also an input for the work of every Subproject.

A standard specifies requirements for products, services and/or processes, laying down their required characteristics. This helps to ensure the free movement of goods and encourages exports. Standardisation promotes efficiency and quality assurance in industry, technology, science and the public sector. It serves to safeguard people and goods and to improve quality in all areas of life. Standards are developed in a consensus-based process organised by a recognised standardisation body.

Anybody can submit a proposal for a new standard through a standardisation body. All those interested in a specific standards topic can participate and contribute with their expertise. Before a standard is officially adopted, a draft version is published so that the public can make comments. Experts working on a standard must come to an agreement on its content, as the standard will not be established otherwise. To ensure that they reflect the state-of-the-art, standards are regularly reviewed by experts at least every five years.

The objectives of the **WP955** are to:

- Update the overview of relevant existing standards and standardisation activities; and thus to share with the consortium the status quo of standardisation within the field of crisis management.
- Crosslink with the respective SPs in order to identify the potential implications of DRIVER+ results for standardisation; and thus to identify the need for standards as well as to summarize and prioritize proposals for new standardisation activities.
- Support future standardisation activities on existing standards and standards under development with.

This deliverable addresses the first objective. It provides an introduction to the standardisation landscape and an overview on standardisation activities in the field of crisis and disaster management, with specific emphasis on DRIVER+ activities.

1.1   Background

The standardisation work package **WP955** is part of Subproject *SP95 Impact, Engagement, and Sustainability*. This work package takes care of all standardisation related issues of the project. It aims to support the dissemination and exploitation of DRIVER+ results through standardisation activities and aims towards the improvement of the EU crisis management.

The activities in **WP955** are targeted to raise awareness within the DRIVER+ project about existing standards and standardisation activities in the field of crisis management. Therefore, the gaps in the existing standardisation landscape compared with project related standardisation needs are analysed, and DRIVER+ results are transferred into new standardisation activities. Hence, three tasks are planned:

1. Updating the analysis of existing standards and standardisation activities in the field of crisis management.
2. Analysis of standardisation potential within DRIVER+ project.
3. Initiation of, and/or contribution to standardisation activities with the aim to achieve sustainable usage of the results of the DRIVER+ project.

This deliverable will show the methodology and results of the first task: The analysis of existing standards and standardisation activities.

1.2   Objectives and Scope of Task 955.1 Updating the analysis of existing standards and standardisation activities

This task includes the identification and assessment of existing standards, standards under development, and other standardisation activities in the field of crisis management. This task specifically addresses those relevant for the thematic focuses in every Subproject. The focus will be on the analysis of standardisation activities within the EU, but relevant activities outside Europe (e.g. US) are also considered.

The work is based on available compilations of existing standards in crisis management, especially considering the work already performed between M03-M27 and other EU-funded projects (e.g. ResiStand).

The outcome of this task is a list of standards and standardisation activities within the thematic field of crisis management, and the objective to give an overview regarding these activities. Additionally, the lists of standards are assessed on the relevance to each Subproject of DRIVER+, with the aim to inform the Subproject members of relevant standards in their field of action.

1.3   Document structure

This deliverable contains eight sections. The introduction section presents the background and objectives of the task **T955.1** and its outcomes. This is followed in section 2 by a view on the standardisation landscape regarding to the questions:

- What is the status of international, European and national standardisation in the field of crisis management?
- How are standards developed in general?

In section 3, the methodology of the research and assessment of standardisation activities in DRIVER+ is explained. The results are presented in section 4 and interpreted related to the significance to DRIVER+ in section 5. Section 6 provides an overview of the terminology work done in the project and the relation to standardisation. The conclusion is presented in section 7. Section 8 gives an outlook on the upcoming standardisation activities in DRIVER+.

2. Standardisation landscape

Standardisation is a widely accepted tool to lower trade barriers due to an agreement on field specific terminologies, methodologies, construction methods and a wide range of other possibilities. There are serval ways for standardisation on international, national and European level. In this section, a brief overview of these opportunities is given in the context of the field of crisis management.

A standard is a consensus-based document that is approved by a recognized body. It provides rules, guidelines or characteristics for activities or their results, reflecting the state-of-the-art. It should be based in the consolidated results of science, technology and experience, aiming at the promotion of the optimum community benefits (1).

There are three official standardisation organizations at international level: International Organization for standardisation (ISO), International Electrotechnical Commission (IEC), and International Telecommunication Union (ITU). They work on international standardisation issues, which can be directly addressed to them or via the European or national standardisation bodies. On the European level, the European Committee on Standardisation (CEN), European Committee on Electrotechnical Standardisation (CENELEC) and the European Telecommunication Standards Institute (ETSI) are in charge of standardisation work. On a national level there are a lot of standardisation organizations. Some countries have more than one organization, some of them are financed by the government, and some are independent of them. They are all working together under the roof of the European and international standardisation bodies.

Considering the international standardisation landscape, the Vienna and Dresden Agreements need to be explained. Those agreements between CEN and ISO (Vienna), CENELEC and IEC (Dresden) have the objective to carry out specialist work at one level of standardisation (where possible), and use parallel voting procedures to achieve simultaneous adoption as ISO/IEC and EN standards.

With the aim to provide an overview of standardisation work, as well as standardisation activities, the current activities on international, European and national standardisation level are considered in the next sections. The focus lies on the European standardisation work, due to DRIVER+ project being a European funded project.

2.1 International Standardisation Work

The International Organization for Standardisation (ISO) together with the International Electrotechnical Commission (IEC) are the responsible standardisation organisations on the global level. The International Telecommunications Union (ITU) is the United Nations specialised agency in terms of information and telecommunication technologies. ISO, IEC and ITU established the World Standards Cooperation (WSC) in 2001, in order to strengthen and advance their voluntary consensus-based international standards systems (2) (3) (4).

Many of ISO's members also belong to regional standardisation organizations. ISO has recognised regional standards organizations representing Africa, the Arab countries, the area covered by the Commonwealth of Independent States, Europe, Latin America, the Pacific area, and the South-East Asia nations. The regional bodies commit themselves to adopt ISO standards, unchanged, as the national standards of their members and to develop deviating standards only when there are no suitable ISO Standards that can be adopted nationally. In the case of IEC, similar agreements apply (5).

2.1.1 Development of an ISO standard

International Standards are developed by ISO (or IEC, for electro technical standards) according to the national delegation principle, with each country sending a delegation of experts to represent the national standpoint. This standpoint is developed in national committees that "mirror" the international committees. These mirror committees decide whether or not an International Standard should be adopted

as a national standard; this is voluntary, in contrast to the European Standards, which must be adopted nationally.

As at national level, international standards work begins with a "new work item proposal". Such proposals can be submitted by:

- A member of the International Organization for Standardisation (ISO), or – in electro technical standardisation – by a member of the International Electrotechnical Commission (IEC).
- A working body of ISO or IEC.
- An international organization that has liaison status.
- The Technical Management Board of ISO or IEC.
- The ISO or IEC Secretary General.

A simple majority of national standards organizations with an interest in the subject matter is required for the proposal to be approved. In addition, a sufficient number of these must also agree to participate in the work. Only then will the proposal be accepted and work on the standard can begin. Within two months a "committee draft" is circulated among the members of the responsible Technical Committee for voting. A draft is drawn up taking any comments received into consideration.

The draft standard is then made available to all ISO (or IEC) members, who have three months to submit their national position and comments. Within a two-month period, anyone may comment on this draft. The national mirror committee discusses all comments received and submits the consolidated national viewpoint to ISO.

If the criteria for approval are fulfilled during the voting procedure, the draft is then published as an International Standard. If they are not fulfilled, or if the responsible working group so decides, a Final Draft is published. The ISO or IEC members then have two months to decide whether to accept this as an International Standard. No comments are submitted during this voting period. Acceptance of the Final Draft requires a two-thirds majority of all active members participating, and not more than a quarter of all votes may be negative. Ratification of an International Standard takes place following positive voting. There is no obligation for national standardisation bodies as part of ISO or IEC to adopt International Standards as national standards.

In addition, a standard that has been developed at European level can be simultaneously adopted as an International Standard by means of parallel voting procedures in accordance with the Vienna Agreement. Such standards are to be automatically adopted by the national standards organizations.

2.1.2   Relevant ISO/TCs regarding to the field of crisis management

At the international level, the relevant Technical Committee (TC) (6) in the context of crisis management is ISO/TC 292 security and resilience with its six working groups. Their scope is to enhance the safety and resilience of society. The working groups are specified regarding to the topics they are working on:

- ISO/TC 292/WG 01 Terminology.
- ISO/TC 292/WG 02 Continuity and organizational resilience.
- ISO/TC 292/WG 03 Emergency management.
- ISO/TC 292/WG 04 Authenticity, integrity and trust for products and documents.
- ISO/TC 292/WG 05 Community resilience.
- ISO/TC 292/WG 06 Protective security.

Not included in their working field are sector specific security projects from other areas, like e.g. ISO/TC 262 Risk management.

2.2   European Standardisation Work

At the European level, following EC information directive, standards work is carried out by the European Committee for Standardisation (CEN), the European Committee for Electrotechnical Standardisation (CENELEC) and the European Telecommunication Standards Institute (ETSI) (7).

European standardisation provides harmonised standards that are a reliable indicator of conformity with relevant EU legislation. In this context the New Approach, as an EU Council resolution to technical harmonisation and standardisation has to be mentioned. This approach was introduced in 1985 and changed the European standardisation landscape. Nowadays about 80 % of the published standards are European or international in origin.

The European standardisation organisations are associations of national standardisation bodies according to Belgian (CEN, CENELEC) or French (ETSI) law. Members of CEN and CENELEC are first and foremost the national standards organizations of EU and EFTA member states, and the national standards organisations of other countries intending to become members of the EU or EFTA; members of ETSI are direct members such as companies, institutes and services throughout Europe. With their August 1982 cooperation agreement, CEN and CENELEC declared themselves to be joint European standardisation organisations. Their responsibility is the harmonisation of existing national standards (8).

CEN/CENELEC has working groups including the General Assembly, Administrative and Technical Boards and Technical Committees that are open to all members, and include national delegations presenting agreed positions. European organisations which represent a particular sector may have observer status. In addition to the full members, there are also affiliated standards bodies and associate organizations.

In 1987, ETSI developed from the standardisation activities of the European Conference of Postal and Telecommunications Administrations. It does not involve national delegates, its members being stakeholders from industry, organizations and government.

2.2.1   European Standardisation Documents

At European level, different standardisation documents are available. Each of these represents a different level of consensus.

The European Standard (EN) aims at developing a normative specification reflecting the current state of technology and knowledge. While developed, the standstill policy comes into force. This means that during work on a European standard and after its publication, CEN/CENELEC Members agree not to publish national standards which are not in line with it. This is done to prevent any situation occurring during the preparation or after publication of a standard which could impair or undermine harmonisation. National standards which are in conflict or duplicate EN standards should be withdrawn.

One special type of EN is the mandated European standard (harmonised EN), which is applied in the context of the New Legislative Framework (a.k.a. New Approach (7)) and developed on the basis of a mandate from the European Commission to set out the essential requirements for the product or service that are specified in an EC Directive. These Essential Requirements deal in particular with the health and safety of users and other fundamental matters. It has no special designation, except from a note in the foreword of the standard.

Other products of European standardisation include European Technical Specifications (CEN/TS) which aim to aid market development and growth for products or methods that are still in the development and/or Trial phase, and European Technical Reports (CEN/TR) which provide specifications of a recommendatory and explanatory nature. Special specifications, which are developed with the rapid consensus of expert stakeholders (no full consensus needed), can be found in CEN Workshop Agreements (CWA). All document types differ in their development procedures and binding forces.

Besides the standardisation deliverables described above, the type of content of these documents differ from each one to the other. Thus, it is important to clarify that there are various types of standards

existing, approaching each different aspect in the topic of interest; e.g. related to terminology or to testing. In *EN 45020 "Standardization and related activities - General vocabulary"* some common types of standards are defined as shown in Table 2.1.

Table 2.1: Types of standards as defined in EN 45020

Type of standard	Definition
Basic standard	Wide-ranging coverage or contains general provisions for one particular field.
Terminology standard	Concerned with terms, accompanied by their definitions etc.
Testing standard	Concerned with test methods, sometimes supplemented with other provisions related to testing.
Product standard	Specifies requirements to be fulfilled by product or group of products, to establish its fitness of purpose.
Process standard	Specifies requirements to be fulfilled by a process, to establish its fitness of purpose.
Service standard	Specifies requirements to be fulfilled by a service, to establish its fitness of purpose.
Interface standard	Specifies requirements concerned with the compatibility of products and systems at their point of connection.
Standard on data to be provided	Contains a list of characteristics for which values or other data are to be stated for specifying the product, process or service.

2.2.2 Development of a European Standard (EN)

European Standards are developed by CEN, CENELEC (for electrotechnical standards) or ETSI (for standards in telecommunications). Work at CEN and CENELEC is based, as on international level, on the national delegation principle: each country sends a delegation of experts to represent the national standpoint in the European committees. This standpoint is developed in national committees that "mirror" the European committees. By taking on the secretariat of a European committee, national members can play a leading role in the committee's work. It is often decisive for national interests to be effectively represented at an early stage of the development of a European standard.

European standardisation work begins with a proposal for a standard, which might come from a member of the European standards organisations (CEN/CENELEC/ETSI), the European Commission, or another European or international organisation. At least a simple majority and 71 % of the weighted majority among all national standardisation bodies voting are needed for the proposal to be accepted. In addition, a sufficient number of national standardisation bodies must agree to participate, after having checked with their stakeholders that there is sufficient need - and sufficient financing - for carrying out the necessary work in the national mirror committees. Only then will the proposal be accepted and work on the standard can begin.

If there is an existing International standard on the subject, it will be adopted, unchanged, as the European standard. If this is not the case, the responsible working body will draw up a manuscript for the draft standard (prEN).

The draft standard is distributed to the national standards organisations for commenting in what is called the "public enquiry" stage. National comments are to be submitted within three months. The national mirror committee discusses all comments received and submits the consolidated national standpoint.

On the basis of the comments received, the responsible working group can either decide to publish the standard or to draw up and issue a final draft. In a formal vote over a two-month period, the members then

decide whether to accept this final draft as a European Standard. There is no public enquiry for the final draft. Approval of the final draft requires at least 71 % of the weighted votes of CEN members.

Ratification of a European standard takes place following positive voting. After ratification, the European standard must be adopted, unchanged, as a national standard, and any conflicting national standards withdrawn.

In addition, a standard that has been developed at international level can be simultaneously adopted as a European Standard by means of parallel voting procedures in accordance with the Vienna Agreement. Such standards are also to be automatically adopted by the national standards organisations (9).

2.2.3   Development of CEN Workshop Agreement (CWA)

"A CEN Workshop Agreement (CWA) is a document published by CEN, which is an agreement developed and approved in a CEN Workshop. The workshop is open to the direct participation of anyone with an interest in the development of this agreement. The out coming document has not the formal status of a European Standard (EN) as it involves no obligation at national level" (7)*.

There is a multiple step process described by CEN to develop and produce a CWA. It starts with the request of an interested party to a CEN member. Therefore, the proposer needs to prepare a draft project plan, which describes what the objective of the CEN Workshop is. Afterwards, the CEN-CENELEC Management Centre (CCMC) announces the proposal for a new CEN Workshop on the CEN Website for at least 30 days. This is for information and transparency reasons. Comments on the draft project plan can be made and shall be considered in the further development of the document.

The next step is the kick-off meeting, where the proposed project plan is approved and the Chairperson on the CEN Workshop is elected. Also, the formal launch of the Workshop happens at the kick-off meeting and the formal registration of the participants, who want to work on the CWA takes place. The workshop participants develop draft CWA(s) according to the specifications laid down in the Project Plan. The draft CWA is made available for comments to the registered workshop participants.

Finally, the Chairperson decides when agreement is reached amongst the participants of the workshop on the final text of the CWA. Then, the optional commenting phase starts. It is open to everyone and lasts at least 60 days. The comments are considered by the workshop members. After that the Workshop secretariat submits the approved CWA to CCMC. A CWA is valid for three years, after which the former Workshop Secretariat shall consult the former Workshop participants and the relevant CEN/CENELEC technical bodies to determine whether the CWA shall be confirmed for another three years, revised, transformed into another deliverable (such as a European or international standard), or withdrawn.

CWAs maximum lifetime is six years. After six years from initial publication, the CWA shall be submitted to the CEN/CENELEC BT(s) for decision regarding its transformation into another deliverable or its withdrawal (10).

2.2.4   Relevant CEN/TCs in crisis management

At European level, the Technical committee CEN/TC 391 – Societal citizen security is the most relevant one to be considered in context of crisis and disaster management. Its scope is "*to elaborate a family of European standards, standard-like documents (e.g. procedures, guidelines, best practices, minimal codes of practice and similar recommendations) in the Societal and Citizen Security sector including aspects of prevention, response, mitigation, continuity and recovery before, during and after a destabilising or disruptive event"* (11). The working group CEN/TC 391/WG 3 – Crisis management/civil protection is the one most relating to DRIVER+. Regarding to the selected solutions within the DRIVER+ project also other CEN/TCs might become relevant, such as e.g. CEN/TC 127 Fire safety in buildings.

2.3   National standardisation work

On national level different national standardisation organizations exist, as e. g. British Standards Institute (BSI), German Institute for Standardisation (DIN), Netherlands Standardisation Institute (NEN). In case of Europe each Member State is represented by a national standardisation body within CEN (12). Besides that each national standardisation body is able to develop national standards as far as there is no EN standard existing on a particular scope. There are situations in which it is possible to complement EN standards with additional national standards in order to, for instance, set more detailed requirements suiting to specific needs of the member state.

An important country outside of Europe, which has to be taken into account in the context of standardisation in the field of security, is the United States (US) of America. The US standardisation landscape differs somehow from the European approach. The American National Standards Institute (ANSI) is a private, non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States. The organization also coordinates U.S. standards with international standards. ANSI accredits standards that are developed by representatives of other standards organisations, government agencies, consumer groups, companies, and others. It works as kind of umbrella organization by coordinating 270 Standards Developing Organizations (SDOs), such as Underwriter Laboratories (UL), American Society of Mechanical engineers (ASME), Institute of Electrical and Electronics Engineers (IEEE). Many of them develop standards for the US-market and provide as well certification or accreditation services, e. g. UL. The American Society for Testing and Material (ASTM), which is an ANSI-accredited standards developer (13), is another important national standardisation body in the US. Some standards are implemented in the federal laws; others are viewed more as guidelines for industry. This is the case for many of the standards developed by US-SDOs.

National standards are developed basically in the same way in every country. National standardisation begins with a proposal for standards work that anyone can submit to a standardisation body. Once a proposal has been received, the responsible committee discusses with the relevant experts the need for a standard on that subject and whether the work is to be carried out at national, European or international level. If the proposal is accepted, this is publicly announced. If a decision has been made to develop a national standard, and the responsible steering body has approved this, then a draft standard is developed, which is published. All comments received are discussed by experts in the standards committee, who come to consensus on the content of the standard, which is the final step in the process.

2.4   Standardisation work as part of research projects

Standardisation work is part of research projects due to its possibility to transfer project results, which can be included in an already existing standard or as basis for its own standard. Therefore, it supports the dissemination and exploitation of DRIVER+ results.

2.4.1   Standardisation needs

Especially the European-funded ResiStand project pointed out new ways to improve the crisis management and disaster resilience capabilities of the European Union and individual Member States through standardisation (14). ResiStand made an analysis of diverse research projects, regarding to standardisation potential of their results in the field of crisis management. This work gives a good overview on standardisation work and its possibilities in European research projects. The ResiStand results should be taken into account for the next step in this work package – identification of standardisation potential. Hence, the ResiStand Roadmap[1] on standardisation potentials should be mentioned as harmonized input

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[1] http://www.resistand.risk-technologies.com/RunningApp/Standards/Gaps.aspx

from other European funded projects to DRIVER+, because it already summarizes needs in standardisation from crisis management projects. Some of the needs shown in the ResiStand Roadmap are of interest for DRIVER+ project. They are listed in Table 2.2.

Table 2.2: Identified standardisation needs by ResiStand project

ID	Gap Title
1	Risk Management for Critical Infrastructures
2	Utility Networks: inventory system of Waste water networks
3	EU Common Operational Picture standard
9	Crisis management: Terminology and glossary of terms for disaster resilience and crisis management
10	Exercising and training in crisis management system for public authorities and first responders.
11	Psycho-social support in crisis management
12	Use of drones / UAVs for crisis management
13	Drone Operable Vapor Examiner and Recorder on board multi-rotor UAVs
14	Use of automated vehicles in search and rescue operations
15	Early warning systems
16	EU Common Emergency Metadata standard; Communication and sharing of information during crisis and disasters
17	Collection of information during the crisis
18	Situational awareness: common agreed symbols + alerts
19	Resilient Management Guideline
20	Coastal resilience: Management and policy approaches to increase coastal resilience
23	Cascading effects
24	Supply Chain Interoperability
25	Best practices to ensure data integrity: Security - integrity
27	Wearable, smart and connected devices and garments
28	Serious gaming: Open distributed pan-European Environment for serious gaming
29	Use of social media for informing in emergencies
30	Cross-Border Risk Information Interoperability; Cross-border interoperability; Interoperability in Crisis and Disaster Management; Protection of Critical National Infrastructure

ID	Gap Title
31	Specifications/Capabilities for sensors and systems
32	Certification scheme for security products
33	Requirements for risk analyses for ICT Security
35	Use of GIS and satellite data and capabilities in government organisation
37	Disaster database
39	Emergency plans and planning of industrial sites
43	Data Analysis / Data mining
44	Hazard recognition based on algorithms on human behaviour under stress, panic and strong emotions
46	Crisis, Risk and Emergency Management Evaluation; Integrated Common Framework for Risk-Resilience Assessment; Aligned European Resilience Indicators for Critical Infrastructures.
47	Crisis communication and warnings: Guidelines for effective communication before, during and after crisis
48	Climate risks: Extreme Weather Indicators
63	Specifications for search and rescue equipment
64	Common and standardised template for casualties' registration
65	Next Generation 112
66	Terminology and taxonomy
67	Risk Management Cycle; Debriefing processes after operations, also to optimise lessons learned
69	Socio-technical gap between research and real operational environment

The identification of standardisation needs was made during workshops with experts in the related fields. These identified needs were compared with the current standardisation activities as well as already existing standards. If there was no existing standard/standardisation activity related to the need, a gap in standardisation was resulting. Because it is not the aim of standardisation to standardise everything, but only needed aspects, a gap in standardisation can only be identified with a need for standardisation.

The identification of standardisation needs of DRIVER+ project will be the main part of **T955.2**. The identified needs will be compared with needs identified in ResiStand project.

2.4.2   Liaison

Another way to build cooperation between research projects and standardisation is to establish a Liaison between a CEN and/or CENELEC Technical Bodies and a consortium of a funded European research project. This can be done with the aim to get input from research projects into the standardisation work. Therefore, the Liaison Organization has the opportunity to participate in CEN and/or CENELEC Technical Committees, which means that they have the possibility:

- To propose technical documents with a view of their possible conversion into CEN or CENELEC, deliverables, through the regular consensus and approval process.
- To introduce preparatory work as a support to ongoing standardisation activities.
- To submit technical contributions to the body's meetings.
- To formulate advice on current and future standards programmes (9).

DRIVER+ has built a Liaison with CEN/TC 391 – Societal and citizen security to be updated and give input into standardisation activities in the field of crisis and disaster management. Every standardisation activity which is initiated in the field of crisis and disaster management on European level is considered in the CEN/TC 391. Therefore, DRIVER+ as Liaison Organisation will be informed on current standardisation work. The CEN/TC members are experts from national standardisation bodies, which enable DRIVER+ to extend its network via the Liaison. Within the DRIVER+ project the following activities were conducted or are planned in the framework of the Liaison to CEN/TC 391:

- Support the conduction of the I4CM event in Warszawa in September 2018, mainly to identify common fields of activities and potential standardisation ideas based on DRIVER+ results.
- Support the assessment of standardisation potentials of the DRIVER+ project,
- Support the upcoming initiation of standardisation activities via possible participation of experts from this Technical Committee in the development of the standards (see also section 6 for their support to the *CWA 17335 '*Terminologies in Crisis and Disaster Management'),
- Support the promotion and further uptake of the final standardisation deliverables, e.g. by proposing to uptake directly on EN or ISO level.

3. Methodology for the research and analysis of existing standards

The objective of the research and analysis of existing standards and ongoing standardisation activities is to give an overview on the current standardisation landscape in the field of crisis management. The resulting overview of standards shall be used as input for the different Subprojects as for example:

- Raising general awareness on standards relevant for the topic of crisis management and the project at all.
- Identification of standards having a relation to the used and considered solutions within the project, as well as related to interoperability aspects (e.g. standards for exchanging information between solutions that are supported also by the Test-bed).
- Providing relevant definitions of terms coming from the identified terminology standards (i.e. for DRIVER+ terminology, but also for the CWA on Terminologies in Crisis and Disaster Management – see also section 6).

Additionally, this overview of existing standards will be used to support the identification of standardisation potentials or needs in **T955.2**.

The process of the methodology to research and analyse existing standards relevant for the project is mainly divided in five different steps. In order to research on standards at first relevant keywords in the field of crisis management need to be identified before secondly searching and collecting standards of possible relevance for the project. Afterwards the analysis of standards included step three to identify criteria for assessing the relevance of standards and specific keywords that are related to each Subproject. As fourth step the identification and assessment of for the project relevant standards takes place, this is finalized with an overview of relevant standards for each Subproject in step five. Figure 3.1 summarizes the whole process and the following subsections describe in more details each step.
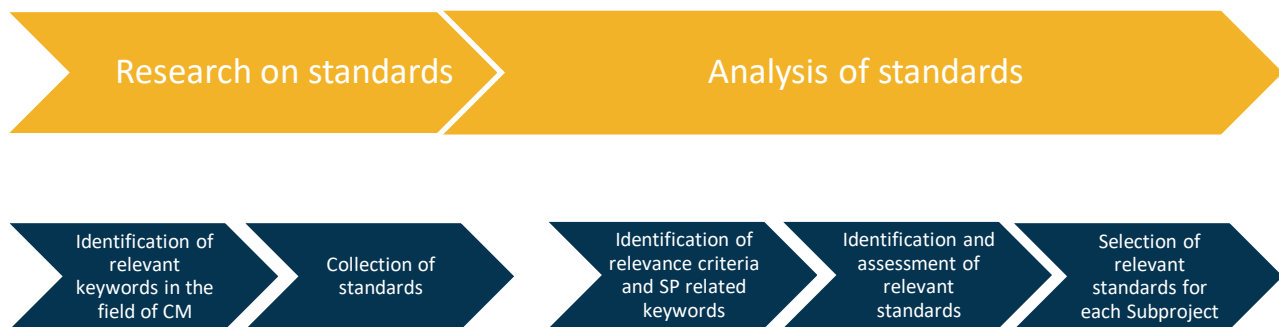
Figure 3.1 : Process of methodology used to identify relevant standards for the Subprojects of DRIVER+

3.1 Research of existing standards

Before explaining in detail the two steps to research on existing standards more information on the assessment team need to be provided. Thus in order to research and analyse existing standards project partners with significant background on the topic of crisis management and with having knowledge on each of the Subprojects of DRIVER+ are needed to fulfil these tasks. The following Table 3.1 provides an overview of the organizations involved in the assessment of the standards as well as the individual expertise and experiences of the staff involved to conduct the assessment.

Table 3.1: Organizational and personal background of the assessment team in WP955

Project partner	Company background	Individual expertise	Role of organization in DRIVER+	Role of person in DRIVER+
AIT	Development of digital safety and security solutions, energy, mobility.	Development of concepts and solutions for crisis and disaster management, standardisation for societal security.	**SP93** lead, **WP933** lead, main role in the development of Portfolio of Solutions and Trial Guidance Tool, Trial 3 coordination.	**SP93** lead, member of terminology working group, involvement in **WP955**.
PSCE	A membership forum focused towards the improvement of communication between actors during public safety activities.	Technology background focusing on capability building and adoption of new technologies for improved communication.	**SP94**, with the aim to assess the suitability of The Guidance Methodology (TGM) following Trials in **SP94** and feeding back to **SP92**. **SP95** with a specific focus on dissemination activities.	Assessment of standards and the guidance methodology.
TCS	Telecommunications, security, critical information systems.	Information processing, Open Source information, Command and Control.	**WP934** CM Solutions leader, Solution coordinator for Trial 2 and final demo. Security in Test-bed.	**WP934** CM Solutions WP leader, Trial 2 and final demo Solution coordinator.
Valabre	Civil protection training for special operations (forest fires, mountainous rescue, etc.); research and certification of material.	Three different persons have participated in the assessment: • Engineer in metrology, highly experienced in testing and certifying material and products. • Project manager specialised in search and rescue domain, biologist. • Project manager specialised in crisis management. • Doctor in thermodynamics, expert background in certification of fire fighter material.	Trial 2 owner (**WP944** leader), gaps assessment coordinator.	Trial 2 owner and organisation team members, coordination and participation in gaps assessment.
WWU	Researcher.	Voluntary firefighter for more than 10 years.	Main role within **SP92** as part of the TGM development and application in Trials, **WP942** – TGM perspective for the PoS, task leader in **T942.1**, member of the review board member.	**WP922** – guidance methodology: development and applicability, Involvement in **SP94** as TGM support. Involvement in **WP955**.

As first step within the research on existing standards, the identification of relevant keywords in the field of crisis management took place. This was done by the members of this task, who are experts in the field of crisis management (as shown in Table 3.1 above). By using various exchanges via email and web meetings the following extensive list of general keywords was extracted (see Table 3.2).

Table 3.2: Keywords as basis for the research on standards

Category	Keywords provided by the project partners and DIN
Fundamental terms	Disaster management, crisis management, emergency management, incident management.
Directly related to crisis, disaster, emergency and incident management	Integrated disaster management, disaster prevention methods (crisis, disaster, emergency, incident), International (crisis, disaster, emergency, incident), planning (crisis, disaster, emergency, incident), information provision (crisis, disaster, emergency, incident), firefighting (crisis, disaster, emergency, incident), resilience (crisis, disaster, emergency, incident), response (crisis, disaster, emergency, incident), interoperability, selection and verification criteria for persons appointed for crisis management, costing methods for CM solutions, basis for decision in a disaster, experimentation / experiments (crisis, disaster, emergency, incident), innovation (crisis, disaster, emergency, incident), coordination (crisis, disaster, emergency, incident), communication (crisis, disaster, emergency, incident), CM policies, CM organization, CM procedures, CM capabilities, CM Laboratories, crisis communications, incidents (transportation-related events) emergency management centres, exchange of data about public safety and emergency management, common incident management message sets - Abstract Syntax Notation One ("ASN.1" or "ASN"), Social networks information, Ground and aerial resources for anticipation and firefighting, Communication networks, Cooperation, Interoperability, Information exchange, Regulations.
Training & learning	Training (crisis, disaster, security), lessons learned, Evolved Learning Experimentation Campaigns, Simulation models (Virtual learning- Serious Games), Test bed, Integration & Transverse experiment, Geo Data used for training, virtual environment, Evaluation.
Societal issues	Volunteer management, Community Resilience, societal /society resilience, preparedness, early warning, civil protection, Secure society, Citizen alert system, prevention regulations, anticipation.
Others	Situation assessment (COP and CIS), Operationalization, Sustainability, Performance and Effectiveness Metrics, risk perception, Access control, Authentication and Identity management, Assurance, compliance and information security management, Privacy and data protection, Cost reduction, Cross Border Events, Digital exchange of geographic data, floods, decontamination, contingency plan, evacuation, command and control system, critical infrastructure, vulnerability, security innovation, victims, Wildland-Urban interface, confinement, evacuation, smoke, intoxication, erosion, refuge, clearing, dam, advanced medical post, decision support tool, modelling, critical communications, location (indoor/outdoor), triage, Interoperability, Semantic interoperability, Syntactic interoperability, Object level interoperability, Information Management, Informational interoperability.

In the second step the search engine PERINORM was used to identify potential standards of relevance for the project. Beside the standards of European national organizations like DIN, NEN or BSI, and Non-European national organizations (e.g. from Brazil, USA or South Africa), the database also includes standards from the European organizations CEN, CENELEC, ETSI and international organizations such as ISO, IEC and ITU. Regulations, technical documents and reports on these levels were considered for the analysis.

In case of national standards, it had to be stated that due to language barriers mostly those providing at least an English title are considered.

Afterwards the results of this research were merged into one list, including among others the following information on each identified standard:

- Document number.
- Title of document.
- Abstract/Scope.
- Keywords of the standard.
- Date of publication.
- ICS classification (International classification for standards from ISO[2]).
- Origin code.

The collected standards give an initial overview of already existing standards in the field of crisis management. Therefore, they can be used as input for the work in the Subprojects, or as basis for upcoming standardisation ideas within the project. However as the amount of standards in this initial list is usually high, a more project related analysis and assessment of the identified standards need to take place. This will be described in the following section.

3.2   Analysis of existing standards

The analysis of existing standards and standardisation activities started with the identification of relevance criteria. Therefore the list of initially collected standards was analysed according to the relevance for the project. To do this in a transparent way, relevance criteria were identified. They were used to select, which standard is relevant for the project and which are not. Some examples of non-relevance for the project are:

- By using the keyword "training", standards have been identified that are related to training but not specific to crisis or disaster management at all.
- Initially identified standards are too sector specific and not directly related to the project, e. g. focussing on cleanness of water or CBRNE.
- Identified standards are too general, e. g. related to innovation management or information technology.

In order to diminish the initial comprehensive and large list of standards related to crisis management and to limit the list to only for the project relevant standards, the following three steps approach was done:

1. Check occurrence of Subproject specific keywords in standard.
2. Rating the importance of the standard for the Subproject.
3. Specify the potential use of the standard in DRIVER+.

Step 1: As in the initial research on standards only general keywords have been used, in this analysis of the identified standards a more detailed and tailored list of keywords for each Subproject was needed. Each Subproject expert of the assessment group provided information and in total six keywords were identified for each Subproject (except for **SP91**, due to its general nature). The Subproject tailored keywords are shown in Table 3.3.

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[2] See https://www.iso.org/files/live/sites/isoorg/files/archive/pdf/en/international_classification_for_standards.pdf

Table 3.3: Keywords, used as relevance criteria for each Subproject of DRIVER+

SP91	SP 92	SP 93	SP 94	SP 95
Crisis management	Test-bed	Solutions	Trial	Sustainability
Disaster management	Evaluation method	Crisis management functions	Testing	Press relations and media
Terminology	Methodology	Technical requirements	Operational benefit	Harmonization
	Guidance tool	Adaptation of solutions	Demonstration	Shared understanding
	Lessons learnt	Integration of solutions	Evaluation of solutions	Community of practice
	Simulation	Solutions training	Platform	Policy support

If a keyword for an identified standard was found then this gave an indication on the potential relevance of the standard. The occurrence of the keywords has been analysed with the support of MS Excel program. Finally, these keywords have also been listed in the resulting overview of standards for each Subproject (see next section).

Step 2: Besides checking the occurrence of Subproject specific keywords an individual assessment of each initial identified standard was conducted by the assessment team, i.e. to identify their relevance for every Subproject. Therefore, the assessment team had available a scale from 0 to 5 for assessing the importance and relevance of each standard for each Subproject, with having "0" for non-importance up to a "5" for very important standards. The following definitions were used:

- *0 – Non-importance*: The standard is not necessary for DRIVER+, i.e. standard has no relation to the project at all.
- *1 – Less-importance*: The SP should be aware of the standard, i.e. standard might be of Subproject relevance.
- *2 – Little-importance*: There is a clear link between the standard and the Subproject, i.e. standard has relation to Subproject.
- *3 – Medium-importance*: It is highly likely that this standard is relevant to the SP, i.e. standard has relevance to Subproject.
- *4 – Higher-importance*: The standard should be read in detail and taken account of, during the work of the Subproject, i.e. standard has high relevance for implementation of Subproject activities.
- *5 – Utmost importance*: The work for the Subproject must aim to comply with and/or plan to contribute to this standard, i.e. standard is needed to conduct the Subproject activities.

In addition, the following questions were taken into account when assessing the importance and relevance of each standard:

- Does the title and scope of the standard have a relevance to the project at all?
- Does the standard have a general importance for conducting a specific SP/WP/task?
- Does the identified standard have a direct relation to one of the solutions/processes of the SP, and which?
- What is the background of the standard (national, European or international level)? For example, non-English written standards were less considered as they have been identified as difficult to assess and to implement.
- Does the information given is sufficient enough to assess the importance (e.g. missing scope and judgment only on not interesting title)?

In total two individual assessments for each standard have been conducted. Therefore the standard list was divided between the organisations involved in the work package: PSCE, VALABRE, TCS, DIN, AIT, and WWU. Each standard was therefore assessed from at least two different organizations. Due to the individual personal assessment of each standard it was sometimes the result that one person assessed a standard with a "0" and the second person with a "5". The reasons for these differences were for example:

- Different views on the perceived relevance for the project (concrete objectives of the project vs. general importance for the topic of crisis management at date of assessment).
- Not sufficient knowledge on the solutions that will be chosen within the project as well as the on the structure and content of the methodologies to be developed in the project (e. g. Trial Guidance Methodology).
- Different individual priorities (e.g. a terminology standard was rated with a "5" because of the individual involvement of the person in terminology aspects of the project, but the other person rated a "0" due to not being involved[3]).

For the resulting overview of relevant standards for a Subproject only standards have been included that have an average assessment (out of the two individual assessments/ratings of relevance and importance) of three or higher or a single assessment number of four and higher. In the standards list for each Subproject the highest individual assessed importance as well as in brackets the two individual assessments has been included (e.g. 5 (5;4)).

Step 3: The last step for assessing the relevance of the standard was to describe the potential use of the standard within the Subproject. The assessment team used therefore the following initial selection of criteria (examples):

- Relevant for a specific work package or task of the Subproject.
- Relevant for a specific solution, process or methodology.
- Needed for implementing a specific work package or task.
- Needed for conduction the Trials.
- Needed to do the assessment of/interoperability among solutions.
- Needed for the development/set up of Test-bed/methodologies (TGM, SIA etc.).
- Needed for the development of project terminology.
- Relevance to whole project (only for **SP91**).
- Or any other criteria proposed by the assessment team.

By these three steps of the assessment the comprehensive initial list of standards could be reduced to the relevant ones for each Subproject. Additionally, they are divided in separate lists regarding to their relevance for every Subproject. They are shown in Table 4.1 – Table 4.5.
While collecting the standards, which are important for crisis and disaster management, other relevant documents such as secondary publications to standards and related books from standardisation organisations have been found. These documents should also be further taken into account. They are signed in italic in Table 4.1 – Table 4.5.

In order to provide the project partners also the complete comprehensive overview of initial identified standards, the full list of assessed standards is provided to the consortia within the project internal Microsoft SharePoint. There this list will be updated continuously and project partners accordingly informed when relevant new standards have been developed.

The results of the analysis follow in the next section 4.

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[3] Assessment of standards was done before implementing the use of specific terminology in the project.

4. Results of the research and analysis of existing standards

As explained in the methodology section, first the research on existing standards and standardisation activities is made and then, in a second step, the researched standards are assessed. During the research work about 1000 standardisation documents were identified as possibly relevant for the DRIVER+ project. The reason for such a long list lies in the amount of keywords used for the initial research on standards that resulted in the identification of standardisation documents that have not directly a relation to crisis and disaster management and thus to the DRIVER+ project. As a wide range of possible solutions can be further included in the project (i.e. which might be selected for the upcoming Trials), a wide range of standardisation possibilities have to be considered. For this reason, the complete assessed list including only the standards that have relevance for crisis and disaster management remains on the DRIVER+ internal SharePoint as a research tool, supporting the decision of upcoming standardisation opportunities. This list will also be continuously updated within the project timeframe.

To provide a support for every Subproject within DRIVER+, the use for of the identified standardisation documents has been assessed. As a result, the following subsections consist of five lists, one for every Subproject, with the as most important identified standardisation documents. In the next subsections these lists are presented in alphabetical order. Additionally before each list a statement of the usage of specific identified standards is added from the assessment team.

Each table includes the document number, the title of the document and the assessment part, i.e. the keywords, rating of importance and use in DRIVER+. The relevant Subproject tailored keywords for each standard can be found in the column 'keywords'. The occurrence of the keywords is indicated in brackets behind it, if not stated it occurred once. The column rating consists of the highest ranked assessment and in brackets the two individual assessments. It was used the highest rating to be highlight the importance of a standard for this individual assessment (see also expertise of the assessment team in the previous section).

All standardisation documents identified for each Subproject in the following subsections are merged into one list in Annex 2 (in order of the identifier number). There further information about the scope or abstract, a link to the document, author, and the date of publication is provided.

4.1 Results regarding SP91 Project Management

Table 4.1 presents an overview (in order of average assessment) of the standardisation documents, which are assessed by an average number of three or higher or a single assessment number of four and higher. All together the list includes nine standardisation documents, four international standards (ISO), one European (EN), three national standards (BS, GB/T, OENORM) and one standardisation document of the national fire protection association (NFPA).

Statement of using a specific standard in SP91: "*ISO 22300 Terminology 'Societal security – Terminology' standard was an essential element for gathering the necessary definitions of terms for the DRIVER+ terminology."* (AIT).

Table 4.1: Recommended standardisation documents for SP91 *Project Management*

Document No.	Title of the Document	Keywords	Rating	Use in DRIVER+
BS 11200	Crisis management. Guidance and good practice	Crisis management	5 (5;0)	Relevance for whole project
EN 15602	Security service providers – Terminology	Terminology (2)	4 (0;4)	Development of project terminology
GB/T 26376	Basic terms on natural disaster management	disaster management, terminology	4 (0;4)	Development of project terminology

Document No.	Title of the Document	Keywords	Rating	Use in DRIVER+
ISO 22300	Societal security – Terminology	Terminology (3)	4 (0;4)	Development of project terminology
ISO 22319	Security and resilience - Community resilience – Guidelines for planning the involvement of spontaneous volunteers	-	4 (4;0)	Awareness on guidelines development
ISO 22398	Societal security – Guidelines for exercises	-	5 (5;0)	Awareness for the other SP leaders
ISO Guide 73	Risk management – Vocabulary	Terminology	5 (5;4)	Development of project terminology
NFPA 1561	Standard on Emergency Services Incident Management System and Command Safety	-	4 (4;0)	Relevance for whole project
OENORM S 2308	Integrated disaster management – Tactical graphics	Disaster management, terminology	4 (4;0)	Relevance for whole project

4.2   Results regarding SP92 Test-bed

Table 4.2 presents an overview of the standardisation documents, which are assessed by an average number of three or higher or a single assessment number of four and higher (in order of average assessment). All together the list includes 14 standardisation documents: two national standardisation documents (AC, BS), 11 international standards (ISO, ITU) and another document relating to standardisation work published by AFNOR, the French standardisation institution (marked in italic).

Statement of using specific standards in **SP92***:*

"A standard that really stood out from the above-mentioned ones is *ISO 22398 'Societal security – Guidelines for exercises'*. While this standard focuses on exercises instead of Trials, there still are some important keywords in the abstract that refer to similarities, i.e. similar phases (planning, conducting and improving exercises "vs." preparation, execution and evaluation of Trial) or the idea of "assessing" something (plans and programs in exercises "vs." socio-technical solutions in Trials). So it will be analysed where the similarities can really be seen and if something of the standard can be included in the TGM." (WWU).

Table 4.2: Recommended standardisation documents for SP92 *Test-bed*

Document No.	Title of the Document	Keywords	Rating	Use in DRIVER+
AC X50-200	Integrated management systems — Good practices and experience feedback	Lesson	3 (3;3)	Relevant for TGM evaluation (**T922.4**)
BS 11200	Crisis management. Guidance and good practice	Guidance	4 (4;3)	Conduction of Trials
EN ISO/IEC 27002	Information technology – Security techniques – Cod of practice for information security controls	-	4 (4;2)	Relevant for **WP923**

Document No.	Title of the Document	Keywords	Rating	Use in DRIVER+
ISBN: 2-12-475534-X Ref.: 3475534	Crisis management	Lesson	3 (3;3)	Conduction of Trials
ISO 22316	Security and resilience – Organizational resilience – Principles and attributes	-	3 (3;3)	Relevant for **WP923**
ISO 22320	Security and resilience - Emergency management - Guidelines for incident management	Method, guidance	5 (5;4)	Conduction of Trials
ISO 22398	Societal security – Guidelines for exercises	-	5 (5;5)	Relevant for **WP922**
ISO Guide 73	Risk management – Vocabulary	-	4 (4;4)	Development of project terminology
ISO/IEC 14598-2	Software engineering – Product evaluation – Part 2: Planning and management	Evaluation	4 (2;4)	Relevant for TGM evaluation (**T922.4**)
ISO/IEC 20016-1	Information technology for learning, education and training -- Language accessibility and human interface equivalencies (HIEs) in e-learning applications -- Part 1: Framework and reference model for semantic interoperability	-	5 (5;0)	Relevant for Training Module (**T924.1**)
ISO/IEC 27035-2	Information technology – Security techniques – Information security incident management – Part 2: Guidelines to plan and prepare for incident response	-	4 (4;3)	Relevant for **WP923**
ISO/IEC TR 27008	Information technology – Security techniques – Guidelines for auditors on information security controls	-	4 (4;2)	Relevant for **WP923**
ISO/TR 22351	Societal security – Emergency management – Message structure for exchange of information	-	5 (5;0)	Relevant for **WP923**
ITU-T X.1303	Common alerting protocol (CAP 1.1)	-	4 (3;4)	Relevant for **WP923**

4.3 Results regarding SP93 Solutions

Table 4.3 presents an overview of the standardisation documents, which are assessed by an average number of three or higher or a single assessment number of four and higher (in order of average assessment). All together the list includes 39 standardisation documents, 22 international standards (ISO, ITU, IEEE), three European (EN, CWA), four national standards (ASTM, OENORM, SANS) and some other documents relating to standardisation work as (marked in italic) e.g. one book published by AFNOR or one standardisation document of the national fire protection association (NFPA).

Statement of using a specific standard in SP93: "For **WP934** *ISO/IEC 20016-1 'Information technology for learning, education and training -- Language accessibility and human interface equivalencies (HIEs) in e-learning applications -- Part 1: Framework and reference model for semantic interoperability'* and *ISO TR 22351 'Societal security - Emergency management - Message structure for exchange of information'* contain relevant information related to interoperability with interesting information for integration purposes." (AIT).

Table 4.3: Recommended standardisation documents for SP93 *Solutions*

Document No.	Title of the Document	Keywords	Rating	Use in DRIVER+ AIT
ASTM F 1221	Standard Guide for Interagency Information Exchange	-	5 (3;5)	Relevant for solutions interoperability and integration (**T934.3**)
CWA 15931-1	Disaster and emergency management - Shared situation awareness - Part 1: message structure	Management	3 (3;3)	Relevant for interoperability solutions and integration (**WP934**)
CWA 15931-2	Disaster and emergency management - Shared situation awareness - Part 2: codes for the message structure	Management	3 (3;3)	Relevant for interoperability solutions and integration (**WP934**)
EN ISO 19111	Geographic information — Spatial referencing by geographic identifiers	-	4 (4;3)	Relevant for all solutions with mapping functionalities (**T934.2**)
EN ISO 19112	Geographic information- spatial references by geographic identifiant	-	4 (4;3)	Relevant for all solutions with mapping functionalities (**T934.2**)
EN ISO 19118	Geographic information - Spatial referencing by coordinates	-	4 (4;3)	Relevant for all solutions with mapping functionalities (**T934.2**)
EN ISO 22311	Societal security — Video-surveillance — Export interoperability	-	4 (4;3)	Of limited relevance for DRIVER+
EN ISO 7010/A5	Graphical symbols - Safety colours and safety signs - Registered safety signs (ISO 7010:2011/Amd 5:2014); German version EN ISO 7010:2012/A5:2015	Requirements	3 (3;3)	Potentially relevant for solutions involving video surveillance (**T934.2**)
EN ISO 7731	Ergonomics: danger alerts	-	4 (4;3)	Relevant for the development and adaptation of

Document No.	Title of the Document	Keywords	Rating	Use in DRIVER+ AIT
				Alerting solutions (**T934.2**)
EN ISO 9241-303	Ergonomics of human-system interaction — Part 303: Requirements for electronic visual displays	Requirements (2)	4 (4;3)	Relevant for all solution developments (e.g. **WP932**, **WP933**)
EN ISO/IEC 27002	Information technology - Security techniques - Code of practice for information security controls (ISO/IEC 27002:2013 including Cor 1:2014 and Cor 2:2015)	Management (2)	4 (4;3)	Relevant for solutions security development and testing (**T934.3**)
IEEE 1512	Common incident management message sets for use by emergency management centres	Management (9)	3 (3;3)	Limited relevance for DRIVER+, might be relevant for Trial 3 (**WP945**)
IEEE 1512.1	Common traffic incident management message sets for use by emergency management centres	Management (9)	3 (3;3)	Relevant for solutions involving traffic management (**WP934**)
ISBN: 978-2-12-239111-2 Ref. : 3239111CD	*Electronic signature*	Management	4 (4;2)	Potentially relevant for account management (**WP933**)
ISO 22311	Societal security - Video-surveillance - Export interoperability	-	3 (3;3)	Potentially relevant for solutions involving video surveillance (**T934.2**)
ISO 22319	Security and resilience - Community resilience - Guidelines for planning the involvement of spontaneous volunteers	Function	5 (5;3)	Support in volunteer management preparation (Trial 3 preparation, **WP945**)
ISO 22398	Societal security -- Guidelines for exercises	Management, training (2)	5 (5;1)	Potentially relevant for Trial planning and execution (**SP94**)
ISO Guide 73	Risk management - Vocabulary	Management (3)	4 (4;4)	Relevant for Terminology Working Group (**WP911**)
ISO 22300	Security and resilience - Terminology	Management	4 (2;4)	Central document for Terminology Working Group, relevant for all SPs (**WP911**)
ISO 22320	Security and resilience - Emergency	Crisis,	5 (5;3)	Relevant for

Document No.	Title of the Document	Keywords	Rating	Use in DRIVER+ AIT
	management - Guidelines for incident management	management (12), function (2)		Terminology Working Group (**WP911**)
ISO/IEC 19501	Information technology -- Open Distributed Processing -- Unified Modelling Language (UML) Version 1.4.2	-	4 (4;3)	Relevant for any solution development, e.g. **WP933**
ISO/IEC 20016-1	Information technology for learning, education and training -- Language accessibility and human interface equivalencies (HIEs) in e-learning applications -- Part 1: Framework and reference model for semantic interoperability	-	5 (5;0)	Relevant for interoperability solutions and integration (**WP934**)
ISO/TR 22351	Societal security - Emergency management - Message structure for exchange of information	Management (2)	5 (5;3)	Relevant for solutions interoperability and integration (**T934.3**)
ITU-T X.1303	Common alerting protocol (CAP 1.1)	-	4 (4;4)	Relevant for solutions interoperability and integration (**T934.3**)
ITU-T Y.4102	Requirements for Internet of things devices and operation of Internet of things applications during disasters	Requirements	3 (3;3)	Relevant to IOT based solutions development and adaptation (**T934.2**)
NFPA 1561	Standard on Emergency Services Incident Management System and Command Safety	Management	4 (4;3)	Potentially relevant in Trial and experiments (**SP94**)
OENORM S 2304	Integrated disaster management - Terms and definitions	Management	4 (2;4)	Supporting document for TWG, no specific relevance for **SP93** (**WP911**)
OENORM S 2308	Integrated disaster management - Tactical graphics	Management	4 (4;3)	Potentially relevant for C2 solutions symbology and exercise execution
SANS 23026	Software Engineering - Recommended Practice for the Internet - Web Site Engineering, Web Site Management, and Web Site Life Cycle	Management (4)	4 (3;4)	Relevant for all solution developments, i.e. PoS, TGT (**WP933**, **WP932**)
	VISOV: Social media in emergency situation #MSGU	-	*5 (5;3)*	Potential relevant for **SP94** for social media solutions

Document No.	Title of the Document	Keywords	Rating	Use in DRIVER+ AIT
	ORSEC measures – methodologies for managing crisis: S3 (Floods); G1 (General crisis management); G2 (population support during crisis); G3 (public information cell); G4 (population information and alert); G5 (restoring networks providing critical services like water, electricity, etc.).		*5 (5;0)*	Potentially relevant for Trial planning and execution (**SP94**)
	PORTAIL ORSEC MODE D'EMPLOI SY.N.E.R.G.I (Numerical system for data exchange, relaying and management of information)	Crisis (2), management (4)	*5 (5;0)*	Relevant for interoperability solutions and integration (**WP934**)

4.4 Results regarding SP94 Trials

Table 4.4 presents an overview of the standardisation documents, which are assessed by an average number of three or higher or a single assessment number of four and higher (in order of average assessment). All together the list includes 35 standardisation documents, 11 international standards (ISO), one European (CWA), three national standards (DIN, OENORM, SAE) and some other documents relating to standardisation work as e.g. one book published by AFNOR (marked in italic).

Statement of using a specific standard in SP94: "*Common alerting protocol (CAP 1.1)* and *ISO/TR 22351 'Societal security - Emergency management - Message structure for exchange of information (EMSI)'* standards were used as a basis to organize the exchange of information between the different trialled solutions that were integrated together during Trial 2.*" (VALABRE).

<div align="center">

Table 4.4: Recommended standardisation documents for SP94 *Trials*

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Document No.	Title of the Document	Keywords	Rating	Use in DRIVER+
CWA 15263	Analysis of privacy protection technologies, privacy-enhancing technologies (PET), privacy management systems (PMS) and identity management systems (IMS), the drivers thereof and the need for standardisation	-	3 (3;3)	/
DIN 13050	Terms and definitions for medical rescue services	-	3 (3;3)	To look into if specific definitions are necessary
FD X50-253	AFNOR: Management des risques - Processus de management des risques - Lignes directrices pour la communication	-	4 (4;3)	Food for thought if some Trial address crisis communication related gaps
ISBN: 2-12-475534-X Réf :	*Crisis management*	-	*5 (5;0)*	Useful to design the baseline of Trials

Document No.	Title of the Document	Keywords	Rating	Use in DRIVER+
3475534				
ISBN: 978-2-12-465310-2 Réf.: 3465310	*EFQM - Evaluation guide book*	Evaluation (2)	*4 (4;2)*	Useful to develop the evaluation approach of a Trial
ISO 22300	Societal security – Terminology	Operation	4 (3;4)	To look into if specific definitions are necessary
ISO 22319	Security and resilience - Community resilience - Guidelines for planning the involvement of spontaneous volunteers	-	5 (5;1)	Of interest for designing Trial 3
ISO 22320	Societal security - Emergency management - Requirements for incident response	-	5 (5;0)	Useful to design the baseline of Trials
ISO 22398	Societal security -- Guidelines for exercises	Testing (2), operation, demonstration	5 (5;3)	Food for thought for designing Trial conduction processes
ISO Guide 73	Risk management – Vocabulary	-	4 (4;4)	To look into if specific definitions are necessary
ISO/IEC 14598-2	Software engineering -- Product evaluation -- Part 2: Planning and management	Evaluation	4 (2;4)	Useful to evaluate the solution dimension in the Trial
ISO/IEC 20016-1	Information technology for learning, education and training -- Language accessibility and human interface equivalencies (HIEs) in e-learning applications -- Part 1: Framework and reference model for semantic interoperability	-	5 (5;0)	Useful for Trials addressing gaps related to interoperability
ISO/IEC TR 18121	Information technology — Learning, education and training — Virtual experiment framework	-	4 (4;2)	Useful for designing a Trial
ISO/TR 18317	Intelligent systems for transport - Communication network pre-emption for the rescue in case of disaster and emergency communication. Use cases scenario.	-	5 (5;0)	Useful for designing Trial scenarios
ISO/TR 22351	Societal security - Emergency management - Message structure for exchange of information	Operation	5 (5;1)	Useful standard to exchange information

Document No.	Title of the Document	Keywords	Rating	Use in DRIVER+
				between solutions (used in Trial 2)
ITU-T X.1303	Common alerting protocol (CAP 1.1)	-	4 (4;4)	Used by some of the trialled solutions to exchange information (used in Trial 2)
L562-1	*Plan for predictable natural risks prevention (PPRN)- Environment Code*	-	*5 (5;0)*	Useful to design the baseline of Trials (in a French scenario)
OENORM S 2304	Integrated disaster management - Terms and definitions	-	3 (3;3)	To look into if specific definitions are necessary
SAE AIR 5925A	Measurement Uncertainty Applied to Cost-Effective Testing	Testing (2)	4 (2;4)	Useful t develop the evaluation approach of a Trial
	ORSEC measures – methodologies for managing crisis: S3 (Floods); G1 (General crisis management); G2 (population support during crisis); G3 (public information cell); G4 (population information and alert); G5 (restoring networks providing critical services like water, electricity, etc.)	-	*5 (5;0)*	Doctrine of reference used to design the scenario applied in Trial 2
	ORSEC – methodologies for managing crisis: Guide for earthquake seism; Guide methodological for field test; Thematic guide on PPI exercises; Thematic guide for exercises on the national railway network and train station; Handbook on the Civil Safety Exercises; Lessons learns synthesis	-	*4 (4;3)*	Doctrine of reference used to design the scenario applied in Trial 2.
	PORTAIL ORSEC MODE D'EMPLOI SY.N.E.R.G.I (Numerical system for data exchange, relaying and management of information)	-	*5 (5;2)*	Used as a legacy tool in Trial 2
	White book on the defence and the national security.	-	*5 (5;0)*	Useful to design the baseline of Trials (in a French scenario)

4.5 Results regarding SP95 Impact, Engagement, and Sustainability

Table 4.5 presents an overview of the standardisation documents, which are assessed by an average number of three or higher or a single assessment number of four and higher (in order of average assessment). All together the list includes 11 standardisation documents, five international standards (ISO), one European (EN), and five national standards (ANSI, GB/T, OENORM, DIN).

Table 4.5: Recommended standardisation documents for SP95 *Impact, Engagement, and Sustainability*

Document No.	Title of the Document	Keywords	Rating	Use in DRIVER+
ANSI/APCO 1.112.1	Best Practices for the Use of Social Media by Public Safety Communications	Media(4), practice	5 (5;3)	Relevant for **SP94** if social media solutions are chosen for Trials
ANSI/APCO 2.103.1	Public Safety Communications Common Incident Types for Data Exchange	-	5 (0;5)	Assessment of interoperability among solutions
DIN 13050	Terms and definitions for medical rescue services	-	5 (0;5)	Development of project terminology
EN 15602	Security service providers - Terminology	-	5 (0;5)	Development of project terminology
GB/T 26376	Basic terms on natural disaster management	-	5 (0;5)	Development of project terminology
ISO 22300	Societal security - Terminology	Understanding, community	5 (0;5)	Development of project terminology
ISO 22319	Security and resilience - Community resilience - Guidelines for planning the involvement of spontaneous volunteers	Community, support	5 (5;1)	Conduction of Trials where volunteers are involved (Trial 4)
ISO 22320	Security and resilience - Emergency management - Guidelines for incident management	-	5 (5;0)	Conduction of Trials where scenarios are defined
ISO Guide 73	Risk management - Vocabulary	-	5 (0;5)	Development of project terminology
ISO/TR 22351	Societal security - Emergency management - Message structure for exchange of information	Community	5 (5;1)	Set up of Test bed
OENORM S 2304	Integrated disaster management - Terms and definitions	-	5 (0;5)	Development of project terminology

5.   Significance of the results for DRIVER+ project

Most of the identified standards are relevant for more than one Subproject. If they are merged together in one list without duplication (see Annex 2) there are 54 standardisation documents, which have been assessed as relevant for the project.

It has to be mentioned that the assessment was done only by a limited number of partners from the project, thus the results obtained are based on a quite subjective rating. However, as described in section 3.1 the assessment team consisted of several project partners with having a significant knowledge on each Subproject, even sometimes leading the Subproject or a major Work package of the Subproject. For not devaluing any of the initially collected 1000 assessed items, the complete list of standards is available for the whole consortia on the project internal Microsoft SharePoint.

In order to support the consideration and usage of the standards identified the significance of this analysis of existing standards and ongoing standardisation activities for DRIVER+ concentrates directly to each Subproject. Therefore, the assessment of the standards was done by referring to the content of each Subproject. By reviewing the lists of standardisation documents for each Subproject as illustrated in the section 4, the following important recommendations to each Subproject can be provided.

SP91 *Project Management*: Especially the terminology standards, that are important for the development of the DRIVER+ Terminology, need to be highlighted. Further work on establishing a common terminology in the project and beyond should take advantage of the terms already defined in the e.g. *ISO 22300 'Societal security – Terminology'*, in which more than 270 terms are included, as well as *ISO Guide 73 'Risk management – Vocabulary'*, in which about 50 terms are listed. In particular the *ISO 22300 'Societal Security – Terminology'* is a major element of which definitions have been chosen for the DRIVER+ Terminology. And as the project will include in future more solutions and methods, more definitions for terms might be necessary. For this primarily the identified terminology standards can be used.

SP92 *Test-bed*: the standards series of *ISO 223xx on Societal security (Guidelines for exercises, Emergency management – Requirements for incident response, Organizational resilience – Principles and attributes)* need to be considered for the gathering of different requirements in the activities of **WP922** *Guidance Methodology and Guidance Tool* and **WP923** *Test-bed infrastructure*. The *ISO 22398 Societal security – Guidelines for exercises* focuses on exercises instead of Trials, but there are still some important keywords in the abstract that refer to similarities, such as similar phases (planning, conducting and improving exercises "vs." preparation, execution and evaluation of Trial) or the idea of "assessing" something (plans and programmes in exercises "vs." socio-technical solutions in Trials). Thus it will be further analysed where the similarities can really be seen and if something of the standard can be included in the Trial Guidance Methodology. Also *ISO/TR 22351 Societal security - Emergency management - Message structure for exchange of information* might be of relevance for the interfaces of the technical Test-bed and will be assessed further. Whereas *ITU-T X.1303 Common alerting protocol (CAP 1.1)* is clearly addressing the Common Alerting Protocol (CAP). This will be forwarded to the technical Test-bed developers, as it will be discussed what kind of interfaces should be pre-coded in order to enable Trials and sustainability.

SP93 *Solutions*: The standards series of *ISO 223xx on* Societal Security need to be taken into account. Two standards that are only assessed for being relevant for **SP93** are 1) *ISO 22319 Security and resilience - Community resilience - Guidelines for planning the involvement of spontaneous volunteers*, which results that it is import to involve externals such as volunteers in any solution important for crisis and disaster management, and 2) *ASTM F 1221 Standard Guide for Interagency Information Exchange*, that emphasizes the relevance of interoperability among existing and new solutions. Additionally, the list of identified standards can support the selection of the solutions to be included in the Portfolio of Solutions as there might be standards related to specific solutions. In general and due to the potential wide range of solutions most of the relevant identified standards have some specific relevance for this Subproject. In further progress of the project these standards need to be further considered.

SP94 *Trials*: *ISO 22398 Societal security - Guidelines for exercises* can support the preparation, conduction and follow up of the Trials, as well as the terminology standards such as *ISO 22300 Societal security – Terminology* are of relevance and to be considered within this Subproject. For the latter, it is important to

have a common understanding on the most important terms within the Trials. If not all participants speak the same language and use the terms in the same way the envisaged outcomes of these Trials might not been reached. Additionally the *ISO/DIS 22320 Security and resilience - Emergency management - Guidelines for incident management* focuses on incident management which might be the area of most DRIVER+ Trials and thus important for designing the basement of the Trials. And the book *ISBN: 2-12-475534-X Réf.: 3475534 Crisis management* is important for DRIVER+ lessons learnt, especially with regard to the assessment of conducted DRIVER+ experiments.

SP95 *Impact, Engagement, and Sustainability*: only a few standards are related directly to the work of the Subproject. To mention is the standard from *ANSI/APCO 1.112.1 'Best Practices for the Use of Social Media by Public Safety Communications'*, which can give valuable support to the activities of **WP952** ***Dissemination and Communication*** as well as to **WP953** ***Enhancing the shared understanding of CM***. Moreover the complete list of standards will be used to raise awareness at project level on existing standards and ongoing standardisation activities and will support the initiation of new standardisation activities. Thus this information will also seek into the further activities of **WP955** ***Standardisation activities***. Especially it will serve as an input for the I4CM event scheduled for September 2018 in which the needs for standardisation activities based on the DRIVER+ results and the existing standards and ongoing standardisation activities will be identified and potentials for new standardisation activities assessed.

6.   DRIVER+ Terminology and its relation to standardisation

In the early stages of DRIVER+ the need for a common project terminology was defined as an essential part of the quality management. The main purpose of such a terminology is to achieve mutual understanding of the project partners by setting clear definitions to project relevant terms. In order to set up and improve the terminology, the DRIVER+ Terminology Working Group (TWG) was established. The main target of the TWG is to continuously update the existing terminology in order to support the project work of the DRIVER+ partners. For this purpose, central vocabularies, taxonomies or terminologies e.g. from the UN or ISO are scanned to identify best possible definitions for the project's purposes. Following a specifically designed process for the development of the DRIVER+ Terminology, the TWG continues to ensure the evolution of the DRIVER+ Terminology in a dynamic way (see also **WP911**).

The request of mutual understanding is a key requirement of the crisis and disaster management domain and definitively not limited to the DRIVER+ project team. In this light the DRIVER+ partners decided to provide their terminology not only to the project team, but also to external users via the DRIVER+ website. Nevertheless, the DRIVER+ team is aware that, depending on the specific purpose and context such as cultural or organisational background, different understandings of concepts and terms exist in the crisis and disaster management domain. The expectation of the future use of a single terminology in this domain beyond organisational, structural, political and cultural borders is not realistic. Taking this situation into account, it was decided that, apart from the DRIVER+ Terminology, other terminologies such as the *ISO 22300:2018 'Societal Security – Terminology'* or *UNISDR 2015* are going to be made available to the community via the DRIVER+ Portfolio of Solutions by integrating them in an electronic thesaurus (see **WP933**).

The concept of such a thesaurus as well as methodologies to compare definitions of terms and scopes were developed and made available in the CEN Workshop Agreement *(CWA) 17335:2018 (Terminologies in Crisis and Disaster Management)*. Taking profit from the potential of standardisation as a significant influencer, as well initiation as development of the *CWA 17335* were central parts of task **T955.3**. The CWA developed methodologies that allow analysing and quantifying the degree of terminologies´ context similarity on one hand and the similarity of different definitions of the same term on the other. Currently these methodologies are applied and tested. Furthermore, their potential use in other domains is going to be investigated. It is not expected that the DRIVER+ Terminology in its entirety becomes an international standard, but the methodology to analyse similarities of context and definitions described in the *CWA 17335* has the potential to become a European standard. Within **WP955** this potential is currently investigated.

6.1   DRIVER+ Terminology

To achieve mutual understanding of practitioners and other key actors involved in international crisis and disaster management is a key challenge. Barriers to understanding due to different cultural, organisational and educational background are the main challenges of communication and information exchange of several activities such as border crossing cooperation.

In this light, DRIVER+ decided to establish an English project terminology of key terms and associated definitions based on widely accepted standards in order to enhance a common understanding within the project team and to contribute to a shared understanding within Europe.

6.1.1   Development of the DRIVER+ Terminology

The TWG defined the basis version of the terminology as well as the process of continuous evolution of the DRIVER+ Terminology. This group consists of the quality manager, who leads it, the scientific coordinator, the **SP93** lead, and the **WP955** lead, therefore standardisation was involved in the development of the DRIVER+ Terminology since the beginning of the project.

The TWG took the terms and definitions of the already existing terminology from the initial project phase as basis. The next step was then to identify if all terms of the initial list were still relevant for the current project context. Several terms were eliminated because they were not considered relevant anymore. Then it was controlled if:

1. A definition from the *UNISDR 2015* terminology could be identified for any of the terms of the initial DRIVER+ list – in case such a definition was found, the definition from *UNISDR 2015* was taken for the DRIVER+ Terminology.

2. The second step was to check the definitions of *ISO 22300* – in case of availability of a definition from *ISO 22300* for the remaining terms this was chosen for the DRIVER+ Terminology.

3. For terms where neither *UNISDR 2015* nor *ISO 22300* could provide a definition a search in the ISO database was executed, adequate definitions were selected and introduced.

After execution of these three steps the consolidated initial status of the terminology was reached. Next, a process of continuous update of the terminology was set up.

In November 2018, the DRIVER+ Terminology consisted of 79 terms. As the list is continuously updated it will grow at least until the end of the projects´ duration. The current version of the DRIVER+ Terminology is available on the public DRIVER+ website.

6.1.1.1   Process of continuous update of the terminology

In almost all cases when an update is requested, this results from an input of a DRIVER+ partner or a member of the TWG. The TWG forwards the request to the Project Coordination Team (PCT) and in case of acceptance of the request the TWG takes the following actions:

1. The TWG examines if an adequate definition can be found in *UNISDR 2015, ISO 22300* and the ISO database.

2. If one or more adequate definitions are found in these sources, all definitions are proposed to the PCT together with a recommendation for a selection.

3. If no adequate definition is found, other already available sources are examined without giving any ranking to the PCT in case of identification of adequate definitions. These sources are:

- *SDSIE 2017: Service de défense, de sécurité et d'intelligence économique, Crisis & crisis management terminology translation.*
- *IFRC 1991: Code of conduct – International Federation of Red Cross and Red Crescent Societies.*
- *ICRC 2013: Professional standards for Protection Work.*
- *HM Government 2013: Emergency Response and Recovery Non-statutory guidance accompanying the Civil Contingencies Act 2004.*
- NATO glossary of terms and definitions: AAP-06 Edition 2018[4]

At this stage it has to be noted that the list of available sources maybe extended in case additional relevant terminologies are identified by the TWG.

In case all examined sources do not provide any or adequate definitions, additional sources can be examined or self-defined definitions can be taken.

In general, recognized and well accepted definitions are given priority compared to self-defined DRIVER+ definitions. However, available definitions are sometimes suited for the DRIVER+ purposes, but an

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[4] https://nso.nato.int/nso/zzlinks/terminology_public__non-classified%20nato%20glossaries.html

additional comment to the definition is helpful in order to make the DRIVER+ context more specific. This can be done by adding a so called DRIVER+ Note in addition to the definition.

6.1.2 Spreading the word

To distribute the DRIVER+ Terminology and therefore enhance a common understanding within the project team and to contribute to a shared understanding within Europe several activities took place: The terminology was published in the DRIVER+ project handbook and on the DRIVER+ website. In every DRIVER+ project deliverable a mandatory Annex 1 is listing the ten most relevant terms and their definitions for this deliverable. The document responsible can use the terminology to fill in this table. They can also use this table to list terms without a definition to propose them easily to the TWG. During the quality checks on the document before delivery these terms will be labelled as "under construction" in the table and the TWG will consequently establish the best definition in the aftermath.

6.1.3 DRIVER+ Terminology linked to standardisation

Even though the terminology uses definitions from standardisation documents, it does not follow the exact approach to find a new definition as it is done in the standardisation process. In standardisation a term has to be in such a way defined, that it can be exchanged with this term in every part of the document where the term is used. That limits the possibilities for a definition and makes it sometimes complicated to understand the definition without knowing the document. As DRIVER+ Terminology has the aim to enhance a shared understanding this development approach was not followed. The DRIVER+ Terminology has already several links to standardisation, as the *CWA 17335* (see section 6.2) received essential input from DRIVER+. Additionally the current content of the DRIVER+ Terminology might be further linked with standardisation by e.g. including the new terms in the annex of the *CWA 17335* (when updated) or providing this terminology to further revisions of *ISO 22300 Societal Security – Terminology*.

6.2 CWA 17335:2018 Terminologies in crisis and disaster management

6.2.1 Summary of the CWA 17335

During the course of DRIVER+ the CWA 17335: 2018 terminologies in crisis and disaster management5 was finalized in fall 2018. This CEN Workshop Agreement (CWA) was started during the initial phase of DRIVER+ and published in September 2018. It analyses definitions of terms used in crisis and disaster management as well as the scopes of the related source. Both scopes and definitions from different sources are compiled and compared regarding several aspects such as their context and envisaged audience. Sources could be a terminology standard or web services. The focus is set in responses to large scale critical events. Small scale incidents managed by daily routine processes of stakeholders are also covered, but are not the main focus of this CWA. Selected terminologies predominantly originating from the crisis and disaster management domain are used for the analysis and are included in the document. The workshop that developed this CWA constituted of DRIVER+ partners, from organizations taking part in similar research activities as DRIVER+ as well as experts from the CEN/TC 391. The engagement of the latter group was achieved due to the liaison with the TC and previous promotional activities to them in this regard.

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[5] Freely available: https://www.cencenelec.eu/research/CWA/Pages/default.aspx

6.2.2 Methodological approach of the CWA 17335

In order to enhance semantic interoperability, a basic methodology for creating a thesaurus by cross-referencing internationally acknowledged and accepted terminologies was developed. In addition to the compilation of a thesaurus in the domain of crisis and disaster management, a process to quantify similarities of different definitions of the same terms was developed. A proof of the generated methodology was conducted by taking test terms from relevant selected sources. Such sources are represented by terminologies such as the *ISO standard 'Security and Resilience-Vocabulary' (ISO, 2018)* or the *"UNISDR Terminology on Disaster Risk Reduction" (UNISDR, 2017)*.

The analytical framework of the methodology encompasses analysis and comparison of several relevant parameters, such as the type of organizations/actors, the category/the scenario of application of the term, geographical regions, addressed objects and described effects. Indicators were created to quantify the differences between definitions.

To develop a comparable and above all practically feasible system to discriminate definitions and their terms a system of categories with multiple-choice options was developed (cf. Table 6.1). The central relations between concepts/terms proposed in this methodology were identified to have the following semantic values:

- Exact match: concepts have exactly the same meaning.
- Non-exact match: concepts are related either hierarchically (broader or narrower) or they have certain semantic overlaps or equivalency - they can also be similar or associated in some way while the degree of those connections can be specified by using an indicator (not shown here).
- No match: concepts have no or no significant semantic connection.

Main steps in the development of the methodology are:

- Methodology specification including universe of discourse setting as well as indicator definition.
- Selection and collection of informative sources: identification of relevant terminologies.
- Data analysis encompassing selection of adequate candidates of definitions for comparisons (exactly the same terms from different terminologies with different definitions), establishment of relations between different concepts/terms.

Table 6.1: Definition categories and multiple choice selection parameters

Type of organisation	Phase	Range of escalation	Scenario of application	Objects	Effect	Type of region
Governmental.	Prevention (Mitigation, risk management).	Emergency (small scale).	"Geo" - geophysical (incl. landslide).	Groups of persons.	Positive.	Local.
Industry/ other business.	Preparation (resilience).	Disaster (large scale).	"Met" - meteorological (incl. flood).	Equipment.	Negative.	Regional.
Research and Education.	Response.	Other (to be specified).	"Safety" - general emergency and public safety.	Infra-structure.	Neutral / None.	National.
Standardisation.	Recovery.	Not Specified.	"Security" - law enforcement, military, homeland and local/private security.	Concept.		International (EU, continent, cross border).
NGOs.			"Rescue" - rescue and recovery.			Other (to be specified).
General Public.			"Fire" - fire suppression and rescue.			Not specified.
First responders.			"Health" - medical and public health.			
Practitioners.			"Env" - pollution and other environmental.			
International.			"Transport" - public and private transportation.			
Other (to be specified).			"Infra" - utility, telecommunication, other non-transport infrastructure.			
Not specified.			"CBRNE" – chemical, biological, radiological, nuclear.			
			Other or not specified.			

In addition to the methodological approach shown above, indicators to quantify the degree of similarity were developed. For more details show the *CWA 17335* or Neubauer et al 2018 (15).

6.2.3 Example of a comparison according to CWA 17335

In the *CWA 17335*, the general constellations of definitions to each were identified as following:

- One term is defined by different sources and generating organizations → similarities and/or deviations according to the selected categories and contexts.
- One term is included in the definition of another term → they have overlaps and similarities (e.g. item and sub-item).
- Two terms are (more or less) sharing one definition → identification of overlaps and differences; specifically in the context of different organisations this is relevant.

In Table 6.2 a comparison of the definitions for the term "Emergency Management" included in two different terminologies, i.e. *ISO 22300 (2018)* and *UNISDR (2015)* is shown according to (15). Differences and partial overlaps are relevant in the categories of phase, range of escalation and objects. They demonstrate the potential misunderstandings and thus the importance of a common understanding and language supported by the CWA-outputs.

Table 6.2: Exemplary exercise of the definitions for the term "Emergency Management"

Source	ISO 22300	UNISDR 2015
Term	Emergency Management.	Emergency Management.
Definition.	Overall approach preventing and managing emergencies that might occur.	The organization and management of resources and responsibilities for addressing all aspects of emergencies and effectively respond to hazardous event or disaster.
Type of organisation.	Not specified.	Not specified.
Phase.	Prevention & response (managing).	Prevention and preparation.
Range of escalation.	Emergency.	Emergency and disaster.
Scenario of Application.	Not specified (all possible).	Not specified (all possible).
Objects.	Concept (assisting).	All categories (resources and responsibilities).
Effect.	Positive.	Positive.
Type of region.	Not specified.	Not specified.

6.2.4 Integration of the CWA 17335 content in DRIVER+

As indicated in the introduction of section6 it is intended to make a thesaurus available in the PoS of DRIVER+. The following services will be provided consequently:

- In case a user of the DRIVER+ website wants to have a proposal of a definition for a specific term, the definition from the DRIVER+ Terminology will be proposed (including the reference of the definition).
- In case the user wants to get alternative definitions for the term of interest, all other definitions as well as the references available in the DRIVER+ thesaurus will be shown to the user. These definitions are taken from the compilation of terminologies the TWG is using for its work.

7.   Conclusion

This deliverable reports on the research and analysis of standardisation activities in the field of crisis management. It belongs to **SP95 *Impact, Engagement and Sustainability*** and shows the results of the first task within **WP955 *Standardisation activities***. Standards are one way to make the results of DRIVER+ useable after the project ends. But they are also an input for the work of every Subproject.

There are quite a lot of standardisation activities on national, European and international level that are related to crisis and disaster management and to DRIVER+ project as such. These activities and the fact that DIN, as a standardisation body, is part of these activities will allow an easier transfer of project results into standards developed or to give input to already existing standards to the respective technical standardisation committees. On European level the CEN/TC 391 and the WG3 on Crisis Management will be the main exchange point. This exchange point provides DRIVER+ with all ongoing standardisation activities in the field of crisis and disaster management on European level – including standardisation activities from other European funded projects. Therefore, a Liaison is built between DRIVER+ and CEN/TC 391. Afterwards, DRIVER+ can give input to the work of the CEN/TC and can comment on their standardisation activities.

Outputs from the DRIVER+ project should be compatible with state-of-the-art in the field of crisis management. This state-of-the-art is presented by standards and standardisation documents. Therefore, the relevant documents were searched and assessed during this task. All together 1000 standards were found during the initial research process. The assessment by the WP members decreased this to about 300 standardisation documents, which are somehow relevant for the project's work. The 54 as most relevant evaluated documents are shown in this deliverable. As this assessment was done by only the experts that are involved in this Work Package, it has a nature of individuality and subjectivity. For this reason not only the 54 as most important for the SPs identified documents, but also the complete list of 300 assessed standards will be shared within the project consortium. Therefore, the lists in section 4 will be created in a useable way and distributed to the Subprojects. These lists will be updated at least mid-2019 to guarantee a current state-of-the-art. Already existing and new standardisation activities with regard to the selected solutions for the Trials will be researched in an ongoing process and the findings will be shared directly with the relevant project partners.

The standards list has a key role and is the basis for the upcoming work within **WP955 *Standardisation activities***, but also for the implementation of the DRIVER+ project. For the latter, several standards have been identified with specific relevance for different tasks and work packages of the project. Thus already the development and dissemination of such a list has raised the awareness among the project partners on the existence of relevant standards and ongoing standardisation activities. The statements included in the previous sections give some background information on the individual usage of some as relevant identified standards.

Another important activity was the support to the terminology in DRIVER+. Terminology work in DRIVER+ project started with the aim to provide a shared understanding within the project. Definitions for crisis management terms are given by many sources as well as standardisation documents. Therefore, the terminology working group takes not only UNISDR, etc. but also standards, especially the ISO 22300 into account. A process was developed to agree on an appropriate definition for terms used in DRIVER+. The publication of DRIVER+ Terminology aims to support a shared understanding in the field of crisis management. The work on terminology within DRIVER+ fed also already in the development of the *CWA 17335 Terminologies in Crisis and Disaster Management*.

8.   Outlook and status of tasks T955.2 and T955.3

The list of standardisation documents that is provided and recommended to be considered for each Subproject is already giving indications that several standards are of relevance for the work of the Subprojects and the project in general. It can be concluded that this list builds the basis for the upcoming activities in **WP955 *Standardisation Activities*** as well as can support the conduction of the activities of the other Subprojects. As it shows the current state-of-the-art it will be the basis to identify standardisation needs that are identified by DRIVER+ project. The research and assessment of standardisation documents will stay as basis for the next tasks within **WP955**.

The identification of needs based on standardisation potentials within DRIVER+ will be the next task within **WP955**. **T955.2** consists of the identification, assessment and decision on future standardisation activities in DRIVER+ project. Therefore a standardisation potential workshop was conducted during the general assembly in September 2018 to find tools, processes or methods, which were developed by DRIVER+ to use as input for standardisation activities. Seven potentials were identified. They will be compared with the list of identified standards (from **T955.1**) to see if there is already a standard, which addresses this need or if there is a standardisation gap. The short descriptions of the standardisation ideas are presented on the DRIVER+ website; a more detailed description will be given in **D955.21**. A decision on future standardisation activities of DRIVER+ will be made with support of the ResiStand Assessment Framework[6] and the involvement of CEN/TC 391 until the end of January 2019. To collect information for this decision, surveys are conducted.

The third task, where results of DRIVER+ contribute to standardisation activities started with the development of the *CWA 17335 Terminologies in Crisis and Disaster Management,* which was published in September 2018. Further development of CWAs will start in spring 2019. Therefore an internal open call for participation will be conducted. To invite external organizations to the CWA developments the project plans of the other two or three envisaged CWAs will be published on the CEN website. The cooperation is open to every interested party. An overview of all conducted standardisation activities within DRIVER+ will be given in **D955.31**.

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[6] http://resistand.risk-technologies.com/home.aspx?lan=230&tab=2942&itm=2942&pag=3003

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Annexes

Annex 1 – DRIVER+ Terminology

In order to have a common understanding within the DRIVER+ project and beyond and to ensure the use of a common language in all project deliverables and communications, a terminology is developed by making reference to main sources, such as ISO standards and UNISDR. This terminology is presented online as part of the Portfolio of Solutions and it will be continuously reviewed and updated[7]. The terminology is applied throughout the documents produced by DRIVER+. Each deliverable includes an annex as provided hereunder, which holds an extract from the comprehensive terminology containing the relevant DRIVER+ terms for this respective document.

Table A1: DRIVER+ Terminology

Terminology	Definition	Source
CEN Workshop Agreement	CEN-CENELEC Workshop Agreement (CWA) is a CEN-CENELEC agreement, developed by a Workshop, which reflects the consensus of identified individuals and organisations responsible for its contents.	DIN 820-2
Crisis Management	Holistic management process that identifies potential impacts that threaten an organization and provides a framework for building resilience, with the capability for an effective response that safeguards the interests of the organization's key interested parties, reputation, brand and value-creating activities, as well as effectively restoring operational capabilities. Note 1 to entry: Crisis management also involves the management of preparedness, mitigation response, and continuity or recovery in the event of an incident, as well as management of the overall programme through training, rehearsals and reviews to ensure the preparedness, response and continuity plans stay current and up-to-date.	ISO22300:2018 (en).
European Standard	A European standard is a standard adopted by CEN-CENELEC and carrying with it an obligation of implementation as an identical national standard and withdrawal of conflicting national standards.	DIN 820-2
International standard	An international standard is standard that is adopted by an international standardizing/standards organization and	ISO 28803

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[7] The Portfolio of Solutions and the terminology of the DRIVER+ project are accessible on the DRIVER+ public website (https://www.driver-project.eu/). Further information can be received by contacting coordination@projectdriver.eu.

Terminology	Definition	Source
	made available to the public.	
National standard	A national standard is a standard that is adopted by a national standards body and made available to the public.	EN 45020
Societal security	Protection of society from, and response to, incidents, emergencies and disasters caused by intentional and unintentional human acts, natural hazards, and technical failures.	ISO 22300
Standard	A standard is a document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.	ISO 28803
Standardisation body	A standardisation body is the same as a standardizing body, which is a body or organization that carries out recognized activities in the area of standardization such as the development, adoption and publication of standards and whose membership may be composed of national, regional or other standardizing bodies, or of organizations such as companies, governmental, academic or other institutions and individuals.	ISO 10241-2
Standardisation document	A standardisation document is document published by an international, European or national standardisation body.	This definition is still "under construction" and can be found online in the near future.
Terminology	Set of terms representing a system of concepts within a specified domain.	ISO/TS 17117:2002(en), 3.1

Annex 2 – List of standards and standardisation activities within thematic field of crisis management[8]

Annex 2 presents the list of standards and standardisation activities, such as draft standards, CWAs, guidelines, etc. within the field of crisis management. The table consists of seven columns. The ID is the identification number of the standard/standardisation activity for DRIVER+ internal identification. All 1000 standards got a number in the research phase. The Document No. lists the formal number of the standard/standardisation activity as well as the abbreviation for the type of standard. For example ISO/IEC TR 27008 is an international technical report developed and published by ISO and IEC with the number 27008. The third column shows the title of the standard/standardisation activity, followed by its scope in column four. Column five until seven show the date of publication of the standard/standardisation activity, the author of this document and a link to the document, in case one exists. In the table in italic marked fields are documents that are not part of the formal standardisation system.

Table A2: List of standards and standardisation activities

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
3	GB/T 26376	Basic terms on natural disaster management	This standard specifies the basic terms of natural disaster management. This standard applies to natural disaster management.	2010-00-00	SAC/TC 307	
4	ISO Guide 73	Risk management - Vocabulary	ISO Guide 73:2009 provides the definitions of generic terms related to risk management. It aims to encourage a mutual and consistent understanding of, and a coherent approach to, the description of activities relating to the management of risk, and the use of uniform risk management terminology in processes and frameworks dealing with the management of risk.	2009-11-00	ISO	
5	EN 15602	Security service providers - Terminology	This standard applies to providers of security services.	2008-01-00	CEN	
7	ISO 22300	Societal security - Terminology	ISO 22300:2018 defines terms used in security and resilience standards.	2018-02-00	ISO/TC 292	

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[8] Sorted by ID – the initial list of standards that was assessed had in total about 1000 standards. Links are only provided if it is not a standardisation document from an official standardisation body.

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
10	DIN 13050	Terms and definitions for medical rescue services	The document contains important definitions for emergency services.	2015-04-00	DIN	
11	ANSI/APCO 2.103.1	Public Safety Communications Common Incident Types for Data Exchange	To provide a comprehensive list of terms and associated acronyms that can be used to classify the situation (incident) that Public Safety Answering Points (PSAPs) and emergency responders are engaged in. The list of terms, (Incident Type Codes) will encompass situations that involve a multi discipline combination of resources. The standardized Incident Types will be used whenever a PSAP shares incident information externally with other PSAPS, emergency service responders or other authorized agencies.	2012-00-00	ANSI	
12	OENORM S 2304	Integrated disaster management - Terms and definitions	The present ÖNORM defines terms for use in all areas of disaster management, but also the management of crises, large-scale incidents, emergencies and other damaging events in Austria, and also outside Austria to ensure the necessary interoperability. The target group are all authorities, emergency organizations and institutions appointed to work in disaster management - especially those from research, teaching and business.	2011-07-15	ASI/Komitee 246 Societal Security	
18	EN ISO 7010/A5	Graphical symbols - Safety colours and safety signs - Registered safety signs (ISO 7010:2011/Amd 5:2014); German version EN ISO 7010:2012/A5:2015	In addition to DIN EN ISO 7010, this Amendment prescribes 10 safety signs for the purposes of accident prevention, fire protection, health hazard information and emergency evacuation.	2015-04-00	DIN	

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
22	OENORM S 2308	Integrated disaster management - Tactical graphics	This ÖNORM specifies uniform signs for the location of damage events of different magnitudes, in particular for use in integrated bars in case of disaster.	2015-11-15	ASI/Komitee 246 Societal Security	
90	BS 11200	Crisis management. Guidance and good practice	BS 11200 is the British Standards Institution Guidance on Crisis Management and superseded PAS 200:2011 in 2014. BS 11200 is aimed primarily at senior managers and the development of the strategic crisis management capability within an organisation.	2014-05-31	SSM/1	
103	ISO 22319	Security and resilience - Community resilience - Guidelines for planning the involvement of spontaneous volunteers	ISO 22319:2017 provides guidelines for planning the involvement of spontaneous volunteers (SVs) in incident response and recovery. It is intended to help organizations to establish a plan to consider whether, how and when SVs can provide relief to a coordinated response and recovery for all identified hazards. It helps identify issues to ensure the plan is risk-based and can be shown to prioritize the safety of SVs, the public they seek to assist and incident response staff.	2017-04-00	ISO/TC 292 Security	
105	ISO 22316	Security and resilience - Organizational resilience - Principles and attributes	ISO 22316:2017 provides guidance to enhance organizational resilience for any size or type of organization. It is not specific to any industry or sector. ISO 22316:2017 can be applied throughout the life of an organization. ISO 22316:2017 does not promote uniformity in approach across all organizations, as specific objectives and initiatives are tailored to suit an individual organization's needs.	2017-03-00	ISO/TC 292 Security	

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
107	ISO/TR 22351	Societal security - Emergency management - Message structure for exchange of information	ISO/TR 22351:2015 describes a message structure for the exchange of information between organizations involved in emergency management. An organization can ingest the received information, based on the message structure, in its own operational picture. The structured message is called Emergency Management Shared Information (EMSI). ISO/TR 22351:2015 describes the message structure built in order to facilitate interoperability between existing and new information systems. The intended audience of ISO/TR 22351:2015 is control room engineers, information systems designers and decision makers in emergency management.	2015-09-00	ISO/TC 292 Security	
110	ISO 22398	Societal security - Guidelines for exercises	ISO 22398:2013 recommends good practice and guidelines for an organization to plan, conduct, and improve its exercise projects which may be organized within an exercise programme. It is applicable to all organizations regardless of type, size or nature, whether private or public. The guidance can be adapted to the needs, objectives, resources, and constraints of the organization. It is intended for use by anyone with responsibility for ensuring the competence of the organization's personnel, particularly the leadership of the organization, and those responsible for managing exercise programmes and exercise projects.	2013-09-00	ISO/TC 292 Security	

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
133	ISO 22320	Security and resilience - Emergency management - Guidelines for incident management	This document gives guidelines for incident management, including principles that communicate the value and explain the purpose of incident management, basic components of incident management including process and structure, which focus on roles and responsibilities, tasks and management of resources, and working together through joint direction and cooperation. This document is applicable to any organization involved in responding to incidents of any type and scale. This document is applicable to any organization with one organizational structure as well as for two or more organizations that choose to work together while continuing to use their own organizational structure or to use a combined organizational structure.	2018-11-00	ISO/TC 292 Security	
136	ISO 22311	Societal security - Video-surveillance - Export interoperability	ISO 22311:2012 is mainly for societal security purposes and specifies a common output file format that can be extracted from the video-surveillance contents collection systems (stand alone machines or large scale systems) by an exchangeable data storage media or through a network to allow end-users to access digital video-surveillance contents and perform their necessary processing.	2012-11-00	ISO/TC 292 Security	
166	NFPA 1561	Standard on Emergency Services Incident Management System and Command Safety	This standard contains the minimum requirements for an incident management system to be used by emergency services to manage all emergency incidents.	2014-00-00	National Fire Protection Association	

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
171	CWA 15263	Analysis of privacy protection technologies, privacy-enhancing technologies (PET), privacy management systems (PMS) and identity management systems (IMS), the drivers thereof and the need for standardization	For the purposes of this report, the term "technologies" will be defined as those technologies that are designed with a primary purpose of enhancing the privacy of the user. Such technologies are referred to as PET (Privacy Enhancing Technologies) and IMS Identity Management Systems. These technologies can be implemented in hardware and/or software. This report will analyse the impact of data protection technologies. It will provide recommendations for longer term co-ordinated advice to regulators, and make recommendations to ensure that standards take account of the state of the art in this area. The results will be published as a CEN Workshop Agreement.	2005-04-01	CEN	
172	ISO/IEC 27002	Information technology - Security techniques - Code of practice for information security controls	ISO/IEC 27002:2013 gives guidelines for organizational information security standards and information security management practices including the selection, implementation and management of controls taking into consideration the organization's information security risk environment(s).	2014-01-18	ISO/IEC	

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
173	ISO/IEC TR 27008	Information technology - Security techniques - Guidelines for auditors on information security controls	ISO/IEC TR 27008:2011 provides guidance on reviewing the implementation and operation of controls, including technical compliance checking of information system controls, in compliance with an organization's established information security standards. ISO/IEC TR 27008:2011 is applicable to all types and sizes of organizations, including public and private companies, government entities, and not-for-profit organizations conducting information security reviews and technical compliance checks. It is not intended for management systems audits.	2011-10-00	ISO/IEC JTC 1/SC 27 IT	
317	CWA 15931-1	Disaster and emergency management - Shared situation awareness - Part 1 : message structure	The context of this CEN Workshop Agreement (CWA) is disaster and emergency management, and it aims to assist organizations involved by providing a message structure for the transfer of information between computer based systems in such a way that it can be reliably decoded. This is done by encoding the information in an XML Schema. The companion CWA-Part 2 provides a system of terms relating to disasters and emergencies and their encoding. Many of the XML fields are required to use a term from the companion CWA-Part 2, rather than free text, so that the information is well defined, and can be automatically translated into language appropriate to the user.	2009-02-01	CEN	https://www.oasis-open.org/committees/download.php/42411/CWA_15931-1.pdf

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
318	CWA 15931-2	Disaster and emergency management - Shared situation awareness - Part 2 : codes for the message structure	The context of this CEN Workshop Agreement (CWA) is disaster and emergency management, and it aims to assist organizations involved by providing the list of codes for the message structure for the transfer of information between computers based systems in such a way that it can be reliably decoded. This is done by encoding the information in an XML Schema. This CWA-Part 2 provides a system of terms relating to disasters and emergencies and their encoding. Many of the XML fields are required to use a term from this companion CWA-Part 2, rather than free text, so that the information is well defined, and can be automatically translated into language appropriate to the user.	2009-02-01	CEN	https://www.oasis-open.org/committees/download.php/42412/CWA_15931-2.pdf
624	ITU-T X.1303	Common alerting protocol (CAP 1.1)	The common alerting protocol (CAP) is a simple but general format for exchanging all-hazard emergency alerts and public warnings over all kinds of networks. CAP allows a consistent warning message to be disseminated simultaneously over many different warning systems, thus increasing warning effectiveness while simplifying the warning task. CAP also facilitates the detection of emerging patterns in local warnings of various kinds, such as might indicate an undetected hazard or hostile act. CAP also provides a template for effective warning messages based on best practices identified in academic research and real-world experience. ITU-T Recommendation X.1303 also provides both an XSD specification and an equivalent ASN.1 specification (that permits a compact binary encoding) and allows the use of ASN.1 as well as XSD tools for the generation and processing of CAP messages. This Recommendation enables existing systems, such as H.323 systems, to more readily encode, transport and decode CAP messages.	2007-09-00	ITU	

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
664	ISO/IEC 27035-2	Information technology - Security techniques - Information security incident management - Part 2: Guidelines to plan and prepare for incident response	ISO/IEC 27035-2:2016 provides the guidelines to plan and prepare for incident response. The guidelines are based on the "Plan and Prepare" phase and the "Lessons Learned" phase of the "Information security incident management phases" model presented in ISO/IEC 27035‑1.	2016-11-00	ISO/IEC JTC 1/SC 27 IT	
692	SANS 23026	Software Engineering - Recommended Practice for the Internet - Web Site Engineering, Web Site Management, and Web Site Life Cycle	Defines recommended practices for World Wide Web page engineering for Intranet and Extranet environments, based on World Wide Web Consortium and related industry guidelines. Does not address stylistic considerations or human-factors considerations in Web page design beyond limitations that reflect good engineering practice.	2010-11-17	SANS	
694	ISO/IEC 14598-2	Software engineering -- Product evaluation -- Part 2: Planning and management	-	2004-12-17	ISO/IEC	

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
732	ITU-T Y.4102	Requirements for Internet of things devices and operation of Internet of things applications during disasters	Recommendation ITU-T Y.2074 provides requirements for Internet of things (IoT) devices used for operation of IoT applications in the context of disaster in addition to the common requirements of IoT in ITU T Y.2066. It also provides requirements for the operation of IoT applications during disaster. It is necessary to specify these requirements in order to use IoT devices and IoT applications during disaster for evacuation and rescue processes. Appendix I describes methods concerning the assurance of integrity and reliability of data produced by IoT devices during disaster. This Recommendation is relevant for IoT application developers and IoT service providers as well as emergency service providers.	2015-01-00	ITU	
733	ASTM F 1221	Standard Guide for Interagency Information Exchange	1.1 This guide covers the planning, operations, and evaluation phases of interagency communications as part of a comprehensive EMS system. 1.2 This is a guide for interagency communications within an EMS system. Interagency communications involves the EMS responder and support agencies whose primary mission is not to deliver prehospital emergency medical care. 1.3 The primary focus of this guide is to address interagency communications necessary for ongoing EMS responses. 1.4 The guide also addresses interagency communications in any major EMS incident, including man-made or natural disasters. 1.5 The recommendations for drills/exercises for the evaluation of interagency communications during an EMS event are also incorporated into this guide. 1.6 Additional information can be found in Guide F 1220 and Refs 1-5. 1.7 The sections in this guide appear in the following sequence: 1.8 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.	1989-00-00	ASTM	

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
738	IEEE 1512	Common incident management message sets for use by emergency management centers	Revision Standard - Active. This standard addresses the exchange of vital data about public safety and emergency management issues involved in transportation-related events, through common incident management message sets. The message sets specified are consistent with the National Intelligent Transportation Systems Architecture and are described using Abstract Syntax Notation One (ASN.1 or ASN) syntax. This standard comprises the basic volume of the family of incident management standards, a multi-volume set of documents centered around this Base Standard. Other members of that family include three other companion volumes, specifying incident management message sets for transportation-management-related data exchange and hazardous-material- and cargo-related data exchange, etc. Collectively, that family of standards shall be referred to as the 1512 Family of Standards. The goal of that family of standards is to support efficient communication for the real-time, interagency management of transportation-related events. Those events include incidents, emergencies, accidents, planned roadway closures, special events, and disasters caused by humans or natural events. Those events include any such event that impacts transportation systems or that causes a report to be received by an emergency management system, whether or not the event actually affects a transportation system and whether or not a response is required.	2006-00-00	IEEE Standards Coordination Committees	

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
739	IEEE 1512.1	Common traffic incident management message sets for use by emergency management centers	Revision Standard - Active. Revision of IEEE Std 1512.1-2003 This standard addresses the exchange of vital data about public safety and emergency management issues involved in transportation-related events, through common incident management message sets. The message sets specified are consistent with the National Intelligent Transportation Systems Architecture and are described using Abstract Syntax Notation One (ASN.1 or ASN) syntax. This standard comprises the basic volume of the family of incident management standards, a multi-volume set of documents cantered around this Base Standard. Other members of that family include three other companion volumes, specifying incident management message sets for transportation-management-related data exchange and hazardous-material- and cargo-related data exchange, etc. Collectively, that family of standards shall be referred to as the 1512 Family of Standards. The goal of that family of standards is to support efficient communication for the real-time, interagency management of transportation related events. Those events include incidents, emergencies, accidents, planned roadway closures, special events, and disasters caused by humans or natural events. Those events include any such event that impacts transportation systems or that causes a report to be received by an emergency management system, whether or not the event actually affects a transportation system and whether or not a response is required.	2006-00-00	IEEE Standards Coordination Committees	

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
757	EN ISO 12052	Health informatics - Digital imaging and communication in medicine (DICOM) including workflow and data management (ISO 12052:2006)	ISO 12052:2017, within the field of health informatics, addresses the exchange of digital images and information related to the production and management of those images, between both medical imaging equipment and systems concerned with the management and communication of that information.	2011-05-15	ISO	
787	SAE AIR 5925A	Measurement Uncertainty Applied to Cost-Effective Testing	The report shows how the methodology of measurement uncertainty can usefully be applied to test programs in order to optimize resources and save money. In doing so, it stresses the importance of integrating the generation of the Defined Measurement Process into more conventional project management techniques to create a Test Plan that allows accurate estimation of resources and trouble-free execution of the actual test. Finally, the report describes the need for post-test review and the importance of recycling lessons learned for the next project.	2013-07-09	SAE	
801	EN 13200-8	Spectator facilities - Part 8: Safety Management; German version EN 13200-8:2017	This European Standard specifies general characteristics of safety management in spectator facilities. It specifies the layout and the planning of the management, the criteria to maintain this planning before, during and after any event. It covers the following: the safety personnel, safety policy, safety procedures. This European Standard does not apply to the roles and responsibilities of those who are part of the security system (police and security companies).	2017-07-00	DIN	

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
831		ORSEC measures	The ORSEC (Organisation of the Civil Safety response) measures are an organization framework of the rescue means at the departmental level, in case of major event. Guides exist for different Civil safety actions: S3: Flooding; G: networks; G4: population alert and information; G1: general method; G2: population support; G3: public information cell; PCS: Communal Plan of safeguarding.	*2004-2013*	-	https://www.interieur.gouv.fr/Le-ministere/Securite-civile/Documentation-technique/Planification-et-exercices-de-Securite-civile
845		Lessons learns synthesis	Six documents about exercises and lessons learned: 1 - Guide for earthquake seisme; 2- Guide methodological for field test; 3- Thematic guide on PPI exercises; 4- Thematic guide for exercises on the national railway network and train station; 5- Handbook on the Civil Safety Exercises; 6- Lessons learns synthesis.	-	ORSEC	https://www.interieur.gouv.fr/Le-ministere/Securite-civile/Documentation-technique/Planification-et-exercices-de-Securite-civile
847	FD X50-253	AFNOR: Management des risques - Processus de management des risques - Lignes directrices pour la communication	AFNOR document that explains why the communication is important and how to deploy it efficiently for risk management. Main lines are given for the case of crisis.	2011-05	-	https://norminfo.afnor.org/norme/fd-x50-253/management-des-risques-processus-de-management-des-risques-lignes-directrices-pour-la-communication/83036
852		PORTAIL ORSEC MODE D'EMPLOI SY.N.E.R.G.I (Numerical system for data exchange, relaying and management of information)	The SYNERGI (Numerical system for data exchange, relaying and management of information) is a tool for crisis management that is included in the ORSEC measures. Its main feature is to facilitate the data exchange between players and authorities during a crisis.	-		http://www.mayenne.gouv.fr/content/download/9239/59739/file/

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854		VISOV: Social media in emergency situation #MSGU	Social media activated during emergency situation. Works with local authorities.	-	-	http://www.visov.org/ http://crd.ensosp.fr/doc_num .php?explnum_id=8211
857	*ISBN: 2-12-475534-X Réf. : 3475534*	Crisis management	Reference book about good practices and lessons learned in crisis management.	*October 2006*	J.-J. Roulmann, L. Goulvestre, J. Segonds, F. Rouault	https://www.boutique.afnor. org/livre/gestion-de-crise/article/631606/fa09210 3
859	ISO/TR 18317	Intelligent systems for transport-Communication network preemption for the rescue in case of disaster and emergency communication. Use cases scenario.	ISO/TR 18317:2017 provides the outcome of discussions on use case scenarios and assumed requirements for using ad-hoc wireless networks under disaster and emergency conditions including related priority, security and urgency aspects of communication requirements.	2017-08	-	
860	AC X50-200	Integrated management systems — Good practices and experience feedback	An integrated management system is a process that takes into account the requirements of different domains: quality, safety, environment…. This standard book from AFANOR presents recommendation about the setting up of a integrated management system in enterprises.	2003-01	-	https://www.boutique.afnor. org/norme/ac-x50-200/systemes-de-management-integre-bonnes-pratiques-et-retours-d-experiences/article/710799/f a124557

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864	ISO/IEC TR 18121	Information technology — Learning, education and training — Virtual experiment framework	ISO/IEC TR 18121:2015 defines the framework for IT standards and specifications on virtual experiments supporting IT-enhanced learning, education and training. It is based on implementations of standards and specifications that are used to support virtual experiment, development, evaluation and management that rely on ITLET.	2015-12	-	
870	EN ISO 9241-303	Ergonomics of human-system interaction — Part 303: Requirements for electronic visual displays	ISO 9241-303:2011 establishes image-quality requirements, as well as providing guidelines, for electronic visual displays. These are given in the form of generic (independent of technology, task and environment) performance specifications and recommendations that will ensure effective and comfortable viewing conditions for users with normal or adjusted-to-normal eyesight.	2011-11	-	
871	ISBN: 978-2-12-465310-2 Réf. : 3465310	EFQM - Evaluation guide book	Guide book for EFQM: quality performance assessment.	2011-06	P. Iribarne, S. Verdoux	https://www.boutique.afnor.org/livre/efqm-le-guide-de-l-evaluation/article/634819/fa091660
875	EN ISO 7731	Ergonomics: danger alerts	ISO 7731:2003 specifies the physical principles of design, ergonomic requirements and the corresponding test methods for danger signals for public and work areas in the signal reception area and gives guidelines for the design of the signals. It may also be applied to other appropriate situations. ISO 7731:2003 does not apply to verbal danger warnings (e.g. shouts, loudspeaker announcements). ISO 9921 covers verbal danger signals. Special regulations such as those for a public disaster and public transport are not affected by this International Standard.	2003-11	-	

ID	Document No.	Title	Abstract/Scope	Date of publication	Author	Link
885	*ISBN: 978-2-12-239111-2 Ref. : 3239111CD*	Electronic signature	Standards for alert systems and access control.	*2001-01*	-	https://www.boutique.afnor.org/norme/nf-en-50133-2-1/systemes-d-alarme-systemes-de-controle-d-acces-a-usage-dans-les-applications-de-securite-partie-2-1-exigences-generales-co/article/780104/fa048030
892	EN ISO 19112	Geographic information-spatial references by geographic identifiant	ISO 19112:2003 defines the conceptual schema for spatial references based on geographic identifiers. It establishes a general model for spatial referencing using geographic identifiers, defines the components of a spatial reference system and defines the essential components of a gazetteer. Spatial referencing by coordinates is not addressed in this document; however, a mechanism for recording complementary coordinate references is included. ISO 19112:2003 assists users in understanding the spatial references used in datasets. It enables gazetteers to be constructed in a consistent manner and supports the development of other standards in the field of geographic information. It is applicable to digital geographic data, and its principles may be extended to other forms of geographic data such as maps, charts and textual documents.	2003-10	-	

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893	EN ISO 19111	Geographic information — Spatial referencing by geographic identifiers	ISO 19111-2:2009 specifies the conceptual schema for the description of spatial referencing using parametric values or functions. It applies the schema of ISO 19111 to combine a position referenced by coordinates with a parametric value to form a spatio‑parametric coordinate reference system (CRS). The spatio‑parametric CRS can optionally be extended to include time. The intended users of ISO 19111-2:2009 are producers and users of environmental information. Parameters which are attributes of spatial locations or features, but which are not involved in their spatial referencing, are not addressed by ISO 19111-2:2009.	2009-08	-	
894	EN ISO 19118	Geographic information - Spatial referencing by coordinates	ISO 19118:2011 specifies the requirements for defining encoding rules for use for the interchange of data that conform to the geographic information in the set of International Standards known as the "ISO 19100 series". ISO 19118:2011 specifies requirements for creating encoding rules based on UML schemas, requirements for creating encoding services, and requirements for XML-based encoding rules for neutral interchange of data. ISO 19118:2011 does not specify any digital media, does not define any transfer services or transfer protocols, nor does it specify how to encode inline large images.	2011-10	-	

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895	ISO/IEC 19501	Information technology -- Open Distributed Processing -- Unified Modeling Language (UML) Version 1.4.2	Language ISO/IEC 19501:2004 describes the Unified Modeling Language (UML), a graphical language for visualizing, specifying, constructing and documenting the artifacts of a software-intensive system. The UML offers a standard way to write a system's blueprints, including conceptual things such as business processes and system functions, as well as concrete things such as programming language statements, database schemas, and reusable software components.	2005-04	-	
924	ISO/IEC 20016-1	Information technology for learning, education and training -- Language accessibility and human interface equivalencies (HIEs) in e-learning applications -- Part 1: Framework and reference model for semantic interoperability	ISO/IEC 20016-1:2014 states the principles, rules and metadata elements for specifying language accessibility and Human Interface Equivalents (HIEs) in e-learning environments. It is structured to be able to support the requirements of applicable jurisdictional domains and in particular that of the UN Convention on the Rights of Persons with Disabilities.	2014-02	-	
939		White book on the defense and the national security	This white book sets up the French strategy in defense and national security, and clarifies its link with the common security and defense politic of the European Union and the Atlantic Alliance, as well as the needed capabilities to implement it in the next fifteen to twenty years.	*2013*	Président de la république	http://www.livreblancdefense etsecurite.gouv.fr/ http://www.livreblancdefense etsecurite.gouv.fr/pdf/le_livre _blanc_de_la_defense_2013. pdf

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940	L562-1	Plan for predictable natural risks prevention (PPRN)- Environment Code	The Plan for predictable natural risks prevention (PPRN) is one of the essential tools for the French State actions regarding natural risks prevention, in order to reduce the vulnerability of the people and the goods.	2013-01	Law/ French Authorities/ République Française	https://www.legifrance.gouv.fr/affichCodeArticle.do?cidTexte=LEGITEXT000006074220&idArticle=LEGIARTI000026849100
941	ANSI/APCO 1.112.1	Best Practices for the Use of Social Media by Public Safety Communications	Social media is a common form of communication used by agencies and agency employees. This standard provides guidance on the use of social media for developing specific local procedures (ex: Facebook, Twitter, Instagram, Google+, etc).	2014-00-00	-	-