

## D2.2 Analysis of standards and standardisation experiences relevant to disaster resilience



Report Title:	D2.2 Analysis of standards and standardisation experiences relevant to disaster resilience		
Author(s):	Ying Ying Lau, Debora van der Tas, Jolien van Zetten, Christopher Liedtke, René Lindner, Else-Marie Fykse, Gerald Walther, Larissa Müller, Isabelle Linde-Frech, Antti Karppinen, Sergio García Alvarez, Gerardo Glorioso, Flor Angela Quintero		
Responsible Project Partner:	NEN	Contributing Project Partners:	DIN, FFI, FhG-INT, SFS, TREE, R-Tech

Document data:	File name (QMS compliant):	ResiStand_D2.2_AnalysisOfStandards_v01ml28042017_FINAL	
	Pages:	247	No. of annexes: 15
	Status:	Final	Dissemination level: PU
Project title:	ResiStand: Increasing disaster Resilience by establishing a sustainable process to support Standardisation of technologies and services		GA No.: 700389
			Project No.: 12134
WP title:	WP2 Cross-sectorial screening and identification of resilience-relevant standards		Deliverable No: D2.2
Date:	Due date:	30 April, 2017	Submission date: 28 April, 2017
	Keywords: Standards, standardisation, committees, country studies, screening, identification		
Reviewed by:	Michael Löscher	Review date:	18 April, 2017
	Susan Anson	Review date:	18 April, 2017
Approved by Coordinator (GEO):	Pertti Woitsch	Approval date:	28 April, 2017

Delft, 28 April 2017



## Project Contact

**GEOWISE** GEOWISE Oy, Mr. Pertti Woitsch, Rälssitie 7 A, 01510 Vantaa, Finland

## ResiStand Project

Standardisation is a powerful tool to achieve better interoperability. However, it needs to overcome a lack of interest and modest participation from stakeholders. Also, promising research results are not always used as the basis for new standards.

The overall goal of ResiStand is to find new ways to improve the crisis management and disaster resilience capabilities of the European Union and individual Member States through standardisation.

ResiStand contributes to an improved disaster resilience by identifying and analysing the drivers, constraints and expectations of three main stakeholder communities: Standardisation Organisations, End-Users and Suppliers, consisting of researchers, industry and SMEs.

Based on this information, gaps in standardisation are identified and a prioritised roadmap for new initiatives will be created. The roadmap will be complemented by a critical evaluation of standards as a tool to improve disaster resilience.

ResiStand aims at implementing a pre-standardisation process that supports the development of standards. The feasibility of the process will be tested by developing a new work item. The aim is that stakeholders will continuously utilize this “ResiStand Process” in the future, and that the project delivers a better understanding of the potential of standards for contributing to an improved disaster resilience.

ResiStand will support the management of increasing threats to society such as armed conflicts, terrorism, pandemics and natural disasters, which have increasingly cross-border, even global consequences due to the on-going globalisation.

Protection of citizens through anticipation, preparedness, response and adaptation to crisis situations – i.e. maintaining disaster resilience – will be more efficient. Collaboration between national, European and international stakeholders will be improved by unified processes and management systems as well as by technical, procedural, operational and semantic interoperability.

## Executive summary

This report provides an overview of international, European and national standardisation committees as well as international and European organisations in the area of disaster resilience, including the analysis of relevant standards and guidelines as well as involved stakeholders and standardisation experiences.

Deliverable D2.1 ‘Overview of standardisation committees and organisations, including the stakeholders involved, for disaster resilience’ served as the basis for this report, in which information is further enhanced and further analysis on standards and guidelines as well as interviews were added. This report thus presents the full overview of the work done in WP2.

### **International, European and national standards**

A large number of standards relevant to disaster resilience have been identified on international, European and national level. Most of the standards are developed on international level. There are less European standards developed than international standards. However, some of the international standards are also adopted as European standards. On national level, standards of the following countries have been analysed: France, Germany, Italy, Sweden, United Kingdom and United States. Except for Sweden, all of the countries have one or more standards in the area of disaster resilience. No standards in different countries were found that cover exactly the same topic.

### **Stakeholder involvement in standardisation committees**

The involvement of stakeholders in international, European and national standardisation committees differs, but in all levels of standardisation the category ‘Industry/SME and consultancy’ is best represented. There is often a lack of stakeholder participation in the other categories and the interviews with chairs as well as secretaries of standardisation committees confirm that there is a need for more experts dedicated to the standardisation work.

### **Guidelines and standards from other EU and international organisations**

Many guidelines of different organisations exist with regard to disaster resilience. They deal with various aspects and tasks. The described guidelines show that current events are taken into account in the development of guidelines (e.g. guidelines about volcanic ash). The guidelines that were analysed mostly deal with the mitigation and preparedness phase. They focus mainly on measures to limit/reduce the impact of disasters or on developing/maintaining the organisation structure and capabilities to carry out response and recovery activities in case of a disaster.

With regard to NATO, some standards were publicly available; however a major part of the standards and documents published by NATO is not publicly available due to security classification.

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## List of Abbreviations

ANSI	American National Standards Institute
UNE	Standardisation and Certification Spanish Association
AFNOR	Association Française de Normalisation
API	American Petroleum Institute
ASIS	American Society for Industrial Security
CBRNE	Chemical, Biological, Radiological, Nuclear & Explosive
CEN	European Committee for Standardisation
CENELEC	European Committee for Electrotechnical Standardisation
CIP	Critical Infrastructure Protection
CIPRNet	Critical Infrastructure Preparedness and Resilience Research Network
CIWIN	Critical Infrastructure Warning Information Network
CNAD	Conference of National Armamnet Directors Committee
CRPP	City Resilience Profiling Programme
CS	Senior Committee for Standardisation /Community Specifications
DIN	German Institute for Standardisation
DKE	German Commission for Electrical Engineering, Electronics and Information Technology
DRM	Disaster risk management
EASA	European Aviation Safety Agency
EADRCC	Euro-Atlantic Disaster Response Coordination Centre
EC	European Commission
EMSA	European Maritime Safety Agency
EMV	Emergency Management Victoria
ENLETS	European Network of Law Enforcement Technology Services
ESCAP	Economic and Social Commission for Asia and the Pacific
ESO	European Standardisation Organisations
ETSI	European Telecommunications Standards Institute
FNFW	The Firefighting and Fire Protection Standards Committee
GCI	Global Cities Institute
GCIP	Global Cities Indicators Facility
GIB	Global Infrastructure Basel
GSURR	Social, Urban, Rural and Resilience Global Practice
IACP	International Association of Chiefs of Police
ICN	Information Centric Networking
ICT	Information and Communication Technologies
IEC	International Electrotechnical Commission
ISO	International Organization for Standardisation ** (Methodology)

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ITU	International Telecommunications Union
NAC	NATO's Military Committee
NADL	DIN Standards Committee Services
NASA	National Aeronautics and Space Administration
NCC	National Coordination Centres
NFV	Network Functions Virtualization
NGN	Next generation networks
NGO	Non-Governmental Organisation
NIA	Information Technology and selected IT Applications
NIAC	National Infrastructure Advisory Council
NSO	NATO standardisation organization
MC	Military Committee
ROE	Regional Office for Europe
SARP	Standards and Recommended Practices
SDO	Standard Developing Organisation
SES	single European sky
SFS	Finnish Standards Association
SIS	Swedish Standards Institute
STO	Science and Technology Organization
TC	Technical Committee (within Standards Developing Organisations)
TCCE	TETRA and Critical Communications Evolution
UNISDR	United Nations International Strategy for Disaster Reduction
WG	Working Group
WMD	Weapons of mass destruction

## 1 Introduction

### 1.1 Objectives

Work package 2 (WP2) aims to collect and review existing standards, emerging standards and guidelines from national to international level, (potentially) relevant for improving disaster resilience. More specifically, the objectives of WP2 are:

- To provide an overview of stakeholders involved in crisis and disaster resilience related standardisation;
- To provide an overview of technical committees and organisations developing standards relevant to crisis and disaster resilience;
- To provide an overview of existing standards, standards under development and foreseen further standards relevant to crisis and disaster resilience.

This work package resulted in two deliverables: deliverable D2.1 provided the basis for D2.2. The result of deliverable D2.2 is a full overview of the work done in WP2.

### 1.2 Approach

The work in WP2 started with identifying and clustering of standardisation committees and organisations developing standards which are (potentially) relevant for disaster resilience, including the involved stakeholders. For the standardisation committees, this includes International and European standardisation committees, as well as a selection of national standardisation committees. Also the types of involved stakeholders were looked into. For the organisations, a broad field of international and European organisations have been selected. The general approach for this work was desk research and resulted in D2.1.

To look further into the identified standardisation committees and organisations, the work continued with:

- Research into standards<sup>1</sup> developed by the relevant standardisation committees and organisations, categorising these according to the Disaster Management Cycle (see Section 1.2.2) ;
- In-depth interviews for the most relevant standardisation committees; better understanding the structure of the committees as well as the involved stakeholders, while also collecting the standardisation experiences as well as the relevant standards and the standards under development;
- Identification of relevant guidelines in collateral fields including screening of EC documentation.

Furthermore, this work will serve as an input for two specific developments in the ResiStand project, of which an outlook is presented:

- Preparation of the web catalogue for storing the list of standards and guidelines which will be used for the further identification of standardisation gaps in WP5<sup>2</sup>;

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<sup>1</sup> Standards refers to all types of standardisation documents, including full European and International standards (EN/ISO) as well as CEN Workshop Agreements, Technical Reports, International Workshop Agreements, National standards, Best Practices published by national standardisation bodies, etc.

<sup>2</sup> WP5 = Work package 5 'Preparation and roadmapping for standardisation activities'

- Structure for the Standards Advisory Group (SAG) and identify members. A more detailed explanation of the SAG can be found in section 1.2.3.

The result of the work mentioned above was added to D2.1 and resulted in D2.2. Deliverable D2.2 provides the full overview of the work done in WP2 and can be considered as an updated and further extended version of D2.1. Deliverable D2.2 was approached in this way to make it easier for the reader to have one document with the full overview on standardisation committees and organisations, rather than needing to go into two documents to understand the work in a specific committee or organisation (See Table 2 for overview of the work done in D2.1 and D2.2).

Two important starting points for this report are the categorisation of the stakeholders (see 1.2.1) and the Disaster Management Cycle (see 1.2.2).

### 1.2.1 Stakeholder categories

The following stakeholder categorisations were used for the identification and clustering of the stakeholders involved in standardisation for disaster resilience:

- First responders (e.g. fire fighters and police)
- Governmental organisations, except for first responders (e.g. ministries)<sup>3</sup>
- NGOs, except for first responders
- Industry/SME
- Consultancy
- Research
- Standardisation bodies
- Others

An exception has been made regarding these stakeholder categories for the European and International standardisation committees as ISO has already defined and allocated stakeholder groups for most of their members in the system that was consulted. The ISO stakeholder groups are very similar to the stakeholder categories defined in the approach. From a practical point of view, the ISO stakeholder groups are adopted with small changes for the stakeholder analysis of the European and international committees. The stakeholder categories used for European and international standardisation committees can be found in Table 1. In addition, for the analysis, corrections were made to the ISO stakeholder group 'Industry & Commerce' as ISO members are automatically assigned to this group if no group was selected during registration. For the European committees, the same modified stakeholder categories have been applied for comparison reasons.

Further details about the applied methodology can be found in section 2.1.

### 1.2.2 Disaster Management approach

A clear way to analyse the identified standards and guidelines is needed. The ResiStand Conceptual Framework<sup>4</sup> provides the basic concepts on disaster management and resilience. It describes the disaster management approach by the so-called Disaster Management Cycle. The Disaster Management Cycle consists of four phases: Mitigation, Preparedness, Response and Recovery. For each of these four phases, operational tasks as well as supporting tasks have been identified.

For the analysis of the standards and guidelines, this approach is applied, including the phases and tasks.

Further information and a description of the phases and related tasks can be found in ResiStand Deliverable 1.1.

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<sup>3</sup> Policy makers are not separately looked into as a stakeholder group. This group will be specifically looked into in WP5 of the ResiStand project.

<sup>4</sup> See ResiStand deliverable D1.1 Project Handbook, section 4 (<http://resistand.eu/deliverables>)

Table 1: WP2 stakeholder categories and modified stakeholder types for international and European committees

WP2 stakeholder categories	Modified stakeholder types for analysis of international and European committees
First responders	Governmental organisations Non-governmental organisations
Governmental organisations	
NGOs	
Industry/SME	Industry and Commerce
Consultancy	
Research	Academia and research
Standardisation bodies	Standardisation bodies
Others	Others

### 1.2.3 Standards Advisory Group (SAG)

The ResiStand Standards Advisory Group (SAG) is one of the three communities within the ResiStand project and provides expertise with regards to current practices, issues and perspectives for standardisation development. They have already done so (among others) through participating in interviews conducted by the ResiStand partners in this deliverable. Furthermore, the SAG will provide feedback on tools developed as part of the ResiStand process, such as the ResiStand Assessment Framework for possible standardisation projects. This framework was developed in T 1.1 of the project. The members of the SAG, who are mainly secretaries and chairpersons from relevant TCs, will benefit from better planning through an increased knowledge of standards that are developed.

The members of the SAG will also be asked to review and comment on specific ResiStand outcomes, which will become part of the sustainable ResiStand process.

In return, the ResiStand project will support standardisation developing organisations and other members of the SAG through the following means:

- Input for future work programmes
- Identification of experts to join committees
- Relevant and updated input on standardisation needs and opportunities through an implemented sustainable process

## 1.3 Report structure

This report presents a full overview of the work done in WP2, including the results of D2.1 and where possible, the results of D2.1 are enhanced. Table 2 provides an overview of the report structure with explanation on what work was done in D2.1 and in D2.2.

Table 2: Overview of the work done in D2.1 and D2.2 according to the structure of D2.2.

Section	Content	Work included in D2.1	Work included in D2.2
<b>1 Introduction</b>			
1.1, 1.2, 1.3	Objectives, approach, report structure	Approach: <ul style="list-style-type: none"> <li>- Desk research, survey</li> <li>- Categorisation of stakeholders in stakeholder categories</li> </ul>	Approach added: <ul style="list-style-type: none"> <li>- Further desk research, interviews</li> <li>- Categorisation of standards according to disaster management cycle</li> </ul>
<b>2 Overview of standardisation committees</b>			
2.1, 2.2	Introduction, methodology	Methodology: <ul style="list-style-type: none"> <li>- Desk research on standardisation committees</li> <li>- Survey</li> </ul>	Methodology added: <ul style="list-style-type: none"> <li>- Selection of standardisation committees</li> <li>- Further desk research on standards</li> <li>- Interviews</li> </ul>
2.3	International standardisation committees	<ul style="list-style-type: none"> <li>- Overview of relevant international committees</li> <li>- Stakeholder involvement</li> </ul>	Added: <ul style="list-style-type: none"> <li>- Selection of relevant international committees to look into standards</li> <li>- Overview of identified international standards</li> <li>- Interviews with chairpersons of international committees</li> <li>- Summary</li> </ul>
2.4	European standardisation committees	<ul style="list-style-type: none"> <li>- Overview of relevant European committees</li> <li>- Stakeholder involvement</li> </ul>	Added: <ul style="list-style-type: none"> <li>- Selection of relevant European committees to look into standards</li> <li>- Overview of identified international standards</li> <li>- Interviews with chairpersons of international committees</li> <li>- Summary</li> </ul>
2.5	National standardisation committees	<ul style="list-style-type: none"> <li>- Standardisation framework of selected national committees: Czech Republic, France, Germany, Finland, Sweden, United Kingdom, United States</li> <li>- Stakeholder involvement</li> <li>- Survey</li> </ul>	Added: <ul style="list-style-type: none"> <li>- Structure of national committees: France, Germany, Italy, Sweden, United Kingdom, United States</li> <li>- Overview of national standards</li> <li>- Interviews and survey with secretaries of national committees</li> <li>- Summary</li> </ul>
2.6	Analysis	N/A	<ul style="list-style-type: none"> <li>- Analysis of identified international standards</li> <li>- Analysis of identified European standards</li> <li>- Analysis of identified national standards</li> </ul>
<b>3 NATO</b>			
3.1, 3.2, 3.3	Introduction, NATO, analysis	<ul style="list-style-type: none"> <li>- Introduction about NATO organisation (was part of section 3 "European and international organisations developing standards").</li> </ul>	Added: <ul style="list-style-type: none"> <li>- Separate section on NATO</li> <li>- Identified NATO standards included</li> </ul>



4 Overview of European and international organisations			
4.1, 4.2	Introduction, methodology	Methodology: <ul style="list-style-type: none"> <li>- Desk research on relevant European and international organisations</li> </ul>	Methodology added: <ul style="list-style-type: none"> <li>- Selection of organisations</li> <li>- Further desk research on relevant guidelines</li> </ul>
4.3, 4.4	European and International organisations	<ul style="list-style-type: none"> <li>- Overview of relevant European and international organisations</li> </ul>	Added: <ul style="list-style-type: none"> <li>- Selection of relevant European and international organisations to look into guidelines</li> <li>- Overview of identified European and international guidelines</li> <li>- Summary</li> </ul>
4.5	Analysis	N/A	<ul style="list-style-type: none"> <li>- Analysis of identified European and international guidelines</li> </ul>
5 Conclusions			
5.1, 5.2, 5.3, 5.4	Conclusions	<ul style="list-style-type: none"> <li>- No conclusions, first findings presented</li> </ul>	<ul style="list-style-type: none"> <li>- Conclusions on standardisation committees (regarding standards and stakeholder involvement)</li> <li>- Conclusions on NATO</li> <li>- Conclusions on guidelines</li> </ul>
6 Next steps and outlook			
6.1, 6.2, 6.3	Introduction, ResiStand web catalogue, SAG	<ul style="list-style-type: none"> <li>- Next steps for D2.2 presented</li> </ul>	<ul style="list-style-type: none"> <li>- Input for two specific developments: ResiStand web catalogue, Standards Advisory Group (SAG)</li> </ul>
Annexes			
Annexes		<ul style="list-style-type: none"> <li>- Various annexes</li> </ul>	Annexes added: <ul style="list-style-type: none"> <li>- Annexes with interview questions</li> <li>- Annexes with excluded standardisation committees and organisations</li> <li>- Annexes with extensive analysis of the identified standards: international, European, national, IT, CBRN</li> <li>- Annex with extensive analysis of identified organisations</li> <li>- Annexes with information on the ResiStand web catalogue and SAG</li> </ul>

## 2 Overview of standardisation committees

### 2.1 Introduction

This section provides an overview of standardisation committees on international, European and national level related to disaster resilience and crisis management. The study on these committees mainly includes general information on each standardisation committee, the scope, information on involved stakeholders and the relevant standards. The standards have been analysed according to the phases of the disaster management cycle. For the most relevant standardisation committees, additional interviews have been conducted to gain a better insight in the standardisation experiences. This section first starts with a description of the applied methodology, followed by the information on the standardisation committees and standards.

### 2.2 Methodology

This methodology describes the approach of the study on the International, European and national standardisation work relevant for the field of disaster resilience.

For the European and international standardisation committees (also known as technical committees or TCs), the formal standardisation networks (i.e. CEN, CENELEC, ETSI, ISO, IEC and ITU-T) were considered. Only the standardisation committees and working groups (WGs) that are related to disaster resilience have been included in the study. The selection process to identify TCs and WGs of relevance for disaster resilience was supported by taking into account different sources including for example:

- Report on mandate M/487
- Lists of security related TCs on CEN and ISO webpages (incl. analysing the scopes of the TCs)
- Existing standards lists of other disaster resilience related projects

Public available information from various websites has been consulted as well as interviews with representatives from 4 of the most relevant TCs. Next to that, as the standardisation bodies work with an internal system for the registration of members to the European and international TCs and WGs (ISO and CEN Global Directory), this system was also used to create the list of members of the relevant TCs and WGs<sup>5</sup>. For information on IT standardisation committees (ETSI and ITU-T), there was no access to the member lists as this is registered in another system. Contact has been sought with these committees to obtain information about the members. Some information was shared, but this was limited. The information presented for the IT committees therefore differs slightly.

For the national standardisation committees, several countries were selected to have an understanding of the committee structures on national level. In addition to public available information on Internet, the standardisation bodies of the selected national standardisation committees were asked to fill in a short survey. Again, interviews with national standardisation committees that turned out to be most interesting and relevant regarding the European framework were conducted.

In the course of conducting the research about standardisation committees in WP2 and especially in Task 2.2 the work was divided into the research on the committees themselves with their motivation, stakeholder

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<sup>5</sup> The data from the ISO and CEN Global Directory was obtained in September 2016.

distribution, national participation etc. and the research about standards that have been developed and respectively are being developed within the work programme of those committees.

### 2.2.1 Research on standardisation committees

#### International and European standardisation committees

During T2.1 the stakeholders for the International and European TCs were analysed on a working group level. The reason for this is that in formal standardisation, the actual development of the standards is done in WGs, where the participants act as experts. For each TC, the data of all the relevant WGs are combined and represent the stakeholders that contribute to the standardisation work in this TC related to disaster resilience. As the member lists contain names, it was possible to calculate the number of persons involved in the various WGs of a TC (even if a person is involved in more than one WG, this person is only counted once). The personal data has been treated confidential and have only been used for the analysis by the involved standardisation bodies. No personal data is included in this section.

On TC level decision-making takes place, and the participants there represent their countries. Therefore on TC level only the countries are included. Furthermore, the stakeholder types of liaisons with European or International organisations or projects are also included in this study.

There is a difference between the active countries in ISO and CEN. For European standardisation, all countries that are member of CEN automatically are involved in the decision-making process. However, the countries that actively participate in a TC or WG will have participants registered in the member lists. These countries are included as active countries for European standardisation. In ISO, there are three options for countries: to participate as an active country, as an observing country or no participation. Therefore, for the ISO/TCs a distinction is made between active countries (which are countries that actively participate in the TC) and observing countries (which are countries that only follow the work, but not actively contribute to it). Furthermore, for the international committees, the number of European countries is calculated. The European countries follow the list of CEN-CENELEC members for comparison reasons.

Finally, the number of active participants is calculated based on the registrations of members in all the relevant working groups. Some members are in more than one working group. To be able to calculate the number of persons involved, a distinction is made between *memberships* in working groups (= total of members in all working groups) and *members* (= total number of persons involved, corrections applied if a person is involved in more than one working group).

In T2.2 the analysis of the relevant TCs continued with a more in depth look at the TCs itself. The standards it produces or is currently developing and the clustering of these standards according to the disaster management cycle. This data was, together with the data already obtained in T 2.1, used as input for determining the relevant TCs to invite to participate in in-depth interviews. This decision was made on the basis if the TC has developed or is currently developing relevant standards with regards to disaster resilience. The chairpersons of the TCs to which this applied were contacted and given the option to participate in the interview. Out of the six chairpersons invited four accepted the invitation. The reasons for the two who declined to participate were time constraints and the fact that the TC was only recently founded and therefore did not see the relevance to participate in the research already. The topics covered in the interviews focused on the background of the TC, the work program of the TC with regards to disaster resilience and stakeholder involvement. The outcomes of these interviews are presented in the sections which are titled Standardisation experiences. The information obtained from the interviews was mostly used to verify the data we obtained in the desk research. But also to gain insight in the actual involvement of the experts, the TCs work programme and their views on future standardisation opportunities. In the Analysis and Conclusions and Recommendations sections all the information of the research was combined to draw conclusions. The interview questions can be found in 0.

#### National committees

In deliverable D2.1, national standardisation committees relevant to disaster resilience and crisis management were selected to look into the structure of the committee and the stakeholders involved. The national committees that were included were from the following countries: Czech Republic, Finland, France, Germany, Spain, Sweden, United Kingdom and United States. The criteria for choosing these specific countries include geographical diversity (mostly in Europe), main roles in European and international

standardisation and accessibility of information. Next to the desk research, representatives of the national standardisation bodies (NSBs) were requested to provide information on the relevant national standardisation committees, composition of these committees in terms of stakeholder categories and involvement in European and international committees by means of a survey (see Annex 4 for the survey). The information collected together was presented in D2.1.

The information given in D2.1 was further enhanced as preparation for the interviews for this deliverable as the current deliverable aims to further look into the national committees and to understand the national standards and the standardisation experiences gained by the NSB. Deliverable D2.2 made some changes to the selection of the countries due to the following reasons:

- As some countries studied in D2.1 showed not to have much activities on national level (Czech Republic, Finland and Spain), these countries have been excluded from further study in D2.2. The information on these countries from D2.1 is added to Annex 5.
- Information from the Italian NSB was received after the publication of D2.1, which showed an interesting national development. Therefore Italy has been added to further look into in D2.2.

As a result, this deliverable will further look into the following countries in terms of standards and standardisation experiences: France, Germany, Italy, Sweden, United Kingdom and United States. Interview questions were prepared to further discuss the structure of the national committees, the national standards and the standardisation experience with the national standardisation bodies (NSBs). All NSBs responded to the interview request:

- France, Germany, Italy and Germany participated in the interviews
- Sweden responded by correspondence
- United States did not provide any further information

The results from the interviews were used to verify the information obtained in D2.1 and to add specific insight on the national committees to the respective sections. The interview questions can be found in Annex 6.

## **2.2.2 Research on standards developed by technical committees**

### **International and European standards**

Several sources have been used to identify and list necessary information on relevant standards developed and published within the formal standardisation landscape of international and European standardisation. After the initial research on relevant standardisation committees in T 2.1 the most relevant ones were chosen to be further investigated in T2.2 regarding standards in the field of crisis management and disaster resilience.

To collect data about published standards, the technical committees have been looked up using the search engine of Perinorm. Perinorm is a widely used data base that provides much supplemental information as e. g. document number, document title, abstract, international correspondence and much more on already published standards. This information is extractable into an Excel sheet and has been used whenever possible. In particular, respective CEN- and ISO/TC numbers have been looked up using the “Author” search field. The search results could be screened for their relevance and being extracted if evaluated positive. A wide range of published standards particularly developed with the scope of crisis management and disaster resilience could be identified using this approach.

The resulting initial list of standards has been utilised further with two different approaches in order to identify additional relevant standards developed by other European and international technical committees respectively standards that are not associated with specific technical committees but rather with temporary committees as e. g. CEN workshops. First, the International Classification for Standards (ICS) has been analysed. ICS classes are used to classify standards regarding their thematic focus. The most relevant ICS classes in the field of crisis management and disaster resilience could be identified and used for a second search query in Perinorm. Again, the relevance of standards found has been evaluated and added to the standards list when appropriate.

Second, another search in Perinorm has been conducted using keywords like “crisis” and “disaster” the keywords which were identified as the most relevant in the already obtained standards list. Screening of the results brought up additional relevant European and international standards.

As a second source the CEN and ISO webpages have been used to identify standards which are currently under development in the field of crisis management and disaster resilience. The CEN and ISO/TCs being found in the already obtained standards list have been looked up for their current work programmes. Relevant work items had to be added up to the standards list manually. The information available on current standardisation activities are less than those being available for published standards.

In order to update the list of standards obtained at this point, it would be necessary to monitor activities that will contribute with new relevant standards at a certain point. Then necessary information can be extracted from a data base as e. g. Perinorm.

### **International and European IT standards**

The start of the desk research was looking into the major IT standardisation bodies: ITU-T, ETSI and CEPT/ECC. Also main standardisation bodies were considered at International and European levels: ISO/IEC and CEN/CENELEC.

The main source of information for looking into all standardisation bodies were the standardisation bodies' public websites. There was also an identification phase in order to obtain the main areas where IT is involved in disaster resilience, which is mainly in communications and keeping records of events. In these categories, there are also sub-categories that are around IT management (including processes, personnel qualifications requirements, IT procurement, etc.), systems topologies, security techniques, and high level communication protocols and personnel qualifications requirements for disaster resilience. There is one specific category under IT management that is heavily related to disaster resilience which is the protection of critical infrastructure that falls into the field of protection systems of data and radio networks and in the smart cities field (cyber security).

The main International SDO is ITU-T which regulates telecommunications worldwide. This SB is divided in Study Groups (SGs) and Focus Groups (FGs). The first groups produce standards based on industrial requirements and needs while FGs are designed for the fast development of standards and recommendations. ITU-T Focus Group on Disaster Relief Systems, Network Resilience and Recovery<sup>6</sup> is the one related to this project therefore all involved Study Groups were taken into consideration for this study.

ETSI is divided into TCs and initiatives with other SBs from countries outside Europe such as 3GPP and oneM2M. Activities within 3GPP were carried out related to disaster resilience and TCs related to this initiative have been taken into account. Also CEPT/ECC was involved with 3GPP in workshops for elaborating standards on disaster resilience therefore specific standards were explored for this SB directly on their web site.

With regards to CEN/CENELEC, activities related to cyber security were taken into account when considering IT however this SB mainly adopts ISO/IEC standards and has an on-going liaison with ETSI for developing standards through the CYBER TC. Therefore the focus was mainly on ISO/IEC and ETSI.

After sorting TCs from all SBs, individual emails were sent to secretariats for gathering information from the TCs. Some SGs from ITU-T claimed not to be involved in disaster resilience standardisation in spite of having being involved in workshops therefore no information was extracted from those or at least where not considered for the clustering of IT standards. Some ITU-T SGs and ETSI TCs that were not obviously related to disaster resilience had standards on disaster resilience and therefore have been included in this report.

CEN and ISO webpages have been used to identify standards which are currently under development in the field of crisis management and disaster resilience. The CEN and ISO/TCs being found in the already obtained standards list have been looked up for their current work programmes. Relevant work items had to be added up to the standards list manually. The information available on current standardisation activities are less than those being available for published standards.

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<sup>6</sup> <http://www.itu.int/en/ITU-T/focusgroups/dnrnr/Pages/default.aspx>

### **Standards clustering**

In T2.2 the European and International standardisation committees from the formal standardisation networks (i.e. CEN, CENELEC, ETSI, ISO, IEC, CEPT/ECC and ITU-T) that were considered for the desk research in T2.1 were taken into account. Only the standardisation committees and working groups (WGs) that are related to disaster resilience have been included in the study. For the investigation of IT TCs the main sources of information have been the TC's public websites (ITU-T, ETSI, ISO/IEC and CEPT/ECC). Information from standards under development in CEN and ISO/IEC were extracted through the use of Perinorm and the TC websites.

The information extracted from the sites mentioned in the section above included standards lists, standards abstracts, ICS classification (in some cases), document number, title and WG in charge of documents development. As mentioned above, information about standards under development was limited.

The disaster management phases these standards are related to had to be analysed taking into consideration the definition included in D1.1 Section 4.4 of the "ResiStand Handbook". A spread sheet for the classification of standards was used with relevant identification labels such as document number, abstract, etc. Obtained data about the scope of the standards was used to determine the correct phase within the disaster management cycle.

### **National standards**

During the interviews as described in 2.2.1, the NSBs were also asked to mention the national standards that are relevant in the area of disaster resilience. These standards were further looked into.

As two countries did not participate in the interviews, the standards were collected in a different way. For Sweden the information was obtained using web research and a short questionnaire was answered by the Swedish national standardisation body. For the American standards, public available information from the National Science and Technology Council Committee on Homeland and National security was consulted and in particular the subcommittee on standards. Furthermore, next to the ANSI websites, also the websites of ASTM, NIST and ASIS were consulted for relevant standards.

### **International, European and national CBRN standards**

A separate search has been done for CBRN standards. The ISO and CEN web pages have been consulted and key words like CBRN, chemical, radiological, and biological have been used. A few ISO and CEN standards and CWA guidelines were identified. International CBRN standards are listed in section 2.3.7, European CBRN standards are listed in Section 2.4.6 and in the NATO Section 3.2. Annex 9 contains a CBRN section including a list of all the CBRN standards identified including the national CBRN standards from USA and a few others.

### **Classification of standards with respect to the disaster management cycle**

Relevant standards that have been identified during the research needed to be analysed in order to be assigned to the different phases and tasks within the disaster management cycle (for explanation, see section 1.2.2). To perform this task mainly information about the title, abstract and standard keywords per standard have been used. At least one disaster management task was assigned for each standard but there was an option to assign multiple tasks as well. The categorisation within the disaster management phases and related tasks has been done by different partners and checked for general consistency again by one partner.

## ***2.3 International standardisation committees***

### ***2.3.1 Introduction***

Considering the international standardisation landscape, first of all the Vienna and Dresden Agreements need to be explained. The 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.

The International Organization for Standardisation (ISO)<sup>7</sup> as well as the International Electrotechnical Commission (IEC)<sup>8</sup> are the responsible standardisation organisations on a global level. The United Nations specialized agency in terms of information and telecommunication technologies is the International Telecommunications Union (ITU)<sup>9</sup>. ISO, IEC and ITU established the WSC - The World Standards Cooperation in 2001, in order to strengthen and advance their voluntary consensus-based international standards systems.<sup>10</sup>

Many of ISO's members also belong to regional standardisation organisations. ISO has recognized regional standards organisations 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 case of IEC similar agreements apply.<sup>11</sup>

On an international level ISO/TC 292 "Security and resilience" is the key player when it comes to standardisation related to disaster resilience. Compared to the European level, ISO/TC 292 has a broader scope than CEN/TC 391. However, similarly it is very much about organisational issues linked to security and disaster resilience. Next to ISO/TC 292 only a few other TCs have been considered relevant in line with the ResiStand scope: ISO/TC 224 has two WGs that are related to disaster resilience measures, and ISO/TC 262 is very much about general organisational processes in order to reduce and manage risks to ultimately be resilient as an organisation. IT-related TCs are mainly about cyber security issues. For an overview, see Table 3. Detailed information on the technical committees included in this table is provided in the next sections.

As the scope of the ResiStand project is more about disaster resilience than about general security issues, some TCs that have been identified initially, have not been further investigated. These TCs are listed in Annex 1.

Table 3: Relevant International technical committees

Standards Developing Organisation	TC No	TC title
ISO	224	Service activities relating to drinking water supply systems and wastewater systems - Quality criteria of the service and performance indicators
ISO	262	Risk management
ISO	292	Security and resilience
ISO/IEC	JTC 1/SC 27	IT Security techniques
ITU	T FG-DR&NRR	Focus Group on Disaster Relief Systems, Network Resilience and Recovery

### 2.3.2 ISO/TC 224 – Service activities relating to drinking water supply systems and wastewater systems - Quality criteria of the service and performance indicators

#### 2.3.2.1 About ISO/TC 224

##### TC scope and working groups

TC scope:

<sup>7</sup> ISO, [Online]. Available: [www.iso.org](http://www.iso.org).

<sup>8</sup> IEC, [Online]. Available: [www.iec.ch](http://www.iec.ch).

<sup>9</sup> ITU, [Online]. Available: [www.itu.int](http://www.itu.int).

<sup>10</sup> WSC, [Online]. Available: <http://www.worldstandardscooperation.org/about.html>.

<sup>11</sup> IEC, [Online]. Available: <http://www.iec.ch/dyn/www/f?p=103:218:0>

- Standardisation of a framework for the definition and measurement of service activities relating to drinking water supply systems and wastewater systems. The standardisation includes the definition of a language common to the different stakeholders, the definition of the characteristics of the elements of the service according to the consumers' expectations, a list of requirements to fulfil for the management of a drinking water supply system and a wastewater system, service quality criteria and a related system of performance indicators, without setting any target values or thresholds.
- Excluded: design and construction of water supply and wastewater systems, or maintenance techniques; limits of acceptability for drinking water quality and wastewater discharged in the receiving body; analytical methods.<sup>12</sup>

ISO/TC 224 has in total 11 working groups, of which 2 are relevant:

- ISO/TC 224 WG 7 – Crisis management of water utilities
- ISO/TC 224 WG 11 – Storm water management

#### **Secretariats and chairs**

- An overview of the secretariats and chairs of the TC and the relevant working groups is given in Table 4.
- The secretariats are provided by France, Israel and Japan, which corresponds with the countries that are most active in this TC.
- The chairs and convenors represent the following stakeholder categories: 2 chairs from 'Industry and Commerce', 1 chair from 'Governmental organisation'.

Table 4: ISO/TC 224 – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
<b>ISO/TC 224</b>	France	Standardisation Body	France	Industry & Commerce
<b>WG 7</b>	Israel	Standardisation Body	Israel	Industry & Commerce
<b>WG 11</b>	Japan	Standardisation Body	Japan	Governmental organisation

#### **Involved countries**

- An overview of the active and observing countries in ISO/TC 224 is given in Table 5.
- In ISO/TC 224, a total of 59 countries are involved: 36 active countries and 23 observing countries. There is a strong presence of European countries; 14 out of the 36 active countries are European. In total 23 European countries are involved in the work of ISO/TC 224 (active and observing), which is almost 70% of the CEN-CENELEC member countries.
- Interesting is the number of African countries involved (Zambia, Morocco and Kenya).

#### **Overview of participation**

- An overview of the country participation in ISO/TC 224 and the relevant working groups is given in Table 6.
- Looking at the participation in working groups, the countries that are most involved are: Israel, Japan, Zambia and France. The top 10 most active countries include only 2 European countries.
- In the 2 relevant working groups, there are a total of 86 active participants. Counting from the working groups separately, there are in total 95 active participants. There is an overlap of 10% in participants in the working groups.
- The working group with the most participants is WG 7 (74 participants), led by Israel.

<sup>12</sup> [http://www.iso.org/iso/iso\\_technical\\_committee?commid=299764](http://www.iso.org/iso/iso_technical_committee?commid=299764)



Table 5: ISO/TC 224 – Involved countries

ISO/TC 224	Involved countries
<b>Active countries</b>	36 countries in total, 14 European countries Argentina; Australia; Austria; Bulgaria; Canada; China; Cuba; Czech Republic; Finland; France; Germany; India; Indonesia; Ireland; Israel; Japan; Kenya; Korea, Republic of; Malaysia; Mexico; Morocco; Netherlands; Nigeria; Portugal; Russian Federation; Singapore; Slovakia; South Africa; Spain; Switzerland; Tunisia; Turkey; United Arab Emirates; United Kingdom; United States; Zambia
<b>Observing countries</b>	23 countries in total, 9 European countries Algeria; Belgium; Colombia; Denmark; Hungary; Iran, Islamic Republic of; Italy; Luxembourg; Macao; Mongolia; Montenegro; New Zealand; Norway; Oman; Poland; Romania; Serbia; Sri Lanka; Sweden; Trinidad and Tobago; Uganda; Uruguay; Zimbabwe

Table 6: ISO/TC 224 – Overview of participation in TC and relevant working groups

Country*	TC 224	WG 7	WG 11	Total active memberships in WGs
<i>Japan</i>	Active	6	4	10
<i>Israel</i>	Active	9	-	9
<i>Zambia</i>	Active	8	-	8
France	Active	6	2	8
<i>Canada</i>	Active	5	3	8
<i>Australia</i>	Active	4	3	7
<i>Morocco</i>	Active	6	-	6
Austria	Active	4	2	6
Germany	Active	5	-	5
<i>United States</i>	Active	3	1	4
<i>China</i>	Active	4	-	4
Portugal	Active	3	-	3
<i>Kenya</i>	Active	2	1	3
United Kingdom	Active	1	2	3
Netherlands	Active	1	1	2
<i>Singapore</i>	Active	-	2	2
<i>Mexico</i>	Active	2	-	2
Ireland	Active	2	-	2
Spain	Active	1	-	1
Finland	Active	1	-	1
<i>Argentina</i>	Active	1	-	1
<i>Malaysia</i>	Active	-	-	-
<i>United Arab Emirates</i>	Active	-	-	-
<i>Tunisia</i>	Active	-	-	-
<i>Nigeria</i>	Active	-	-	-
<i>Cuba</i>	Active	-	-	-
<i>India</i>	Active	-	-	-
Switzerland	Active	-	-	-
<i>Russian Federation</i>	Active	-	-	-

Country*	TC 224	WG 7	WG 11	Total active memberships in WGs
Turkey	Active	-	-	-
<i>Indonesia</i>	Active	-	-	-
Bulgaria	Active	-	-	-
Slovakia	Active	-	-	-
Czech Republic	Active	-	-	-
<i>South Africa</i>	Active	-	-	-
<i>Korea, Republic of</i>	Active	-	-	-
<b>Total active memberships</b>	<b>36</b>	<b>74</b>	<b>21</b>	<b>95</b>
<b>Total active European memberships</b>	<b>14</b>			
<b>Total active members, with corrections**</b>				<b>86</b>
<p>* The countries that have a CEN-CENELEC membership are in regular font, the countries outside of this membership are in <i>italic</i>.</p> <p>** If one person is in more than one working group, a correction is applied. This number shows the actual number of persons involved per country.</p>				

### Liaisons

- An overview of the stakeholder types of the liaisons in ISO/TC 224 is given in Table 7.
- ISO/TC 224 has 4 external liaisons. Most of these liaisons are represented by the stakeholder groups 'Industry & Commerce'.
- ISO/TC 224 has 10 liaisons with other TCs.

Table 7: ISO/TC 224 – Stakeholder type distribution in TC liaisons

Stakeholder Type	Number of liaisons
Academic & Research	-
Governmental organisation	-
Industry & Commerce	3
NGO	-
Other	1
Standardisation Body	10
Total	14

### Stakeholders in relevant working groups

- The relevant working groups are:
  - o ISO/TC 224 WG 7 – Crisis management of water utilities
  - o ISO/TC 224 WG 11 – Storm water management
- An overview of the number of stakeholders and the stakeholder distribution in the relevant working groups is given in Table 8.
- In terms of stakeholder type distribution: most of the participants are from 'Industry and Commerce' (64%), followed by 'governmental organisation' (21%). A similar distribution also applies for the working groups.

Table 8: ISO/TC 224 – Stakeholder type distribution in relevant working groups

Stakeholder Type	WG 7	WG 11
Academic & Research	3	-
Governmental organisation	12	7
Industry & Commerce	48	12
NGO	4	2
Other	3	-
Standardisation Body	4	-
<b>Total</b>	<b>74</b>	<b>21</b>

### 2.3.2.2 Relevant standards developed by ISO/TC 224

Table 9: ISO/TC 224 – Relevant standards

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
<b>ISO 24518</b>	Activities relating to drinking water and wastewater services - Crisis management of water utilities	published		x		
<b>ISO/AWI 20325</b>	Service activities relating to drinking water supply and wastewater systems -- Guidelines for stormwater management in urban areas	under development		x		
<b>ISO/AWI TR 24525</b>	Service activities relating to drinking water supply systems and wastewater systems -- Crisis management -- Examples of practiced crisis management	under development		x		
<b>ISO/DTS 24520</b>	Service activities relating to drinking water supply systems and wastewater systems -- Crisis management -- Good practice for technical aspects	under development		x		
Sum			0	4	0	0

### 2.3.2.3 Standardisation experience

In order to gain more insight into the work of ISO/TC 224 the chairperson of the TC was interviewed. This section reflects the results of this interview.

The TC was formed after a request from AFNOR (the French NSB) was made to ISO/TMB. In 2001 ISO/TMB passed the resolution and the TC was formed with AFNOR providing the secretariat. AFNOR had started working on standardisation in the area of service activities relating to drinking water already in the 1990s. Up until today AFNOR still holds the secretariat of ISO/TC 224.

#### Work programme in relation to disaster resilience

The standards that have a relationship with disaster resilience are developed in WG 7 and WG 11 of the TC. The standards do not focus on the technical aspects but only on the management of services. The main initiators of the standards are usually countries like the USA, Canada, China and Japan and from the European countries Germany and the Netherlands.

From the Standards that are developed and are currently under development in ISO/TC 224 none are related to EC regulations.

Like most TCs ISO/TC 224 does not have direct insight into the use of their standards. The work in WG 5 in ISO/TC 224 is to follow up on the standards. This is done by providing technical reports and examples on how to use the standards. WG 5 is currently working on a best practise on how the standards are best used. But exact numbers on how many times a certain standard is sold and implemented is not available.

According to the chairperson of ISO/TC 224 an opportunity for a new standard for the TC could be Storm Water Management. With the global warming and natural disasters related to water happening, this topic is something to think about and possibly consider. In Japan there are for example already standards with regards to Tsunamis.

### **Involvement of experts**

As in most TCs the number of experts registered to the TC and its WGs are much larger than the actual number of experts that are actively participating in writing the standards. The feeling is that the distribution of the different stakeholder groups in the TC and its WGs is very equal. But it has taken time to achieve this as in the beginning of the TC work (in 2001) the end users were overrepresented.

ISO/TC 224 has liaisons with other TCs, but not with other entities like Research projects, End user organisations, Sector organisations, or Regulators. Currently consumers and End user organisations are not as much involved in the work as wanted. It would be interesting for ISO/TC 224 to work more closely with regulators. A goal should be to identify the key components of a good system of service. Currently it is very difficult to recruit the regulators. In general there is a need for more standards to cover the components of services.

## **2.3.3 ISO/TC 262 – Risk management**

### **2.3.3.1 About ISO/TC 262**

#### **TC scope and working groups**

TC scope:

- Standardisation in the field of risk management<sup>13</sup>

ISO/TC 262 has in total 4 working groups, of which all are relevant:

- ISO/TC 262 WG 2 – Core risk management standards
- ISO/TC 262 WG 3 – Disruption related risk
- ISO/TC 262 WG 4 – Supply chain risk
- ISO/TC 262 WG 5 – Management of Legal Risk

#### **Secretariats and chairs**

- An overview of the secretariats and chairs of the TC and the relevant working groups is given in Table 10.
- The secretariats are provided by the United Kingdom France and Australia.
- The chairs are from UK (2 chairs), Australia, China, United States. For UK, Australia and China, these countries correspond with the countries that are most active in this TC.
- The chairs represent the following stakeholder categories: 4 chairs from 'Industry and Commerce', 1 chair from 'Governmental organisation' and 1 chair in the category 'Other'.

#### **Involved Countries**

- An overview of the active and observing countries in ISO/TC 262 is given in Table 11.
- In ISO/TC 262, a total of 64 countries are involved: 49 active countries and 15 observing countries. There is a strong presence of European countries; 21 out of the 49 active countries are European. In total 25 European countries are involved in the work of ISO/TC 262 (active and observing), which is 76% of the CEN-CENELEC member countries.

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<sup>13</sup> [http://www.iso.org/iso/iso\\_technical\\_committee?commid=629121](http://www.iso.org/iso/iso_technical_committee?commid=629121)

- Remarkable is the high number of Latin American countries and Asian countries involved.

Table 10: ISO/TC 262 – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
<b>ISO/TC 262</b>	United Kingdom	Standardisation Body	United Kingdom	Industry & Commerce
<b>WG 2</b>	France	Standardisation Body	United Kingdom	Industry & Commerce
<b>WG 3</b>	Australia	Governmental organisation	Australia	Other
<b>WG 4</b>	United Kingdom	Standardisation Body	United States	Industry & Commerce
<b>WG 5</b>	United Kingdom	Standardisation Body	China	Governmental organisation

Table 11: ISO/TC 262 – Involved countries

ISO/TC 262	Involved countries
<b>Active countries</b>	49 countries in total, 21 European countries Argentina; Armenia; Australia; Austria; Belgium; Bulgaria; Canada; China; Colombia; Czech Republic; Finland; France; Germany; Hungary; India; Indonesia; Iran, Islamic Republic of; Ireland; Italy; Japan; Luxembourg; Malaysia; Mexico; Morocco; Netherlands; New Zealand; Norway; Poland; Portugal; Russian Federation; Singapore; Slovakia; South Africa; Spain; Sri Lanka; Sweden; Switzerland; Turkey; United Kingdom; United States; Zimbabwe; Palestine, State of; Thailand; Brazil; Panama; Peru; Chile; Egypt; Jordan
<b>Observing countries</b>	15 countries in total, 4 European countries Croatia; Denmark; Iceland; Israel; Korea, Republic of; Macao; Mongolia; Oman; Romania; Serbia; Hong Kong; Barbados; Iraq; Namibia; Pakistan

### Overview of participation

- An overview of the country participation in ISO/TC 262 and the relevant working groups is given in Table 12.
- Looking at the participation in working groups, the countries that are most involved are: Australia, United Kingdom and China. There are 12 countries with 4 or more participants, including 5 European countries.
- In the 4 relevant working groups, there are a total of 182 active participants. Counting from the working groups separately, there are in total 114 active participants. There is an overlap of 37% in participants in the **working groups**.
- The working group with the most participants is WG 2 (88 participants), led by the UK.

Table 12: ISO/TC 262 – Overview of participation in TC and relevant working groups

Country	TC 262	WG 2	WG 3	WG 4	WG 5	Total active memberships in WGs
<i>Panama</i>	Active	4	4	4	4	16
Switzerland	Active	3	3	3	4	13
<i>Australia</i>	Active	6	4	1	1	12
United Kingdom	Active	7	-	1	3	11
<i>Indonesia</i>	Active	2	2	2	2	8

Country	TC 262	WG 2	WG 3	WG 4	WG 5	Total active memberships in WGs
Ireland	Active	4	3	1	1	9
<i>Brazil</i>	Active	2	1	3	-	6
<i>Canada</i>	Active	3	2	1	2	8
<i>South Africa</i>	Active	2	2	1	2	7
<i>China</i>	Active	4	-	-	3	7
France	Active	4	2	-	-	6
Germany	Active	2	2	2	-	6
<i>Peru</i>	Active	4	2	-	-	6
Czech Republic	Active	3	1	1	-	5
Netherlands	Active	3	1	1	-	5
<i>Jordan</i>	Active	1	1	1	1	4
<i>Malaysia</i>	Active	2	-	2	-	4
Sweden	Active	3	-	1	-	4
<i>Singapore</i>	Active	3	-	1	-	4
Belgium	Active	1	1	1	-	3
Finland	Active	2	-	1	1	4
Italy	Active	2	-	1	-	3
<i>Japan</i>	Active	2	1	-	-	3
Spain	Active	1	1	1	-	3
<i>United States</i>	Active	3	-	-	-	3
<i>Iran, Islamic Republic of</i>	Active	1	1	1	-	3
Austria	Active	1	-	-	1	2
<i>Mexico</i>	Active	1	-	-	-	1
Luxembourg	Active	2	-	-	-	2
<i>Argentina</i>	Active	-	-	2	-	2
<i>Colombia</i>	Active	1	1	-	-	2
Turkey	Active	1	-	-	-	1
<i>New Zealand</i>	Active	2	-	-	-	2
<i>Russian Federation</i>	Active	2	-	-	-	2
Norway	Active	1	-	-	-	1
<i>Sri Lanka</i>	Active	1	-	-	-	1
Portugal	Active	-	-	-	1	1
<i>Chile</i>	Active	1	-	-	-	1
<i>Egypt</i>	Active	-	-	-	-	0
<i>Morocco</i>	Active	-	-	-	-	0

Country	TC 262	WG 2	WG 3	WG 4	WG 5	Total active memberships in WGs
Poland	Active	-	-	-	-	0
<i>Thailand</i>	Active	-	-	-	-	0
<i>Zimbabwe</i>	Active	-	-	-	-	0
Bulgaria	Active	-	-	-	-	0
<i>Armenia</i>	Active	-	-	-	-	0
Slovakia	Active	-	-	-	-	0
<i>India</i>	Active	-	-	-	-	0
European		1	-	-	-	1
Hungary	Active	-	-	-	-	0
<i>Palestine, State of</i>	Active	-	-	-	-	0
<b>Total active memberships</b>	<b>49</b>	<b>88</b>	<b>35</b>	<b>33</b>	<b>26</b>	<b>182</b>
<b>Total active European memberships</b>	<b>21</b>					
<b>Total active members, with corrections**</b>						<b>114</b>
<p>* The countries that have a CEN-CENELEC membership are in regular font, the countries outside of this membership are in <i>italic</i>.</p> <p>** If one person is in more than one working group, a correction is applied. This number shows the actual number of persons involved per country.</p>						

### Liaisons

- An overview of the stakeholder types of the liaisons in ISO/TC 262 is given in Table 13.
- ISO/TC 262 has 8 external liaisons. Most of these liaisons are represented by the stakeholder groups 'Industry & Commerce'.
- ISO/TC 262 has 12 liaisons with other TCs

Table 13: ISO/TC 262 – Stakeholder type distribution in TC liaisons

Stakeholder Type	Number of liaisons
Academic & Research	-
Governmental organisation	1
Industry & Commerce	7
NGO	-
Other	-
Standardisation Body	12
<b>Total</b>	<b>20</b>

**Stakeholders in relevant working groups**

- The relevant working groups are:
  - o ISO/TC 262 WG 2 – Core risk management standards
  - o ISO/TC 262 WG 3 – Disruption related risk
  - o ISO/TC 262 WG 4 – Supply chain risk
  - o ISO/TC 262 WG 5 – Management of Legal Risk
- An overview of the number of stakeholders and the stakeholder distribution in the relevant working groups is given in Table 14.
- In terms of stakeholder type distribution: most of the participants are from 'Industry and Commerce' (67%), followed by 'Academic & Research' (10%). For all working groups 'Industry and Commerce' is the biggest stakeholder group.

Table 14: ISO/TC 262 – Stakeholder type distribution in relevant working groups

Stakeholder Type	WG 2	WG 3	WG 4	WG 5
Academic & Research	10	4	3	-
Governmental organisation	9	5	4	3
Industry & Commerce	56	20	22	20
NGO	5	-	-	-
Other	1	-	-	-
Standardisation Body	7	6	4	3
<b>Total</b>	<b>88</b>	<b>35</b>	<b>33</b>	<b>26</b>

**2.3.3.2 Relevant standards developed by ISO/TC 262**

Table 15: ISO/TC 224 - Relevant standards

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
ISO 31000	Risk management - Principles and guidelines	published	x			
ISO Guide 73	Risk management - Vocabulary	published		x	x	
ISO/IEC 31010*IEC/ISO 31010	Risk management - Risk assessment techniques	published	x			
ISO/TR 31004	Risk management - Guidance for the implementation of ISO 31000	published	x			
IEC/CD 31010	Risk management -- Risk assessment techniques	under development	x			
ISO/AWI 31022	Guidelines for Implementation of Enterprise Legal Risk Management	under development	x			
ISO/DIS 31000	Risk management -- Guidelines	under development	x			
Sum			6	1	1	0



### **2.3.3.3 Standardisation experience**

The interview with ISO/TC 262 was done with the former chairperson of ISO/TC 262, who recently passed on this position to his successor. But as the former chairperson had been involved with the TC from the start this was the most eligible person to provide us with the information. The rest of this section reflects the results of the interview.

Even though the establishment of ISO/TC 262 was only just formalised in 2011, the work on Risk Management standards goes back to 1998/1999 when Australia started working on standards regarding this topic. Years later Japan also showed interest as well as Great Britain and a Project Committee was formed by ISO which later on was converted into an ISO/TC. The ISO 31000 standard series provides a management philosophy. Many countries are using this standard as basis for disaster planning. This includes countries in Africa, Asia and South America.

#### **Work programme in relation to disaster resilience**

As the scope of the TC fully relates to disaster resilience and crisis management all standards which are developed within the TC are relevant to ResiStand. Besides the current standards and the standards under development the TC is also working on a handbook for management of legal risk, which is more specific than ISO 31000.

ISO 31000 is commonly used as a starting document when dealing with risk management. The aim is to evolve ISO 31000 to deal with more practical situations.

A revised version of ISO 31000 is planned to be published in the second half of 2017. In order to develop a new standard, the formal ISO procedure to write and present a NWIP to the members of ISO/TC 262 to vote for is followed. However, the problem experienced within ISO/TC262 is very often that after a NWIP is accepted, it is difficult to gather enough experts to actually develop the standard. Within ISO/TC 262 countries like UK, USA, New Zealand Australia, Germany, France and Canada are the most active in proposing NWIPs. Liaisons can also propose NWIPs as was done with a proposal for Managing Supply Chain Risks. But due to a lack of experts this standard wasn't developed further.

According to the chairperson one of the main challenges in developing standards for disaster resilience is that the different countries don't have common definitions or terminologies. To translate standards into different languages proves to be difficult due to different definitions of important concepts in disaster resilience. In the opinion of the chairperson there should be a guidance document for definitions of concepts that could be used for standard development.

According to the ISO website, ISO 31000 is one of the top 10 selling standards. ISO 31000 should be kept as a generic document as it is written for managers in general and not for specific areas of business. Exact numbers of sales are not available. But a LinkedIn user group for ISO 31000 has 45000 members from all over the world. And the assumption is that these are all users of the standard.

#### **Involvement of experts**

In ISO/TC 262 a large number of experts are signed up. However, different people are attending the meetings in different parts of the world. The number of experts listed does not reflect the actual number of experts participating in TC and WG meetings. Usually there are approximately 40-60 experts attending the TC and WG meetings. The problem with experts only being able to attend a meeting in person once is that it prevents continuity in the work. During the process of writing ISO 31000 a hard core of 30-35 experts was involved, and these experts were present at all meetings. This ensured that the standard was written in an efficient way.

There are a large number of stakeholders registered to the group with different backgrounds such as experts with environmental, insurance and governmental perspectives. The chairperson expresses the feeling is that the group of stakeholders is diverse and there is not a particular stakeholder group missing. ISO/TC 262 does see a shift in attendance of the meetings. The number of people participating in meetings who work for a National Standardisation Body is increasing and the number of technical experts is decreasing.

ISO/TC 262 does work with other organisations. The TC and WGs are currently working with UN Disaster Management. This organisation also recognizes that there is a greater need for harmonisation of terms and

definitions. ISO/TC 262 has several liaisons with other TCs, but they are closest related to ISO/TC 292. And even though they recognize the need for liaisons their focus is currently on the revision of ISO 31000 and they do not want to cooperate with or involve other organisations before the new version is being published.

### 2.3.4 ISO/TC 292 – Security and resilience

#### 2.3.4.1 About ISO/TC 292

##### TC scope and working groups

TC scope:

- Standardisation in the field of security to enhance the safety and resilience of society.
- Excluded: Sector specific security projects developed in other relevant ISO committees and projects developed in ISO/TC 262 and ISO/PC 278.<sup>14</sup>

ISO/TC 292 has in total 6 working groups and 3 communication groups, of which all are relevant:

- ISO/TC 292 WG 1 – Terminology
- ISO/TC 292 WG 2 – Continuity and organizational resilience
- ISO/TC 292 WG 3 – Emergency management
- ISO/TC 292 WG 4 – Authenticity, integrity and trust for products and documents
- ISO/TC 292 WG 5 – Community resilience
- ISO/TC 292 WG 6 – Protective security
- ISO/TC 292 DCCG – Developing Countries Contact Group
- ISO/TC 292 AHG 1 – Communication group
- ISO/TC 292 AHG 2 – Task Force UN Cooperation

##### Secretariats and chairs

An overview of the secretariats and chairs of the TC and the relevant working groups is given in Table 16.

- The secretariats are provided by Sweden, Australia, the United Kingdom, Germany and France.
- The chairs are from Sweden (2 chairs), Serbia, Canada, UK (2 chairs), Germany (2 chairs), France and 2 international organisations. All these countries, except for Serbia, correspond with the countries that are most active in this TC.
- There is a strong European presence amongst the chairs; the chair of the ISO/TC as well as the chairs from 7 out of 9 working groups are from European countries.
- The chairs represent the following stakeholder categories in an even distribution: governmental organisation (3 chairs), industry & commerce (3 chairs), and academic & research (3 chairs).

##### Involved Countries

- An overview of the active and observing countries in ISO/TC 292 is given in Table 17.
- In ISO/TC 292, a total of 58 countries are involved: 44 active countries and 14 observing countries. There is a strong presence of European countries; 18 out of the 44 active countries are European. In total 23 European countries are involved in the work of ISO/TC 292 (active and observing), which is almost 70% of the CEN-CENELEC member countries.
- Remarkable is the large number of participants from Indonesia, a shared fourth place in the list of active members participation (together with UK and Germany).

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<sup>14</sup> <http://www.isotc292online.org/about-isotc-292/>

Table 16: ISO/TC 292 – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
<b>ISO/TC 292</b>	Sweden	Standardisation Body	Sweden	Governmental organisation
<b>WG 1</b>	Australia	Industry & Commerce	Canada	Other
<b>WG 2</b>	United Kingdom	Standardisation Body	United Kingdom	Industry & Commerce
<b>WG 3</b>	Germany	Standardisation Body	Germany	Academic & Research
<b>WG 4</b>	Germany	Standardisation Body	Germany	Industry & Commerce
<b>WG 5</b>	United Kingdom	Standardisation Body	United Kingdom	Academic & Research
<b>WG 6</b>	France	Standardisation Body	France	Governmental organisation
<b>DCCG</b>	Sweden	Standardisation Body	Serbia	Academic & Research
<b>AHG1</b>	Germany	Standardisation Body	Sweden	Governmental organisation
<b>AHG2</b>	Sweden	Standardisation Body	International	Governmental organisation

Table 17: ISO/TC 292 – Involved countries

ISO/TC 292	Involved countries
<b>Active countries</b>	44 countries in total, 18 European countries Argentina, Australia, Austria, Belgium, Canada, China, Colombia, Denmark, Finland, France, Germany, Indonesia, Ireland, Israel, Italy, Japan, Kenya, Korea, Republic of, Mexico, Morocco, Netherlands, Nigeria, Norway, Portugal, Romania, Russian Federation, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Trinidad and Tobago, United Arab Emirates, United Kingdom, United States, Thailand, Panama, Ukraine, Chile, Mauritius, Haiti
<b>Observing countries</b>	14 countries in total, 6 European countries Brazil, Bulgaria, Czech Republic, Hong Kong, Hungary, Iceland, India, Iraq, Luxembourg, Mongolia, New Zealand, Pakistan, Palestine, State of, Poland

### Overview of participation

- An overview of the country participation in ISO/TC 292 and the relevant working groups is given in Table 18.
- The relevant working groups are:
  - o ISO/TC 292 WG 1 – Terminology
  - o ISO/TC 292 WG 2 – Continuity and organizational resilience
  - o ISO/TC 292 WG 3 – Emergency management
  - o ISO/TC 292 WG 4 – Authenticity, integrity and trust for products and documents
  - o ISO/TC 292 WG 5 – Community resilience
  - o ISO/TC 292 WG 6 – Protective security
  - o ISO/TC 292 DCCG – Developing Countries Contact Group
  - o ISO/TC 292 AHG 1 – Communication group
  - o ISO/TC 292 AHG 2 – Task Force UN Cooperation
- Looking at the participation in working groups, the top 3 countries are: United States, Canada and France. The top 10 most active countries include 4 European countries.
- In the 9 working groups, there are a total of 499 active participants. Counting from the working groups separately, there are in total 234 active participants. There is an overlap of 53% of the participants in the working groups. The high percentage of overlap is partially due to the working groups AHG 1, AHG 2 and

DCCG as these are communication groups that do not producing standards, and therefore only have members that also participate in one of the other groups.

- The two largest working groups are WG 2 'Continuity and organizational resilience' (91 members) and WG 3 'Emergency management' (92 members), led respectively by the UK and Germany.

Table 18: ISO/TC 292 – Overview of participation in TC and relevant working groups

Country*	TC 292	WG 1	WG 2	WG 3	WG 4	WG 5	WG 6	AHG 1	AHG 2	DCCG	Total active memberships in WGs
<i>Canada</i>	Active	9	12	18	6	12	9	5	1	-	72
<i>United States</i>	Active	5	13	6	10	6	15	4	-	1	60
<i>France</i>	Active	2	6	10	6	6	15	-	-	-	45
<i>Australia</i>	Active	4	5	6	3	6	5	4	-	2	35
<i>Korea, Republic of</i>	Active	3	5	4	5	3	7	1	-	-	28
<i>Sweden</i>	Active	3	4	7	2	5	3	1	1	1	27
<i>South Africa</i>	Active	3	4	4	3	4	3	1	2	2	26
<i>Panama</i>	Active	4	4	4	4	4	4	-	-	-	24
<i>Germany</i>	Active	2	3	1	6	4	3	3	-	-	22
<i>Indonesia</i>	Active	3	2	7	2	2	2	-	-	4	22
<i>Japan</i>	Active	2	4	4	2	4	4	2	-	-	22
<i>United Kingdom</i>	Active	-	12	-	1	3	1	1	-	-	18
<i>Russian Federation</i>	Active	3	1	6	3	4	-	-	-	-	17
<i>Italy</i>	Active	1	3	1	1	4	3	-	-	-	13
<i>Mexico</i>	Active	2	2	2	2	3	2	-	-	-	13
<i>Austria</i>	Active	-	2	4	1	3	1	-	-	-	11
<i>Norway</i>	Active	1	1	2	-	-	5	-	-	-	9
<i>Netherlands</i>	Active	1	2	1	1	2	1	-	-	-	8
<i>Switzerland</i>	Active	-	1	1	2	1	1	-	-	-	6
<i>Singapore</i>	Active	1	1	1	1	1	1	-	-	-	6
<i>China</i>	Active	-	2	1	-	-	-	-	-	-	3
<i>Chile</i>	Active	-	1	2	-	-	-	-	-	-	3
<i>Denmark</i>	Active	-	1	-	-	1	-	-	-	-	2
<i>Belgium</i>	Active	-	-	-	-	-	1	-	-	-	1
<i>Slovakia</i>	Active	-	-	-	1	-	-	-	-	-	1
<i>Colombia</i>	Active	-	-	-	1	-	-	-	-	-	1
<i>Spain</i>	Active	-	-	-	-	-	1	-	-	-	1
<i>International</i>		-	-	-	-	-	-	-	-	2	2

Country*	TC 292	WG 1	WG 2	WG 3	WG 4	WG 5	WG 6	AHG 1	AHG 2	DCCG	Total active memberships in WGs
<i>Serbia</i>	Active	-	-	-	-	-	-	1	-	-	1
<i>United Arab Emirates</i>	Active	-	-	-	-	-	-	-	-	-	-
<i>Trinidad and Tobago</i>	Active	-	-	-	-	-	-	-	-	-	-
<i>Mauritius</i>	Active	-	-	-	-	-	-	-	-	-	-
<i>Nigeria</i>	Active	-	-	-	-	-	-	-	-	-	-
<i>Israel</i>	Active	-	-	-	-	-	-	-	-	-	-
<i>Argentina</i>	Active	-	-	-	-	-	-	-	-	-	-
<i>Haiti</i>	Active	-	-	-	-	-	-	-	-	-	-
<i>Kenya</i>	Active	-	-	-	-	-	-	-	-	-	-
<i>Thailand</i>	Active	-	-	-	-	-	-	-	-	-	-
<i>Morocco</i>	Active	-	-	-	-	-	-	-	-	-	-
<i>Ukraine</i>	Active	-	-	-	-	-	-	-	-	-	-
Slovenia	Active	-	-	-	-	-	-	-	-	-	-
Finland	Active	-	-	-	-	-	-	-	-	-	-
Portugal	Active	-	-	-	-	-	-	-	-	-	-
Ireland	Active	-	-	-	-	-	-	-	-	-	-
Romania	Active	-	-	-	-	-	-	-	-	-	-
Total active memberships	45	49	91	92	63	78	87	23	4	12	499
Total active European memberships	18										
Total active members, with corrections**											234
* The countries that have a CEN-CENELEC membership are in regular font, the countries outside of this membership are in <i>italic</i> .											
** If one person is in more than one working group, a correction is applied. This number shows the actual number of persons involved per country.											

### Liaisons

- An overview of the stakeholder types of the liaisons in ISO/TC 224 is given in Table 19.
  - ISO/TC 292 has 7 liaisons. The liaisons are represented by the stakeholder groups 'Industry & Commerce' and 'Governmental organisations'.
- ISO/TC 292 has 16 liaisons with other TCs.

Table 19: ISO/TC 292 – Stakeholder type distribution in TC liaisons

Stakeholder Type	Number of liaisons
Academic & Research	-
Governmental organisation	3
Industry & Commerce	3
NGO	-
Other	1
Standardisation Body	16
<b>Total</b>	<b>23</b>

**Stakeholders in relevant working groups**

- The relevant working groups are:
  - o ISO/TC 292 WG 1 – Terminology
  - o ISO/TC 292 WG 2 – Continuity and organizational resilience
  - o ISO/TC 292 WG 3 – Emergency management
  - o ISO/TC 292 WG 4 – Authenticity, integrity and trust for products and documents
  - o ISO/TC 292 WG 5 – Community resilience
  - o ISO/TC 292 WG 6 – Protective security
  - o ISO/TC 292 DCCG – Developing Countries Contact Group
  - o ISO/TC 292 AHG 1 – Communication group
  - o ISO/TC 292 AHG 2 – Task Force UN Cooperation
- An overview of the number of stakeholders and the stakeholder distribution in the relevant working groups is given in Table 20.

Table 20: ISO/TC 292 – Stakeholder type distribution in relevant working groups

Stakeholder Type	WG 1	WG 2	WG 3	WG 4	WG 5	WG 6	AHG 1	AHG 2	DCCG
Academic & Research	7	13	13	5	11	12	3	-	-
Governmental organisation	7	15	27	6	21	1	2	2	3
Industry & Commerce	25	5-	41	39	35	52	12	1	8
NGO	2	4	3	3	2	5	2	-	-
Other	4	3	2	2	4	2	3	1	-
Standardisation Body	4	6	6	8	5	6	1	-	1
<b>Total</b>	<b>49</b>	<b>91</b>	<b>92</b>	<b>63</b>	<b>78</b>	<b>87</b>	<b>23</b>	<b>4</b>	<b>12</b>

Relevant standards developed by ISO/TC 292 **Error! Reference source not found.** More than half of all the involved participants are from 'Industry and Commerce'. Looking further into these stakeholders, many are involved in consultancy. The second largest group of stakeholders are from governmental organisations. The third largest group is followed by 'Academic & Research'. This distribution also applies for almost all of the working groups.

Table 21: ISO/TC 292 - Relevant standards

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
ISO 12931	Performance criteria for authentication solutions used to combat counterfeiting of material goods	published	x			
ISO 16678	Guidelines for interoperable object identification and related authentication systems to deter counterfeiting and illicit trade	published	x			
ISO 18788	Management system for private security operations - Requirements with guidance for use	published	x	x		
ISO 22300	Societal security - Terminology	published		x	x	
ISO 22301	Societal security - Business continuity management systems - Requirements	published		x	x	x
ISO 22311	Societal security - Video-surveillance - Export interoperability	published	x	x		
ISO 22313	Societal security - Business continuity management systems - Guidance	published		x	x	x
ISO 22315	Societal security - Mass evacuation - Guidelines for planning	published		x		
ISO 22320	Societal security - Emergency management - Requirements for incident response	published			x	
ISO 22322	Societal security - Emergency management - Guidelines for public warning	published		x	x	
ISO 22324	Societal security - Emergency management - Guidelines for colour-coded alerts	published		x	x	
ISO 22325	Security and resilience - Emergency management - Guidelines for capability assessment	published	x			
ISO 22397	Societal security - Guidelines for establishing partnering arrangements	published		x		
ISO 22398	Societal security - Guidelines for exercises	published		x		
ISO 28000	Specification for security management systems for the supply chain	published	x			
ISO 28001	Security management systems for the supply chain - Best practices for	published	x			

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
	implementing supply chain security, assessments and plans - Requirements and guidance					
ISO 28002	Security management systems for the supply chain - Development of resilience in the supply chain - Requirements with guidance for use	published	x			
ISO 28003	Security management systems for the supply chain - Requirements for bodies providing audit and certification of supply chain security management systems	published	x			
ISO 28004-1 Technical Corrigendum 1	Security management systems for the supply chain - Guidelines for the implementation of ISO 28000 - Part 1: General principles; Technical Corrigendum 1	published	x			
ISO 28004-1*ISO 28004-1:2012	Security management systems for the supply chain - Guidelines for the implementation of ISO 28000	published	x			
ISO 28004-2	Security management systems for the supply chain - Guidelines for the implementation of ISO 28000 - Part 2: Guidelines for adopting ISO 28000 for use in medium and small seaport operations	published	x			
ISO 28004-3	Security management systems for the supply chain - Guidelines for the implementation of ISO 28000 - Part 3: Additional specific guidance for adopting ISO 28000 for use by medium and small businesses (other than marine ports)	published	x			
ISO 28004-4	Security management systems for the supply chain - Guidelines for the implementation of ISO 28000 - Part 4: Additional specific guidance on implementing ISO 28000 if compliance with ISO 28001 is a management objective	published	x			
ISO/DIS 22316	Security and resilience - Guidelines for organizational resilience	published		x		
ISO/DIS 22319	Security and resilience - Guidelines for planning the involvement of	published			x	



Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
	spontaneous volunteers					
ISO/DIS 34001	Security and resilience - Security management system for organizations assuring authenticity, integrity and trust for products and documents	published	x			
ISO/TR 22312	Societal security - Technological capabilities	published	x	x	x	x
ISO/TR 22351	Societal security - Emergency management - Message structure for exchange of information	published		x	x	
ISO/TS 22317	Societal security - Business continuity management systems - Guidelines for business impact analysis (BIA)	published	x			
ISO/TS 22318	Societal security - Business continuity management systems - Guidelines for supply chain continuity	published	x	x		
ISO/AWI 19998	Security and resilience -- Requirements for the content, security and issuance of excise tax stamps	under development	x			
ISO/AWI 22320	Security and resilience -- Emergency management -- Guidelines for incident response	under development			x	
ISO/AWI 22327	Security and resilience -- Emergency management -- Community-based landslide early warning system	under development			x	
ISO/AWI 22375	Security and resilience -- Guideline for complexity assessment process to improve security and resilience.	under development	x			
ISO/AWI 22396	Security and resilience -- Community resilience -- Guidelines for information exchange between organizations	under development			x	
ISO/AWI TS 22330	Security and resilience -- Business continuity management systems -- Guidelines for people aspects of business continuity	under development		x		
ISO/AWI TS 22331	Security and resilience -- Business continuity management systems -- Guidelines for business continuity strategy	under development		x		
ISO/CD 19564	Security and resilience -- Product fraud countermeasures and control -- General	under development	x			

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
	principles					
ISO/CD 20229	Security and resilience -- Guidelines for establishing interoperability among object identification systems to deter counterfeiting and illicit trade	under development	x			
ISO/CD 22326	Security and resilience -- Emergency management -- Guidelines for monitoring facilities with identified hazards	under development	x			
ISO/CD 22395	Security and resilience -- Community resilience -- Guidelines for supporting community response to vulnerable people	under development		x		
ISO/DIS 22300	Security and resilience -- Terminology	under development		x	x	
ISO/DIS 34001.4	Security and resilience -- Security management system for organizations assuring authenticity, integrity and trust for products and documents	under development	x			
ISO/FDIS 22316	Security and resilience -- Organizational resilience -- Principles and attributes	under development		x		
ISO/PRF 22319	Security and resilience -- Community resilience -- Guidelines for planning the involvement of spontaneous volunteers	under development			x	
Sum			24	19	14	3

#### 2.3.4.2 Standardisation experience

In order to gain more insight into the work of ISO/TC 292 the chairperson of the TC was interviewed. This section reflects the results of this interview.

In 2014 the Technical Management Board of ISO took the decision to create a new ISO committee called ISO/TC 292 where three existing ISO/TCs were merged into one. These 3 TCs being: ISO/TC 223, ISO/TC 247 and ISO/PC 284. ISO/TC 292 was formally installed in 2015.

The background for the establishment of ISO/TC 292 was that the area of societal security and resilience needed a new way to develop standards. The structure of the committee was optimized to limit and avoid duplication of work and to prevent development of overlapping standards. The committee should also better take into account the need from end-users.

The scope of the committee is to enhance societal security and resilience. As the TC has only recently started it is in the beginning stages of developing their own standards. However, the committee inherited an existing set of standards from the other committees. The inheritance of these standards influences the present activity in ISO/TC 292. All six working groups of ISO/TC 292 are related to disaster resilience since disaster resilience covers a broad range of topics.

**Work programme in relation to disaster resilience**

The TC has a broad scope and all work in ISO/TC 292 is covered by the scope. At the moment the TC is preparing a roadmap to identify future topics for standards development. Most important is that members have a dialog with their mirror committees and put forward NWIPs for standards, which take into account the role of the end-users. For the development of standards the general ISO procedures for suggesting NWIPs and standard development is followed. There are some countries that are more active in proposing standards. In general, large countries are more active. However, there are countries that are facing language problems, preventing them from submitting NWIPs.

A challenge in standardisation activities' is always to recruit the right experts to develop standards. The TC does not monitor the use the different standards published by the TC as it is difficult to get reliable information. At the moment no potential gaps in standards are identified. However, the roadmap is under development, once finished this should give some indications. The standards to be developed in ISO/TC 292 should be quite general and have global relevance.

**Involvement of experts**

Experts are registered in the different working groups, and it is a core group of 25-30 people that participates in the work and the TC meeting. It is difficult to recruit new people. One of the reasons is the lack of financial funding. This especially concerns developing countries. For countries in Africa and South America it is in general difficult to participate in TC meetings. In meetings the Northern countries, Europe, China, Japan and North America are mostly participating. This distribution of people does not reflect a good representation of the market.

ISO/TC 292 collaborates with the UN on disaster resilience work. Specific topics are urbanisation and the fact that developing countries are most affected by disasters. However, people from these countries are less active in the TC work. ISO has reduced the funding for developing countries to participate in standardisation work, and people from these countries are only allowed to participate in three ISO meetings per year. It is difficult to develop standards for a target group that can't be involved in the actual development of these standards. ISO has collaboration with the UN on such topics. However, the funding of such work should be higher. Besides with the UN the TC is also actively working with some other TCs. The results of the roadmapping will show the way forward for ISO/TC292 and also give some indications on future collaborations that will be useful for the TC.

***2.3.5 ISO/IEC JTC 1/SC 27 – IT Security techniques<sup>15</sup>******2.3.5.1 About ISO/IEC JTC 1/SC 27*****TC scope and working groups**

TC scope:

- Standardisation activity by this subcommittee includes general methods, management system requirements, techniques and guidelines to address both information security and privacy.

ISO/IEC JTC 1/SC 27 has in total 7 working groups; none of the working groups are included in this analysis as the standards they developed proved not to be relevant for this project.

**Secretariats and chairs**

An overview of the secretariat and chair of the TC is given in Table 22.

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<sup>15</sup> [https://en.wikipedia.org/wiki/ISO/IEC\\_JTC\\_1/SC\\_27](https://en.wikipedia.org/wiki/ISO/IEC_JTC_1/SC_27)

Table 22: ISO/IEC JTC 1/SC 27 – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
ISO/IEC JTC 1/SC 27	Germany	Standardisation Body	Germany	Industry & Commerce

**Involved countries**

- An overview of the active and observing countries in ISO/IEC JTC 1/SC 27 is given in Table 23.
- In ISO/IEC JTC 1/SC 27, a total of 73 countries are involved: 52 active countries and 21 observing countries. In total 29 European countries are involved in the work of ISO/IEC JTC 1/SC 27 (active and observing), which is 88% of the CEN-CENELEC member countries.

Table 23: ISO/IEC JTC 1/SC 27 – Involved countries

ISO/IEC JTC 1/SC 27	Involved countries
<b>Active countries</b>	52 countries in total, 21 European countries: Algeria; Argentina; Australia; Austria; Belgium; Canada; China; Cyprus; Czech Republic; Denmark; Finland; France; Germany; India; Ireland; Israel; Italy; Japan; Kenya; Korea, Republic of; Luxembourg; Malaysia; Mexico; Netherlands; New Zealand; Norway; Poland; Portugal; Romania; Russian Federation; Singapore; Slovakia; South Africa; Spain; Sri Lanka; Sweden; Switzerland; United Arab Emirates; United Kingdom; United States; Uruguay; Brazil; Côte d'Ivoire; Panama; Ukraine; Peru; Chile; The Former Yugoslav Republic of Macedonia; Kazakhstan; Lebanon; Mauritius; Rwanda
<b>Observing countries</b>	21 countries in total, 7 European countries Bosnia and Herzegovina; Bulgaria; Estonia; Hungary; Iceland; Indonesia; Iran, Islamic Republic of; Lithuania; Morocco; Serbia; Slovenia; Turkey; Belarus; Ghana; Costa Rica; Hong Kong; El Salvador; Palestine, State of; Saudi Arabia; Swaziland; Thailand

**Liaisons**

- An overview of the stakeholder types of the liaisons in ISO/IEC JTC 1/SC 27 is given in Table 24.
- ISO/IEC JTC 1/SC 27 has 10 external liaisons. Most of these liaisons are represented by the stakeholder groups 'Industry & Commerce'.
- ISO/IEC JTC 1/SC 27 has 29 liaisons with other TCs.

Table 24: ISO/IEC JTC 1/SC 27 – Stakeholder type distribution in SC liaisons

Stakeholder Type	Number of liaisons
Academic & Research	1
Governmental organisation	1
Industry & Commerce	5
NGO	2
Other	1
Standardisation Body	29
<b>Total</b>	<b>39</b>

## 2.3.5.2 Relevant standards developed by ISO/IEC JTC 1/SC 27

Table 25: ISO/IEC JTC 1/SC 27 - Relevant standards

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
ISO/IEC TR 19791:2010	Information technology -- Security techniques -- Security assessment of operational systems	Published	x			
ISO/IEC 19792:2009	Information technology -- Security techniques -- Security evaluation of biometrics	Published	x			
ISO/IEC CD 19896-1	Information technology -- Security techniques -- Competence requirements for information security testers and evaluators -- Part 1: Introduction, concepts and general requirements	Under development		x		
ISO/IEC CD 19896-2	Information technology -- Security techniques -- Competence requirements for information security testers and evaluators -- Part 2: Knowledge, skills and effectiveness requirements for ISO/IEC 19790 testers	Under development		x		
ISO/IEC CD 19896-3	Information technology -- Security techniques -- Competence requirements for information security testers and evaluators -- Part 3: Knowledge, skills and effectiveness requirements for ISO/IEC 15408 evaluators	Under development		x		
ISO/IEC NP 19989	Information technology -- Security techniques -- Criteria and methodology for security evaluation of biometric systems	Under development	x			
ISO/IEC NP 19989-1	Information technology -- Security techniques -- Criteria and methodology for security evaluation of biometric systems -- Part 1: Performance	Under development	x			
ISO/IEC NP 19989-2	Information technology -- Security techniques -- Criteria and methodology for security evaluation of biometric systems -- Part 2: Presentation attack detection	Under development	x			
ISO/IEC TR 20004:2015	Information technology -- Security techniques -- Refining software vulnerability analysis under ISO/IEC	published	x			

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
	15408 and ISO/IEC 18045					
ISO/IEC WD 20085-1	Test tool requirements and test tool calibration methods for use in testing noninvasive attack mitigation techniques in cryptographic modules -- Part 1: Test tools and techniques	Under development		x		
ISO/IEC AWI 20085-2	Test tool requirements and test tool calibration methods for use in testing noninvasive attack mitigation techniques in cryptographic modules -- Part 2: Test calibration methods and apparatus	Under development		x		
ISO/IEC NP TS 20540	Information technology -- Security techniques -- Guidelines for testing cryptographic modules in their operational environment	Under development	x			
ISO/IEC 24745:2011	Information technology -- Security techniques -- Biometric information protection	published	x			
ISO/IEC 27000:2016	Information technology -- Security techniques -- Information security management systems -- Overview and vocabulary	Published		x		
ISO/IEC 27001:2013	Information technology -- Security techniques -- Information security management systems -- Requirements	Published		x		
ISO/IEC 27002:2013	Information technology -- Security techniques -- Code of practice for information security controls	Published		x		
ISO/IEC 27003:2010	Information technology -- Security techniques -- Information security management system implementation guidance	Published		x		
ISO/IEC 27004:2016	Information technology -- Security techniques -- Information security management -- Monitoring, measurement, analysis and evaluation	Published	x			
ISO/IEC 27005:2011	Information technology -- Security techniques -- Information security risk management	Published	x			
ISO/IEC 27006:2015	Information technology -- Security techniques -- Requirements for bodies providing audit and certification of	Published		x		

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
	information security management systems					
ISO/IEC 27007:2011	Information technology -- Security techniques -- Guidelines for information security management systems auditing	Published		x		
ISO/IEC PDTS 27008	Information technology -- Security techniques -- Guidelines for the assessment of information security controls	Under development	x			
ISO/IEC TR 27008:2011	Information technology -- Security techniques -- Guidelines for auditors on information security controls	Published		x		
ISO/IEC 27010:2015	Information technology -- Security techniques -- Information security management for inter-sector and inter-organizational communications	Published		x		
ISO/IEC 27011:2016	Information technology -- Security techniques -- Code of practice for Information security controls based on ISO/IEC 27002 for telecommunications organizations	Published	x			
ISO/IEC 27013:2015	Information technology -- Security techniques -- Guidance on the integrated implementation of ISO/IEC 27001 and ISO/IEC 20000-1	Published	x			
ISO/IEC TR 27015:2012	Information technology -- Security techniques -- Information security management guidelines for financial services	Published	x			
ISO/IEC 27017:2015	Information technology -- Security techniques -- Code of practice for information security controls based on ISO/IEC 27002 for cloud services	Published	x			
ISO/IEC TR 27019:2013	Information technology -- Security techniques -- Information security management guidelines based on ISO/IEC 27002 for process control systems specific to the energy utility industry	Published	x			
ISO/IEC DIS 27019	Information technology -- Security techniques -- Information security controls for the energy utility industry	Under development	x			

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
ISO/IEC 27031:2011	Information technology -- Security techniques -- Guidelines for information and communication technology readiness for business continuity	Published		x		
ISO/IEC 27035-1:2016	Information technology -- Security techniques -- Information security incident management -- Part 1: Principles of incident management	Published	x		x	x
ISO/IEC 27035-2:2016	Information technology -- Security techniques -- Information security incident management -- Part 2: Guidelines to plan and prepare for incident response	Published		x		
ISO/IEC 27043:2015	Information technology -- Security techniques -- Incident investigation principles and processes	Published	x		x	
Sum			19	15	2	1

### 2.3.6 ITU-T FG-DR&NRR – Focus Group on Disaster Relief Systems, Network Resilience and Recovery

#### 2.3.6.1 About FG-DR&NRR

The Focus Group on Disaster Relief Systems, Network Resilience and Recovery (FG-DR&NRR) started on January 2012 by the ITU-T TSAG meeting (Telecommunication Standardisation Advisory Group) in Geneva and was terminated in June 2014. The Focus Group, established in accordance with Recommendation ITU-T A.7, conducts the work on disaster relief systems/applications, network resilience and recovery aiming at:

- identifying requirements for disaster relief and network resilience and familiarize the ITU-T and standardisation communities with those requirements;
- identifying existing standards and existing work that are related to the requirements mentioned above;
- identifying any additional standards that may need to be developed and identifying future work items for specific ITU-T Study groups and related actions;
- encouraging collaboration among ITU-T Study Groups, in particular SG2, SG5, SG11, SG13, SG15, SG16 and SG17, ITU-R, ITU-D and relevant organisations and communities, including the PCP-TDR;<sup>16</sup>

Taking into account this first approach on standardisation initiatives for disaster resilience, the following groups fall under this study:

- ITU-T-SG 2 Operational Aspects of service provision and telecommunications management
- ITU-T-SG 5 Environment and Climate Change
- ITU-T-SG 13 Future networks including cloud computing, mobile and next-generation networks
- ITU-T-SG 15 Networks, Technologies and Infrastructures for Transport, Access and Home
- ITU-T-SG 16 Multimedia

<sup>16</sup> <http://www.itu.int/en/ITU-T/focusgroups/dnrnr/Documents/ToR/ToR-FG-DR-NRR.pdf>



- ITU-T-SG 17 Security

### TC Scopes and study groups

#### SG Scopes

- **ITU-T-SG 2:** Study Group 2 is home to Recommendation ITU-T E.164 which is the numbering standard. SG 2 is also responsible for standards on the management of telecom services, networks and equipment.<sup>17</sup>
- **ITU-T-SG 5:** Study Group 5 is responsible for studying ICT environmental aspects of electromagnetic phenomena and climate change. This has a straight relation with natural phenomena that could affect telecommunication networks and equipment.<sup>18</sup>  
This TC also carries out studies on the electromagnetic compatibility, the effect of equipment electromagnetic fields on health and the environmental impact of the use of ICT.
- **ITU-T-SG 13:** SG 13 is in charge of standards elaborations on next generation networks(NGN) and mobile networks. This includes the evolution of NGNs and the standardisation of new services as they emerge. Cloud computing also falls into the studies carried out in this group as well as 3G and 4G mobile networks.<sup>19</sup>
- **ITU-T-SG 15:** This groups takes over the elaboration of standards related to the global network, mainly those based on fiber-optics and copper all for industry and home use:
  - o Transport: Standard protocols and physical characteristics for digital networks such as Optical Transport Network (OTN), SDH (Synchronous Digital Hierarchy) and other well known technologies such as IP/MPLS(Multi Protocol Label Switching), Ethernet, Fibre Channel, SDI(Serial Digital Interface), DVB\_ASI (Digital Video Broadcasting\_Asynchronous Serial Interface) and Automatically Switched Optical Network (ASON)
  - o Access: Standards such as digital subscriber line (DSL) and Passive Optical Networks (PONs)
  - o Smart Grids and homes: Orthogonal frequency-division multiplexing (OFDM)-based narrowband powerline communication (NB-PLC) standards for the analysis and control of power supply<sup>20</sup>
- **ITU-T-SG 16:** SG16 is active in all aspects of multimedia standardisation, including terminals, architecture, protocols, security, mobility, interworking and quality of service (QoS). It focuses its studies on telepresence and conferencing systems; IPTV; digital signage; speech, audio and visual coding; network signal processing; PSTN modems and interfaces; facsimile terminals; and ICT accessibility.  
A large push for standardized digital signage solutions came after the Great East Japan Earthquake and Tsunami in 2011, as standards-based digital signage systems can be a powerful vehicle for public announcements in the event of public emergencies.
- **ITU-T-SG 17:** This TC works towards standardisation in relation to security in the use of information and communication technologies (ICTs) and to facilitate more secure network infrastructure, services and applications. This work is directly related to Cyber Security through Cybex group.<sup>21</sup>

#### Other TCs in ITU-T working on disaster resilience

In the process of searching for standards related to disaster resilience other SGs appear to be working on such field yet they were not directly involved in the FG-DR&NRR. These SGs include:

- **ITU-T SG 1:** Spectrum management principles and techniques, general principles of sharing, spectrum monitoring, long-term strategies for spectrum utilization, economic approaches to national spectrum management, automated techniques and assistance to developing countries in cooperation with the Telecommunication Development Sector.<sup>22</sup>

<sup>17</sup> <http://www.itu.int/en/ITU-T/studygroups/2013-2016/02/Pages/default.aspx>

<sup>18</sup> <http://www.itu.int/en/ITU-T/studygroups/2013-2016/05/Pages/default.aspx>

<sup>19</sup> <http://www.itu.int/en/ITU-T/studygroups/2013-2016/13/Pages/default.aspx>

<sup>20</sup> <http://www.itu.int/en/ITU-T/studygroups/2013-2016/15/Pages/default.aspx>

<sup>21</sup> <http://www.itu.int/en/ITU-T/studygroups/2013-2016/17/Pages/default.aspx>

<sup>22</sup> <http://www.itu.int/en/ITU-R/study-groups/rsg1/Pages/default.aspx>

- **ITU-T SG 4:** Systems and networks for the fixed-satellite service, mobile-satellite service, broadcasting-satellite service and radiodetermination-satellite service.<sup>23</sup>
- **ITU-T SG 11:** Responsible for 'signalling', producing international standards (ITU-T Recommendations) that define how telephone calls and other calls (such as data calls) are handled in the network.<sup>24</sup>
- **ITU-T SG 20:** Study Group 20 is working to address the standardisation requirements of Internet of Things (IoT) technologies, with an initial focus on IoT applications in smart cities and communities (SC&C)<sup>25</sup>

### Secretariats and chairs

An overview of the secretariats and chairs of the relevant ITU-T groups is given in Table 26. The ITU-T General Secretariat is the office where the financial and administrative matters of the union are managed therefore there are no secretariats assigned to each Study Group.<sup>26</sup>

Table 26: Relevant ITU-T groups – Assistants and chairs

	Assistant		Chair	
	Country	Stakeholder type	Country	Stakeholder type
ITU-T SG 1	N/A	N/A	Russia	Governmental organisation
ITU-T-SG 2	France	Standardisation organisation	Egypt	Governmental organisation
ITU-T SG 4	N/A	N/A	USA	Industry & Commerce
ITU-T-SG 5	France	Standardisation organisation	France	Industry & Commerce
ITU-T SG 11	Switzerland	Standardisation organisation	China	Industry & Commerce
ITU-T-SG 13	France	Standardisation organisation	Switzerland	Governmental organisation
ITU-T-SG 15	Switzerland	Standardisation organisation	USA	Industry & Commerce
ITU-T-SG 16	Switzerland	Standardisation organisation	Japan	Industry & Commerce
ITU-T-SG 17	Switzerland	Standardisation organisation	Russia	Governmental organisation
ITU-T SG 20	Switzerland	Standardisation organisation	UAE	Governmental organisation

### Stakeholders

Table 27 only includes information about ITU-T SG 17 since that group was the only one to support ResiStand in the survey performed. The other ITU-T SGs could not share further information.

<sup>23</sup> <http://www.itu.int/en/ITU-R/study-groups/rsg4/Pages/default.aspx>

<sup>24</sup> <http://www.itu.int/en/ITU-T/about/groups/Pages/sg11.aspx>

<sup>25</sup> <http://www.itu.int/en/ITU-T/about/groups/Pages/sg20.aspx>

<sup>26</sup> <http://www.itu.int/en/general-secretariat/Pages/default.aspx>

Table 27: ITU-T SG 17 - Stakeholder type distribution in liaisons

Stakeholder Type	Number of liaisons
Academic & Research	11
Governmental organisation	65
Industry & Commerce	53
NGO	-
Other	22
Standardisation Body	-
<b>Total</b>	<b>151</b>

### 2.3.6.2 Relevant standards developed by ITU-T FG-DR&NRR and Study Groups involved in disaster resilience

The mission of FG-DR&NRR was not to develop standards but had the following objectives:

- identifying requirements for disaster relief and network resilience and familiarize the ITU-T and standardisation communities with those requirements;
- identifying existing standards and existing work that are related to the requirements mentioned above;
- identifying any additional standards that may need to be developed and identifying future work items for specific ITU-T Study groups and related actions;
- encouraging collaboration among ITU-T Study Groups, in particular SG2, SG5, SG11, SG13, SG15, SG16 and SG17, ITU-R, ITU-D and relevant organisations and communities, including the Telecommunications for Disaster Relief and Mitigation - Partnership Co-ordination Panel<sup>27</sup>.

Table 28: ITU-T FG-DR&amp;NRR - Relevant standards

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
ITU-T E.106	International Emergency Preference Scheme (IEPS) for disaster relief operations	Published		x		
ITU-T E.107	Emergency Telecommunications Service (ETS) and interconnection framework for national implementations of ETS	Published		x		
ITU-T E.119	Requirements for Safety Confirmation and Broadcast Message Service for Disaster Relief	Superseeded			x	
ITU-T E.412.1	Assessing the impact of resource discontinuity	Published	x			

<sup>27</sup> <http://www.itu.int/en/ITU-T/pcptdr/Pages/default.aspx>

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
	in transport networks on service availability					
ITU-T M.495	Transmission restoration and transmission route diversity: terminology and general principles	Published				x
ITU-T M.496	Functional organization for automatic transmission restoration	Published				x
ITU-T K.11	Principles of protection against overvoltages and overcurrents	Published	x			
ITU-T K.46	Protection of telecommunication lines using metallic symmetric conductors against lightning-induced surges	Published	x			
ITU-T K.47	Protection of telecommunication lines against direct lightning flashes	Published	x			
ITU-T K.56	Protection of radio base stations against lightning discharges	Published	x			
ITU-T K.57	Protection measures for radio base stations sited on power line towers	Published	x			
ITU-T K.72	Protection of telecommunication lines using metallic conductors against lightning – Risk management	Published	x			
ITU-T K.115	Mitigation methods against electromagnetic security threats	Published	x			
ITU-T K.118	Requirements for Lightning Protection of Fibre To The distribution point (FTTdp) Equipment	Published	x			
ITU-T K Suppl. 5	ITU-T K.81 - Estimation examples of the high-power electromagnetic threat and vulnerability for telecommunication systems	Published	x			
ITU-T Y.2705	Minimum security requirements for the interconnection of the Emergency Telecommunications Service (ETS)	Published	x			
ITU-T Y.2740	Security requirements for mobile remote financial transactions in next generation networks	Published	x			
ITU-T Y.2760	Mobility security framework in NGN	Published	x			
ITU-T E.409	Incident organization and security incident handling: Guidelines for telecommunication organizations	Published		x		

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
ITU-T X.1036	Framework for creation, storage, distribution and enforcement of policies for network security	Published	x			
ITU-T X.1051	Information technology - Security techniques - Code of practice for Information security controls based on ISO/IEC 27002 for telecommunications organizations	Published		x		
ITU-T X.1052	Information security management framework	Published		x		
ITU-T X.1054	Information technology - Security techniques - Governance of information security	Published		x		
ITU-T X.1055	Risk management and risk profile guidelines for telecommunication organizations	Published	x	x		
ITU-T X.1056	Security incident management guidelines for telecommunications organizations	Published		x		
ITU-T X.1057	Asset management guidelines in telecommunication organizations	Published		x		
ITU-T X.1086	Telebiometrics protection procedures – Part 1: A guideline to technical and managerial countermeasures for biometric data security	Published		x		
ITU-T X.1207	Guidelines for telecommunication service providers for addressing the risk of spyware and potentially unwanted software	Published	x	x		
ITU-T X.1208	A cybersecurity indicator of risk to enhance confidence and security in the use of telecommunication/information and communication technologies	Published	x			
ITU-T X.1210	Overview of source-based security troubleshooting mechanisms for Internet protocol-based networks	Published			x	
ITU-T X.1211	Techniques for preventing web-based attacks	Published	x			
ITU-T X.1631	Information technology - Security techniques - Code of practice for information security controls based on	Published	x			

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
	ISO/IEC 27002 for cloud services					
ITU-T X.1642	Guidelines of operational security for cloud computing	Published	x	x		
ITU-R BO.1774-2*ITU-R BO.1774	Use of satellite and terrestrial broadcast infrastructures for public warning, disaster mitigation and relief	published			x	
ITU-R M.1042-3*ITU-R M.1042	Disaster communications in the amateur and amateur-satellite services	published			x	
ITU-R M.1637-0*ITU-R M.1637	Global cross-border circulation of radiocommunication equipment in emergency and disaster relief situations	published			x	
ITU-R M.1826-0*ITU-R M.1826	Harmonized frequency channel plan for broadband public protection and disaster relief operations at 4 940-4 990 MHz in Regions 2 and 3	published		x		
ITU-R M.1854-1*ITU-R M.1854	Use of mobile-satellite service in disaster response and relief	published		x		
ITU-R M.2009-1*ITU-R M.2009	Radio interface standards for use by public protection and disaster relief operations in some parts of the UHF band in accordance with Resolution 646 (Rev.WRC-012)	published		x		
ITU-T E.108	Requirement for disaster relief mobile message service	Published			x	
ITU-T H.785.0	Digital signage: Requirements of disaster information services	published		x		
ITU-T L.390	Disaster management for outside plant facilities	published	x			
ITU-T L.391	Monitoring systems for outside plant facilities	published	x			
ITU-T L.392	Disaster management for improving network resilience and recovery with movable and deployable information and communication technology (ICT) resource units	Under development	x			
ITU-T Q.761 AMD 3	Support for the International Emergency Preference Scheme	published		x		
ITU-T Q.762 AMD 3	Support for the International Emergency Preference Scheme	published		x		
ITU-T Q.1902.4	Support for the International Emergency	published		x		

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
AMD 3	Preference Scheme					
ITU-T Y.4102	Requirements for Internet of things devices and operation of Internet of things applications during disasters	published			x	
Sum			23	19	7	2

### 2.3.7 Other international standards

Besides the studied international technical committees above there are several other committees which have developed one or a few standards that are related to disaster resilience, but do not focus on disaster resilience. These international standards are listed in Table 29. Four general topics appear in the list. Those are nuclear energy and radiation protection, acoustics, transport systems and personal safety equipment. The eleven identified standards are particularly focussing on preparedness and response.

Table 29: Other international standards

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
ISO/TR 19083-1	Intelligent transport systems - Emergency evacuation and disaster response and recovery - Part 1: Framework and concept of operation	ISO/TC 204 – Intelligent transport systems	published		x	x	
ISO 11320	Nuclear criticality safety - Emergency preparedness and response	ISO/TC 85 – Nuclear energy	published		x		
ISO 8201	Acoustics; Audible emergency evacuation signal	ISO/TC 43 – Acoustics	published			x	
IEC 60973*CEI 60973	Test procedures for germanium gamma-ray detectors	IEC/TC 45 – Nuclear instrumentation	published		x	x	
IEC 62401*CEI 62401	Radiation protection instrumentation - Alarming personal radiation devices (PRD) for detection of illicit trafficking of radioactive material	IEC/SC 45B – Radiation protection instrumentation	published		x	x	
IEC 62463*CEI 62463	Radiation protection instrumentation - X-ray systems for the screening of persons for security	IEC/SC 45B – Radiation protection instrumentation	published		x	x	

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
	and the carrying of the illicit items	ion					
IEC 62484*CEI 62484	Radiation protection instrumentation - Spectroscopy-based portal monitors used for the detection and identification of illicit trafficking of radioactive material	IEC/SC 45B – Radiation protection instrumentation	published		x	x	
IEC 62533*CEI 62533	Radiation protection instrumentation - Highly sensitive hand-held instruments for photon detection of radioactive material	IEC/SC 45B – Radiation protection instrumentation	published		x	x	
IEC 62534*CEI 62534	Radiation protection instrumentation - Highly sensitive hand-held instruments for neutron detection of radioactive material	IEC/SC 45B – Radiation protection instrumentation	published		x	x	
IEC 62709*CEI 62709	Radiation protection instrumentation - Security screening of humans - Measuring the imaging performance of X-ray systems	IEC/SC 45B – Radiation protection instrumentation	published		x	x	
ISO/TS 16975-2	Respiratory protective devices - Selection, use and maintenance - Part 2: Condensed guidance to establishing and implementing a respiratory protective device programme	ISO/TC 94 – Personal safety - Protective clothing and equipment	Published		x		
Sum				0	10	8	0

### 2.3.8 Summary

Besides the IT-standards with relevance to disaster resilience there are three ISO/TCs developing relevant international standards. From these three TCs, ISO/TC 292 is developing the majority of them. The majority of the international standards with relevance to disaster resilience can be classified within the Mitigation and Preparedness phase. But there are also still quite a few standards that apply to the Response phase, while there are not many standards applying to the Recovery phase.

In international standardisation Industry/Commerce is the largest stakeholder group represented in the TCs while Government is not very well represented. When looking at the European countries involved in International standardisation it is interesting to note that the majority are Western European countries.

Current standardisation related to disaster resilience in ISO/IEC covers mainly Cyber Security, Cloud services and business continuity processes always focused on mitigation and preparedness phases. ITU-T is an industry driven organisation that has a solid ground of standards related to disaster resilience for basic critical infrastructure (telephone, radio, mobile, satellite, etc.) also addressing mitigation and preparedness phases mainly.



## 2.4 European standardisation committees

### 2.4.1 Introduction

European standardisation is a widely accepted tool to lower trade barriers. It provides harmonized standards that are a reliable indicator of conformity with relevant EU legislation. 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).

The European standardisation organisations are associations of national standards bodies according to Belgian (CEN, CENELEC) or French (ETSI) law. Members of CEN and CENELEC are first and foremost the national standards organisations 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. CEN and CENELEC have declared themselves to be joint European standardisation organisations. Their responsibility is the harmonization of existing national standards.

CEN/CENELEC organs such as the General Assembly, Administrative and Technical Boards and Technical Committees 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 organisations.

On a European level there are several TCs which are relevant for the field of security and disaster resilience, most importantly is CEN/TC 391 - Societal and Citizen Security. CEN/TC 391 is responsible for many aspects of the security mandate M/487. The focus here is very much on organisational issues while many other TCs are about product related standardisation activities or are only partly considering security and disaster resilience related aspects in their work programmes. IT-related TCs are mainly about cyber security issues. For an overview, see Table 30.

Detailed information on the technical committees included in this table is provided in the next sections.

As the scope of the ResiStand project is more about disaster resilience than about general security issues, some TCs that have been identified initially, have not been further investigated. These TCs are listed in Annex 1.

Table 30: Relevant European technical committees

Standards Developing Organisation	TC No	TC title
CEN	72	Fire detection and fire alarm systems
CEN	164	Water Supply
CEN	278	Intelligent transport systems
CEN	391	Societal and Citizen Security
CEN	439	Private security services
CEN-CENELEC	4	Services for fire safety and security systems
CEN-CENELEC	JWG 8	Privacy management in products and services
CENELEC	79	Alarm systems
ETSI	ETSI CYBER	Cyber Security

### 2.4.2 CEN/TC 164 – Water supply

#### 2.4.2.1 About CEN/TC 164

##### TC scope and working groups

TC scope:

- To establish standards for the installation and performance requirements of systems, constructions of components used for the water supply from the production facility, including the treatment of the

water, to the taps attached or unattached to a sanitary appliance with the view of maintaining the quality of water as stated in Directive 80/778.

CEN/TC 164 has in total 11 working groups, of which 2 working groups are relevant:

- CEN/TC 164 WG 14 – Valves and fitting for buildings and devices to prevent pollution by backflow
- CEN/TC 164 WG 15 – Security of drinking water supply

#### Secretariats and chairs

- An overview of the secretariats and chairs of the TC and the relevant working groups is given in Table 31.
- The secretariats and chairs are from France and Germany. This corresponds with the countries that are most active in this TC.
- The stakeholder type of the chair of the TC is 'Academic & Research'. The chairs of the WGs are from 'Industry and Commerce'.

Table 31: CEN/TC 164 – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
<b>CEN / TC 164</b>	France	Standardisation Body	France	Academic & Research
<b>WG 14</b>	Germany	Standardisation Body	Germany	Industry & Commerce
<b>WG 15</b>	Germany	Standardisation Body	Germany	Industry & Commerce

#### Involved countries

- An overview of the active countries in CEN/TC 164 2 is given in Table 32.
- In CEN/TC 164, a total of 29 countries are involved, which is 88% of the CEN-CENELEC members.
- Looking at the participation in the relevant working groups, the top 3 countries are: Germany, France and United Kingdom.
- Interesting is that Mongolia is also active in the working groups.

Table 32: CEN/TC 164– Involved countries

<b>CEN / TC 164</b>	<b>Involved countries</b>
<b>Active countries</b>	29 countries in total: Austria, Belgium, Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom

#### Overview of participation

- An overview of the country participation in CEN / TC 164 and the relevant working groups is given in
- Table 33.
- In the 2 working groups, there are a total of 75 active participants. Counting from the working groups separately, there are in total 84 active participants. There is an overlap of 11% in participants in the working groups.
- The working group with the most participants is WG 14 'Valves and fitting for buildings and devices to prevent pollution by backflow' (61 participants), led by Germany.

Table 33: CEN/TC 164 – Overview of participation in TC and relevant working groups

Country	TC 164	WG 14	WG 15	Total active memberships in WGs
Germany	Active	14	3	18
Netherlands	Active	4	1	15
United Kingdom	Active	7	2	14
France	Active	8	2	11
Switzerland	Active	6	1	8
Sweden	Active	4	-	7
Finland	Active	3	2	7
Slovenia	Active	2	2	6
Ireland	Active	1	2	6
Italy	Active	3	1	5
Austria	Active	1	1	4
<i>Mongolia</i>	Active	2	2	4
Poland	Active	-	-	3
Portugal	Active	-	2	3
Estonia	Active	-	-	3
Latvia	Active	-	-	2
Spain	Active	-	1	2
European	Active	2	-	2
<i>Armenia</i>	Active	1	1	2
Czech Republic	Active	2	-	2
Belgium	Active	1	-	2
Bulgaria	Active	-	-	2
Turkey	Active	-	-	1
Cyprus	Active	-	-	1
Iceland	Active	-	-	1
Greece	Active	-	-	1
Lithuania	Active	-	-	1
Hungary	Active	-	-	1
Denmark	Active	-	-	1
Romania	Active	-	-	1
Slovakia	Active	-	-	1
Croatia	Active	-	-	1
Norway	Active	-	-	1
<b>Total active European memberships</b>	<b>33</b>	<b>61</b>	<b>23</b>	<b>84</b>
<b>Total active members, with corrections*</b>				<b>75</b>
* If one person is in more than one working group, a correction is applied. This number shows the actual number of persons involved per country.				

### Liaisons

- An overview of the stakeholder types of the liaisons in CEN/TC 164 is given in Table 34.

- CEN/TC 164 has 5 external liaisons. The most liaisons are with the stakeholder group 'Industry & Commerce'.

Table 34: CEN/TC 164 – Stakeholder type distribution in TC liaisons

Stakeholder Type	Number of liaisons
Academic & Research	-
Governmental organisation	-
Industry & Commerce	4
NGO	-
Other	1
Standardisation Body	-
<b>Total</b>	<b>5</b>

#### Stakeholders in relevant working groups

- The relevant working groups are:
  - o CEN/TC 164 WG 14 – Valves and fitting for buildings and devices to prevent pollution by backflow
  - o CEN/TC 164 WG 15 – Security of drinking water supply

An overview of the number of stakeholders and the stakeholder distribution in the relevant working groups is given in Table 35. In terms of stakeholder type distribution: the majority of the participants are from 'Industry and Commerce' (77%).

Table 35: CEN/TC 164– Stakeholder type distribution in relevant working groups

Stakeholder Type	WG 14	WG 15
Academic & Research	2	2
Governmental organisation	3	3
Industry & Commerce	47	11
NGO	-	-
Other	-	-
Standardisation Body	9	7
<b>Total</b>	<b>61</b>	<b>23</b>

#### **2.4.2.2 Relevant standards developed by CEN/TC 164**

Table 36: CEN/TC 164 – Relevant standards

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
EN 15975-1+A1	Security of drinking water supply - Guidelines for risk and crisis management - Part 1: Crisis management	published		x	x	x
EN 15975-2	Security of drinking water supply - Guidelines for risk and crisis management - Part 2: Risk management	published	x			
Sum			1	1	1	1

### 2.4.3 CEN/TC 391 – Societal and Citizen Security

#### 2.4.3.1 About CEN/TC 391

##### TC scope and working groups

TC scope:

The main objective of CEN/TC 391 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. Verification and training will also be considered. CEN/TC 391 will not deal with issues already dealt with in other TCs. Concerning technology, CEN/TC 391 may identify needs in product standardisation, but this will not lead to direct action by this CEN/TC. These issues shall be communicated to those CEN, ISO or other TCs working within the framework of these specific products. Where other TCs do not address the identified areas, then CEN/TC 391 will develop the standard(s) or proposed deliverables where appropriate. The standardisation activities will consider the following main issues related to Societal and Citizen Security:

- Products and services (equipment, communication, information, goods, transport, energy, cultural inheritance and properties);
- Infrastructures (roads, ports, airports, rail stations, bridges, factories...);
- Stakeholder needs and requirements, potential conflicts;
- Relationship (cultural and geographical diversity);
- Citizen requirements and vulnerabilities, including privacy.<sup>28</sup>

CEN/TC 391 is the responsible European mirroring committee for ISO/TC 292 and the adoption of their standards on European level.

CEN/TC 391 has in total 3 working groups, of which all working groups are relevant:

- CEN/TC 391 WG 1 – Healthcare Facilities
- CEN/TC 391 WG 2 – CBRNE
- CEN/TC 391 WG 3 – Crisis management/civil protection

##### Secretariats and chairs

- An overview of the secretariats and chairs of the TC and the relevant working groups is given in
- Table 37.
- The secretariats are provided by the Netherlands, Czech Republic and the United Kingdom.
- The chairs are provided by France, Czech Republic and the United Kingdom One position for a chair is vacant (WG 2).
- The chairs represent the following stakeholder categories: 2 chairs from 'Industry and Commerce', 1 chair in the category 'Governmental organisation'.

Table 37: CEN/TC 391 – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
<b>CEN/TC 391</b>	Netherlands	Standardisation Body	France	Governmental organisation
<b>WG 1</b>	Czech Republic	Standardisation Body	Czech Republic	Industry & Commerce
<b>WG 2</b>	Netherlands	Standardisation Body	Vacant	
<b>WG 3</b>	United Kingdom	Standardisation Body	United Kingdom	Industry & Commerce

<sup>28</sup> [https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP\\_ORG\\_ID:680331&cs=18422BF6F2CD25C72E8F633D87A8147AB](https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP_ORG_ID:680331&cs=18422BF6F2CD25C72E8F633D87A8147AB)

### Involved Countries

- An overview of the active and observing countries in CEN/TC 391 is given in Table 38.
- In CEN/TC 391, a total of 24 countries are involved, which is 73% of the CEN-CENELEC members.
- Remarkable is that Czech is the only Eastern European country involved in this TC.

Table 38: CEN/TC 391 – Involved countries

CEN/TC 391	Involved countries
Active countries	24 countries in total: Austria; Belgium; Bulgaria; Cyprus; Czech Republic; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Italy; Latvia; Lithuania; Netherlands; Norway; Poland; Romania; Slovenia; Spain; Sweden; Switzerland; United Kingdom

### Overview of participation

- An overview of the country participation in CEN/TC 391 and the relevant working groups is given in Table 39.
- Looking at the participation in working groups, the top 3 countries are: United Kingdom, France and Spain.
- In the 3 working groups, there are a total of 51 active participants. Counting from the working groups separately, there are in total 66 active participants. There is an overlap of 23% in participants in the working groups.
- The working group with the most participants is WG 3 'Crisis management/civil protection' (25 participants), led by the UK.

Table 39: CEN/TC 391 – Overview country participation in TC and working groups

Country	TC 391	WG 1	WG 2	WG 3	Total active memberships in WGs)
France	Active	-	4	6	10
United Kingdom	Active	2	1	4	7
Germany	Active	1	3	3	7
European		2	3	2	7
Spain	Active	6	-	-	6
Austria	Active	1	1	3	5
Finland	Active	1	3	1	5
Ireland	Active	2	1	1	4
Czech Republic	Active	3	1	-	4
Italy	Active	1	-	2	3
Sweden	Active	-	1	1	2
Netherlands	Active	1	1	-	2
Belgium	Active	1	1	-	2
Switzerland	Active	-	-	1	1
Norway	Active	-	-	1	1
Cyprus	Active	-	-	-	0
Slovenia	Active	-	-	-	0
Romania	Active	-	-	-	0

Country	TC 391	WG 1	WG 2	WG 3	Total active memberships in WGs)
Hungary	Active	-	-	-	0
Bulgaria	Active	-	-	-	0
Iceland	Active	-	-	-	0
Greece	Active	-	-	-	0
Poland	Active	-	-	-	0
Latvia	Active	-	-	-	0
Lithuania	Active	-	-	-	0
Total active European memberships	24	21	20	25	66
Total active members, with corrections*					51
* If one person is in more than one working group, a correction is applied. This number shows the actual number of persons involved per country.					

### Liaisons

- An overview of the stakeholder types of the liaisons in CEN/TC 391 is given in Table 40.
- CEN/TC 391 has 9 external liaisons. The most liaisons are with the stakeholder group 'Academic & Research'. Other liaisons with stakeholder groups 'Industry & Commerce' and 'Governmental organisations' are also established.
- CEN/TC 391 has 1 liaison with another TC

Table 40: CEN/TC 391 – Stakeholder type distribution in TC liaisons

Stakeholder Type	Number of liaisons
Academic & Research	3
Governmental organisation	3
Industry & Commerce	3
NGO	-
Other	-
Standardisation Body	1
<b>Total</b>	<b>10</b>

### Stakeholders in relevant working groups

- The relevant working groups are:
  - o CEN/TC 391 WG 1 – Healthcare Facilities
  - o CEN/TC 391 WG 2 – CBRNE
  - o CEN/TC 391 WG 3 – Crisis management/civil protection
- An overview of the number of stakeholders and the stakeholder distribution in the relevant working groups is given in Table 41.
- In terms of stakeholder type distribution: most of the participants are from 'Industry and Commerce' (41%), followed by 'governmental organisation' (24%). WG 1 and WG 3 have a similar distribution of stakeholder types. However, WG 2 (CBRNE) has more 'Governmental organisation' involved, closely followed by 'Industry and Commerce'.

Table 41: CEN/TC 391 – Stakeholder type distribution in relevant working groups

Stakeholder Type	WG 1	WG 2	WG 3
------------------	------	------	------

Academic & Research	2	-	5
Governmental organisation	3	10	9
Industry & Commerce	11	8	8
Other	4	-	2
Standardisation Body	1	2	1
<b>Total</b>	<b>21</b>	<b>20</b>	<b>25</b>

#### 2.4.3.2 Relevant standards developed and adopted by CEN/TC 391

Table 42: CEN/TC 391 – Relevant (adopted) standards

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
CEN/TS 16595	CBRN - Vulnerability Assessment and Protection of People at Risk	published	x			
CEN/TS 16850	Societal and Citizen Security - Guidance for managing security in healthcare facilities	published	x			
EN ISO 22300	Societal security - Terminology (ISO 22300:2012)	published		x	x	
EN ISO 22301	Societal security - Business continuity management systems - Requirements (ISO 22301:2012)	published		x	x	x
EN ISO 22311	Societal security - Video-surveillance - Export interoperability (ISO 22311:2012)	published	x	x		
EN ISO 22313	Societal security - Business continuity management systems - Guidance (ISO 22313:2012)	published		x	x	x
(WI=00391010)	Glossary CBRNE	under development		x	x	
(WI=00391011)	Indicators for quality of service for societal safety/security	under development	x			
(WI= 00391012)	Guidance for the security of CBRNE substances lifecycle in healthcare facilities	Under development		x	x	
prCEN/TS 17091(WI=00391013)	Crisis Management - Developing a strategic capability	under development				x
prEN ISO 22300 rev(WI=00391016)	Societal security - Terminology	under development		x	x	
prEN ISO	Societal security - Mass evacuation -	under		x		



Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
22315(WI=0039 1015)	Guidelines for planning	development				
prEN ISO 22397(WI=0039 1014)	Societal security - Guidelines for establishing partnering arrangements	under development		x		
Sum			4	9	6	3

### 2.4.3.3 Standardisation experience

In order to gain more insight into the work of CEN/TC 391 the chairperson of the TC was interviewed. This section reflects the results of this interview.

CEN/TC 391 was established in 2009 and NEN, the Dutch NSB and the EC were involved in this establishment. The present chairperson of CEN/TC 391 was involved in the TC as a French expert since 2013 and was elected as the chairperson in 2017. CEN/TC 391 has a broad scope and in general the topics are related to societal security. At the moment CEN/TC 391 is working on a new business plan and a priority list of possible standardisation topics, which will be presented in the future.

Examples of subjects covered by the TC are; prevention of crisis, disasters, civil protection, any kind of prevention and response, natural disasters, CBRNE and health care facility security. According to the chairperson there are gaps in the topics currently covered by the TC; examples are evacuation control, coordination of a crisis from the government and communication. In CEN/TC 391 WG 2 (CBRNE) and WG 3 (Crisis management) are directly related to disaster resilience. However, WG 1 (Health care facilities) might also be of relevance.

#### Work programme in relation to disaster resilience

In the future the TC would also like to include topics like border security and counter terrorism as well as the previously mentioned gaps to their work programme. In the area of critical infrastructure protection there is a lot of overlap between different TCs and a better collaboration should be in place. A network of experts should be established and they should work together in order to prevent overlap in the work of different TCs. The only standard the TC is working on at the moment is a CBRN glossary. Finland initiated the work. There is a need for a common language. Currently also two Technical Specifications in the CBRNE topics are being developed. However, these are pushed by the industry and the end-user group is not very well represented at the moment.

At the moment there are no topics that the TC has decided not to develop a standard for. A “wide” view on what can be addressed is important to the chairperson. Quality and need are important issues when topics for standards are decided. Standards should reflect what the real operational needs are and how to address these.

Challenges in developing standards are the fact that you have to raise awareness that the standard is needed. Also the lack of financial support for experts to participate in the work of developing standards is a challenge the TC faces. And it is a challenge to develop standards that the users understand. Standards can often be difficult to read and understand for people that are not experts in a certain area.

At present there is no liaison with ISO/TC 292, but a future aim is to build such a liaison as there is a large overlap in the scope of their work.

### Involvement of experts

To get the right stakeholders involved it is important to identify the knowledge, who is the expert, in which company and sectors are they working etc. It is important for the work of the TC to identify and recruit these people to contribute to work in the TC. The Community of Users network organised by DG HOME can for example be used as a basis for the recruitment of experts.

As in most of the TCs the missing stakeholders in CEN/TC 391 are currently the policy makers.

As was also identified in other interviews, the number of experts registered to the TC and its WGs is higher than the actual number of people participating in meetings and other work. The TC needs to get more people involved in the work. Now in general 7-8 people are involved in the work and 9-10 persons, roughly, participate in the voting. The TC needs to have more countries and experts involved if new activities should be initiated. However if the TC presents interesting project this can also attract experts.

### **2.4.4 CEN/TC 439 – Private security services**

#### **2.4.4.1 About CEN/TC 439**

#### TC scope and working groups

TC scope:

- The scope of the CEN/TC 439 is to be responsible for the standardisation in all civilian security services.
- Excluded from the scope are:
  - Standardisation of the product related requirements;
  - The Societal and citizen sector including aspects of prevention, response, mitigation and recovery before, during and after a destabilizing or disruptive event, which falls under the responsibility of CEN/TC 391 'Societal and citizen security',
  - CEN-CENELEC/TC 4 'Services for fire safety and security systems'
  - Cash-in-transit (CIT), cash processing and cash management activities.<sup>29</sup>

CEN/TC 439 has 1 working group:

- CEN/TC 439 WG 1 – Critical Infrastructure Protection (CIP)

#### Secretariats and chairs

An overview of the secretariats and chairs of the TC and the relevant working groups is given in Table 43.

- The secretariats are provided by Austria and the United Kingdom.
- The chairs are from Austria and UK. UK corresponds with the country that is most active in this TC, Austria does not.
- Both chairs represent the following stakeholder categories: 'Industry and Commerce'.

Table 43: CEN/TC 439 – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
<b>CEN/TC 439</b>	Austria	Standardisation Body	Austria	Industry & Commerce
<b>WG 1<sup>30</sup></b>	United Kingdom	Standardisation Body	United Kingdom	Industry & Commerce

<sup>29</sup>

[https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP\\_ORG\\_ID:1969247&cs=189C0C20C3842C8E05CF975E77B83E1EE](https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP_ORG_ID:1969247&cs=189C0C20C3842C8E05CF975E77B83E1EE)

<sup>30</sup> Scope WG1: - Map out the various definitions and categories of "critical infrastructure" across Europe, - map out the existing standards and legislation for CIP, - gap analysis, - identify any needs for standardisation, - if there are needs make recommendation for priorities, - make a proposal of possible title(s) and scope(s) of preliminary work item(s).

([https://standards.cen.eu/dyn/www/f?p=CENWEB:7:0:::FSP\\_ORG\\_ID:2047508&cs=16EFB48B44BBFFCB316FF1044132C58FF](https://standards.cen.eu/dyn/www/f?p=CENWEB:7:0:::FSP_ORG_ID:2047508&cs=16EFB48B44BBFFCB316FF1044132C58FF))

Involved countries

- An overview of the active and observing countries in CEN/TC 439 is given in Table 44.
- In CEN/TC 439, a total of 16 countries are involved, which is 48% of the CEN-CENELEC members.
- Interesting to note is that 5 out of 16 active countries are Eastern European countries participating in the TC. In the WG, 3 out of 11 countries are from Eastern Europe.

Table 44: CEN/TC 439 – Involved countries

CEN/TC 439	Involved countries
Active countries	16 European countries: Belgium; Bulgaria; Denmark; Finland; France; Germany; Hungary; Ireland; Italy; Latvia; Poland; Romania; Spain; Sweden; Switzerland; United Kingdom

Overview of participation

- An overview of the country participation CEN/TC 439 and the relevant working groups is given in Table 45.
- Looking at the participation in the working group, the countries most involved are Germany (2), Spain (2), Sweden (2) and United Kingdom (2).

Table 45: CEN/TC 439 – Country participation in TC and working groups

Country	TC 439	WG 1	Total active memberships in WG
Sweden	Active	2	2
France	Active	-	-
Germany	Active	2	2
Ireland	Active	1	1
United Kingdom	Active	2	2
Spain	Active	2	2
Poland	Active	1	1
Latvia	Active	-	-
Switzerland	Active	1	1
Denmark	Active	1	1
Hungary	Active	1	1
Finland	Active	-	-
Belgium	Active	-	-
Austria	Active	1	1
Bulgaria	Active	-	-
Italy	Active	-	-
Romania	Active	-	-
Czech Republic	Active	1	1
<b>Total active European memberships</b>	<b>18</b>	<b>15</b>	<b>15</b>

Liaisons

- An overview of the stakeholder types of the liaisons in CEN/TC 439 is given in Table 46.

- CEN/TC 439 has 1 external liaison from the stakeholder type 'Industry and Commerce'.

Table 46: CEN/TC 439 – Stakeholder type distribution in TC liaisons

Stakeholder Type	Number of liaisons
Academic & Research	-
Governmental organisation	-
Industry & Commerce	1
NGO	-
Other	-
Standardisation Body	-
<b>Total</b>	<b>1</b>

#### Stakeholders in relevant working groups

- The relevant working group is:
  - o CEN/TC 439 WG 1 – Critical Infrastructure Protection (CIP)
- An overview of the number of stakeholders and the stakeholder distribution in the working group is given in Table 47.
- In terms of stakeholder type distribution: the majority of the participants are from 'Industry and Commerce' (67%).

Table 47: CEN/TC 439 – Stakeholder type distribution in relevant working groups

Stakeholder Type	WG 1
Academic & Research	2
Governmental organisation	1
Industry & Commerce	10
Other	1
Standardisation Body	1
<b>Total</b>	<b>15</b>

#### 2.4.4.2 Relevant standards developed by CEN/TC 439

Table 48: CEN/TC 439 – Relevant standards

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
EN 15602	Security service providers - Terminology	published		x	x	
EN 16082	Airport and aviation security services	published		x		
EN 16747	Maritime and port security services	published		x		
Sum			0	3	1	0

#### 2.4.5 IT European standardisation committees: ETSI TCs and CEPT/ECC

##### Relevant ETSI groups

Activities related to disaster resilience were undertaken mainly by ETSI 3GPP and ETSI TETRA. In this context the study of the LTE standard for emergency use is being carried out. Moreover, a workshop took place on September 2016 along with CEPT/ECC (Conference of Postal and Telecommunications Administrations/Electronic Communications Committee) to identify opportunities for Broadband PPDR standardisation: “Public Protection and Disaster Relief: Regulatory changes and new opportunities for Broadband PPDR”. This workshop supported 3GPP activities therefore all TCs that follow 3GPP activities are mentioned in this section since 3GPP is not a TC inside ETSI.

There are other TCs that are conducting activities on Cyber Security and ITS (Intelligent Transportation System). All those activities are related to public and private communication infrastructure for securing citizens in emergency situations and threats on the use of ICT (Information and Communication Technologies).

The relevant ETSI groups are:

- ETSI Cyber: Cyber Security
- ETSI EMTel: Emergency Communications
- ETSI TCCE: TETRA and Critical Communications Evolution
- ETSI Safety
- ETSI ITS: Intelligent Transportation Systems

##### Scopes

- **ETSI Cyber**<sup>31</sup>: Development of standards for security of infrastructures, devices, services and protocols, as well as security tools and techniques to ensure security for citizens and organisations

This TC is also producing standards related to:

- o security assurance
- o monitoring the security of Network Functions Virtualization (NFV)
- o the protection and retention of personally identifiable information
- o security aspects of Lawful Interception (LI) and data retention interfaces
- o an LI security baseline for NFV and related platforms
- o a global cyber security ecosystem
- o platform security technology
- o the post quantum computing impact on ICT security

Cooperation with CEN-CENELEC is through the Cyber Security Co-ordination Group

- **ETSI EMTel**<sup>32</sup>: This TC takes over the implementation of standards related to the use of telecommunications in emergency services.

EMTEL is currently defining the user requirements for the four main areas of emergency communications:

- o communication from citizens to authorities/organisations (emergency calls)
- o communication between authorities/organisations (public safety communications)
- o communication from authorities/organisations to citizens (warning systems)
- o communication amongst citizens during emergencies

- **ETSI TCCE**: The scope of this TC falls mainly in the maintenance of the TETRA standard and interfacing with Emergency Services, Government, Military, Transportation, Utility and Industrial organisations as well as Public Access Mobile Radio (PAMR) Operators.

In the maintenance of the TETRA standard the following activities are carried out by TCCE:

<sup>31</sup> <http://www.etsi.org/technologies-clusters/technologies/cyber-security>

<sup>32</sup> <http://www.emtel.etsi.org/activities.htm>

- The provision and development of proportionate security measures for TETRA and mission critical communications services.
- The selection and development of suitable CODECs for Audio and video services.
- The evolution and enhancement of TETRA and critical communications services as required by the market with the provision of new services, facilities and functionality made possible by new technology innovations and standards.
- To identify requirements for the further development of the TETRA standard.
- The maintenance of the TETRA standard.
- **ETSI Safety<sup>33</sup>**: This TC works on the development of standards related to the safety of ICT physical devices and technologies:
  - audio, video, information technology and communication technology equipment: In collaboration with IEC TC 108 and 100 and CENELEC TC 108 and 209
  - laser: Following IEC TC 76
  - batteries of hand held communication devices:
  - exposure of humans to electro magnetic fields:
    - Exposure limits
    - Equipment standards
    - Protection of workers
- **ETSI ITS<sup>34</sup>**: The ETSI ITS TC works on the development on standards related to telematics and all communications related to Intelligent Transportation Systems including vehicles communications which can be between vehicles and with the road infrastructure. However this is not only restricted to road, it also includes ICTs for rail, water and air transport. The following topics are under research:
  - Automotive systems:
    - Dedicated Short-Range Communications (DSRC)
    - Wireless Communications Systems dedicated to Intelligent Transport Systems and Road Transport and Traffic
    - Continuous Air interface Long and Medium range (CALM)
  - Railway communications based on GSM
  - Aeronautical and maritime systems

### Secretariats and chairs

It is worth mentioning in this section that ETSI has one secretariat that provides technical, administrative and logistical support for all our activities<sup>35</sup> therefore only Technical Officers are mentioned in the TCs along with Chairs. An overview of the secretariats and chairs of the relevant ETSI groups is given in Table 49.

### Stakeholders

It wasn't possible to get information from ETSI TCs. ETSI claims not to be able to share information that is not in the public website.

Table 49: Relevant ETSI groups – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
<b>ETSI Cyber</b>	France	Standardisation organisation	United Kingdom	Industry & Commerce
<b>ETSI EMTel</b>	France	Standardisation organisation	United Kingdom	Industry & Commerce

<sup>33</sup> <http://www.etsi.org/technologies-clusters/technologies/safety>

<sup>34</sup> <http://www.etsi.org/technologies-clusters/technologies/intelligent-transport>

<sup>35</sup> <http://www.etsi.org/about/how-we-work/how-we-organize-our-work/secretariat>

ETSI TCCE	United Kingdom	Industry & Commerce	United Kingdom	Industry & Commerce
	France	Standardisation organisation		
ETSI Safety	France	Standardisation organisation	United Kingdom	Industry & Commerce
ETSI ITS	France	Standardisation organisation	Denmark	Industry & Commerce

### CEPT/ECC

The ECC considers and develops policies on electronic communications activities in European context, taking account of European and international legislations and regulations.<sup>36</sup>

The ECC's Working Group Frequency Management (WG FM) is responsible for developing strategies, plans and implementation advice for the management of the radio spectrum.<sup>37</sup>

### Secretariats and chairs

Table 50: CEPT/ECC – Secretariat and chair

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
CEPT/ECC WG FM	N/A	N/A	Germany	Governmental organisation

#### 2.4.5.1 Relevant standards developed by ETSI and CETP/ECC

Table 51: ETSI and CETP/ECC – Relevant standards

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
TR 103 305-1	Critical Security Controls for Effective Cyber Defence; Part 1: The Critical Security Controls	Published	x	x		
TR 103 305-2	Critical Security Controls for Effective Cyber Defence; Part 2: Measurement and auditing	Published	x			
TR 103 305-3	Critical Security Controls for Effective Cyber Defence; Part 3: Service Sector Implementations	Published	x			
TR 103 305-4	Critical Security Controls for Effective Cyber Defence; Part 4: Facilitation	Published	x			

<sup>36</sup> <http://www.cept.org/ecc/>

<sup>37</sup> <http://www.cept.org/ecc/groups/ecc/wg-fm/client/introduction/>

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
	Mechanisms					
TR 103 303	Protection measures for ICT in the context of Critical Infrastructure	Published	x			
TR 103 305	Critical Security Controls for Effective Cyber Defence	Published	x	x	x	
TS 122 268	Digital Cellular telecommunications systems (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Public Warning System (PWS) requirements	Published		x		
TS 102 181	Emergency Communications (EMTEL); Requirements for communication between authorities/organizations during emergencies	Published			x	
TS 102 182	Emergency Communications (EMTEL); Requirements for communications from authorities/organizations to individuals, groups or the general public during emergencies	Published			x	
TR 102 410	Emergency Communications (EMTEL); Basis of requirements for communications between individuals and between individuals and authorities whilst emergencies are in progress	Published		x		
TR 102 445	Emergency Communications (EMTEL); Overview of Emergency Communications Network Resilience and Preparedness	Published		x		
CEPT/ECC/REC/(08)04	The identification of frequency bands for the implementation of broad band disaster relief (BBDR) - Radio applications in the 5 GHz frequency range	published	x			
CEPT/ECC/REC/(11)10	Location tracking application for emergency and disaster situations	published	x			
ETSI TR 102410 V 1.1.1	Emergency Communications (EMTEL) - Basis of requirements for communications between individuals and between individuals and authorities whilst emergencies are in progress	published			x	
ETSI TR 102445	Emergency Communications (EMTEL) -	published	x			



Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
V 1.1.1	Overview of Emergency Communications Network Resilience and Preparedness					
ETSI TR 102485 V 1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM) - Technical characteristics for Broadband Disaster Relief applications (BB-DR) for emergency services in disaster situations - System Reference Document	published		x		
ETSI TR 102496 V 1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM) - Short Range Devices (SRD) - Technical characteristics for indoor Location Application for Emergency Services (LAES) in disaster situations operating within the frequency range from 3 GHz to 5 GHz - System Reference Document	published		x		
ETSI TR 102496 V 2.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM) - System Reference Document - Short Range Devices (SRD) - Technical characteristics for Location tracking Applications for Emergency Services (LAES) in disaster situations operating within the frequency range from 3,4 GHz to 4,8 GHz	published		x		
ETSI TR 103229 V 1.1.1	Environmental Engineering (EE) - Safety Extra Low Voltage (SELV) DC power supply network for ICT devices with energy storage and grid or renewable energy sources options	published		x		
ETSI TR 103303 V 1.1.1	CYBER - Protection measures for ICT in the context of Critical Infrastructure	published	x			
			10	9	4	0

#### 2.4.6 Other European standards

Besides the studied international technical committees above there are several other committees which have developed one or a few standards that are related to disaster resilience, but do not focus on disaster resilience. These international standards are listed in Table 52. Out of the 13 identified standards ten have been developed as CEN Workshop Agreements. CWA 15537, CWA 15931-1 and CWA 15931-2 are withdrawn on European level but still in effect in some European member states as Belgium, Netherlands and France. Mitigation, preparedness and response are the prevalent disaster management phases those standards are covering.

Table 52: Other European standards

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
CWA 15537	Network Enabled Abilities - Service-Oriented Architecture for civilian and military crisis management	CEN Workshop	withdrawn		x		
CWA 15931-1	Disaster and emergency management - Shared situation awareness - Part 1: Message structure	CEN Workshop	withdrawn		x	x	
CWA 15931-2	Disaster and emergency management - Shared situation awareness - Part 2: Codes for the message structure	CEN Workshop	withdrawn		x	x	
CWA 17008	Cultural guidelines for humanitarian demining	CEN Workshop	published				x
EN 14126	Protective clothing - Performance requirements and tests methods for protective clothing against infective agents	CEN/TC 162 – Protective clothing including hand and arm protection and lifejackets	published		x	x	
EN 14126/AC	Protective clothing - Performance requirements and tests methods for protective clothing against infective agents	CEN/TC 162 – Protective clothing including hand and arm protection and lifejackets	published		x	x	
EN 62327	Radiation protection instrumentation - Hand-held instruments for the detection and identification of radionuclides and for the indication of ambient dose equivalent rate from photon radiation (IEC 62327:2006, modified)	CLC/TC 45B – Radiation protection instrumentation	published		x	x	
CWA 15517:2011	European Handbook for Defence Procurement	CEN Workshop	published				
CWA 15793	Laboratory biorisk management	CEN Workshop	published	x		x	

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
CWA 16106:2010 (E)	PPE for Chemical, Biological, Radiological and Nuclear, (CBRN) hazards	CEN Workshop	published			x	
CWA 16335	Biosafety professional competence	CEN Workshop	published	x			
CWA 16393	Laboratory biorisk management - Guidelines for the implementation of CWA 15793:2008	CEN Workshop	published	x		x	
CWA 16649	Managing emerging technology-related risks	CEN Workshop	published	x			
Sum				4	6	8	1

#### 2.4.7 Summary

There are three European TCs, which develop standards with relevance to disaster resilience. Besides developing their own standards some of these TCs also adopt International standards as European standards. The available European standards represent all four phases of the disaster management cycle, but the majority of the European standards represent the mitigation and preparedness phase.

The stakeholder group Industry/Commerce is well represented in all three of the researched TCs and Government is underrepresented. The majority of the European countries who are member of CEN are involved in one or more of the relevant TCs.

In Europe, from one side ETSI follows both ISO/IEC and ITU-T and has a liaison with CEN/CENELEC in the IT field. Standardisation activities on the European side is industry driven and has the same level of standardisation in mitigation and preparedness phases than ITU-T yet it goes further on cyber security and cloud services. From another side, CEPT/ECC creates recommendations for the IT sector yet it is not very active in the disaster resilience area.

## 2.5 National standardisation committees

### 2.5.1 Introduction

Every country has a national standardisation body. These national standardisation bodies (NSBs) are internationally united as members of ISO/IEC, while European countries are also united on European level as members of CEN/CENELEC. Most countries have separate bodies for electro technical and ICT standardisation.

The way NSBs are organised is a national matter; however membership to ISO/IEC and CEN/CENELEC does bring certain obligations regarding consensus based decision making within committees, voting procedures, etc. Usually, the NSB establishes national standardisation committees for specific areas. These committees can develop national standards, but also mirror and participate in CEN/CENELEC and ISO/IEC committees.

In order to get an understanding of national standardisation activities and the relationship to international standardisation, the following countries have been selected to further look into the national standardisation framework related to disaster resilience and crisis management: France, Germany, Italy, Sweden, United Kingdom, and United States. For methodology and selection of the countries, please see section 2.2.1.

Using the results from D2.1 as a basis, the secretaries of the relevant national standardisation bodies have been interviewed, and the following information is included to the extent that information was available and/or shared<sup>38</sup>:

- Structure of national standardisation committees
- Stakeholder involvement
- National standards in the area of disaster resilience
- Other relevant national initiatives in the area of disaster resilience
- Future of standardisation in disaster resilience

Regarding the national standards, only standards that are developed nationally have been included here (not the International and European adopted standards).

### 2.5.2 France

AFNOR (Association Française de Normalisation) is the national standardisation institute in France. Within AFNOR there is one national standardisation committee dealing with standardisation activities in the area of disaster resilience and crisis management. AFNOR has published two relevant national documents.

#### Structure of national standardisation committee

Standardisation activities related to disaster resilience are carried out by the national standardisation committee for security and resilience (*AFNOR CN Sécurité et Résilience*). This committee mirrors and participates in the work of the following European and international TCs:

- CEN/TC 391 Societal and citizen security
- CEN/TC 439 Private security services
- ISO/TC 292 Security and Resilience

As can be seen in Figure 1, the committee mirrors the international and European work in the following working groups:

- Working group on Resilience
- Working group on Emergency management (including crisis management)
- Working group on CBRNE
- Working group on Fraud and Antifraud
- Working group on Video protection (note: this is the only working group not following the work of the above mentioned TCs, but work of other TCs in the area of video protection)
- Working group on Private Security

Notes on the working groups of AFNOR that are relevant for disaster resilience:

- Figure 1 still shows a working group on 'Resilience and Emergency Management'. However, due to the large work programmes, the work has been split into two working groups, being 'Resilience' and 'Emergency management'.
- The working group on CBRNE has recently been reactivated.
- Within the working group on Private Security, a subgroup on security management has been created. This topic is not on international level yet, but as it was found to be an important topic, the subgroup was created to first gather the national viewpoint. It is expected that this work will be put forward to ISO in the near future.

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<sup>38</sup> The study on the German national standardisation committees is more extensive than the other studies as DIN is partner in the ResiStand Project, and therefore has more information accessible. The study on US is less extensive as no response was given to the survey or the interview request. No information could therefore be obtained with regard to US standardisation committees and stakeholder involvement.

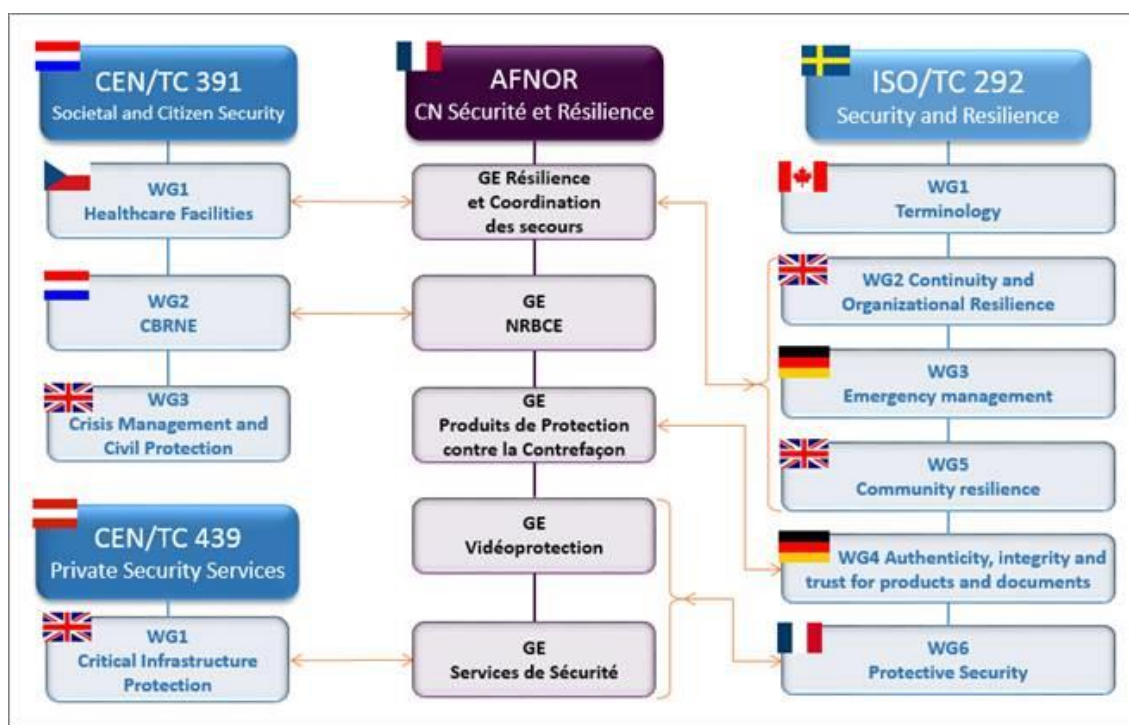


Figure 1: National standardisation committee France - Structure and international relations<sup>39</sup>

### Stakeholder involvement

There is a high interest in the work of the French standardisation committee and the international work in the field of disaster resilience. The committee has 106 members registered, that are interested in being informed. However, when looking at active members and the show-up to meetings, there are around 20 persons that are active in the standardisation development.

Looking at the members, the largest stakeholder group is governmental organisations, mostly represented by Ministries. A large number of ministries and departments are involved. The chairperson of this mirror committee is also from this stakeholder group, i.e. from the French Ministry of Interior. The second largest stakeholder group is Industry, including big manufacturers. Next to these, academics/researchers, SMEs and consultancies are also represented.

In the French mirror committee there is a good representation from the market; however it is a challenge to get all the stakeholders at the table. There are two reasons, which are general challenges in standardisation, which is that standardisation is often not part of a business strategy and the lack of funding to participate in standardisation. This results in a challenge to involve actual experts to standardisation. Additionally, when it comes to traveling to international meetings, another funding challenge arises.

In general, the committee consists of a balanced set of stakeholders. French experts participate actively in the CEN and ISO committees mentioned above. Furthermore, France also holds the international secretariat for ISO/TC 292 WG 6 Protective Security.

<sup>39</sup> <http://norminfo.afnor.org/structure/58203#presentation>

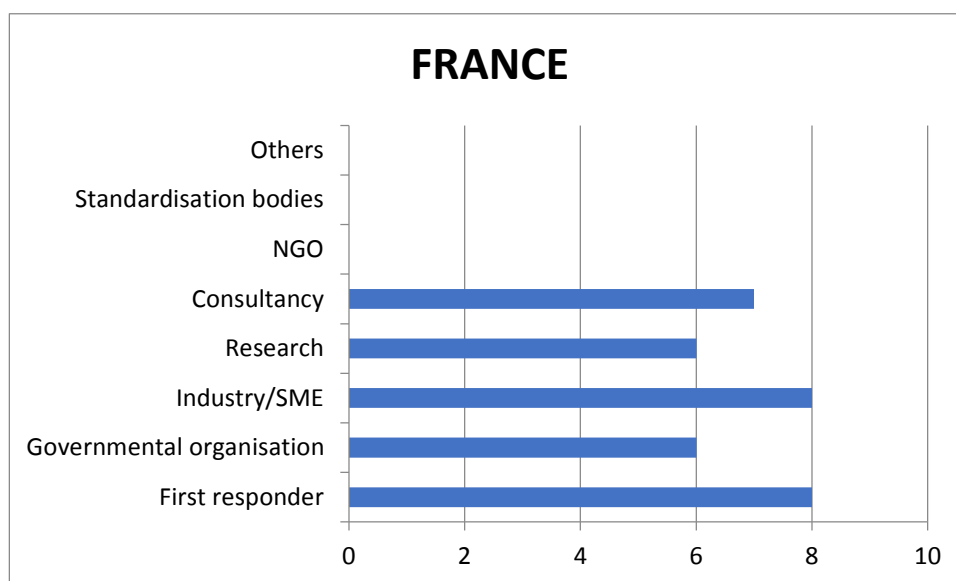


Figure 2: National standardisation committee – Distribution of stakeholder groups - France

### National standards

AFNORs policy is to focus on the adoption of international and European standards. Documentations are then translated in French. These translations are very important for the dissemination in France, but also for other French-speaking countries (e.g. countries in Africa).

AFNOR has published two relevant national documents: one national standard and one best practice on Business Continuity Planning. Both documents cover all the phases of the disaster management cycle, except the mitigation phase.

Table 53: France – Relevant national standards

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
BP Z74-700	Plan de Continuité d'Activité (PCA) (English : Business Continuity Plan (BCP))	AFNOR CN Sécurité et Resilience	Published	x	x	x	x
FD X 50-259	Management du risque — Plan de continuité d'activité (PCA) — Démarche de mise en place et de maintien (English : Risk management — Business continuity plan — Implementation and maintenance procedure)	AFNOR CN Sécurité et Resilience	Published	x	x	x	x
Sum				2	2	2	2

### Other national initiatives

The study did not identify other national initiatives in the area of disaster resilience.

### Future of standardisation in disaster resilience

Disaster resilience and crisis management are very important topics. This is also reflected by the sequence in the creation of the working groups; the very first group created under the national standardisation committee is the one on 'resilience' as this is the main topic of the committee. The working groups that were later established all show a strong relation to the topic of resilience.

It will be important to develop standards that are easier to implement for this group as one of the problems is the implementation of standards in the area of disaster resilience (e.g. ISO 22301 and 22313), especially for SMEs.

### 2.5.3 Germany

DIN (Deutsches Institut für Normung) is the national standardisation institute in Germany. Within DIN there are several national standardisation committees dealing with standardisation activities in the area of disaster resilience and crisis management. DIN has published 15 relevant national documents.

#### Structure of national standardisation committees

With regard to civil and societal security the steering committees *NA 031-05 FBR 'Steering Committee of the Section Societal Security'* and the *'Coordination Committee Coordination Office for Civil Security'* have a more strategic view on the topics with a stronger market focus. The more operative and recently established committees *NA 031-05 FBR-01 SO 'Coordination of mirror work of ISO/TC 292'*, *NA 031-05-01 AA 'Technical Standards for Societal Security'* and *NA 031-05-02 AA 'Organisational and Supervising Standards for Civil Protection'* are mirroring the European and international committees CEN/TC 391 'Societal and citizen security' and ISO/TC 292 'Security and resilience' (incl. all Working Groups).

Other relevant national standardisation committees are:

- The *Firefighting and Fire Protection Standards Committee (FNFV)* has its roots back to the year 1920 and carries out the standardisation work required in its domain on the national, European and International level. Its activities include the standardisation within the fields of fire protection, disaster control, preventive fire protection, technical support and crisis management. There are three different committees within the FNFV that are dealing with the topic of disaster resilience and crisis management: *NA 031-02 FBR 'Section Committee Fire Detection and Fire Alarm Systems'*, *NA 031-03 FBR 'Section Committee Fixed Firefighting Systems'* and *NA 031-05 FB 'Section Societal Security'*.
- The committee *NA 031-03 FBR 'Section Committee Fixed Firefighting Systems'* handles more technical issues and mirrors the CEN/TC 191 'Fixed firefighting systems' and 'ISO/TC 21 'Equipment for fire protection and fire fighting'. *NA 031-02 FBR 'Section Committee Fire Detection and Fire Alarm Systems'* is the committee dealing with systems for alarming or alerting. It mirrors the standardisation activities of the CEN/TC 72 'Fire detection and fire alarm systems'.
- Additionally and to align the several activities of the FNFV and the below mentioned national committees DIN established in 2010 with the support of the Federal Ministry for Economic Affairs and Energy (BMWi) the coordination office for civil security to coordinate the cooperation of any interested party participating in standardisation in the field of security.
- The *DIN Standards Committee Services (NADL)* is responsible for professional support of topics in the field of business-related services and individual-related services within the framework of national, European and international standardisation. It has two working groups which need to be mentioned. The committee *NA 159-01-02 AA 'Private security services'* is mirroring the corresponding European committee CEN/TC 439 'Private Security services'. The *NA 159-01-16 GA NADL/DKE 'Services for fire safety and security systems'* mirrors the CEN/CENELEC/TC 4 'Services for fire safety and security systems'. The latter one is a joint working group with the DKE, the responsible organisation in Germany for electrotechnical standardisation.
- With regard to IT-Security and privacy aspects the *DIN Standards Committee 'Information Technology and selected IT Applications' (NIA)* is another national committee handling topics of disaster resilience and crisis management. The two relevant committees within NIA are the *NA 043-01-27 AA 'IT Security Techniques'* that mirrors the work of ISO/IEC JTC 1/SC 27 'IT security techniques' and the *NA 043-01-27-05 AK 'Identity management and privacy technologies'* that mirrors CEN/CENELEC/JWG 8 'Privacy management in products and services'.
- The DIN Standards Committee for Organizational Processes (NAOrg) is responsible for standardisation in the field of organisational processes including management system standards at national, European and international level. In this regard the committee *NA 175-00-04 AA 'Risk management principles'* that mirrors the ISO/TC 262 'Risk management' needs to be mentioned.
- The national committee handling the topic of security of drinking water is placed within the *DIN Standards Committee Water Practice (NAW)*. Its committee *NA 119-07-02 AA 'Service activities and*

*management relating to drinking water supply systems and wastewater systems'* mirrors the corresponding European and international activities within CEN/TC 164/WG 15 'Security of drinking water supply' and ISO/TC 224/WG 7 'Crisis management of water utilities'.

- As alarming and surveillance systems are more electrotechnical topics the corresponding standardisation activities are taking place within the DKE, especially within *DKE/UK 713.1 'Alarm and monitoring systems'* and its subcommittees that mirror European and international standardisation committees such as CENELEC/SR 79 'Alarm systems'; CENELEC/TC 79 'Alarm systems'; IEC/TC 79 'Alarm and electronic security systems'.

### Stakeholder involvement

Over 200 members participate in the standardisation committees mentioned above. They represent a variety of stakeholders. The majority of the members represent industry, but other stakeholder types participate very actively as well. All stakeholder groups are in general quite well represented. On some topics related to civil and societal security representatives from governmental organisation are missing when it comes to product standardisation and industry representatives when process standardisation is taking place. Figure 3 is summarizing the distribution of stakeholders in German Technical Committees.

The relatively high involvement of stakeholders in German Technical Committees is based on a continuously exchange with the experts and on some funding by the German government for firefighter participation within specific topics.

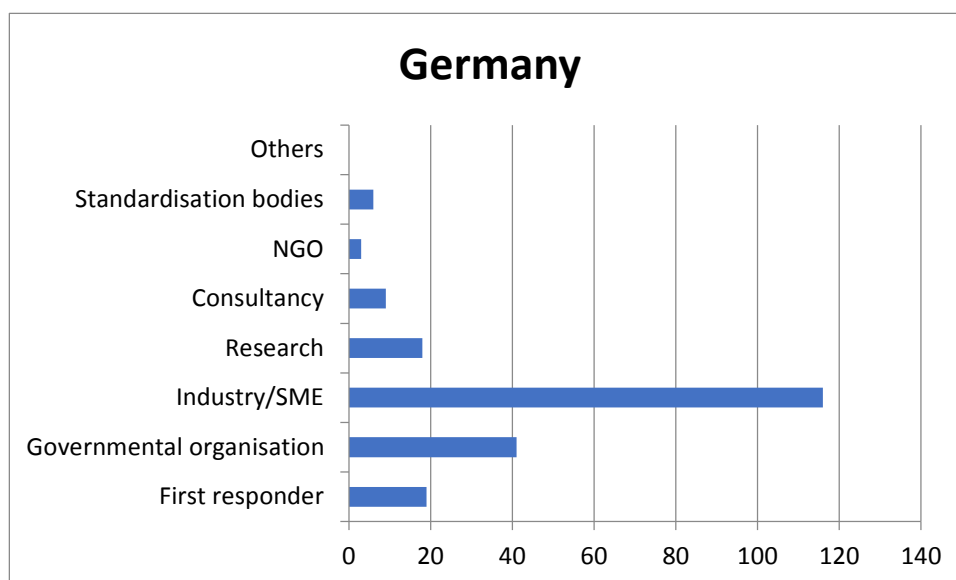


Figure 3: National standardisation committee – Distribution of stakeholder groups - Germany

### National standards

Table 54 displays the standards related to disaster resilience developed in Germany. Most of the identified standards are related to the preparedness phase, some are related to the mitigation and response phase and only two related to the recovery phase. Almost half of the identified standards have been developed throughout the framework of a national research project (see author is DIN SPEC (PAS, CWA)). Civil and societal security is still a young area of work for standardisation and thus only a few standards are available on national, as well as on European and international level. Apart from the national standards the German technical committees in the area of disaster resilience are mostly following the European and international standardisation activities and check their adoption possibilities.



Table 54: Germany - Relevant national standards

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
DIN 4063	Signs for civil defense	Firefighting and Fire Protection Standards Committee	Published		X	X	
DIN 77200	Static guarding and mobile patrol services - Requirements	Services Standards Committee	Published		X		
DIN SPEC 14660	Firefighting and fire protection - Personal protective devices 230 V/16 A and 400 V/16 A for rescue teams	Firefighting and Fire Protection Standards Committee	Published		X	X	
DIN SPEC 35220	Adaption to climate change - Projections on climate change and ways for handling uncertainties	DIN SPEC (PAS, CWA)	Published	X			
DIN SPEC 91282	Terminology for security management transport infrastructures	DIN SPEC (PAS, CWA)	Published		X	X	
DIN SPEC 91291	Emergency concept for the protection of sensitive logistics hubs - Configuration, simulation and implementation	DIN SPEC (PAS, CWA)	Published		X	X	
DIN SPEC 91296	Classification of threats to buildings by acts of terrorism	DIN SPEC (PAS, CWA)	Published	X	X		
DIN SPEC 91330	Terminology relating to events in pipeline- and cable-based infrastructures	DIN SPEC (PAS, CWA)	Published		X	X	X
DIN SPEC 91331	Classification of risks for international large-scale projects	DIN SPEC (PAS, CWA)	Published	X			
DIN VDE V 0827-1	Emergency und danger systems - Part 1: Emergency and danger response systems - Basic requirements, duties, responsibilities and activities	German Commission for Electrical, Electronic and Information Technologies of DIN and VDE	Published			X	
DIN VDE V 0827-2	Emergency and danger systems - Part 2: Emergency and danger	German Commission	Published			X	

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
	response systems - Additional requirements for Emergency- and Hazard-Intercom	for Electrical, Electronic and Information Technologies of DIN and VDE					
DVGW G 1001	Security of gas supply - Risk management of gas infrastructures under operational conditions	DVGW Deutscher Verein des Gas- und Wasserfaches e. V. - Technisch-wissenschaftlicher Verein	Published	X	X	X	
DVGW G 1002	Security in Gas Supply; Organisation and Management in Crisis	DVGW Deutscher Verein des Gas- und Wasserfaches e. V. - Technisch-wissenschaftlicher Verein	Published			X	X
VDE-AR-N 4140	Cascading of measures for the system security of electrical energy supply networks	Forum Netztechnik/ Netzbetrieb im VDE (FNN)	Published	X	X		
VDI 4055	Operational safety management	VDI Society Energy and Environment	Published		X		
Sum				5	10	9	2

### Other national initiatives

There are different national associations which are private or have governmental support. They are working mostly on White Papers, providing guidance on the civil and societal security issue and are often through cooperation directly represented in the operational and strategic German Technical Committees.

The following associations are relevant in the area of disaster resilience:

- VDI – Association of German engineers, who provides specifications on security for industrial handling as well as information and data security
- DFV – German Association of Firefighters, who focuses on processes and activities of firefighters in crisis situations

- ZVEI – German Electrical and Electronic Manufacturers Association, who works on different White Papers on Cyber Security, including certification
- THW – Federal Agency for Technical Relief, who is a governmental organisation and well presented in the relevant German Technical Committees on disaster resilience
- BDI – Federation of German Industries, who develops strategic papers on security and defense

Other standards developing organisations within Germany that are not formally integrated in the standardisation system of DIN and DKE are for example DVGW 'German Technical and Scientific Association for Gas and Water', VdS 'German association of damage insurers' and BSI 'Federal Office for Information Security'. Some of these organisation are also forwarding their standardisation activities into national standardisation, thus the German Technical Committees have exchanged with most of them or even have included them in their committees.

#### **Future of standardisation in disaster resilience**

On international level it will be important that the relevant standardisation committees take further into account initiatives dealing with civil and societal security such as UN activities and the SENDAI-Framework, and to foster a close cooperation where the topics cover each other. On European level the standardisation activities on disaster resilience will be influenced by possible standardisation requests from the European Commission.

In general, experts and people working on the security topics seek to work more closely together for fulfilling the objective of having a peaceful Europe and world.

Additionally it will be important that the European needs will be considered in international standards and that the standardisation process will be adjusted to meet the needs for interested experts.

#### ***2.5.4 Italy***

UNI (Ente Nazionale Italiano di Unificazione) is the national standardisation institute in Italy. Within UNI there is one national standardisation committee dealing with standardisation activities in the area of disaster resilience and crisis management. UNI has published one relevant national document.

#### **Structure of national standardisation committee**

Standardisation efforts regarding disaster resilience and crisis management are dealt with in one national committee: UNI/CT 043 'Security of society and citizen'. The scope of this committee includes standardisation within the fields of society and citizen protection. Fire detection systems and alarm systems are excluded.

The Italian committee is organized in working groups, of which most mirror European and international TCs:

- UNI/CT043/GL01 Working group 1 on Archetypal Work: this group mirrors ISO/PC 286 (Collaborative business relationship management Framework), CEN/TC 391 (Societal and Citizen Security ) and ISO/TC 292 (Security and resilience)
- UNI/CT 043/GL02 Working group 2 on Risk Management: this group mirrors ISO/TC 262 (Risk management)
- UNI/CT 043/GL 03 Working group 3 on Supply Chain Security: this group mirrors ISO/PC 278 (Anti-bribery management systems)
- UNI/CT043/GL04 Working group 4 on Mobility Security: this group mirrors ISO/TC 241 (Road traffic safety management systems)
- UNI/CT043/GL05 Working group 5 on Security Organization and Management: this group mirrors CEN/TC 431 (Service Chain for Social Care Alarms), CEN/TC 419 (Forensic Science Processes), CEN/TC 439 (Private Security services), ISO/TC 272 (Forensic sciences) and ISO/TC 278 (Anti-bribery Management Systems)
- UNI/CT043/GL06 Working group 6 on Disaster Manager: this group does not mirror international committees
- UNI/CT043/GL 07 Working group 7 on Security in Beaches: this group is a national group and does not mirror any international work

#### **Stakeholder involvement**

A total of 78 members participate in UNI/CT 043. They represent a variety of stakeholders and the majority of the members represent industry/SME, but other and consultancy stakeholder types participate very actively as well. All stakeholder groups are represented; however NGOs, governmental organisations and first

responders are not represented by a large number. Figure 4 summarises the distribution of stakeholders in the Italian national standardisation committee.



Figure 4: National standardisation committee – Distribution of stakeholder groups - Italy

### National standards

UNI/CT 043/GL06 developed a standard defining the competences of a disaster manager professional. It was developed after the Italian law 4/2013 was issued, that required all unregulated professions to have the skills and competences defined that are obtained through non-formal learning. As the competences for the disaster manager professional were not captured, the Department of Civil Protection requested UNI to develop a standard defining the competences. This standard was developed and is maintained in working group 6.

Table 55: Italy - Relevant national standards

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
UNI 11656:2016	Attività professionali non regolamentate - Professionista della Protezione Civile (Disaster Manager) - Requisiti di conoscenza, abilità e competenza (English: Unregulated Professional Activities - Disaster Manager Professional - Requirements for Knowledge, Skills and Competence)	UNI/CT 043	Published		X		
Sum					1		

### Other national initiatives

The study did not identify other national initiatives in the area of disaster resilience.

### Future of standardisation in disaster resilience

UNI 11656:2016 on the competences of the disaster manager is recently published in Italy. The national committee is considering whether this standard is suitable to be put forward for further development on European or international level.

### 2.5.5 Sweden

SIS (Swedish Standards Institute) is the national standardisation institute in Sweden. Within SIS there is one national standardisation committee dealing with standardisation activities in the area of disaster resilience and crisis management. SIS has no relevant national documents. In addition, SIS holds the secretariat of ISO/TC 292 'Security and Resilience'.

#### **Structure of national standardisation committee**

The Swedish standardisation committee for security and resilience standardisation is SIS/TK 494 Social Security (Samhällssäkerhet)<sup>40</sup>. This committee mirrors six international ISO/CEN committees:

- CEN/TC 391, Societal and Citizen Security
- CEN/TC 439, Private security services
- ISO/TC 262, Risk management
- ISO/TC 262/WG 2, Core risk management standards
- ISO/TC 292, Security
- ISO/TC 292/AHG 1, Communication group

The Swedish committee is organized in the following working groups:

- SIS/TK 494/AG 03 Management and collaboration
- SIS/TK 494/AG 04 Crisis preparation and continuity planning
- SIS/TK 494/AG 05 Risk management
- SIS/TK 494/AG 06 Security Services

#### **Stakeholder involvement**

Stakeholders represented in the national SIS/TK 494 committee are mostly representing governmental organisations and consulting firms. There is a need to have representatives from the private sector more involved in the national committee. Members from the national committee are also participating in international and European TCs. These stakeholders are mostly representing governmental organisations. The motivation for them to participate in international work is that the national committee has an interest in affecting how standards are developed.

#### **National standards**

No Swedish national standards in the area of disaster resilience have been developed.

#### **Other national initiatives**

Crisis management at the Government Offices of Sweden is based on a joint cross-sector approach. Every government office is responsible for planning and handling crises within its own area of responsibility. Every government agency is responsible for civil emergency planning (CEP) in its own area of expertise, and the Swedish Civil Contingencies Agency (MSB) has the task of coordinating the various stakeholders. The Swedish structure for CEP is coordinated by the MSB, and the entire spectrum of threats and risks, from everyday accidents up to major disasters is included. All Swedish authorities are obliged to carry out risk and vulnerability analyses in their own areas in an effort to strengthen their own, and Sweden's overall emergency management capacity.

#### **Future of standardisation in disaster resilience**

The national mirror committee SIS/TK 494 has an interest in affecting how standards are developed, and the work programme of the committee is to review new standards and to publish standards in Swedish. Until September 2016, 16 standards have been adopted from international standards and published as Swedish standards, translated into Swedish.

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<sup>40</sup> [http://www.sis.se/en/Administration/ProduktSidor/Teknisk-kommitte-produkt/?pid=TC-179767&icslvl1=SIS\\_COMMON\\_04&canonical=/en/management-system/societal-security/sis-tk-494](http://www.sis.se/en/Administration/ProduktSidor/Teknisk-kommitte-produkt/?pid=TC-179767&icslvl1=SIS_COMMON_04&canonical=/en/management-system/societal-security/sis-tk-494)

### 2.5.6 United Kingdom

BSI (British Standards Institute) is the national standardisation institute in the United Kingdom (UK). Within BSI there is one national standardisation committee dealing with standardisation activities in the area of disaster resilience and crisis management. BSI has published nine relevant national documents and currently has one under development.

#### Structure of national standardisation committee

Standardisation related to disaster resilience and crisis management is dealt with in the national standardisation committee *SSM/1 Societal Security Management*. This committee mirrors all activities carried out by ISO/TC 292 Security and Resilience and CEN/TC 391 Societal and Citizen Security, and develops national standards on related subjects. The committee currently manages 11 subcommittees, all responsible for one main subject<sup>41</sup>:

- CBRNE – Chemical, Biological, Radiological, Nuclear & Explosive
- Crisis Management
- Crisis Management drafting panel
- Emergency Preparedness
- Exercising and Testing
- Fraud
- Humanitarian Aid and Disaster Relief Investigation Group
- Joint CCTV Panel
- Public Preparedness
- Resilience
- Societal Technologies

Each of these subcommittees, except for the crisis management drafting panel, mirrors one or multiple working groups under CEN/TC 391 and ISO/TC 292. The crisis management drafting panel is responsible for the drafting of a national standard on crisis management. Depending on stakeholder needs, new subcommittees can be established or subcommittees which are considered no longer relevant can be disbanded.

#### Stakeholder involvement

The SSM/1 committee currently consists of 22 members, from a variety of backgrounds. They include among others first responders, research, industry and consultancy.

Figure 5 contains the sum of the numbers of specific stakeholder types in SSM/1 and all its subcommittees. All stakeholder types are represented, although research organisations are represented most. At BSI, participation in standardisation is free for the experts and funding is available for travel expenses in order to participate in CEN or ISO Technical Committee meetings. Additionally, people involved in standardisation in the UK are highly open for and supporting debates, especially on the topic of disaster resilience.

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<sup>41</sup> See <https://standardsdevelopment.bsigroup.com/Home/Committee/50155025> - the detailed information on each subcommittee was not available.

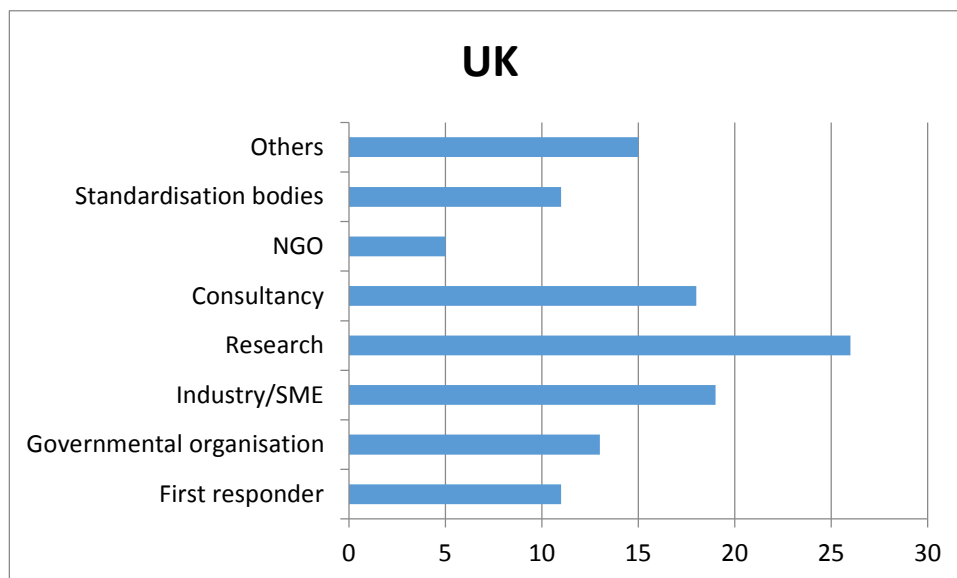


Figure 5: National standardisation committee – Distribution of stakeholder groups - UK

### National standards

The national committee develops national standards and participates actively in international standardisation. For some subjects, including business continuity management and crisis management, national standards were developed in the past. These standards were, once accepted and implemented by a wide range of stakeholders both within and outside of the UK, introduced within CEN or ISO committees, to be developed into European or international standards. This means that some of the main European and international standards in the security area derive from UK national standards.

Table 56 displays the standards related to disaster resilience developed in the UK. Most of the standards developed in the UK and related to disaster resilience are process standards, especially management and organisational standards.

Table 56: UK - Relevant national standards

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
BIP 2217:2011	Business continuity management for small and medium sized enterprises. How to survive a major disaster or failure	ZBIP/5	Published		x		x
BIP 2034:2008	Disaster and emergency management systems	ZBIP/5	Published		x	x	
BS 11200:2014	Crisis management. Guidance and good practice	SSM/1	Published	x	x	x	
BIP 2185:2012	Business continuity communications. Successful incident communication planning with ISO 22301	ZBIP/5	Published	x		x	
BS 12999:2015	Damage management. Code of practice for the organization and	CAR/1/-/6	Published	x	x	x	

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
	management of the stabilization, mitigation and restoration of properties, contents, facilities and assets following incident damage						
BS 10175:2011+A 1:2013	Investigation of potentially contaminated sites. Code of practice	EH/4	Published	x		x	
BS 7982:2001	Guidance on the environmental impact of large-scale fires involving plastics materials	PRI/26	Published				x
BS 65000:2014	Guidance on organizational resilience	SSM/1/6	Published	x	x	x	x
PAS 2015:2010	Framework for health services resilience		Published	x	x	x	x
16/30342526 DC	BS 31111. Cyber risk and resilience. Guide	RM/1	Under development	x	x	x	x
Sum				7	7	8	5

### Other national initiatives

Several organisations are also developing informal standards and occasionally they bring their input directly to the British national standardisation committees. Examples of these organisations are:

- Business Continuity Institute (BCI) - gives guidance and support on continuity
- Institute of Risk Management (IRM) - recognises qualifications and training, publish research and guidance and sets informal standards

### Future of standardisation in disaster resilience

The focus on standardisation in the field of crisis management and disaster resilience is currently on international level, but European standardisation on disaster resilience should be moved forward. Upcoming opportunities coming from e.g. standardisation requests of the European Commission, such as M/487, should be more exploited.

Challenges for standardisation in the future is the attraction of experts and their continuously involvement in the standardisation work, also beyond one specific topic or time period.

### **2.5.7 United States**

#### US standardisation institutes

ANSI (American National Standards Institute) is one of the national standardisation institutes in the United States (US). ANSI is the official ISO member and mirrors the ISO work.

The organisation which supports ANSI by developing disaster resilience relevant standards is the American Society for Industrial Security (ASIS). ASIS International is an organisation for security professionals. The work of preparing standards and guidelines is carried out through the ASIS standards and guidelines committees (SGC) and governed by the commission on standards and guidelines (CSG). ASIS International serves as the ANSI US technical advisory group administrator to ISO/TC 292 on security and resilience.

Other national standardisation institutes in US that develop standards in the area of disaster resilience and crisis management are American Society for Testing and Materials (ASTM), American Water Works Association (AWWA), and Electronic Industries Alliance (EIA).



**Stakeholder involvement**

In general, no information on the stakeholder involvement could be identified. Information regarding stakeholder participation in USA standardisation committees is not publicly available. In addition no response to the survey or the interview request was received and therefore the stakeholder involvement could not be analysed for this study.

**National standards**

There 34 standards of different SDO are related to disaster resilience and crisis management. In Annex 9 national CBRN related standards are listed. These are basically produced by the ASTM and IEEE. A few are produced by the NFPA.

Table 57: US - Relevant national standards

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
ANSI/APCO/NENA 1.105.2	Standard for Telecommunicator Emergency Response Taskforce (TERT) Deployment	ANSI	published		x	x	
ANSI/APCO/NPSTC 1.104.1	Standard Channel Nomenclature for the Public Safety Interoperability Channels	ANSI	published	x	x	x	
ANSI/ASCE/EWRI 56	Guidelines for the Physical Security of Water Utilities	ANSI	published	x	x		
ANSI/ASIS SPC.2	Auditing Management Systems - Risk, Resilience, Security and Continuity - Guidance for Application	ANSI	published	x	x		
ANSI/ASSE A 10.26	Emergency Procedures for Construction and Demolition Sites	ANSI	published	x	x		
ANSI/ASTM E 1546	Guide for Development of Fire-Hazard-Assessment Standards	ANSI	published	x	x		
ANSI/ATIS 0500002	Emergency Services Messaging Interface (ESMI)	ANSI	published		x		
ANSI N 42.26	Radiation Protection Instrumentation - Monitoring Equipment - Personal Warning Devices for X and Gamma Radiations	ANSI	published		x		
ANSI/NFPA 424	Guide for Airport/Community Emergency Planning	ANSI	published		x		
ANSI/NFPA 1600	Standard on Disaster/Emergency Management and Business Continuity Programs	ANSI	published	x	x		

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
ASTM E 2413	Standard Guide for Hospital Preparedness and Response	ASTM	published		x		
ASTM E 2541	Standard Guide for Stakeholder-Focused, Consensus-Based Disaster Restoration Process for Contaminated Assets	ASTM	published		x		
ASTM E 2640	Standard Guide for Resource Management in Emergency Management and Homeland Security	ASTM	published		x	x	
ASTM E 2653	Standard Practice for Conducting an Interlaboratory Study to Determine Precision Estimates for a Fire Test Method with Fewer Than Six Participating Laboratories	ASTM	published		x		
ASTM E 2668	Standard Guide for Emergency Operations Center (EOC) Development	ASTM	published		x		
ASTM E 2915	Standard Guide for Emergency Operations Center (EOC) Management	ASTM	published		x		
ASTM F 2685	Standard Guide for Training of a Land Search Team Leader (STL)	ASTM	published		x		
ASTM F 2751	Standard Guide for Training of a Land Search and Rescue Team Member	ASTM	published	x	x		
AWWA G 440	Emergency Preparedness Practices	WWA <sup>42</sup>	published				
EIA/TIA-1196	Multimedia Priority Service (MMPS) for MMD-based Networks-Stage 1 Requirements	EIA <sup>43</sup>	published	x	x	x	
EIA JESD 246	Customer Notification Process for Disasters	EIA	published	x	x		

<sup>42</sup> AWWA: American Water Works Association

<sup>43</sup> EIA: Electronic Industries Alliance

Document No.	Title	Author	Status	Mitigation	Preparedness	Response	Recovery
NFPA 1600	Standard on Disaster/Emergency Management and Business Continuity/Continuity of Operations Programs	National Fire Protection Association	published			x	
Sum				9	20	5	0

### Future of standardisation in disaster resilience

USA develops a high number of national standards in the field of crisis management and disaster resilience. The accreditation procedure by ANSI ensures the developer meet the requirements for openness, balance, consensus and due process.

#### **2.5.8 Summary**

The investigated national standardisation bodies approach standardisation in the area of disaster resilience in a similar way, but there are some differences. There is one main committee that mirrors the work of both CEN/TC 391 and ISO/TC 292, but some of these committees are also mirroring work from other international or European TCs. Various stakeholder groups are represented in national standardisation committees, but more (and active) participation of stakeholders is still looked-for.

The investigated national standardisation committees mostly adopt international and European standards. Some countries, such as France and Sweden, translate these standards into their native language as this is crucial for the uptake of the standard. With the exception of Sweden, the other ones have also developed national standards.

With regard to other national initiatives, few national initiatives are known by the national standardisation bodies, but some initiatives have been mentioned on national level.

The importance of further development of disaster resilience related standardisation is mentioned, especially the European needs in standards as well as the European Commission, which may encourage standardisation in this area by standardisation requests for example.

## **2.6 Analysis**

### **2.6.1 International standardisation committees**

#### International standards

The international field of TCs with a relationship to disaster resilience can be seen as very concise. This is probably the result of the decision ISO has taken a couple of years ago to cluster all Security and Resilience related TCs into one new TC (ISO/TC 292).

From Table 58 it can be concluded that the majority of the International (IT) standards developed in the field of disaster resilience are in the Mitigation and the Preparedness phase of the disaster management cycle. For IT this is due to the nature of IT activities and technologies since they are related to critical infrastructure and maintenance. And even though there is still a fair amount of International (IT) standards are classified as part of the Response phase there are hardly any standards classified as part of the Recovery phase. The IT side related to the response and recovery phases fall into supportive activities and technologies mainly in communications, therefore the number of standards in these phases is not quite extensive.

Table 58: Overview of relevant international TCs - Number of standards in the disaster management phases

TC#	Title	Mitigation	Preparedness	Response	Recovery
ISO/TC 224	Service activities relating to drinking water supply systems and wastewater systems - Quality criteria of the service and performance indicators	0	4	0	0
ISO/TC 262	Risk management	6	1	1	0
ISO/TC 292	Security and resilience	24	19	14	3
ISO/IEC JTC 1/SC 27	IT security techniques	19	15	2	1
ITU T-FG-DR&NRR	Focus Group on Disaster Relief Systems, Network Resilience and Recovery	23	19	7	2
Sum		72	58	24	6

The extensive analysis of the identified international standards can be found in Annex 10 and Annex 11. Below the standards are analysed by task per disaster management phase.

#### *International standards in mitigation phase*

When looking at the mitigation phase we can conclude that standards are available for all tasks related to this phase. But the majority of the standards, both International and International IT standards, are developed for the Risk assessment and Exposure reduction task. A difference can be seen for the monitoring and review task where far more International IT standards are available than International standards.

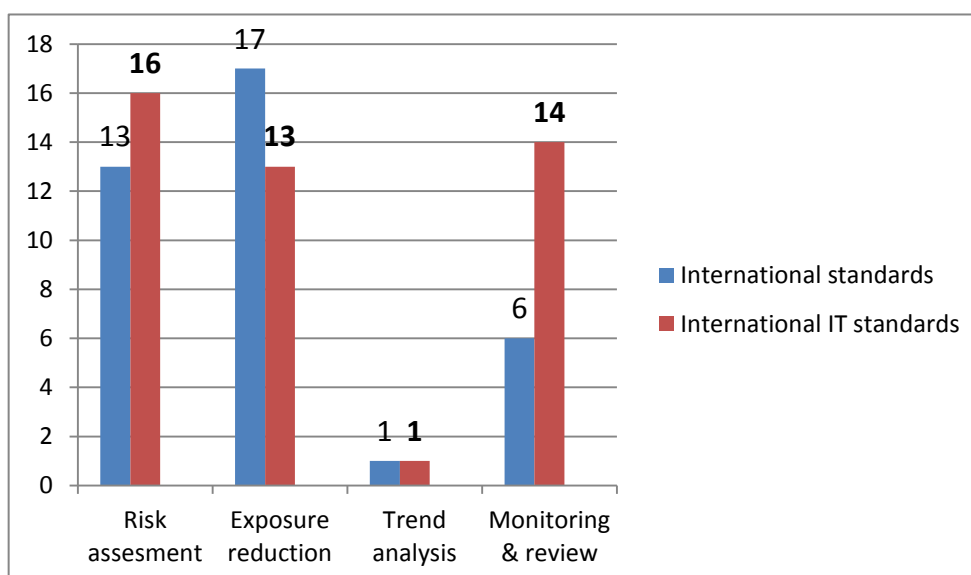


Figure 6: International standards - Categorisation of tasks in the mitigation phase

#### *International standards in preparedness phase*

In the preparedness phase the majority of the standards are developed for the capacity development and the asset management tasks. But it is interesting to see that for capacity management (almost) all standards

are International standards, while for asset management (almost) all standards are International IT standards.

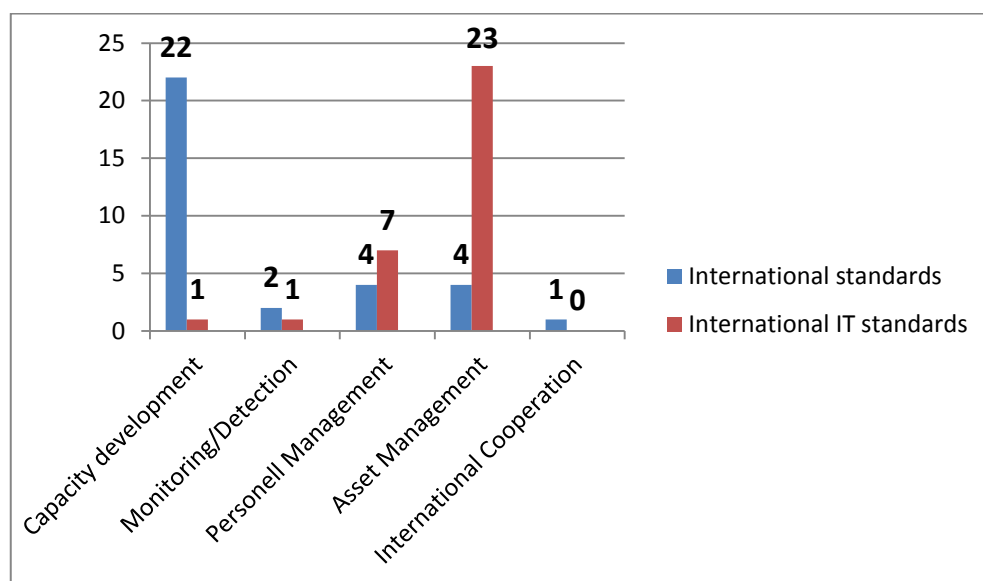


Figure 7: International standards - Categorisation of tasks in the preparedness phase

#### *International standards in response phase*

Even though standards exist for all tasks within the Response phase, there are two tasks that have relatively more standards than the other tasks; Warning/Crisis communication and Control and Coordination. The majority of the standards in this phase are International standards and for the majority of the tasks in this phase no International IT standards exist.

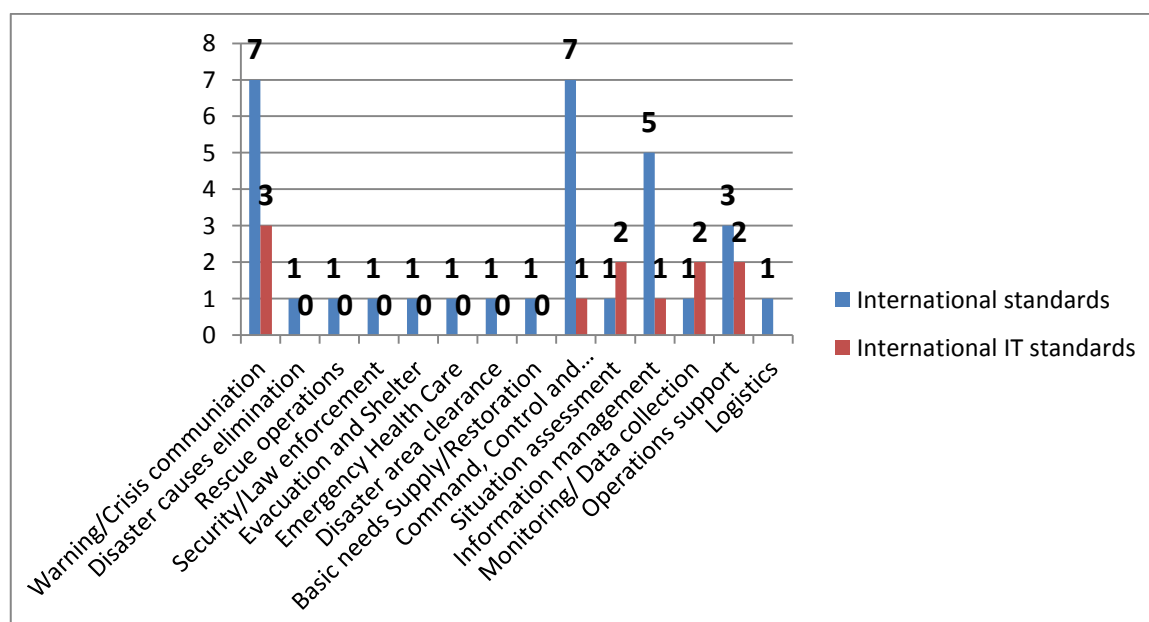


Figure 8: International standards - Categorisation of tasks in the response phase

*International standards in recovery phase*

As was mentioned earlier there are not many International standards and International IT standards developed within the Recovery phase. But the ones that are developed are mainly related to the Re-establishment infrastructure and Establishment of recovery organisation structure.

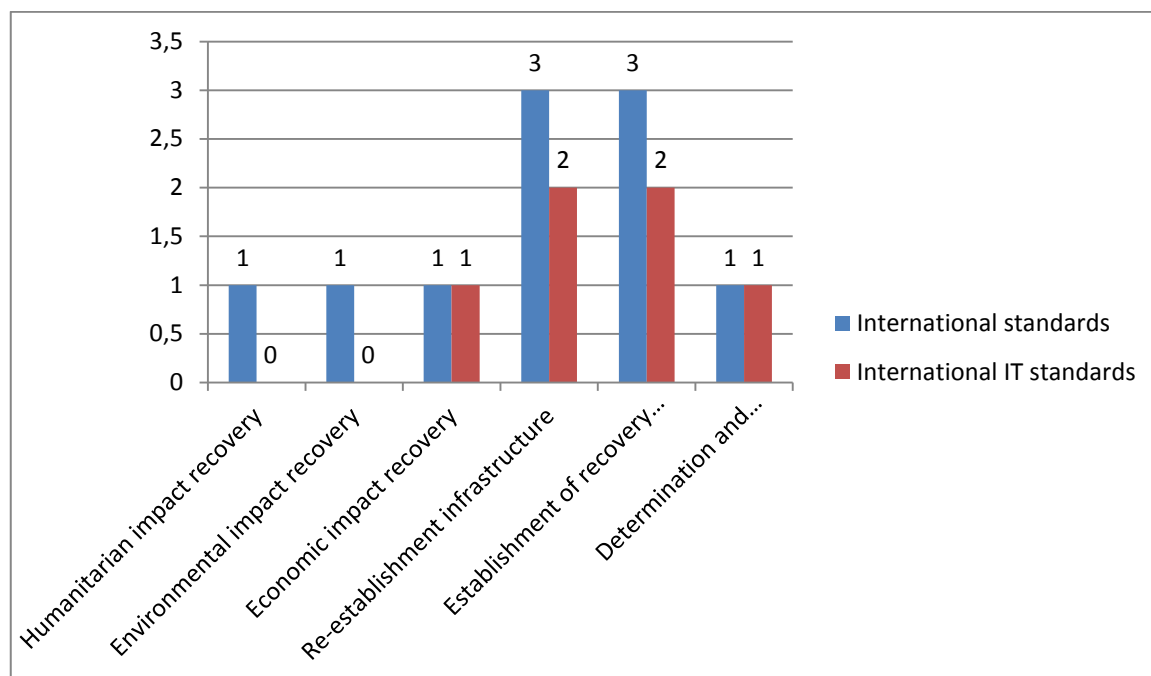


Figure 9: International standards - Categorisation of tasks in the recovery phase

**Stakeholder involvement**

A total of 73 countries are active within one or more of the International TCs. With 26 of those countries active in all four of the International TCs which were identified as most relevant.

Table 59: Overview of relevant international TCs - Countries and participation in TCs

Country	ISO/TC 292	ISO/TC 262	ISO/TC 224	ISO/IEC JTC1/SC 27
Sweden	Yes	Yes	No	Yes
France	Yes	Yes	Yes	Yes
Germany	Yes	Yes	Yes	Yes
Ireland	Yes	Yes	Yes	Yes
United Kingdom	Yes	Yes	Yes	Yes
Spain	Yes	Yes	Yes	Yes
Poland	No	Yes	No	Yes
Switzerland	Yes	Yes	Yes	Yes
Denmark	Yes	No	No	Yes
Hungary	No	Yes	No	No
Finland	Yes	Yes	Yes	Yes
Belgium	Yes	Yes	No	Yes

Country	ISO/TC 292	ISO/TC 262	ISO/TC 224	ISO/IEC JTC1/SC 27
Austria	Yes	Yes	Yes	Yes
Bulgaria	No	Yes	Yes	No
Italy	Yes	Yes	No	Yes
Romania	Yes	No	No	Yes
Czech Republic	No	Yes	Yes	Yes
Netherlands	Yes	Yes	Yes	Yes
Slovenia	Yes	No	No	No
Portugal	Yes	Yes	Yes	Yes
Turkey	No	Yes	Yes	No
Slovakia	Yes	Yes	Yes	Yes
Norway	Yes	Yes	No	Yes
Serbia	Yes	No	No	No
Canada	Yes	Yes	Yes	Yes
United States	Yes	Yes	Yes	Yes
Australia	Yes	Yes	Yes	Yes
Korea, Republic of	Yes	No	Yes	Yes
South Africa	Yes	Yes	Yes	Yes
Panama	Yes	Yes	No	Yes
Indonesia	Yes	Yes	Yes	No
Japan	Yes	Yes	Yes	Yes
Russian Federation	Yes	Yes	Yes	Yes
Mexico	Yes	Yes	Yes	Yes
Singapore	Yes	Yes	Yes	Yes
China	Yes	Yes	Yes	Yes
Chile	Yes	Yes	No	Yes
Colombia	Yes	Yes	No	No
United Arab Emirates	Yes	No	Yes	Yes
Trinidad and Tobago	Yes	No	No	No
Mauritius	Yes	No	No	Yes
Nigeria	Yes	No	Yes	No
Israel	Yes	No	Yes	Yes
Argentina	Yes	Yes	Yes	Yes
Haiti	Yes	No	No	No
Kenya	Yes	No	Yes	Yes
Thailand	Yes	Yes	No	No
Morocco	Yes	Yes	Yes	No

Country	ISO/TC 292	ISO/TC 262	ISO/TC 224	ISO/IEC JTC1/SC 27
Ukraine	Yes	No	No	Yes
Brazil	No	Yes	No	Yes
Peru	No	Yes	No	Yes
Jordan	No	Yes	No	No
Malaysia	No	Yes	Yes	Yes
Iran, Islamic Republic of	No	Yes	No	No
Luxembourg	No	Yes	No	Yes
New Zealand	No	Yes	No	Yes
Sri Lanka	No	Yes	No	Yes
Egypt	No	Yes	No	No
Zimbabwe	No	Yes	No	No
Armenia	No	Yes	No	No
India	No	Yes	Yes	Yes
Palestine, State of	No	Yes	No	No
Zambia	No	No	Yes	No
Tunisia	No	No	Yes	No
Cuba	No	No	Yes	No
Algeria	No	No	No	Yes
Cyprus	No	No	No	Yes
Uruguay	No	No	No	Yes
Côte d'Ivoire	No	No	No	Yes
The Former Yugoslav Republic of Macedonia	No	No	No	Yes
Kazakhstan	No	No	No	Yes
Lebanon	No	No	No	Yes
Rwanda	No	No	No	Yes

The collected data shows that all stakeholder categories are represented in the International TCs.

In most of the International TCs, the stakeholder category 'Industry' is most strongly represented, while 'NGOs' are in general underrepresented.

One of the reasons for this is the available resources. While industry will fund the international participation themselves, other stakeholder groups often lack the resources to participate internationally. For the UK, this is less of a problem as there usually is funding available for traveling. This way, they are able to bring various stakeholder groups to the international meetings. In France, the governmental organisations are able to fund some traveling, making it easier to participate internationally. In Germany the active participation of first responders is remarkable; one of the reasons for this is the available funding from the government for fire-fighters to participate.



Table 60: Overview of relevant international TCs - Stakeholder types in TCs

Stakeholder Type	ISO/TC 292	ISO/TC 262	ISO/TC 224
Academic & Research	64	3	17
Governmental organisation	84	19	21
Industry & Commerce	218	60	118
NGO	21	6	5
Other	21	3	1
Standardisation Body	37	4	20

## 2.6.2 European standardisation committees

### European standards

In the European standardisation field there are quite a lot of TCs which focus on, or are related to disaster resilience. On a first glance all of these TCs seemed to have a relation to the ResiStand project. However further analysis proved that even though the scope of some of these TCs were related to disaster resilience the standards they are producing are not of relevance to the project. Therefore the research for this project only focused on those TCs that has published and/or is working on standards with a relationship to disaster management.

Based on the 4 main phases of the Disaster Management Cycle it can be concluded that most European (IT) standards are focussing on the Mitigation, Preparedness and Response phase, while there are not many standards fitting into the Recovery phase. It is good to mention that in Table 55 the adopted International standards are also included but in the Figures differentiating the Tasks the adopted standards are not included. When taking this into account it can be concluded that the Mitigation phase is the one phase the European (IT) Standards are focussing the most on.

Table 61: Overview of relevant European TCs - Number of standards in the disaster management phases

TC#	Title	Mitigation	Preparedness	Response	Recovery
CEN/TC 164	Water supply	1	1	1	1
CEN/TC 391	Societal and citizen security	4	9	6	3
CEN/TC 439	Private security services	0	3	1	0
ETSI CYBER	Cyber security	10	9	4	0
Sum		15	22	12	4

The extensive analysis of the identified European standards can be found in Annex 10 and Annex 11. Below the standards are analysed by task per disaster management phase.

#### European standards in mitigation phase

Within the mitigation phase the most covered tasks from the European standards are Risk assessment and Monitoring and review. The majority of the European IT standards were related to the Monitoring and review task, and most European standards to the Risk assessment task. No European standards were covering the Trend analysis task.

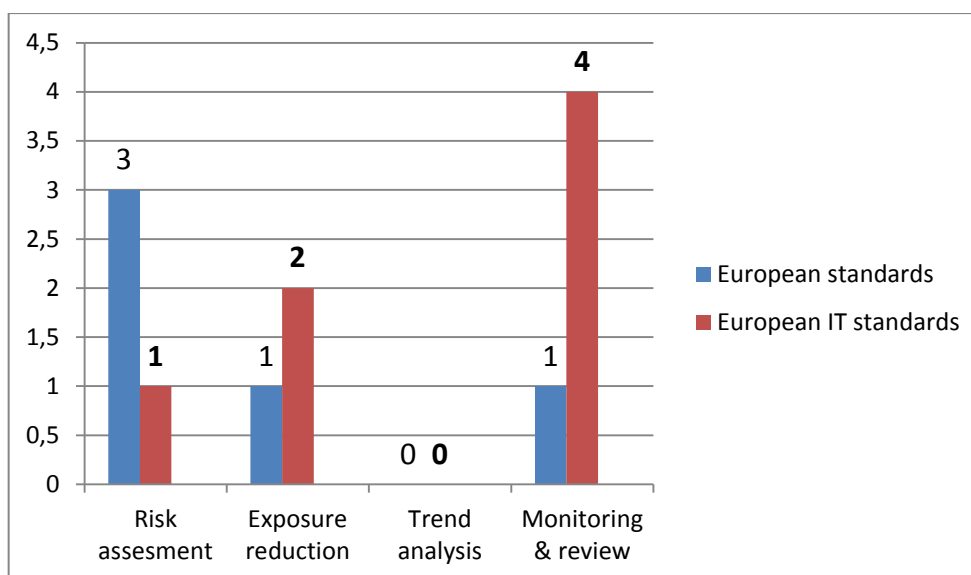


Figure 10: European standards - Categorisation of tasks in the mitigation phase

#### *European standards in preparedness phase*

Only two tasks within the Preparedness phase are covered by European (IT) standards. When looking at Table 61 it would have been expected to have more European (IT) standards covering this phase and the respective tasks. As Figure 11 only takes into consideration the European (IT) standards developed by the different TCs and not the International adopted standards it may be possible that the International (IT) standards already cover the different tasks in this phase sufficiently and there is no need for further European development of (IT) standards. Or there are other reasons why no European (IT) standards have been developed related to these tasks.

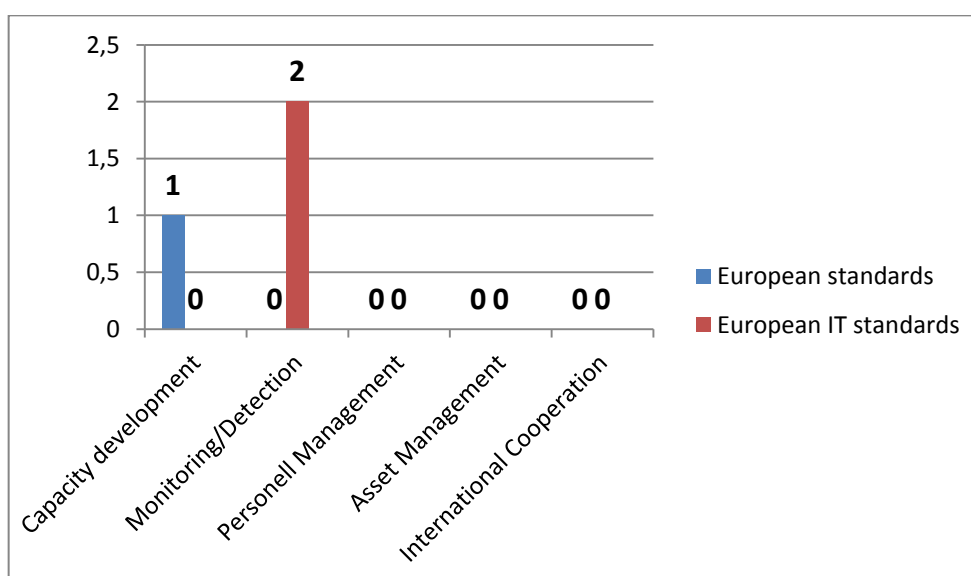


Figure 11: European standards - Categorisation of tasks in the preparedness phase

#### *European standards in response phase*

The response phase has 14 tasks but only three of those are covered by European (IT) standards. These three being: Warning/Crisis communication, Information management and Monitoring/Data collection.

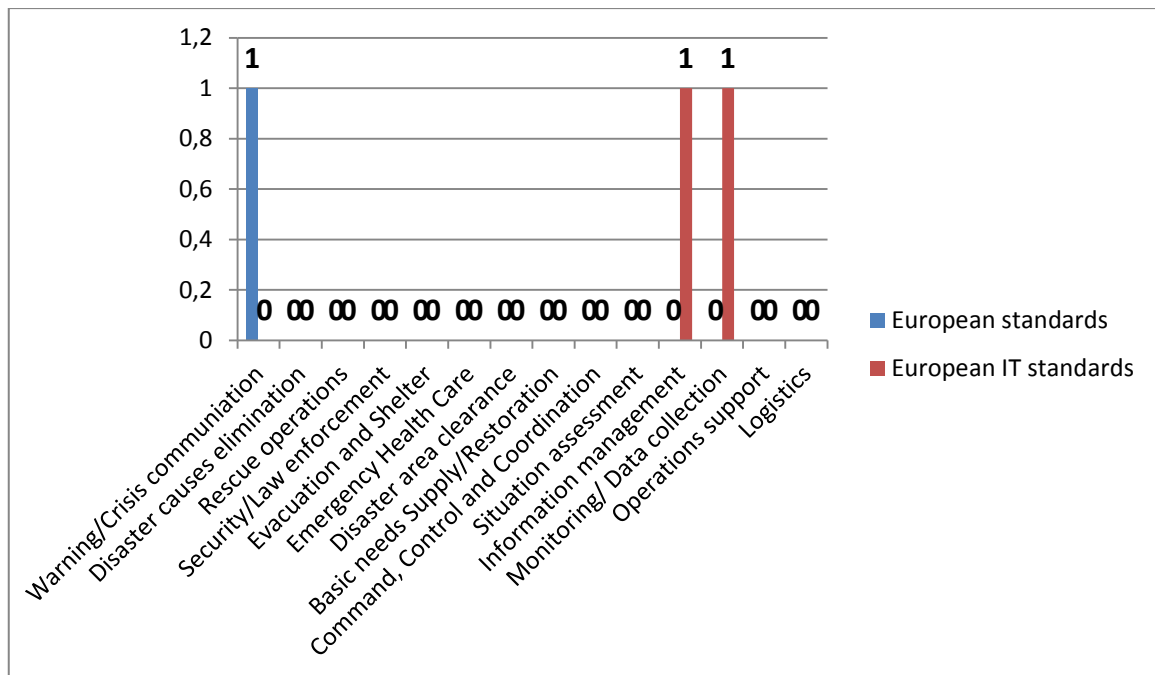


Figure 12: European standards - Categorisation of tasks in the response phase

#### European standards in recovery phase

When looking at the recovery phase we can see that only European standards are covering the different tasks. When looking at the tasks in the recovery phase the majority of them are not covered by European standards. However the following tasks are covered by European standards: Humanitarian impact recovery, Re-establishment infrastructure and Establishment of recovery organisation structure. No European IT standards are applicable to the tasks in this phase.

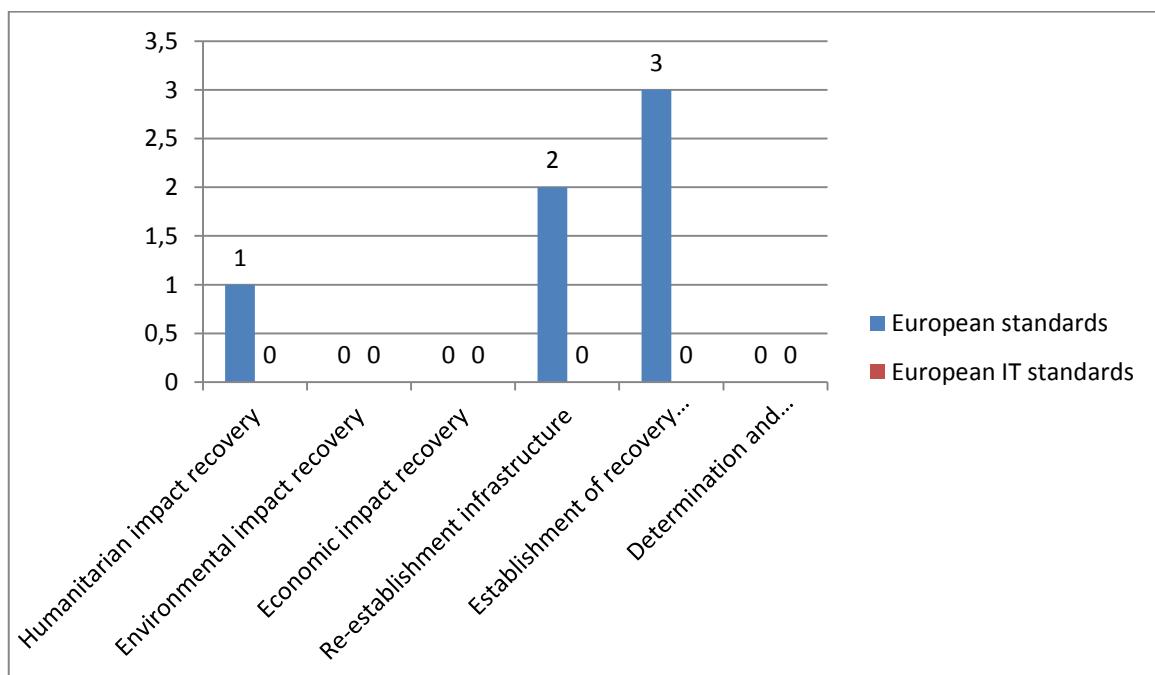


Figure 13: European standards - Categorisation of tasks in the recovery phase

**Stakeholder involvement**

A total of 32 countries are active within one or more of the European TCs. With over 50% of those countries active in all three of the European TCs which were identified as most relevant. As CEN has 34 member countries this means that almost 95% of the member countries are involved in European standardisation with regard to Disaster resilience. When comparing European membership with International membership it is noteworthy that Eastern European countries mainly focus on the European TCs and are not or much less involved with International TCs. Therefore it stresses the importance of European standardisation.

Table 62: Overview of relevant European TCs - Countries and participation in TCs

Country	CEN/TC 164	CEN/TC 391	CEN/TC 439
Sweden	Yes	Yes	Yes
France	Yes	Yes	Yes
Germany	Yes	Yes	Yes
Ireland	Yes	Yes	Yes
United Kingdom	Yes	Yes	Yes
Spain	Yes	Yes	Yes
Poland	Yes	Yes	Yes
Latvia	Yes	Yes	Yes
Switzerland	Yes	Yes	Yes
Denmark	Yes	No	Yes
Hungary	Yes	Yes	Yes
Finland	Yes	Yes	Yes
Belgium	Yes	Yes	Yes
Austria	Yes	Yes	Yes
Bulgaria	Yes	Yes	Yes
Italy	Yes	Yes	Yes
Romania	Yes	Yes	Yes
Czech Republic	Yes	Yes	Yes
Netherlands	Yes	Yes	No
Slovenia	Yes	Yes	No
Mongolia	Yes	No	No
Portugal	Yes	No	No
Estonia	Yes	No	No
Armenia	Yes	No	No
Turkey	Yes	No	No
Cyprus	Yes	Yes	No
Iceland	Yes	Yes	No
Greece	Yes	Yes	No
Lithuania	Yes	Yes	No

Country	CEN/TC 164	CEN/TC 391	CEN/TC 439
Slovakia	Yes	No	No
Croatia	Yes	No	No
Norway	Yes	Yes	No

The collected data show that all stakeholder categories are represented in the European TCs. As the mirror committees varies in the scope and the number of international and European TCs that are being followed, the total number of stakeholders included is much higher for some countries than for others.

In most of the countries, the stakeholder category 'Industry' is most strongly represented, while 'NGOs' are in general underrepresented.

As within International standardisation one of the reasons for this is the available resources. For some countries, like the UK and France this is less of a problem as they have resources available to fund the travelling. In Germany the active participation of first responders is notable; one of the reasons for this is the available funding from the government for fire-fighters to participate.

And as France, UK and Germany are identified as the three most active countries, it should be remarked that the Netherlands is one of the most involved countries within CEN/TC 164 and Spain has a strong participation in WG 1 of CEN/TC 391.

Table 63: Overview of relevant European TCs - stakeholder types in TCs

Stakeholder Type	CEN/TC 164	CEN/TC 391	CEN/TC 439
Academic & Research	4	7	2
Governmental organisation	6	22	1
Industry & Commerce	58	27	10
NGO	-	-	-
Other	-	6	1
Standardisation Body	16	4	1

### 2.6.3 National standardisation committees

#### Structure of the national standardisation committees

In general the structure for the investigated countries is very similar: There is one main committee that mirrors the work of both CEN/TC 391 and ISO/TC 292. Depending on the scope of the committee, some other international TCs are included in the mirror work; most often CEN/TC 439 Private security services and ISO/TC 262 Risk Management (see Table 64). The main committee covers the field of security, resilience, societal security or citizen security or a combination of these, which are mostly derivations of the titles of CEN/TC 391 and/or ISO/TC 292.

An exception is the US, where only the work of ISO/TC 292 is followed and not CEN/TC 391.

Looking at the European committees<sup>44</sup>, these are divided into working groups, which often follows the working groups of CEN/TC 391 and/or ISO/TC 292. Some working groups on national level are included, which do not covered topics of the international or European TCs that are mirrored, e.g. 'Private security' (AFNOR), 'Security in beaches' (UNI) and 'Crisis management drafting panel' (BSI).

<sup>44</sup> The US has not been included here as no information was available on the structure of the national standardisation committee.

As the structure of the national standardisation committees varies, this shows a difference in focus, but also in the interpretation of the term disaster resilience and crisis management.

Table 64: Comparison of mirror work national standardisation committees

Country	National standardisation committee	CEN/TC 391	ISO/TC 292	CEN/TC 439	ISO/TC 262	Others
France	AFNOR CN: Security and Resilience	Yes	Yes	Yes	-	
Germany	NA 031-05 FB: Section Societal Security	Yes	Yes			
Germany	NA 031-02 FBR: Section Committee Fire Detection and Fire Alarm Systems					CEN/TC 72
Germany	NA 031-03 FBR: Section Committee Fixed Firefighting Systems					CEN/TC 191, ISO/TC 21
Italy	UNI/CT 043: Security for society and Citizen	Yes	Yes	Yes	Yes	CEN/TC 419, CEN/TC 431, ISO/PC 278, ISO/PC 286, ISO/TC 241, ISO/TC 272, ISO/TC 278
Sweden	SIS/TK 494: Social Security	Yes	Yes	Yes	Yes	
United Kingdom	SSM/1: Societal Security Management	Yes	Yes			
United States	(Technical advisory group administrator: ASIS International)		Yes			

### National standards

For the investigated European countries, it is common practice to adopt international and European standards. All countries, except for Sweden, also have standards developed nationally. In total 50 national standards have been identified in France, Germany, Italy, United Kingdom and United states.

The two most common ICS code<sup>45</sup> for the national standards are 03.100.01 (Company organisation and management in general) and 13.200 (Accident and disaster control). There were no exact matches on ICS codes when comparing each set of national standards. Therefore it is assumed that there are not national standards from different countries that cover exactly the same.

Of the 50 national standards identified, 33 standards cover more than one disaster management phase, most often a national standard covers 2 or 3 phases that are consecutive.

France has two standards, covering the last three phases of the disaster management cycle. In Italy only one specific national standard was developed that covers the preparedness phase. Germany and the United Kingdom developed national standards, mostly in the preparedness and response phase. The number of German national standards is high also due to the broad inclusion of national standardisation committees

<sup>45</sup> ICS codes explanation (ICS edition 7):

[https://www.iso.org/files/live/sites/isoorg/files/archive/pdf/en/international\\_classification\\_for\\_standards.pdf](https://www.iso.org/files/live/sites/isoorg/files/archive/pdf/en/international_classification_for_standards.pdf)

next to the national committee mirroring the work of ISO/TC 292 and CEN/TC 391. There are many national standards in the United States, especially in the preparedness phase. Many of these standards are CBRN standards. An overview of the national standards categorised in the disaster management phases can be found in Table 65.

Table 65: Overview of national standards - Number of standards in the disaster management phases

Country	Mitigation	Preparedness	Response	Recovery
France	2	2	2	2
Germany	5	10	9	2
Italy	-	1	-	-
Sweden	-	-	-	-
United Kingdom	7	7	8	5
United States	9	20	5	-

As Sweden does not have any national standards, it is left out in the next analysis of national standards in the disaster management phases and tasks.

#### *National standards in mitigation phase*

All investigated countries, except for Italy, have national standards in the mitigation phase. From the 20 standards in the mitigation phase, 19 standards cover the operational task 'Risk assessment' (see Figure 14).

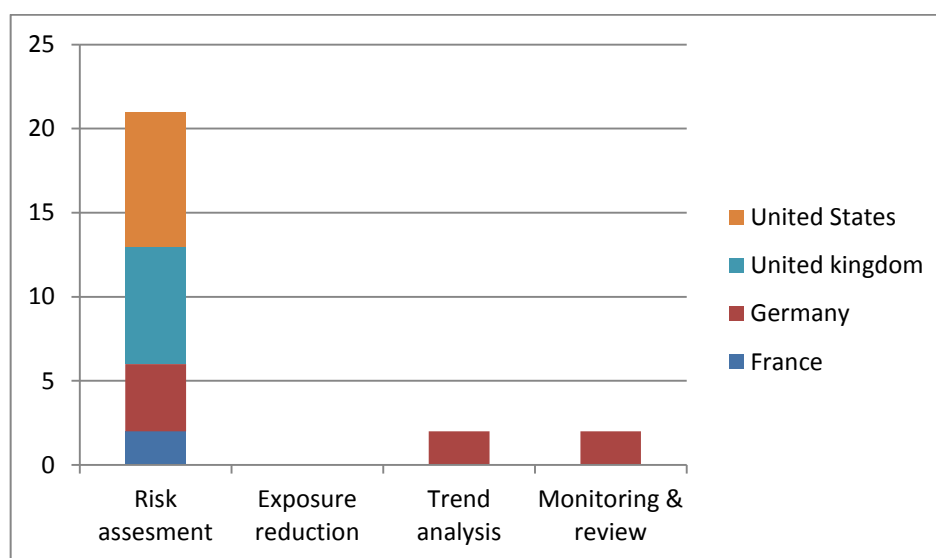


Figure 14: National standards - Categorisation of tasks in the mitigation phase

#### *National standards in preparedness phase*

All investigated countries have national standards in the mitigation phase. Each of the tasks is covered by at least 3 or more standards from different countries (see Figure 15).

From the 33 standards in the preparedness phase, a majority (25 standards) cover the operational task 'Capacity development'. The standards covering 'capacity development' often also cover the task 'Risk management' in the mitigation phase (11 standards overlap).

From the supporting tasks, 'Personnel management' (14 standards) as well as 'Asset management' (10 standards) are often covered. Only for three standards, both of these supporting tasks are covered in the same standards, but most often these tasks are separately covered in standards.

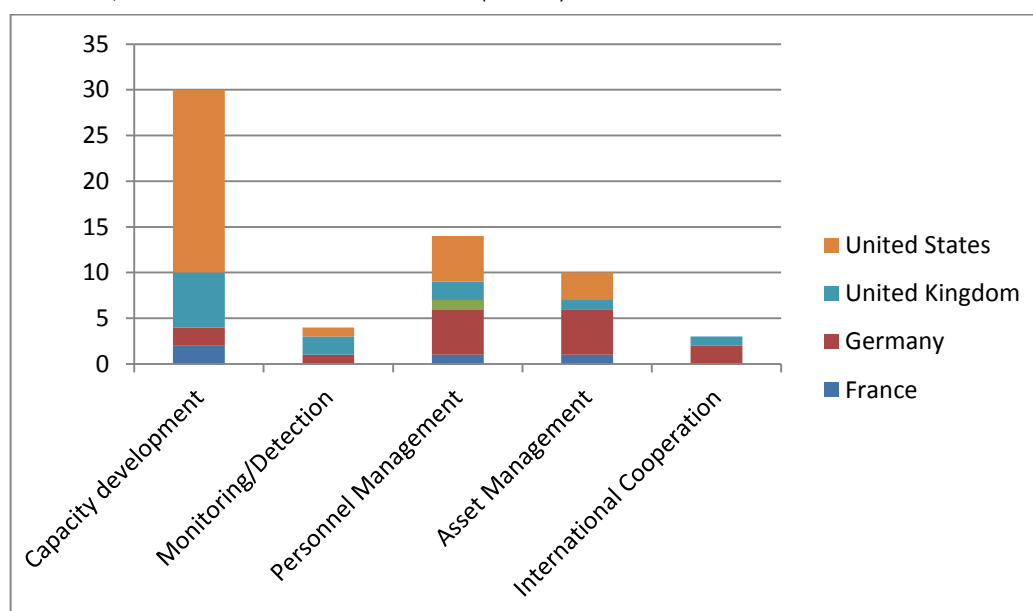


Figure 15: National standards - Categorisation of tasks in the preparedness phase

#### National standards in response phase

All investigated countries, except for Italy, have national standards in the response phase. From the 21 standards in the preparedness phase, Germany has the most standards in this phase (9 German national standards). Not all tasks are covered by national standards (see Figure 16). A majority (14 standards) cover the operational task 'Warning/crisis communication'. These standards are often combined with a supporting task: 'Command, control and coordination' (5 standards), 'Situation assessment' (4 standards), 'Information management' (3 standards), 'Operations support' (4 standards) and 'Logistics' (2 standards).

The standards that cover the operational task 'Rescue operations' (7 standards) are always combined with a supporting task.

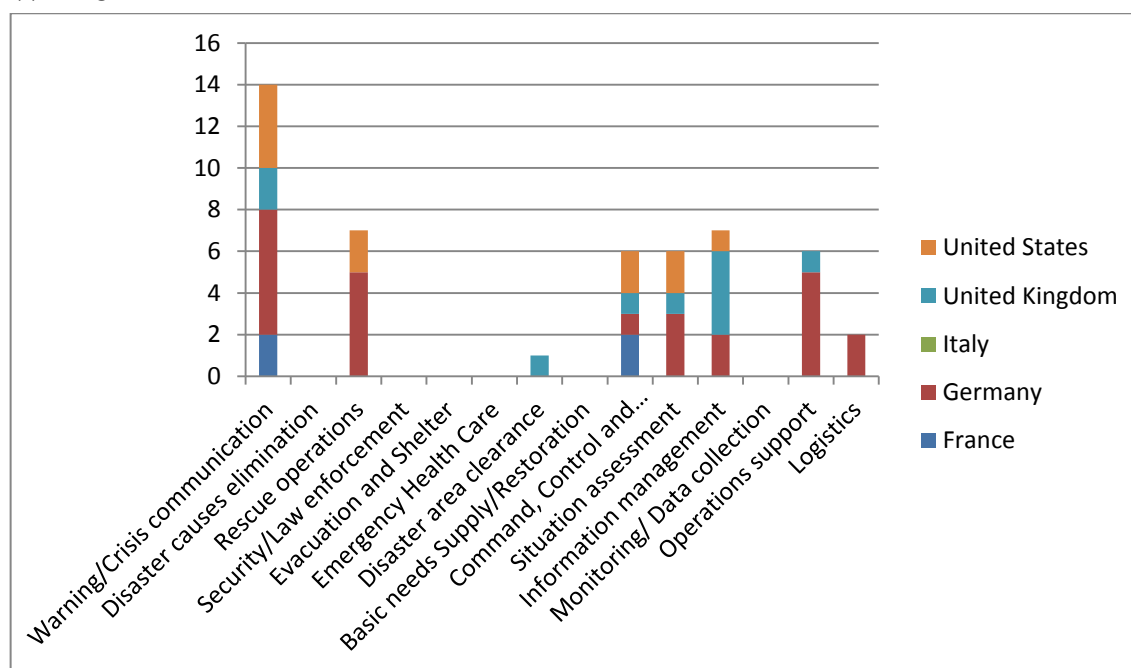


Figure 16: National standards - Categorisation of tasks in the response phase



### National standards in recovery phase

There are very few national standards in the recovery phase; only France, Germany and the United Kingdom have national standards covering this phase (see Figure 17). From the 9 standards in the recovery phase, most of the standards cover the supporting task 'Establishment of recovery organisation structure' (7 standards). Only in the United Kingdom there are standards covering other tasks in this phase.

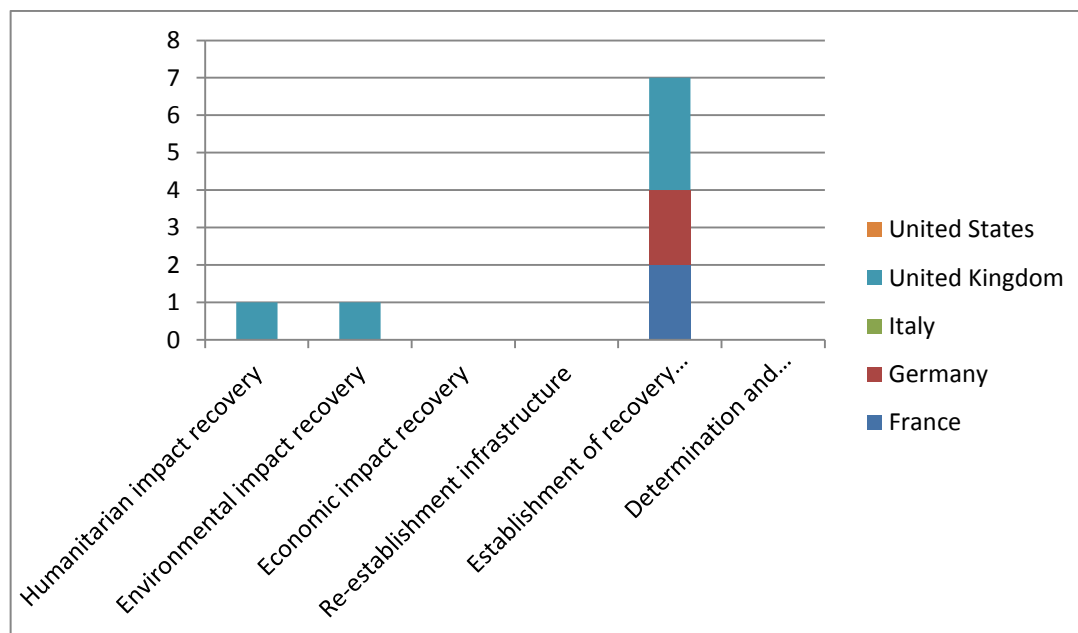


Figure 17: National standards - Categorisation of tasks in the recovery phase

### Stakeholder involvement

The collected data show that all stakeholder categories are represented in the national standardisation committees. As the mirror committees varies in the scope and the number of international and European TCs that are being followed, the total number of stakeholders included is much higher for some countries than for others.

In most of the countries, the stakeholder category 'Industry' is most strongly represented, while 'NGOs' are in general underrepresented. Remarkable is the high and active participation of governmental organisations in France and Sweden. In the UK, research organisations are strongly represented.

Even though all stakeholder groups are represented on the national level, the persons participating in European and international working groups, is mainly represented by 'Industry'. One of the reasons for this is the available resources. While industry will fund the international participation themselves, other stakeholder groups often lack the resources to participate internationally. Some NSBs have funding available for traveling, encouraging active participation in international and/or European standardisation: In France and Germany, governmental funding for specific stakeholder groups are available while the British standardisation institute also provides travel compensation for their experts.

## 3 NATO

### 3.1 Introduction

Standardisation plays an important role in the military domain and has been performed by NATO for decades. In this report NATO standardisation has been given a separate section<sup>46</sup>. The reason for this is that NATO has its own standardisation developing organisation called NSO, which publishes and manages a database of NATO standardisation documents. The information in this report is based on publicly available information. The NATO structure and procedure for standardisation are explained in deliverable D1.2<sup>47</sup>.

### 3.2 NATO

In NATO cooperation on emergency planning is anchored in the Civil Emergency Planning Committee (CEPC). CEPC is the top NATO advisory body for the protection of civilian populations and the use of civil resources in support of NATO's objectives. Civil emergency planning is a national responsibility, but it can be difficult for one country to manage larger disasters alone. The aim of civil emergency planning within NATO is to collect and develop new methods to work with emergency planning. The CEPC has developed a plan for improving the civil preparedness of NATO and partner countries against terrorist attacks. The specific plans are not accessible for public and therefore could not be taken into account in the further analysis. The CEPC also supports the development of NATO cyber capabilities through the provision of advisory expertise and with support for training. The CEPC assists with issues related to energy security, in particular the protection of critical infrastructure, through the exchange of experience and best practice between nations.

Crisis management is a broad concept that goes beyond military operations and includes the protection of populations, and is therefore one of NATO's fundamental security tasks. A crisis can be political, military or humanitarian and can also arise from a natural disaster or as a consequence of technological disruptions. An international handbook<sup>48</sup> describing the structure of the civil emergency planning in NATO and Euro-Atlantic Partnership Council (EAPC) countries has been published by the Swedish Civil Contingencies Agency (MSB). This handbook describes facts about governmental structure and issues, the structure of civil emergencies planning, civil-military cooperation and legal framework in different NATO and EAPC countries. Crisis management can involve military and non-military measures to address the full spectrum of crises – before, during and after conflicts.

NATO's work on counter-terrorism<sup>49</sup> (Defence against terrorism programme of work (DAT POW)) focuses on improving awareness of the threat, developing capabilities to and respond, and enhancing engagement with partner countries and other international actors. The first focus was on technological solutions to mitigate the effects of terrorist attacks but the programme has since widened its scope and now includes exercises,

<sup>46</sup> In deliverable D2.1 NATO was described as part of section 3 "European and international organisations developing standards".

<sup>47</sup> Deliverable D1.2 'Lessons identified and learned from past programming initiatives' (<http://resistand.eu/deliverables>)

<sup>48</sup> International CEP Handbook 2009. Civil emergency planning in the NATO/EAPC countries. ISBN: 978-91-7383-020-1. Copies can be downloaded from the Swedish Civil Contingencies Agency's website, [www.msbmyndigheten.se](http://www.msbmyndigheten.se)

<sup>49</sup> [http://www.nato.int/cps/en/natohq/topics\\_77646.htm](http://www.nato.int/cps/en/natohq/topics_77646.htm)

trials, development of prototypes and concepts, and interoperability demonstrations. No specific guidelines or plans are accessible for public and therefore could not be taken into account in the further analysis.

One of the current threats to NATO's security includes the proliferation of weapons of mass destruction (WMD) and their delivery systems. Rapid advances in biological science and technology also continue to increase the bio-terrorism threat against NATO forces and the civil populations. Therefore, NATO needs to be prepared to prevent, protect and recover from WMD attacks or CBRN events. The Rapidly Deployable Outbreak Investigation Team (RDOIT) is a national or international team with the goal to investigate outbreaks or incidents where intentional use of biological agents (biowarfare, bioterrorism or biocrime) cannot be excluded.

- The STANAG 2529<sup>50</sup> outline the operational concept for the RDOIT team. The team will be deployed for supporting military operations if an outbreak of disease (natural disease or intentional spread of diseases) is identified in an area of a military operation. The team will support the military Commander at the theatre with tasks such as identification of causative agent of the outbreak, epidemiology, medical advices etc. This standard covers the mitigation, preparedness and response phases of the disaster management cycle. For civilian purposes such a deployable outbreak investigation team could be highly important during outbreak of disease threatening the humans.

In NATO, standards and guidelines cover allied operations in a CBRN environment and include agreements and standards for disease surveillance, detection of CBRN agents and rules for restricting troop movements in a CBRN contaminated area. In addition, the organisation conducts training and exercises and seminars that are designed to test interoperability and prepare NATO leaders and forces for operations in a CBRN environment. In general, the main goal of the standards and guidelines is to support military operations; however, they might also be useful for civilian purposes. The following public available STANAGS can be important for capacity building during the preparedness phase. Several guidelines and standards prepared by NATO are not publicly available and cannot be listed in this work.

- The STANAG 2596<sup>51</sup> is an allied joint medical doctrine supporting to chemical, biological, radiological and nuclear (CBRN) defensive operations.
- STANAG 2451<sup>52</sup> is an allied joint doctrine for chemical, biological, radiological and nuclear defence
- STANAG 2551<sup>53</sup> covers training of medical personnel for chemical, biological, radiological, and nuclear (CBRN) defence
- STANAG 2551<sup>54</sup> covers regulations for establishment and employment of MRIIT (medical radiological incident investigation teams).
- STANAG 2474<sup>55</sup> covers recording of operational ionizing radiation exposure for medical purposes and management of dosimeters.

<sup>50</sup> AMedP-7.7 Ed.: A; STANAG 2525: Rapidly Deployable Outbreak Investigation Team (RDOIT).

<sup>51</sup> AJMEDP-7ED.A STANAG 2596 Ed: 1: Allied joint medical doctrine for support to chemical, biological, radiological and nuclear (CBRN) defensive operations.

<sup>52</sup> AJP-3.8 Ed: A NATO STANAG 2451 Ed: 4: Allied joint doctrine for chemical, biological, radiological and nuclear defence.

<sup>53</sup> AMEDP-7.3 ED.A NATO STANAG 2551: Training of medical personnel for chemical, biological, radiological, and nuclear (CBRN) defence.

<sup>54</sup> AMedP-7.4 Ed.: A NATO STANAG 2551: Regulations for establishment and employment of MRIIT (medical radiological incident investigation teams).

<sup>55</sup> AMedP-7.8 Ed.: A NATO STANAG 2474 Ed.: 2: Recording of operational ionizing radiation exposure for medical purposes and management of dosimeters.

Table 66: NATO – Relevant standards (publicly available)

Document No.	Title	Status	Mitigation	Preparedness	Response	Recovery
AJMEDP-7ED.A STANAG 2596	Allied joint medical doctrine for support to chemical, biological, radiological and nuclear (CBRN) defensive operations	Published		x		
AJP-3.8 Ed: A NATO STANAG 2451	Allied joint doctrine for chemical, biological, radiological and nuclear defence	Published		x		
AMEDP-7.3 ED.A NATO STANAG 2551	Training of medical personnel for chemical, biological, radiological, and nuclear (CBRN) defence	Published		x		
AMedP-7.4 Ed.: A NATO STANAG 2551	Regulations for establishment and employment of MRIIT (medical radiological incident investigation teams)	Published		x		
AMedP-7.8 Ed.: A NATO STANAG 2474	Recording of operational ionizing radiation exposure for medical purposes and management of dosimeters	Published		x		
AMedP-7.7 Ed. A: NATO STANAG 2529	The Rapidly Deployable Outbreak Investigation Team (RDOIT)	Published	x	x	x	
Sum			1	6	1	0

### 3.3 Analysis

NATO continues there work to create and improve necessary guidelines and standardisation documents and develops necessary capability improvements in the field of CBRN defence through the work of many groups, bodies and institutions in the NATO system. The purpose of some of the groups is to harmonise requirements, standardisation and information exchange in different area of CBRN defence.

The NATO STANAGs have their focus on tasks covered by the mitigation, preparation and the operational phases of the disaster management cycle. NATO also have civil emergency planning on the agenda, however, no special documents could be mentioned and categorised in this report.

## 4 Overview of European and international organisations developing guidelines

### 4.1 Introduction

The following section analyses the guidelines published by European and International organisations that were identified in Deliverable D2.1. “Guidelines” were understood as “informal standards”: developed by organisations, but without a technical committee being involved.

In D2.1 a wide variety of organisations that have published different guidelines with regard to disaster management have been identified. Within this report, these concrete guidelines have been categorised and analysed with regard to the disaster management phase and task they cover. Unfortunately many of the organisations that have been identified did not have guidelines that were publically accessible, so they could not be taken into account in this analysis and categorisation.

As there are countless guidelines of organisations concerning all different kind of actions, the identified list of organisations and guidelines raises no claim to be being complete or exhaustive. The described guidelines should be understood as examples of the variety and large number of “informal standards” existing beside formal standards and illustrate the importance of these kind of guidelines for collaboration on a European and international level.

### 4.2 Methodology

As part of D2.1, several methods were used to identify institutions that are involved in standardisation in resilience but do not rely on technical committees. First, a review of literature was conducted in addition to an internal discussion among experts on which organisation could be relevant to this activity. This initial identification yielded a few organisations. This list was expanded by identifying affiliated organisations. Finally, a web-search using two search strings – “crisis resilience standards” and “standardisation resilience” – was conducted. The first 100 entries of each search were analysed for additional organisations that fit the profile. Affiliates of these organisations were then reviewed to identify further organisations.

This overall list of organisation was then split into two groups. The first group contained the organisations that have a direct link to standardisation by providing either specific standards or at least guidelines that provide information approximating a standard. The second group consisted of those organisations that may be relevant to any potential standardisation efforts but do not produce specific guidelines. The latter category also included those organisations that have publicly unavailable guidelines.

While the focus of ResiStand is on European stakeholders, this approach also yielded non-European actors. Their inclusion in this document may help in the future to identify good practices employed elsewhere in case standards are found lacking within Europe.

Within D2.2, the identified accessible relevant guidelines and actors for standardisation in crises and disaster management were analysed and categorised into the disaster management phases and tasks. This way, it may be able to deduce the areas where the development of new standards is may either be likely or will not be necessary as there are already implemented rules. These areas have to be monitored closely and taken into account in ResiStand.

Unfortunately this was not possible for every one of the originally identified guidelines as often more detailed information about them was not accessible to the public. These organisations have been moved to Annex 8. Still, 23 guidelines from nine different organisations (six from International organisations and two from European organisations) have been categorised and analysed.

## 4.3 International organisations

### 4.3.1 Introduction

The following seven international organisations were analysed with respect to their guidelines relevant for disaster resilience and: the International Civil Aviation Organisation ICAO, UN ESCAP, Ceres, ICLEI, International Risk Governance Council and NASA. In the next section the guidelines are described and then analysed with respect to the disaster management phases and tasks (see 4.5).

### 4.3.2 International Civil Aviation Organisation ICAO

ICAO is a UN specialized agency established in 1944 to manage the administration and governance of the Convention on International Civil Aviation (Chicago Convention).<sup>56</sup> ICAO works with the Convention's 191 Member States and industry groups to reach consensus on international civil aviation Standards and Recommended Practices (SARPs) and policies in support of a safe, efficient, secure, economically sustainable and environmentally responsible civil aviation sector. These SARPs and policies are used by ICAO Member States to ensure that their local civil aviation operations and regulations conform to global norms, which in turn permits more than 100,000 daily flights in aviation's global network to operate safely and reliably in every region of the world.<sup>57</sup>

ICAO standards and other provisions are developed in the following forms:

- Standards and Recommended Practices - collectively referred to as SARPs;
- Procedures for Air Navigation Services - called PANS;
- Regional Supplementary Procedures - referred to as SUPs; and
- Guidance Material in several formats.<sup>58</sup>

Some guidelines have been published by the ICAO with regard to disaster management:

- ICAO's crisis management framework<sup>59</sup>: This crisis management framework covers the ICAO EUR region. It supports crisis management arrangements at the national (e.g. State), sub-regional (e.g. EACCC scope), and regional level (e.g. EUR Region). The framework: a) is built on EACCC arrangements and experience, b) aims to be in line with global ICAO provisions and be used as a basis for pan/intra-regional cooperation, c) is built on existing national and international crisis management arrangements in the EUR Region, d) aims to propose guidance for States - to help States in enhancing the level of preparedness to threat scenarios, e) aims to harmonise crisis management approach across the whole European Region.
- Volcanic Ash ICAO's international airways volcano watch (IAVW)<sup>60</sup>: provides operational procedures for the dissemination of information on volcanic eruptions and associated volcanic ash clouds in areas which could affect routes used by international flights, together with necessary pre-eruption arrangements. The IAVW comprises principally State volcano observatories, volcanic ash advisory centres, world area forecast centres, State meteorological watch offices and area control centres/flight information centres, international NOTAM offices, and international and regional OPMET data banks. The IAVW facilitates communication and collaboration between all concerned stakeholders.
- Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation (CAPSCA)<sup>61</sup>: The ICAO Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation (CAPSCA) exists to prevent and manage the spread of communicable diseases that cause, or have the potential to cause, a public health emergency of international concern. A multi-sector initiative, it facilitates communication and collaboration between all stakeholders, particularly the

<sup>56</sup> <http://www.icao.int/about-icao/Pages/default.aspx>

<sup>57</sup> <http://www.icao.int/about-icao/Pages/default.aspx>

<sup>58</sup> <http://www.icao.int/safety/airnavigation/Pages/standard.aspx>

<sup>59</sup> [http://www.icao.int/RO\\_EURNAT/EUR%20and%20NAT%20Documents/EUR%20Documents/031%20ICAO%20Crisis%20Management%20Framework%20Document%202014/EUR%20Doc%2031\\_CRISIS%20Manag%20Framework%20vf.pdf](http://www.icao.int/RO_EURNAT/EUR%20and%20NAT%20Documents/EUR%20Documents/031%20ICAO%20Crisis%20Management%20Framework%20Document%202014/EUR%20Doc%2031_CRISIS%20Manag%20Framework%20vf.pdf)

<sup>60</sup> [http://www.icao.int/publications/Documents/IAVW%20Handbook%20Doc%209766\\_en.pdf](http://www.icao.int/publications/Documents/IAVW%20Handbook%20Doc%209766_en.pdf)

<sup>61</sup> [http://www.icao.int/Meetings/a38/Documents/CAPSCA\\_Flyer.pdf](http://www.icao.int/Meetings/a38/Documents/CAPSCA_Flyer.pdf)

public health and aviation sectors, in order to develop and test public health emergency preparedness plans in aviation. It assists States to implement the relevant ICAO Standards and Recommended Practices and to comply with the World Health Organization International Health Regulations (2005). Founded on the need to address hazards and risks associated with communicable diseases that affect aviation, the work is also fundamental to managing other public health emergencies of relevance to aviation, such as those from a nuclear power plant accident.<sup>62</sup>

- Global Aviation Safety Plan or “GASP”, STRATEGY ON DISASTER RISK REDUCTION AND RESPONSE MECHANISMS IN AVIATION<sup>63</sup>: In March of 2015, Member States of the United Nations (UN) adopted the Sendai Framework for Disaster Risk Reduction which sets forth a roadmap for a cross-sectoral, coordinated approach to disaster risk reduction. The international community has made a major shift in its response to emergencies and disasters from a culture of reactive measures to one of a disaster risk reduction. Disaster risk reduction includes disciplines such as disaster management, disaster mitigation and disaster preparedness. The international civil aviation community has made a similar transition from a reactive safety culture to a proactive/predictive approach to safety and security management. Civil aviation plays an essential role in supporting assistance to States and regions affected by natural disasters, conflicts and pandemics.

#### 4.3.3 UN ESCAP

“The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) is the regional development arm of the United Nations for the Asia-Pacific region.”<sup>64</sup> According to their vision “ESCAP is committed to a resilient Asia and the Pacific founded on shared prosperity, social equity and sustainability. Our vision is to be the most comprehensive multilateral platform for promoting cooperation among member States to achieve inclusive and sustainable economic and social development in Asia and the Pacific.”<sup>65</sup>

One of their major themes is to build resilience to disasters. In order to achieve this goal, they provide training in the region<sup>66</sup> and publish information about disasters as well as educational material in how to develop resilience against disasters and their economic fallout, which may prove useful to ResiStand.<sup>67</sup>

One of their published guidelines is their handbook on Resilient Business for Resilient Nations and Communities<sup>68</sup>. It shows how the private sector can act as a key partner for reducing disaster risk that can affect a country’s overall resilience to disasters. This report is among the first to document the evolving thoughts and practices of the private sector in disaster risk management. It offers Asia-Pacific perspectives on the respective roles and responsibilities of the private and public sectors in promoting resilience, highlighting good practices, case studies and lessons learned. The report calls on the private sector to contribute to the implementation of the Sendai Framework for Disaster Risk Reduction. The issue of business engagement in disaster risk management has gained attention in recent years with particular prominence provided to it in the Sendai Framework for Disaster Risk Reduction 2015– 2030. The loss of business assets was explicitly included as a concern in a long-term global goal of disaster risk reduction. Increasingly costly disasters have raised difficult questions: What is, and what should be, the role of businesses in disaster risk management? Can governments foster business engagement in this field? How can disaster managers, businesses and governments work together to reduce disaster-induced losses and ultimately protect the community?

UN ESCAP has also published a report on Building Resilience to Natural Disasters and Major Economic Crises<sup>69</sup>: The Asia-Pacific region has been battered in recent years by a relentless series of shocks. Some have

<sup>62</sup> <http://www.capsca.org/IntroandObjectivesWeb.pdf>

<sup>63</sup> <http://www.icao.int/safety/SafetyManagement/Pages/GASP.aspx>

<sup>64</sup> <http://www.unescap.org/about>

<sup>65</sup> Ibid.

<sup>66</sup> <http://www.unescap.org/our-work/ict-disaster-risk-reduction/building-resilience-disasters/events/upcoming>

<sup>67</sup> <http://www.unescap.org/our-work/ict-disaster-risk-reduction/building-resilience-disasters/publications>

<sup>68</sup> <http://www.unescap.org/sites/default/files/Resilient%20Business%20Book-Final-lowres.pdf>

<sup>69</sup> <https://www.unescap.org/sites/default/files/ThemeStudy2013-full2.pdf>

been related to natural disasters, such as earthquakes or droughts or floods. Others, such as the 2008 financial crisis, have been caused by convulsions in global markets. Still others, such as rocketing food and energy prices, have been the result of a complex combination of shocks. The traditional approach has been to consider such events individually. This is increasingly unrealistic. Governments across the region often find themselves dealing with overlapping shocks that demand a more comprehensive and systemic approach to building resilience. Resilience in this sense means the capacity of countries to withstand, adapt to, and recover from natural disasters and major economic crises – so that their people can continue to lead the kind of life they value. For many policymakers this is new territory: they are more accustomed to focusing on problems in specific economic or social sectors rather than treating them as systemic wholes. Even more difficult, they have to take decisive action now about events that may or may not take place. By definition, this is a step into the unknown. On the whole, human beings are not very good at assessing risks and uncertainties. This report provides a comprehensive response to addressing multiple shocks in Asia and the Pacific. It shows how people, organisations, institutions and policymakers can work together to weave resilience into economic, social and environmental policies.

#### 4.3.4 Ceres

“Ceres is a non-profit organization advocating for sustainability leadership. We mobilize a powerful network of investors, companies and public interest groups to accelerate and expand the adoption of sustainable business practices and solutions to build a healthy global economy.”<sup>70</sup> In 2013, they initiated a project with Insurance companies and city stakeholders to discuss how to build climate resilient cities.<sup>71</sup> The project output is openly available and includes an “Insurer-Cities Resiliency Toolkit”, which describes the method employed in bringing these groups together and working towards the mutual goal.

Ceres published some guidelines with respect to crisis management and disaster resilience.

- Best Practices in Climate Change Risk Analysis for the Electric Power Sector<sup>72</sup>: With input from investors, financial firms and electric power companies, this report outlines actions that power companies and Wall Street firms should take to address the financial risks posed by climate change. The report highlights best practices in climate risk disclosure by electric power companies and specific steps that investors, analysts and companies should take to improve their analysis of the risks that future climate change regulations pose for power companies.
- Building Climate Resilient Cities<sup>73</sup>: In October 2012, Superstorm Sandy made U.S. landfall along the densely populated Eastern Seaboard, devastating homes and businesses beyond recognition, and heavily damaging major urban infrastructure including roads, mass transit, and bridges, along with water and electricity systems. In the summer of 2013, two separate and record-breaking rainfall events in Canada – one in Alberta and a second in Toronto - triggered catastrophic flooding and set new record-breaking levels of damage and loss from natural catastrophes. These events are only some of the latest in a series of extreme weather emergencies in North America, and around the world, characterized by their growing severity and frequency of impact. All send a clear message that we need to better prepare our cities to withstand the impacts of severe weather and climate change, even while we strengthen our work to slow and reverse global warming. Urban resiliency is also an imperative of the insurance industry as it reduces losses, promotes the maintenance of insurability, and presents opportunities for innovative risk transfer and insurance solutions to help manage climate risk. By building public-private partnerships city leadership and the insurance sector have the power to lead in building urban resiliency and protect the people and property. Three guidelines that deal with capacity development and personnel management have been published:

<sup>70</sup> <http://www.ceres.org/>

<sup>71</sup> <http://www.ceres.org/industry-initiatives/insurance/building-climate-resilient-cities>

<sup>72</sup> <http://ceres.org/resources/reports/best-practices-climate-change-risk-analysis-2006>

<sup>73</sup> <https://www.ceres.org/industry-initiatives/insurance/building-climate-resilient-cities>



- Building Climate Resilience in Cities: Priorities for Collaborative Action<sup>74</sup>: This is one of three documents developed by insurance industry leaders and city stakeholders through the Building Climate Resilience in Cities workshop series convened by Ceres and ClimateWise in 2012 and 2013.
- Building Resilient Cities: From Risk Assessment to Redevelopment<sup>75</sup>: This paper by urban strategist Jeb Brugmann is one of three documents arising from the “Building Climate Resilience in Cities” workshop series. It explains one of the core concepts developed through our workshop series. This new strategic . This new strategic planning framework, called a “Resilience Zone” is introduced and explored through a four-stage development process. This paper presents a four-stage strategic planning framework tested and refined in workshops along with the diverse ideas and innovations identified by workshop participants. The approach is proposed for use as a second stage of climate adaptation planning, following the completion of local vulnerability and risk assessments.
- Building Resilient Cities: Toolkit and Curriculum Guide<sup>76</sup>

#### 4.3.5 ICLEI – Local Governments for Sustainability

“ICLEI is the leading global network of more than 1,500 cities, towns and regions committed to building a sustainable future. By helping the ICLEI Network to become sustainable, low-carbon, resilient, ecomobile, biodiverse, resource-efficient and productive, healthy and happy, with a green economy and smart infrastructure, we impact over 25% of the global urban population.”<sup>77</sup> One of the urban agendas is in building resilient cities. Within this agenda, their tools and services include vulnerability and risk assessment, linking mitigation and adaptation, building resilient infrastructure and financing.<sup>78</sup>

ICLEI has published a Resilient City Agenda: A Resilient City is prepared to absorb and recover from any shock or stress while maintaining its essential functions, structures, and identity; adapting and thriving in the face of continual change.

#### 4.3.6 International Risk Governance Council

“The International Risk Governance Council (IRGC) is an independent non-profit foundation which aims to help improve the understanding and management of risks and opportunities by providing insight into systemic risks that have impacts on human health and safety, on the environment, on the economy and on society at large.”<sup>79</sup> They have published a resource guide on resilience, which specifically focusses on metrics.<sup>80</sup> A collection of articles can be found on their homepage. These include guidelines concerning all the disaster management phases and tasks.

#### 4.3.7 National Aeronautics and Space Administration NASA

“NASA is an independent agency of the executive branch of the United States federal government responsible for the civilian space program as well as aeronautics and aerospace research.”<sup>81</sup> NASA’s Technical Standards Unit has developed many standards in all manners related to their work.<sup>82</sup> The following standards might be of interest to ResiStand. Another interesting factor that is being addressed is resilience and how and when it is needed and that a culture has to be flexible to be resilient. Most of the following guidelines cover different tasks in the disaster management cycle but mostly focuses on mitigation and preparedness.

- NASA-HDBK-8709.24 NASA SAFETY CULTURE HANDBOOK<sup>83</sup> is mainly concerned with the mitigation and preparedness phase. It focuses on risk assessment, monitoring/review and personnel management as

<sup>74</sup> <https://www.ceres.org/resources/reports/building-climate-resilience-in-cities-priorities-for-collaborative-action/view>

<sup>75</sup> <https://www.ceres.org/resources/reports/building-resilient-cities-from-risk-assessment-to-redevelopment/view>

<sup>76</sup> <https://www.ceres.org/files/insurance-files/BuildingResilientCitiesToolkit.pdf>

<sup>77</sup> <http://www.iclei.org/>

<sup>78</sup> <http://www.iclei.org/index.php?id=36>

<sup>79</sup> <https://www.irgc.org/about/>

<sup>80</sup> <https://www.irgc.org/irgc-resource-guide-on-resilience/>

<sup>81</sup> <http://www.nasa.gov>

<sup>82</sup> <https://standards.nasa.gov/nasa-technical-standards>

<sup>83</sup> <https://www.hq.nasa.gov/office/codeq/doctree/NHBK870924.pdf>

well as capacity management: The purpose of this Handbook is to define the NASA Safety Culture Program and to provide guidance in the development and implementation—sustainment, growth, and practice—of Safety Culture at the Center level. It defines the NASA Safety Culture Model, describes the Safety Culture Survey (SCS) process, and outlines training and other related resources to support the practices of Safety Culture throughout NASA

- NASA-STD-8719.11 SAFETY STANDARD FOR FIRE PROTECTION<sup>84</sup>: This standard establishes requirements and responsibilities related to NASA's Fire Protection Program. It contains requirements for fire prevention, detection, control, and suppression through engineering, inspection, training, and fire fighting.
- NASA-STD-8719.13 NASA SOFTWARE SAFETY STANDARD<sup>85</sup> deals with asset management: The purpose of this Standard is to define the requirements to implement a systematic approach to software safety as an integral part of system safety and the overall safety program of a program, project, or facility. This Standard specifies the software activities, data, and documentation necessary for the acquisition and development of software in a safety critical system. These activities may be performed by a collaboration of various personnel in the program, project, or facility, and Safety and Mission Assurance (SMA) organizations. Safety critical systems that include software are evaluated for software's contribution to the safety of the system during the concept phase, and repeated at each major milestone as the design matures.
- NASA-STD-8729.1 PLANNING, DEVELOPING AND MANAGING AN EFFECTIVE RELIABILITY AND MAINTAINABILITY (R&M) PROGRAM<sup>86</sup> deals with risk assessment and risk management: This technical standard for reliability and maintainability (R&M) provides guidance to customers (or purchasers) and suppliers (or contractors) on R&M requirements development, design implementation, and evaluation. It has been developed to provide a centralized source of implementation, and evaluation. It has been developed to provide a centralized source of information for establishing R&M performance-based requirements, design factors, and metrics for use on all new NASA programs/projects and contracts. It addresses the challenge of managing mission risk in the development and operation of cost and time constrained flight programs/projects and other NASA assets.
- NASA-STD-8719.7 FACILITY SYSTEM SAFETY GUIDEBOOK<sup>87</sup> focuses on the mitigation and preparedness phase (risk assessment, trend analysis, monitoring/review, capacity development, monitoring/detection, personnel management): This document is a guideline for implementing a Facility System Safety Program to meet the requirements of "NASA Safety Policy and Requirements Document," NHB 1700.1 (V1B). The facility acquisition process information was taken from the "NASA Facility Project Implementation Handbook," NPG 8820.2. The purpose of this Facility System Safety Guidebook is to provide a guideline for facility and safety professionals who are involved with the facility acquisition or modification/construction process and life cycle phases at NASA installations and to provide fundamental information for the development of a facility safety program during the acquisition process. This guidebook provides the framework for implementing facility system safety goals and requirements into NASA facilities. Safety is an integral aspect of the facility acquisition process and must be considered at all phases throughout the life cycle of the facility system. This document has also been developed to support the NASA Safety Training Center (NSTC), "Facility System Safety Course."

#### 4.3.8 Summary

All of the described international organisations are involved in standardisation processes and have developed some guidelines for themselves and for collaboration with other organisations. It is remarkable that the area of aviation seems to be very active in developing guidelines and rules, for better international cooperation in

<sup>84</sup> <https://www.hq.nasa.gov/office/codeq/doctree/871911.pdf>

<sup>85</sup> <https://www.hq.nasa.gov/office/codeq/doctree/NS871913C.pdf>

<sup>86</sup> <https://www.hq.nasa.gov/office/codeq/87291.pdf>

<sup>87</sup> <https://www.hq.nasa.gov/office/codeq/87197.htm>

aviation and in collaboration with health care. All of the mentioned guidelines are concerned with several phases and tasks of the disaster management circle. They focus on actions in the mitigation and preparedness as well as the response phase. It is interesting that within the area of aviation many guidelines are developed with the focus on the occurrence of volcanic ash. This shows that these organisations try to implement new developments and recent events are taken into account.

## 4.4 European organisations

### 4.4.1 Introduction

In the course of the analysis, two organisations that have published guidelines (EASA and ERNCIP) have been looked at. To get a better understanding of the ongoing and future activities within the EU, European actors within the field of standardisation as well as the main points of “The annual union work programme for European for standardisation 2017” will be described within the next section.

### 4.4.2 European Aviation Safety Agency (EASA)

Established in 2002, EASA is an Agency of the European Union.<sup>88</sup> As a Community Agency, EASA is a body governed by European public law; it is distinct from the Community Institutions (Council, Parliament, Commission, etc.) and has its own legal personality. EASA was set up by a Council and Parliament regulation (Regulation (EC) 1592/2002 repealed by Regulation (EC) No 216/2008 and amended by Regulation (EC) 1108/2009) and was given specific regulatory and executive tasks in the field of civil aviation safety and environmental protection. The Agency develops common safety and environmental rules at the European level. It monitors the implementation of standards through inspections in the Member States and provides the necessary technical expertise, training and research. The Agency works hand in hand with the national authorities, which continue to carry out many operational tasks such as certification of individual aircraft or licensing of pilots. EASA's remit does not encompass questions related to civil aviation security e.g. airport security measures, counter-terrorism.

Standardisation represents one of the main tasks allocated to the Agency by the Basic Regulation (Regulation (EC) 216/2008).<sup>89</sup> One of 5 tasks: Promote the use of European and worldwide standards<sup>90</sup>

Several guidelines are provided from the EASA:

- Rules and Guidance Material - Volcanic Ash<sup>91</sup>: EASA has provided a framework of rules and guidance material that supports a safety management approach to volcanic ash for the aviation community. The objectives of EASA's crisis management in case of a volcanic eruption affecting European airspace, are to: Ensure safety of flight, in particular maintain the assurance that the operational concept put in place since 2010 is safe. This objective drives in particular the need for EASA to collect information on ash encounters. Operators remain responsible to decide to fly in airspace predicted to be contaminated, based on a risk assessment, combined with the “Avoid” principle Continuous reporting from operators to ANSPs to VAAC and Met centers, and to EASA. Ensure efficient communication and information flows, internally to EASA, between EACCC and EASA, between EASA and key stakeholders, and towards the public.
- NPA 2015-13 Loss of control prevention and recovery training<sup>92</sup>: Notice of Proposed Amendment (NPA) addresses a safety and regulatory coordination issue related to aeroplane Loss of Control In-flight (LOCI). The following initiatives are linked to this NPA: various accident Safety Recommendations; European Aviation Safety Plan (EASp) safety actions and amended International Civil Aviation Organization (ICAO) standards and recommended practices. This NPA proposes to integrate so-called upset prevention and

<sup>88</sup> <https://www.easa.europa.eu/>

<sup>89</sup> <https://www.easa.europa.eu/system/files/dfu/External%20Stakeholder%20Feedback%202014%20-%202015.pdf>

<sup>90</sup> <https://www.easa.europa.eu/the-agency/the-agency>

<sup>91</sup> <https://www.easa.europa.eu/system/files/dfu/Volcanic%20Ash-Rules%20and%20Guidance%20material.pdf>

<sup>92</sup> <https://www.easa.europa.eu/system/files/dfu/NPA%202015-13.pdf>

recovery training (UPRT) requirements and provisions into the EU pilot training regulatory framework. An aeroplane upset is a condition whereby an aeroplane unintentionally exceeds the flight parameters experienced during normal flight. Upsets that are not timely corrected are likely to lead to Loss of Control In-flight (LOC). The proposed training requirements aim to provide pilots with competencies to prevent upsets or to recover from developed upsets. As a result from taking a risk based approach to develop regulations, the main focus of the new training standards is on pilots who intend to pursue a career with a commercial airline. Such pilots would likely complete either an aeroplane Airline Transport Pilot Licence (ATPL(A)) or a Multi-crew Pilot Licence (MPL) integrated course, followed by a type rating on a multi-pilot aeroplane. The proposed pilot training aims to deliver enhanced pilot competencies through additional upset prevention and upset recovery related theoretical knowledge (TK) and flight instruction. Nevertheless, upset prevention training is also to be integrated into existing flight syllabi for other aeroplane licence training courses, such as for the Light Aircraft Pilot Licence (LAPL(A)), Private Pilot Licence (PPL(A)) and Commercial Pilot Licence CPL(A). The provisions for the LAPL(A) and PPL(A) training courses mostly related to the General Aviation community are lighter and thus more proportionate when compared to the CPL(A) and ATPL(A) training courses. The newly developed upset recovery training in an aeroplane, which is to be mandated for the ATPL(A) training course and also serve as a pre-requisite prior to commencing the first multi-pilot type rating course, is seen as an important step towards enhancing a commercial pilot's resilience to the psychological and physiological aspects often associated with upset conditions, and towards providing them with an enhanced ability to not only overcome these human factor aspects, but to also apply appropriate recovery strategies to return the aeroplane to safe flight. In support of the new standards, the proposals place greater emphasis on the flight and Flight Simulator Training Device (FSTD) instructors who are foreseen to deliver the various UPRT elements. New instructor privileges are proposed for the upset recovery training course in an aeroplane. In addition, FSTD instructor training standards are to be increased, notably for those instructors that deliver upset recovery training in existing Full Flight Simulators (FFSs), to ensure that negative transfer of training is avoided. The proposal also introduces further supporting amendments, such as guidance for NAA inspectors, and is expected to increase safety and ensure harmonisation with ICAO. The foreseen entry into force date of the proposed requirements and provisions is April 2018.

#### 4.4.2.1 *ERNICIP - European reference network for critical infrastructure protection*

ERNICIP aims at providing a framework within which experimental facilities and laboratories will share knowledge and expertise in order to harmonise test protocols throughout Europe, leading to better protection of critical infrastructures against all types of threats and hazards and to the creation of a single market for security solutions.<sup>93</sup>

As part of their work, ERNICIP is developing a database on best practices, guidelines and standards that the network members consider most useful to their work. They have identified a number of standards and guidelines in the following sectors:

- Authentication and Biometry;
  - Cross Sectorial;
  - Explosive Detection;
  - IT and Cyber Security;
  - Resistance of Structures to Explosives;
  - Transport Security;
  - Water & Environment.<sup>94</sup>
- 
- Overview of standards/guidelines and current practices for vulnerability assessment of drinking water security in the European Union: The assets associated with the production and supply of drinking water

<sup>93</sup> [http://cordis.europa.eu/project/rcn/199582\\_de.html](http://cordis.europa.eu/project/rcn/199582_de.html)

<sup>94</sup> <https://erncip-project.jrc.ec.europa.eu/>

are regarded as critical infrastructure (CI) that must be protected against a wide range of incidents that could compromise its integrity. Of concern are those incidents that occur infrequently and often with little or no prior warning and have the potential to cause major contamination or disrupt the supply of drinking water. Member States have included the security of water supply in their national security plans and have conducted vulnerability assessments. Organisational responsibility rests with different government departments depending on the country. Several countries reported conducting research at the national level aimed at safeguarding water supply. Several organisations within the European Commission have implemented action at EU level and Comité Européen de Normalisation (CEN) have several working groups concerned with security and water supplies in particular. In addition, a considerable number of research projects have been funded by the Commission. The assessment is of a very fragmented structure for critical infrastructure protection (CIP) with the European Union. There appears to be overlapping in responsibility for drinking water security between different organisations, which to a certain extent would be expected because of the wide variety of threats that could potentially compromise the integrity of a water supply system. This review has not yet covered all Member States, but it is intended to act as an active document that will be periodically revised to take account of new developments. The information will be used to support the ongoing work of the Thematic Group for Chemical and Biological Risks to Drinking Water with the development of its programme of work aimed at managing chemical and microbiological risks.

#### 4.4.2.2 EU Joint Initiative on Standardisation (JIS)

The JIS was established in June 2016 with the goal to better prepare Europe for future developments in the economy, e.g. the importance of service industry and digital innovations. As part of this effort, the European Commission wants to harmonise standards and the JIS is intended to provide a vision for the future and enable faster standardisation setting. While the scope of the JIS does not specifically encompass resilience or crisis management, its overall actions should be monitored within ResiStand as it might have a wider impact on standardisation in Europe in general.<sup>95</sup>

The Joint Initiative on Standardisation<sup>96</sup> sets out a shared vision for European standardisation. Its aim is to speed up and better prioritise standard setting across the board. Standards must be timely, market-driven and produced in an inclusive way that supports EU policies and Europe's leadership in international standardisation.

To meet the current economic challenges and further contribute to creating jobs and growth, the Joint Initiative sets out concrete actions to further drive innovation, raise awareness of the importance of standards, and improve the representation of European SMEs' interests internationally. This will deliver a modern, dynamic ESS for businesses, consumers and society at large. The Joint Initiative consists of a shared vision that supports the 10 Juncker Commission priorities, as well as specific actions to be delivered by 2019. In line with the EU's Better Regulation policy, the Joint Initiative has been prepared in a collaborative, open, highly inclusive and transparent manner that reconciles both bottom-up and top-down needs and expectations. The initiative is driven by stakeholders (EU and EFTA Member States, standardisation organisations and bodies, European industry and industry associations, SMEs, and societal stakeholders), with the European Commission playing a mainly coordinating role and building consensus - bringing together the expertise of all parties involved. Most European standards are market driven and initiated by business. The ESS has a unique feature: around 20% of European standards are harmonised, meaning they provide a presumption of conformity with the legal requirements of the relevant EU legislation (e.g. the Toys Directive).

Involving SMEs in standard setting is key to ensuring that product development is not stymied by incompatible standards. Standards help define the market and are a way for SMEs to bridge the gap and allow them to compete with large companies on an equal footing.

<sup>95</sup> [http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item\\_id=8852](http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item_id=8852)

<sup>96</sup> [http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item\\_id=8852](http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item_id=8852)

Standards can also help to open up new markets both within and outside the EU. The Joint Initiative aims to improve Europe's export potential by promoting the European regulatory model in third countries. This will also support the interests of European SMEs in international standardisation processes.

#### **4.4.2.3 Outlook: The annual union work programme for European for standardisation 2017<sup>97</sup>**

Strategic priorities for European standardisation are given within the Communication from the Commission of the European Parliament, the Council Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee 2017.<sup>98</sup> ICT Standardisation, Services Standardisation, Strategic priority fields for standardisation requests to the ESOs in 2017. Other thematic areas of the document are International Cooperation, Horizon 2020 – Research and Innovation as well as the Next Cycle.

#### **4.4.2.4 ICT Standardisation**

The first priority is ICT Standardisation. The most urgent four areas are: 5G communications, cloud computing, the internet of things (IoT), (big) data technologies and cybersecurity. The Commission does not foresee to send any standardisation requests to the ESOs but will ask for their involvement in a number of preparatory activities aiming to map and develop the appropriate standards.

In the area of cloud computing, the Commission will request ESOs to update the mapping of cloud standards and guidelines for end users (especially SMEs and the public sector), in collaboration with international SDOs, cloud providers and end users, by mid-2017

In the internet of things (IoT), the Commission will foster an interoperable environment for the Internet of Things, working with ESOs and international Standards Development Organisations. The Commission then will assess if further steps are needed to tackle identified interoperability failures, and if necessary, consider using legal measures to recommend appropriate standards.

In the area of Cybersecurity, the Commission invited ESOs to draw up practical guidelines covering IoT, 5G, Cloud, Big Data and smart factories, by the end of 2016. They furthermore want to invite ESOs to develop standards by the end of 2018 that support global interoperability and seamless trustworthy authentication across objects, devices and natural and legal persons based on comparable trust models. In the next three years, the Commission will support ESOs in the development of standards-based cybersecurity risk management guidelines for organisations and of corresponding audit guidelines for authorities or regulators with oversight responsibilities. The Commission will work with ESOs to ensure that their strategies and activity roadmaps take into account the new requirements emerging from the digitisation industries such as vehicles, energy, eHealth and advanced manufacturing.

#### **4.4.2.5 Services Standardisation**

The second priority mentioned is Services Standardisation. The Commission proposes a combined approach consisting of:

- an enhanced development of European service standards based on a framework for the monitoring of national and other service standards and market needs, identifying possible areas for development of European standards, prioritisation in line with EU priorities, and prompting their development;
- improved mutual recognition and reduction of related national obstacles, starting with a targeted review of existing rules and practices for authorisations concerning standards and certificates in a chosen area as well as the assessment of equivalence of requirements; and
- more effective information to service providers, including improving the availability of information on standards and related requirements through the Digital Single Gateway.

<sup>97</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016DC0357&from=EN>

<sup>98</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016DC0357&from=EN>

The Commission will carry out an analysis of whether there are areas of conflict or duplication between national service standards or where there are potential policy gaps with respect to the ten Commission Priorities. They furthermore engaged by the end of 2016 with European and national standard setters and stakeholders to agree on criteria to prioritise European service standards and will launch in 2017 a targeted review to gather information on existing rules and practices for authorisations on standards and certificates as well as the assessment of equivalence of requirements.

#### **4.4.2.6 Strategic priority fields for standardisation requests to the ESOs in 2017**

Fields are listed where it intends to request the development of standards and deliverables from the ESOs. These fields are the Connected Digital Single Market, Resilient Energy Union with a forward-looking Climate Change Policy and Fairer Internal Market with a Strengthened Industrial Base.

Connected Digital Single Market, the proposed actions aim at enhancing the e-skills and the use of digital technologies

- develop and start the implementation of a comprehensive European framework for the ICT professions, providing a reference of competences as required and applied at the Information and Communication Technology (ICT) workplace, using a common language for competences, skills and proficiency levels that can be understood across Europe;
- improving and facilitating the reporting formalities required by legal acts of the Union and by Member States for ships arriving in and/or departing from ports of the Member States in order to reduce the administrative burdens for shipping companies;
- facilitate the flow, access and use of information in transport in order to enhance efficiency and reduce costs of transport operations.

For the Climate Change Policy, the proposed actions aim at combining our infrastructures, diversifying our energy resources, reducing energy consumption and promoting climate-friendly technologies:

- enabling harmonisation of licensing process and industrial standards for EU nuclear infrastructures development throughout their lifetime (construction, operation, decommissioning, waste management) in order to build a common framework for energy policies and win from economies of scale; and
- assuring interoperability between grids for increase of renewable energies in the power mix, in order to enhance the capacity of the existing infrastructures to absorb green energy resources while not increasing the cost for users.

For the support of the Deeper and Fairer Internal Market with a Strengthened Industrial Base, the Commission proposes actions increasing safety and interoperability requirements which are necessary for the completion of the internal market in products as of to the maintenance of a high performing industrial base in Europe:

- In the construction products sector, the following initiatives will allow the industry to incorporate improvements from other sectors, adapt the existing products and producing new innovative products to meet the current safety and quality needs:
  - 1. assessment methods for regulated dangerous substances and the emission of radiation must be finalised and the new assessment methods should be gradually introduced in construction product standards;
  - 2. construction products in contact with water intended for human consumption;
  - 3. innovative products and assessment of essential characteristics of the construction products performance;
    - methods for assessment of the risk of unlisted substances related with plastic materials and articles intended to come into contact with food in order to update the existing standards against new hazards;
    - plastic biodegradability for packaging and packaging waste which will support recycling;
- In the field of railways, the following initiatives will help on the improvement the interlinking and interoperability of the national rail networks



- 1. interior passive safety supporting the interoperability of the rail system which will improve the safety requirements of travel by train at European level;
  - 2. simplification of the methodology for the calculation of the free passage of the pantograph (mechanical kinematic pantograph gauge) to facilitate the assessment of the acceptance of pantograph heads in overhead contact lines; continued work on the interoperability of the railway system: development of urban railway standards.
- triggered by several accidents and incidents, the following products/procedures are to be addressed in standards: weather information products provided to pilots including applications in the cockpit based on different sources, Runway Overrun Awareness Alerting systems, Onboard Weight and Balance systems;
  - sustainable chemicals produced from secondary raw materials which will minimise the cost and the dependence of European Union for raw materials; and
  - supporting the competitiveness and efficiency of the defence and security sector in order to win from economies of scale and support Europe in its role as a stronger global actor

#### **4.4.2.7 International Cooperation**

The Commission invites the ESOs to continue the joint promotion of international and European standards in those world regions where the European industry can benefit from strengthened standardisation assistance and easier market access.

#### **4.4.2.8 Horizon 2020 – Research and Innovation**

The development and implementation of research and innovation agendas including through standardisation is essential for EU competitiveness. Horizon 2020 will give strong support to the market uptake of innovation, in particular to supporting standardisation through research and putting science into standards. Standardisation activities are an essential channel for the market adoption of research results and for the diffusion of innovations including research results from the Euratom part of Horizon 2020.

Horizon 2020 will give support to improve the efficiency of the standardisation system by promoting open standards and platforms and consistent application of standards and their uptake by the market.

ESOs should encourage and facilitate appropriate representation, at technical level, in standardisation activities of legal entities participating in a project that is related to that area and that is funded by the Union under a multiannual framework programme for activities in the area of research, innovation and technological development. ESOs should have reported to the Commission on the implementation of this action from 2013 until 2016.

#### **4.4.2.9 Next Cycle**

Following the discussions in the context of the Joint Initiative on Standardisation, to enhance the evidence base of the annual governance cycle on EU standardisation policy, the Commission will launch a study to analyse the economic and societal impact of standardisation.

#### **4.4.3 Summary**

For European organisations only a few are openly accessible and could be taken into account in this section. Many guidelines published by the EASA are concerned with risk analysis and assessment. The summary of the most important points of the “Annual union work programme for European for standardisation 2017” showed the strategic priorities of the EU with regard to standardisation activities and provided an outlook on activities in the future.

### **4.5 Analysis**

Overall, 23 guidelines by eight different European and international organisations with regard to disaster resilience were identified, analysed and categorised according to the disaster management phases they covered. Most of the guidelines dealt with tasks in the mitigation and preparedness phases.

*Guidelines in mitigation phase*



Within the mitigation phase the most frequent covered tasks were risk assessment and monitoring and review.

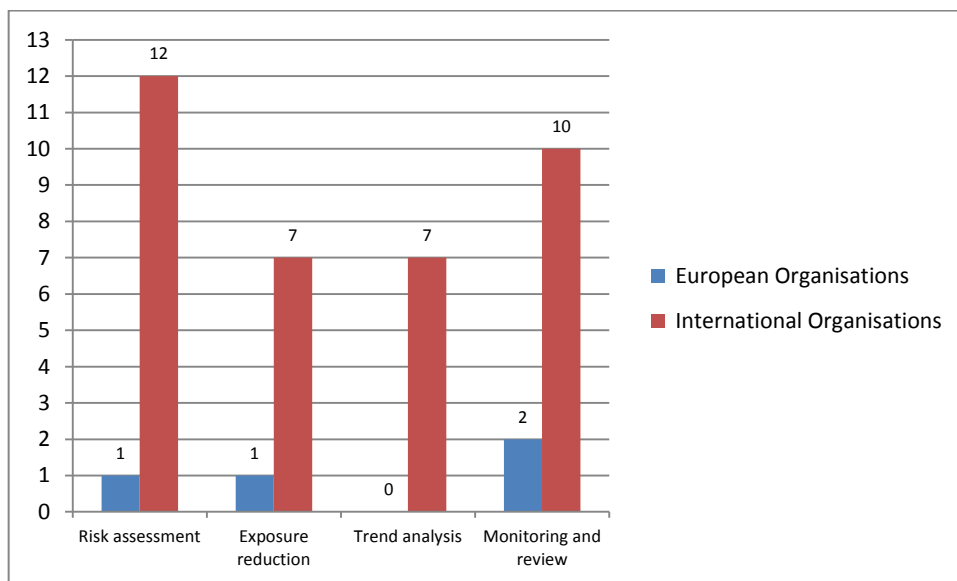


Figure 18: Guidelines - Categorisation of tasks in the mitigation phase

#### *Guidelines in preparedness phase*

Many of the described and categorised guidelines dealt with the preparedness phase. The most frequent tasks were capacity development, personnel management and asset management.

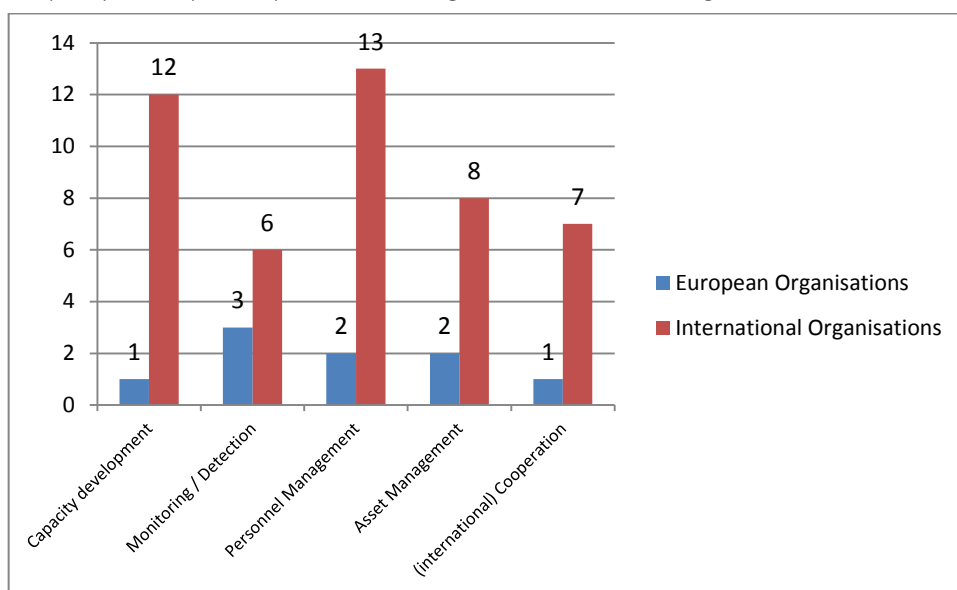


Figure 19: Guidelines - Categorisation of tasks in the preparedness phase

#### *Guidelines in response phase*

Some of the guidelines covered (at least) one task within the response phase, but they were considerably less frequent than the guidelines covering tasks in the mitigation and/or preparedness phase. The most frequent tasks were rescue operations and situation assessment followed by warning/crisis communication, command, control and coordination, information management and logistics.

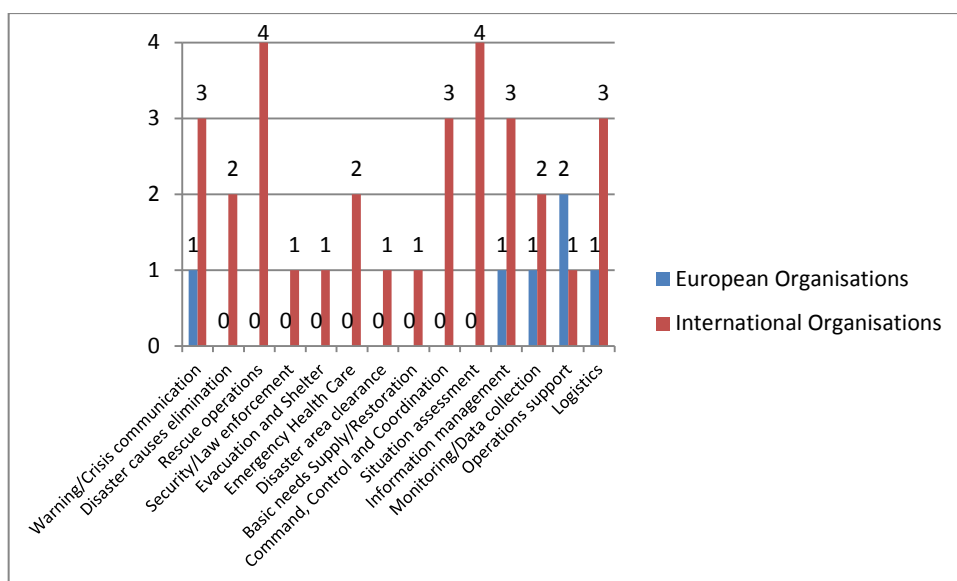


Figure 20: Guidelines - Categorisation of tasks in the response phase

### Guidelines in recovery phase

None of the European guidelines that have been analysed in the course of D 2.2 belonged to the recovery phase, only a few international guidelines dealt with the recovery phase, most of them on the Re-establishment of infrastructure.

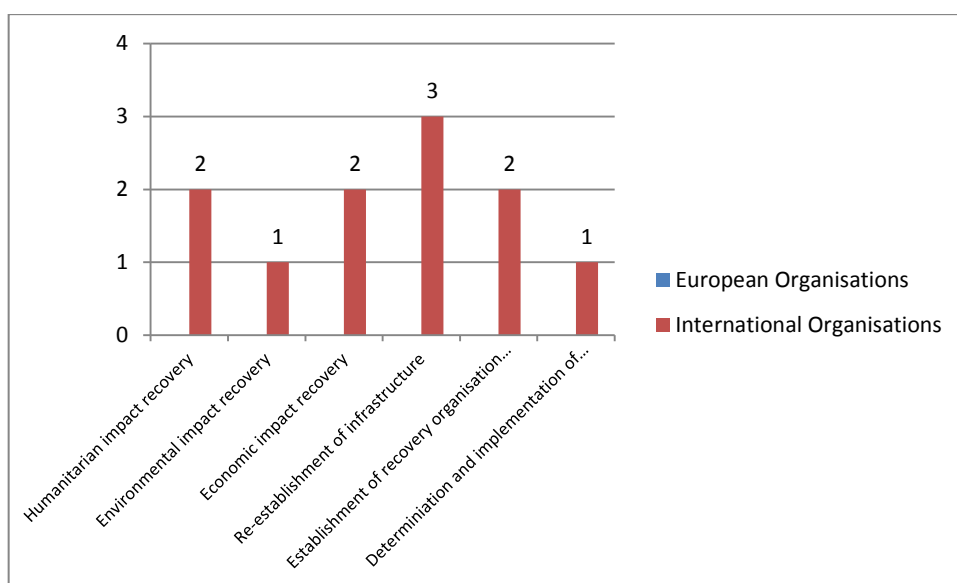


Figure 21: Guidelines - Categorisation of tasks in the recovery phase

The analysed and categorised guidelines can either indicate in which tasks and phases of the disaster management cycle new standards are probable or in which tasks and phases the development of new standards will not be probable as there are already existing and mostly functioning rules that are used by different organisations.

It is noteworthy that the absolute numbers of guidelines covering tasks in the response and recovery phase are substantially lower than the ones covering mitigation and preparedness. The top five of covered tasks all belong to the latter: personnel management (15), capacity development (13), risk assessment (13), monitoring and review (12) and asset management (10).

## 5 Conclusions

### 5.1 General conclusion

This report presented the analysis of standards and guidelines relevant to disaster resilience, and standardisation experiences and involved stakeholders for the relevant standardisation committees. The analysis showed that already a large number of relevant standards and some guidelines exist, covered by various standardisation committees and organisations that develop guidelines. However, the standards and guidelines are covering only partially the Disaster Management Cycle. Also, not all relevant stakeholders are represented in standardisation activities. As the area of disaster resilience can be considered a relatively new area for development of standards, there is still a lot of potential for standardisation activities in this area.

### 5.2 Conclusions on standardisation committees

#### 5.2.1 Standards

A large number of standards relevant to disaster resilience have been identified on international, European and national level. A thorough methodology has been applied to include as many of the most relevant standards.

Most of the standards are developed on international level, and the most relevant of those being developed by ISO/TC 292 on Societal Security. The most relevant European TC is on Societal and Citizen Security (CEN/TC 391).

There are less European standards developed than international standards. However, some of the international standards are also adopted as European standards. This is mostly the case for CEN/TC 391 on Societal and Citizen Security, which has adopted several standards developed by ISO/TC 292.

On national level, no standards in different countries were found that cover exactly the same topic.

With regards to the disaster management cycle, the majority of the international and European standards cover the mitigation and preparedness phase, some in response phase, and very few in recovery phase. For the national standards, most of the phases are touched upon, however mostly in the preparedness phase and least in the recovery phase. A majority of the national standards cover two or three phases in the disaster management cycle.

Looking into the tasks of the phases, it is remarkable that there are quite some national standards that fall under the tasks 'risk assessment' (in the mitigation phase), 'warning/crisis communication' (in the response phase) and 'establishment of recovery organisation structure' (in the recovery phase), while there are also international and European standards covering these tasks.

The majority of the published CBRN related standards are US national standards, other national standards and a few European CEN and ISO standards. Several of these standards are technical standards. CBRN standards identified cover standards for detection, protective clothing, guidelines, sample collection and determination of different radiological compounds in biological samples such as e. g urine. There are developed a number of standards for RN detectors, however, for B and also C detectors only few standards have been developed.

Most IT standardisation activities are in the area of cyber security, cloud services and business continuity processes. These standards cover mostly the mitigation and preparedness phases as they are related to critical infrastructure and maintenance.

Overall, standards in the area of disaster resilience and crisis management are developed in various phases and tasks of the disaster management cycle.

### 5.2.2 Stakeholder involvement

The stakeholder involvement differs depending on the specific stakeholder category:

- *Governmental organisations (including first responders<sup>99</sup>)* are relatively well represented on international and European level. On national level, this differs strongly; for some countries the government (all organisations) are well represented.
- *Non-governmental organisations (NGOs)* are represented on international level, but not on European level. On national level, NGOs are very few represented.
- *Industry/SME and consultancy* is best represented in all levels of standardisation.
- *Research and academia* is little representation on international level with the exception of ISO/TC 292, where a strong representation exists. On European level research is represented, also via liaisons. On national level this differs, but mostly some research is represented.
- *Standardisation bodies* are relative 'odd' stakeholders, as standardisation bodies are facilitators in making standards, not experts in the content of specific areas. National standardisation bodies follow the interest of their country and their experts. However, as disaster resilience is a broad topic, standardisation bodies often represent the interest of their national standardisation committee when participating in international meetings of TCs as it is not always possible for national experts to participate. Therefore a relative high number of representations from the standardisation bodies can be found in the European and international TCs.

All relevant TCs have indicated a need for more experts that are dedicated to the standardisation work. For international and European TCs, a common challenge expressed is the lack of financial resources, limiting experts to participate at meetings. However, in some of the investigated countries (France, Germany, UK), funds are made available (e.g. by the government) to support specific experts in standardisation work, allowing them to join international and European meetings.

Many European countries are active on international and European level, but noteworthy to mention is that the Eastern European countries seem to focus more on European development of standards than on international development, as there is fewer participation of these countries on international level.

The study shows that France, Germany and the UK are frontrunners with regard to international and European standardisation activities, reflected in the take-up of international and European secretariats and chair/convenor positions. The NSBs in these countries found effective ways to lower the threshold for international and European participation of experts (e.g. the before-mentioned funding).

### 5.3 Conclusions on NATO standards

The NATO STANAGs have their focus on tasks covered by the mitigation, preparation and the operational phases of the disaster management cycle. However, a major part of the standards and documents published by NATO is not publicly available due to security classification. Therefore, in this study it is difficult, based on the documentation investigated, to draw conclusions regarding the usefulness of military standard documents in disaster resilience for the civil society.

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<sup>99</sup> With regard to the stakeholder group 'first responders' (e.g. fire fighters and police), this group was initially described as a separate stakeholder group, as they represent a specific group being the ones directly involved dealing with the disaster. However, not for all data it was possible to make this distinction. Most of the first responders are part of governmental organisations, which raises the number of involved governmental organisations.

#### **5.4** *Conclusions on guidelines*

Many guidelines of different organisations exist with regard to disaster resilience. They deal with various aspects and tasks. For the development of standards, this can either indicate fields where new standards are going to be developed in the future or areas where no new standards are unnecessary and not probable as there are already existing and agreed upon rules. The described guidelines show that current events are taken into account in the development of guidelines (e.g. guidelines about volcanic ash). Overall it is noteworthy that the chosen examples of guidelines mostly deal with the mitigation and preparedness phase. They focus mainly on measures to limit/reduce the impact of disasters or on developing/maintaining the organisation structure and capabilities to carry out response and recovery activities in case of a disaster.

## 6 Next steps and Outlook

### 6.1 Introduction

This deliverable provides input for following work packages in the ResiStand project (see Table 67): It will serve as input for the roadmap to be developed in WP5, in the sense that it will help understand where proposed standards could be developed. It will also provide input for the ResiStand Process to be developed in WP6, since the aim of that process is to overcome the gaps between standardisation, end-users, industry and research, e.g. in stakeholder involvement.

Table 67: Input from D2.2 for ResiStand project

WP	Tasks	Input from D2.2
WP5: Preparation and roadmapping for standardisation activities	T5.2 Identification of standardisation gaps	Overview of TCs and organisations developing standards, serving as input for the gap analysis
	T5.3 Assessment of proposed and planned standardisation activities and roadmapping for future standardisation activities	Overview of TCs and organisations, serving as input for roadmap
WP6: Towards a sustainable process	T6.1 Concluding the ResiStand Process to improve future standardisation work	Overview of TCs and organisations developing standards, which form one 'side' of the ResiStand process

This work will serve as an input for two specific developments in the ResiStand project: the development of the web catalogue for storing the list of standards and guidelines to be used for the further identification of standardisation gaps and give structure to the Standards Advisory Group (SAG).

The web catalogue allows further addition of standards and guidelines, which means that this study will not end up as a static list. This report presents a first collection of standards and guidelines relevant for disaster resilience. However, the lists are not exhaustive and many other standards and guidelines (e.g. national standards) exist that have not been included as it was necessary to set limits to the study and the report. Further information, see section 6.2.

The Standards Advisory Group (SAG) will allow for further input and feedback from the standardisation community for the further development of the ResiStand project. Further information, see section 6.3.

### 6.2 ResiStand Web Catalogue

The list of standards and guidelines collected in WP2 will be stored in a catalogue. As a data driven web catalogue, it provides to the users the means to observe the information collected in the project, add additional items, analyse and cluster/categorise the data (WP2 & WP3 data) for the further identification and visualisation of the standardisation gaps (See Annex 14).

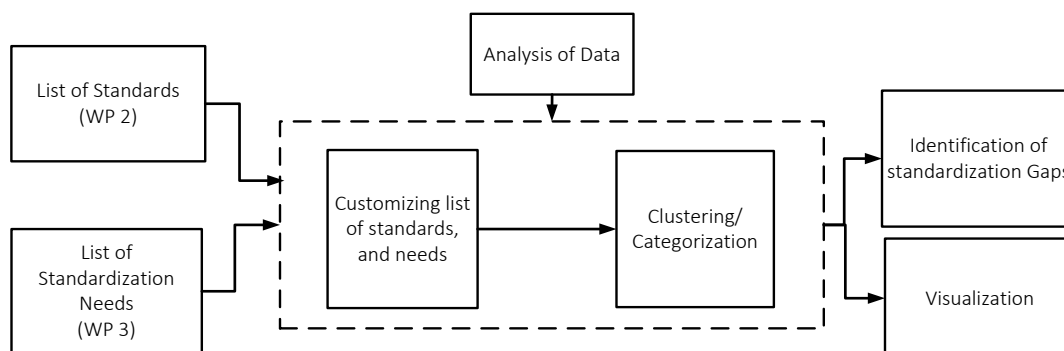


Figure 22: Web catalogue - Identification and visualisation of the standardisation gaps

### Functionalities of the web catalogue

The catalogue would be developed as a web-based application and it would have the following functionalities:

- Data storage
- Search and flexible data sharing
- Data protection
- Member area with different types of user roles
- Possibility for interoperability (Export to excel)
- Part of the ResiStand website (Link to the catalogue on the page)

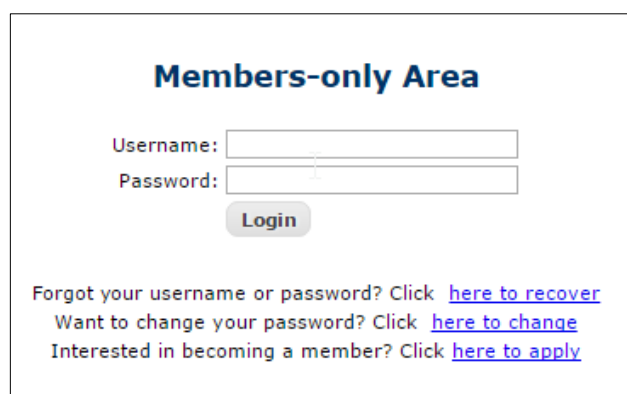
### Specification

The catalogue will be hosted by Microsoft SQL Server 2008 R2.

### User Management

In order to ensure security and control in the management of data, a member area will be developed (See Figure 23) and the following user roles will be established:

- *Observer*: search/view items/ items/propose new item and or revision of existing item
- *IT / Content Administrator*: add/edit/delete items



The screenshot shows a web form titled 'Members-only Area'. It contains two input fields: 'Username:' and 'Password:'. Below these fields is a 'Login' button. At the bottom of the form, there are three lines of text with hyperlinks: 'Forgot your username or password? Click [here to recover](#)', 'Want to change your password? Click [here to change](#)', and 'Interested in becoming a member? Click [here to apply](#)'.

Figure 23: Web catalogue - Member area

### List view option for the list of standards

The list of standards and guidelines in the catalogue will contain approximately 335 standards and 42 guidelines which were identified in the area of disaster management.

The database will display the data through the so called “list view option”. The main purpose of the List View is to search through the different lists by using different search criteria. In addition, it would be possible to export the data to MS Excel. This option will display the data by following their main attributes specified in the excel files (See Annex 14).

### 6.3 Standards Advisory Group (SAG)

Besides the research conducted for D 2.1 work has been carried out over the last months to set up the Standards Advisory Group (SAG). As this group is installed for the duration of the project the work is ongoing. In the section below a more detailed approach for the next steps of the SAG are described<sup>100</sup>.

The following steps were already taken or will be taken regarding the commitment of the SAG in the coming months:

1. Chairs of relevant TCs and representatives of NSBs were interviewed as part of T2.2. During the interview they were invited to join the SAG. Most NSBs have reacted positive on the invite. The Chairs of the TCs mostly preferred to stay informed without joining the SAG as a member. An exception is the Chair of CEN/TC 391 who has joined the SAG and agreed to take up the leading role.
2. Invite people personally known by the ResiStand partners directly, preferably through phone calls (rather than e-mails).
3. Targeted desk research to identify the potential members that partners do not know personally.
4. Ask current SAG members who they consider to be additional important stakeholders to be invited.

The following steps will be taken regarding the involvement of the SAG in the project:

1. Analysis of the current members. As people could sign up to one of the three ResiStand stakeholder groups prior to the start of the project it is important to review the listed members of the SAG to ensure the right people are part of the SAG.
2. Regular contact with the chair of CEN/TC 391 regarding the review of documents and other ways of cooperation.
3. Regular SAG mails aimed at updating the SAG members on the specific subjects within ResiStand relevant for standardisation (in addition to the general ResiStand newsletter).
4. Requests for feedback on specific documents and tasks, as described under “Aim and position of the SAG” (including background information and instructions).

Further information on the SAG regarding tasks and membership can be found in Annex 15.

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<sup>100</sup> The work for the SAG is ongoing and insights on approach may change in the course of the project.



## Annex 1. Overview of excluded European and international standardisation committees related to security (from Annex in D2.1)

Table 68 list the European and international standardisation committees identified in the area of security, with limited relation to the area of disaster resilience and therefore not included in the analysis of the standardisation committees in this deliverable.

Table 68: European and international technical committees related to security (not analysed)

SDO	TC	Title of TC
CEN	TC 127	Fire safety in buildings
CEN	TC 162	Protective clothing including hand and arm protection and lifejackets
CEN	TC 192	Fire service equipment
CEN	TC 224	Personal identification and related personal devices with secure element, systems, operations and privacy in a multi sectorial environment
CEN	TC 234	Gas infrastructure
CEN	TC 239	Rescue systems
CEN	TC 251	Health informatics
CEN	TC 263	Secure storage of cash, valuables and data media
CEN	TC 264	Air quality
CEN	TC 321	Explosives for civil uses
CEN	TC 325	Crime prevention by urban planning and building design
CEN	TC 388	Perimeter protection
CEN	TC 79	Respiratory protective devices
CEN	SS A11	Security services
CEN	WS 081	Postal supply chain security (SAFEPOST)
CEN/CENELEC		Coordination Group adaptation to Climate Change
CEN/CENELEC		Focus group on cybersecurity
CEN/CENELEC/ETSI		Coordination Group on Smart Cities
ISO	TC 59	Buildings and civil engineering works
ISO	TC 94	Personal safety -- Protective clothing and equipment
ISO	TC 85	Nuclear energy, nuclear technologies, and radiological protection
ISO/IEC	JTC 1/SC 31	Automatic identification and data capture techniques
ISO/IEC	JTC 1/SC 37	Biometrics

## Annex 2. Overview of excluded European technical committees (included in D2.1, not further analysed in D2.2)

Some European technical committees that were found interesting in D2.1 but not further analysed in D2.2 are listed below:

- CEN/TC 72 Fire detection and fire alarm systems
- CEN/TC 278 Intelligent transport systems
- CEN/CLC/TC 4 Services for fire safety and security systems
- CEN/CLC/JWG 8 Privacy management in products and services
- CLC/TC 79 Alarm systems

### CEN/TC 72 – FIRE DETECTION AND FIRE ALARM SYSTEMS

#### TC scope and working groups

TC scope:

- To prepare standards, harmonised where necessary to meet the essential requirement 'Safety in case of fire' of the Construction Products Directive, in the field of fire detection and fire alarm systems in and around buildings, covering test methods, requirements and recommendations for: - components; - the combination of components into systems; - the planning, design and installation of systems for use in and around buildings; - usage, maintenance and servicing; - the connections to and control of other fire protection systems; - the combination with other systems to form integrated systems; - the combination with fixed firefighting systems; - the contribution of fire detection and fire alarm systems to fire safety engineering.<sup>101</sup>

CEN/TC 72 has in total 20 working groups; none of the working groups are included in this analysis.

#### Secretariats and chairs

- The secretariat and chair of the TC is given in Table 69.

Table 69: CEN/TC 72 – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
CEN / TC 72	United Kingdom	Standardisation Body	United Kingdom	Industry & Commerce

#### Involved countries

- An overview of the active countries in CEN/TC 72 is given in Table 70.

<sup>101</sup> [https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP\\_ORG\\_ID:6055&cs=1D57DDCB3061EBF39DF3623B532C26C27](https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP_ORG_ID:6055&cs=1D57DDCB3061EBF39DF3623B532C26C27)

Table 70: CEN/TC 72 – Involved countries

CEN / TC 72	Involved countries
Active countries	28 countries in total: Austria, Belgium, Bulgaria, Croatia, Cyprus, Denmark, Estonia, European, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom

**Liaisons**

- An overview of the stakeholder types of the liaisons in CEN/TC 72 is given in Table 71.
- CEN/TC 72 has 4 external liaisons. Most of these liaisons are represented by the stakeholder groups 'Industry & Commerce'.

Table 71: CEN/TC 72 – Stakeholder type distribution in TC liaisons

Stakeholder Type	Number of liaisons
Academic & Research	-
Governmental organisation	1
Industry & Commerce	3
NGO	-
Other	-
Standardisation Body	-
<b>Total</b>	<b>4</b>

**CEN/TC 278 – INTELLIGENT TRANSPORT SYSTEMS****TC scope and working groups**

TC scope:

- Standardisation in the field of telematics to be applied to road traffic and transport, including those elements that need technical harmonization for intermodal operation in the case of other means of transport. It shall support amongst others: - vehicle, container, swap body and goods wagon identification; - communication between vehicles and road infrastructure; - communication between vehicles; - vehicle man machine interfacing as far as telematics is concerned; - traffic and parking management; - user fee collection; - public transport management; - user information.<sup>102</sup>

CEN/TC 278 has in total 15 working groups, of which 1 working group is relevant:

- CEN/TC 278 WG 5 – Traffic control

**Secretariats and chairs**

- An overview of the secretariats and chairs of the TC and the relevant working groups is given in
- Involved **Countries**
- An overview of the active countries in CEN/TC 278 is given in Table 73.
- In CEN/TC 278, a total of 29 countries are involved, which is 88% of the CEN-CENELEC members.

<sup>102</sup> [https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP\\_ORG\\_ID:6259&cs=1EA16FFFE1883E02CD366E9E7EADFA6F7](https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP_ORG_ID:6259&cs=1EA16FFFE1883E02CD366E9E7EADFA6F7)

- Table 72.

#### Involved Countries

- An overview of the active countries in CEN/TC 278 is given in Table 73.
- In CEN/TC 278, a total of 29 countries are involved, which is 88% of the CEN-CENELEC members.

Table 72: CEN/TC 278 – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
<b>CEN/TC 278</b>	Netherlands	Standardisation Body	Netherlands	Governmental organisation
<b>WG 5</b>	(not available)	(not available)	(not available)	(not available)

Table 73: CEN/TC 278 – Involved countries

<b>CEN/TC 278</b>	<b>Involved countries</b>
<b>Active countries</b>	<p>29 countries in total:</p> <p>Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom</p>

#### Overview of participation

- An overview of the country participation in CEN/TC 278 and the relevant working groups is given in Table 74.
- Looking at the participation in the working group, 7 countries are involved: 3 participants are from Slovenia, 2 participants are from Belgium. The other countries are represented by one participant.
- Remarkable is the large number of active countries involved in the TC and the small number of countries and participants in the working group.

Table 74: CEN/TC 278 – Overview of participation in TC and relevant working groups

<b>Country</b>	<b>TC 278</b>	<b>WG 5</b>	<b>Total active memberships in WGs</b>
Slovenia	Active	3	3
Belgium	Active	2	2
Germany	Active	-	-
France	Active	1	1
Austria	Active	-	-
United Kingdom	Active	-	-
Sweden	Active	1	1
Spain	Active	-	-
Estonia	Active	-	-
Greece	Active	-	-
Switzerland	Active	1	1

Country	TC 278	WG 5	Total active memberships in WGs
Czech Republic	Active	1	1
Finland	Active	-	-
Netherlands	Active	-	-
Hungary	Active	-	-
Norway	Active	-	-
Latvia	Active	-	-
Portugal	Active	-	-
Iceland	Active	-	-
Ireland	Active	-	-
Malta	Active	-	-
Bulgaria	Active	-	-
Denmark	Active	-	-
<i>Armenia</i>	Active	1	1
Croatia	Active	-	-
Italy	Active	-	-
Cyprus	Active	-	-
Lithuania	Active	-	-
Romania	Active	-	-
Slovakia	Active	-	-
<b>Total active European memberships</b>	<b>29</b>	<b>10</b>	<b>10</b>

### Liaisons

- An overview of the stakeholder types of the liaisons in CEN/TC 278 is given in Table 75.
- CEN/TC 278 has 14 external liaisons. The most liaisons are with the stakeholder group 'Academic & Research'. The second largest stakeholder group is 'NGO'.
- CEN/TC 278 has 3 liaisons with other TCs.

Table 75: CEN/TC 278 – Stakeholder type distribution in TC liaisons

Stakeholder Type	Number of liaisons
Academic & Research	1
Governmental organisation	1
Industry & Commerce	7
NGO	3
Other	2
Standardisation Body	3
<b>Total</b>	<b>17</b>

### Stakeholders in relevant working groups

- CEN/TC 278 has in total 15 working groups, of which 1 working group is relevant:

- CEN/TC 278 WG 5 – Traffic control
- An overview of the number of stakeholders and the stakeholder distribution in the relevant working groups is given in Table 76.
- In terms of stakeholder type distribution: most of the participants are from 'Industry and Commerce' (40%). No stakeholder from governmental or non-governmental organisations are involved in this working group.

Table 76: CEN/TC 278 – Stakeholder type distribution in relevant working groups

Stakeholder Type	WG 5
Academic & Research	3
Governmental organisation	-
Industry & Commerce	4
NGO	-
Other	-
Standardisation Body	3
<b>Total</b>	<b>10</b>

## CEN/CENELEC/TC 4 – SERVICES FOR FIRE SAFETY AND SECURITY SYSTEMS

### TC scope and working groups

TC scope:

- The Technical Committee should develop a basic standard for services for fire safety and security systems. The basic standard specifies the requirements for quality of services supplied by companies and the competencies of their involved staff charged with the planning and design, engineering, installation and hand over, maintenance and repair of fire safety and/or security systems.
- Examples of fire safety and/or security systems, are fire detection-, fire extinguishing -, voice alarm-, intruder alarm-, hold up-, access control-, social alarm-, smoke and heat exhaust ventilation-, CCTV systems, control equipment for escape and evacuation route, and combination of such systems as mentioned before.<sup>103</sup>

CEN/CENELEC/TC 4 has no working groups; the work is done in the TC itself.

### Secretariats and chairs

- The secretariats and chair of the CEN/CENELEC/TC 4 are given in Table 77.
- The secretariat and chair of the TC is provided by Germany.
- The chair represents the following stakeholder category: Industry & Commerce

Table 77: CEN/CENELEC/TC 4 – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
<b>CEN/CENELEC/TC 4</b>	Germany	Standardisation Body	Germany	Industry & Commerce

### Involved countries

- An overview of the active countries in CEN/CENELEC/TC 4 is given in Table 78.

<sup>103</sup>

[https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP\\_ORG\\_ID:812864&cs=1BDD0E27597AB260500F3549DAA66C8E6](https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP_ORG_ID:812864&cs=1BDD0E27597AB260500F3549DAA66C8E6)

- In CEN/CENELEC/TC 4, a total of 20 countries are involved, which is 61% of the CEN-CENELEC members.

Table 78: CEN/CENELEC/TC 4 – Involved countries

CEN/CENELEC/TC 4	Involved countries
Active countries	20 European countries Austria; Belgium; Bulgaria; Cyprus; Finland; France; Germany; Ireland; Italy; Lithuania; Luxembourg; Netherlands; Norway; Poland; Portugal; Romania; Spain; Sweden; Switzerland; United Kingdom

### Overview of participation

- An overview of the country participation in CEN/CENELEC/TC 4 is given in Table 79.
- As the work is done in the TC itself, the numbers of participants in the TC included in the analysis.
- Looking at the participation in the work, 15 out of the 24 countries actively participate.

Table 79 CEN/CENELEC/TC 4 – Overview of participation in TC and relevant working groups

Country	TC 4	TC 4
United Kingdom	Active	2
Germany	Active	2
Sweden	Active	2
Switzerland	Active	1
Poland	Active	1
France	Active	-
Ireland	Active	1
Spain	Active	2
Austria	Active	1
Finland	Active	-
Romania	Active	-
Bulgaria	Active	-
Netherlands	Active	-
Belgium	Active	-
Hungary	Active	1
Latvia	Active	-
Denmark	Active	1
Norway	Active	-
Italy	Active	-
Lithuania	Active	-
Luxembourg	Active	-
Portugal	Active	-
Cyprus	Active	-
Czech Republic	Active	1
<b>Total active European memberships</b>	<b>24</b>	<b>15</b>

### Liaisons

- An overview of the stakeholder types of the liaisons in CEN/CENELEC/TC 4 is given in Table 80.

- CEN/CENELEC/TC 4 has 6 external liaisons. Most of these liaisons are represented by the stakeholder groups 'Industry & Commerce'.
- CEN/CENELEC/TC 4 has 2 liaisons with other TCs.

Table 80: CEN/CENELEC/TC 4 – Stakeholder type distribution in TC liaisons

Stakeholder Type	Number of liaisons
Academic & Research	-
Governmental organisation	-
Industry & Commerce	4
NGO	-
Other	2
Standardisation Body	2
<b>Total</b>	<b>10</b>

## CEN/CENELEC/JWG 8 – PRIVACY MANAGEMENT IN PRODUCTS AND SERVICES

### TC scope and working groups

TC scope:

- CEN and CENELEC's Joint Working Group on 'Privacy management in products and services' (CEN/CENELEC/JWG 8) was established in 2014. Its aim is to develop standards and specifications setting out best practices and recommendations with regard to the handling of data during the lifecycle of a product or service. These best practices include making privacy the "default setting" for commercial data practices and providing consumers with greater control over the collection and use of their personal data through simplified choices and increased transparency.

Once implemented, these best practices will serve to increase consumer confidence and encourage online commerce.

One specific topic addressed by CEN/CENELEC/JWG 8 is the implementation of privacy management policies in products and services, including dedicated security products. CEN and CENELEC have accepted a request from the European Commission (M/530) to undertake standardisation work in relation to 'privacy and personal data protection management in the design and development of security technologies and service provision'.

The Joint Working Group seeks to engage with stakeholders - including experts from the security industry, data protection authorities, and consumer organisations and data privacy officers or controllers within different EU businesses - in order to develop appropriate standards. The aim is to achieve the broadest possible consensus, in order to ensure that the standards being prepared will be widely accepted by consumers.<sup>104</sup>

CEN/CENELEC/JWG 8 has no working groups.

### Secretariats and chairs

- The secretariats and chair of the CEN/CENELEC/JWG 8 are given in
- Table 81.
- The secretariat and chair of the TC is provided by France.
- The chair represents the following stakeholder category: Industry & Commerce

<sup>104</sup> [http://www.cencenelec.eu/news/brief\\_news/Pages/TN-2016-004.aspx](http://www.cencenelec.eu/news/brief_news/Pages/TN-2016-004.aspx)



Table 81: CEN/CENELEC/JWG 8 – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
CEN/CENELEC/JWG 8	France	Standardisation Body	France	Industry & Commerce

**Involved countries**

- An overview of the active and observing countries in CEN/CENELEC/JWG 8 is given in Table 82.
- In CEN/CENELEC/JWG 8, a total of 15 countries is involved, which is 45% of the CEN-CENELEC members.

Table 82: CEN/CENELEC/JWG 8 – Involved countries

CEN/CENELEC/JWG 8	Involved countries
Active countries	15 European countries Austria; Belgium; Denmark; Finland; France; Germany; Italy; Lithuania; Netherlands; Poland; Portugal; Romania; Spain; Sweden; United Kingdom

**Overview of participation**

- An overview of the country participation in CEN/CENELEC/JWG 8 is given in Table 83.
- Looking at the participation in the working group, the countries most involved are France (8), Germany (4) and United Kingdom (2).

Table 83: CEN/CENELEC/JWG 8 – Overview of participation in TC and relevant working groups

Country	JWG8	JWG 8
France	Active	8
Germany	Active	4
United Kingdom	Active	4
Italy	Active	3
Sweden	Active	2
Netherlands	Active	2
Denmark	Active	1
Romania	Active	1
Portugal	Active	1
Austria	Active	1
Spain	Active	1
Belgium	Active	1
Finland	Active	1
Poland	Active	1
Lithuania	Active	1
<b>Total active European memberships</b>	<b>15</b>	<b>32</b>

**Liaisons**

- An overview of the stakeholder types of the liaisons in CEN/CENELEC/JWG 8 is given in Table 84.

- CEN/CENELEC/JWG 8 has 4 external liaisons, an equal number of liaisons with the stakeholder type 'Governmental organisation' as well as 'others'.

Table 84: CEN/CENELEC/JWG 8 – Stakeholder type distribution in TC liaisons

Stakeholder Type	Number of liaisons
Academic & Research	-
Governmental organisation	2
Industry & Commerce	-
NGO	-
Other	2
Standardisation Body	-
<b>Total</b>	<b>4</b>

## CENELEC/TC 79 – ALARM SYSTEMS

### TC scope and working groups

TC scope:

- To prepare harmonized standards for detection, alarm and monitoring systems for protection of persons and property, and for elements used in these systems. The scope includes in particular intruder and hold-up alarm systems, access control systems, periphery protection systems, combined alarm - fire alarm systems, social alarm systems, CCTV-systems, other monitoring and surveillance systems related to security applications, as well as associated and dedicated transmission and communication systems. The standards shall specify conformity tests.<sup>105</sup>

CENELEC/TC 79 has in total 10 working groups, of which 1 working group is relevant:

- Social alarm systems

### Secretariats and chairs

- The secretariat and chair of the CENELEC/TC 79 are given in Table 85.
- The secretariat and chair of the TC is provided by the United Kingdom.

Table 85: CENELEC/TC 79 – Secretariats and chairs

	Secretariat		Chair	
	Country	Stakeholder type	Country	Stakeholder type
<b>CENELEC/TC 79</b>	United Kingdom	Standardisation Body	(not available)	(not available)
<b>CENELEC/TC 79 WG 4</b>	United Kingdom	Standardisation Body	(not available)	(not available)

### Involved countries

- An overview of the active and observing countries in CENELEC/TC 79 is given in
- Table 86.
- In CENELEC/TC 79 a total of 24 countries is involved, which is 73% of the CEN-CENELEC members.

<sup>105</sup> <https://www.lvs.lv/en/committees/10975>

Table 86: CENELEC/TC 79 – Involved countries

CENELEC/TC 79	Involved countries
Active countries	24 European countries Austria; Belgium; Bulgaria; Croatia; Czech Republic; Denmark; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Malta; Netherlands; Norway; Poland; Portugal; Romania; Slovenia; Spain; Sweden; Switzerland; United Kingdom

**Overview of participation**

An overview of the country participation in CENELEC/TC 79 is given in Table 87.

Table 87: CENELEC/TC 79 – Overview of participation in TC and relevant working groups

Country	CENELEC/TC 79	CENELEC/TC 79
Norway	Active	1
United Kingdom	Active	1
Slovenia	Active	1
Belgium	Active	1
Malta	Active	1
Bulgaria	Active	1
Portugal	Active	1
Croatia	Active	1
Sweden	Active	1
Czech Republic	Active	1
Italy	Active	1
Denmark	Active	1
Netherlands	Active	1
Finland	Active	1
Poland	Active	1
France	Active	1
Romania	Active	1
Germany	Active	1
Spain	Active	1
Greece	Active	1
Switzerland	Active	1
Hungary	Active	1
Austria	Active	1
Ireland	Active	1
<b>Total active European memberships</b>	<b>24</b>	<b>24</b>

**Liaisons**

- An overview of the stakeholder types of the liaisons in CENELEC/TC 79 is given in Table 88.
- CENELEC/TC 79 has 5 external liaisons. The most liaisons are with the stakeholder group 'Industry & Commerce'.
- CENELEC/TC 79 has 3 liaisons with other TCs.

Table 88: CENELEC/TC 79 – Stakeholder type distribution in TC liaisons

Stakeholder Type	Number of liaisons
Academic & Research	-
Governmental organisation	1
Industry & Commerce	4
NGO	-
Other	-
Standardisation Body	3
<b>Total</b>	<b>8</b>

## Annex 3. European and international technical committees - Interview questions (used in D2.2)

### ***Aim of interview***

*Aim of the interview is to understand the scope, work programme (including published and planned standards) and vision of TC regarding disaster resilience.*

### ***Targeted interviewee***

*Chairperson of TC*

### **TC Background**

1. When was the TC established and who took the initiative for the establishment?
2. What was the reason for the establishment of the TC?
3. What is the scope of the TC?
4. What are the subjects covered by the TC that relate to disaster resilience?
5. Which working groups are related to disaster resilience?

### **Work programme in relation to disaster resilience**

6. What are the main subjects of the standards published by the TC so far?
7. For which subjects are standards currently being developed?
8. Are all subjects mentioned in the scope of the TC covered by the TC?
9. Are there any subjects for which the TC has decided not to develop standards? If so, what is the reason for that?
10. How does the TC decide whether a standard should or should not be developed? Is that solely based on the official requirements (number of nominated experts, weighted majority)?
11. Who are the main initiators of standards?
  - a. Are specific countries more active in the initiation?
  - b. Do liaisons initiate standards?
12. What are the challenges in the development of standards (for disaster resilience)?
13. Does the TC develop any standards related to (EC) regulations? If so, please specify the standards and the regulations.
14. Does the TC monitor whether published standards are used and by who? If yes, how? If no, why not?
15. Are there any specific disaster resilience areas for which standards do not exist, but should be developed?

### **Involvement of experts**

16. In our earlier research, we found that approximately (number) experts are registered to participate in the TC and its WGs. Does this number reflect the actual number of experts participating in the TC and WGs (by either attending meetings or contributing to standards development in another way)?
17. Do you think that the participants in the TC and its WGs are a good representation of the market?
  - a) If no, which specific stakeholder groups are missing, and why?

- b) How can these stakeholders be involved?
- 18. Does the TC and its WGs cooperate actively (either through liaisons or in other ways) with:
  - a) Research projects
  - b) End user organisations
  - c) Sector organisations
  - d) Regulators / EC
  - e) Other TCs
- 19. Are there any organisations the TC and its WGs would want to cooperate with, but who are not involved currently? If so:
  - a) Why are they not involved?
  - b) Why should they be involved? How would it benefit the work of the TC/ WGs?
  - c) How can these organisation be involved?

### **The ResiStand project**

- 20. Do you think standards can contribute to disaster resilience? If so:
  - a) Please specify in which specific area
  - b) Please specify how standards can contribute
- 21. Could disaster resilience related standardisation be more effective? If so:
  - a) What would need to happen to increase effectiveness?

ResiStand will develop a process, which improves coordination and cooperation between standardisation, standards users and suppliers of input for standardisation (research/industry). The aim of this process is to identify better and earlier which standards should be developed.

- 22. Do you think such a process would be useful?
- 23. What elements do you consider to be necessary for such a process to be successful?

Stakeholders have a very important role within the ResiStand project. To engage stakeholders, three stakeholder communities have been established:

- Standardisation Advisory Group
- End-User Community
- Supplier Community (research/industry)

- 24. Would you like to be involved/informed about this project?
- 25. Would you like to be a member of one of the stakeholder groups?

## Annex 4. National standardisation committees – Survey questions (used in D2.1)

Country studies on national disaster resilience and crisis management standardisation activities

### Part 1: Questionnaire on national standardisation committees and other SDOs

#### National standardisation committees

1. Which national standardisation committees work in the field of security / crisis management / disaster resilience? Could you provide us with the following information on these committees:

<b>About the national committee</b>		
Name of national committee:		
Translation of the name in English:		
Scope of this committee:		
Work programme of the national committee:		
If relevant, please indicate which CEN/TC or ISO/TC is mirrored <sup>1</sup> :		
<b>About the working groups</b>		
If relevant, please indicate below the working groups (WG) under this national committee:		
Name of WG (in English)	Scope of WG	Mirrored CEN/ISO TC/WG

(Note: if more national committees, please copy and paste the below table for each committee)

<b>About the national committee</b>		
Name of national committee:		
Translation of the name in English:		
Scope of this committee:		
Work programme of the national committee:		
If relevant, please indicate which CEN/TC or ISO/TC is mirrored:		
<b>About the working groups</b>		
If relevant, please indicate below the working groups (WG) under this national committee:		
Name of WG (in English)	Scope of WG	Mirrored CEN/ISO TC/WG

<sup>1</sup> The most relevant TCs identified in this project are CEN/TC 391 and ISO/TC 292. Next to these TCs, there are other TCs that are relevant in this field.

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2. Please specify the composition of the members in the before mentioned national committees:

Name of national committee/working group:		
About the chairperson		
Name of the chairperson (if possible):		
Organisation of chairperson (if possible):		
Stakeholder type of chairperson (please select from the list below):		
About the members		
Total number of members in committee/WG (including chairperson, excluding secretary):		
Please indicate below the distribution of members (including chairperson, excluding secretary)		
Type of stakeholder:	No of members:	No of members actively involved in CEN/ISO (participating in ISO/CEN meetings):
First responders		
Governmental organisations (except for first responders)		
NGOs (except for first responders)		
Industry/SME		
Research		
Consultancy		
Standardisation bodies		
Others		

(Note: if more national committees, please copy and paste the below table for each committee)

Name of national committee/working group:		
About the chairperson		
Name of the chairperson (if possible):		
Organisation of chairperson (if possible):		
Stakeholder type of chairperson (please select from the list below):		
About the members		
Total number of members in committee/WG (including chairperson, excluding secretary):		
Please indicate below the distribution of members (including chairperson, excluding secretary)		
Type of stakeholder:	No of members:	No of members actively involved in CEN/ISO (participating in ISO/CEN meetings):
First responders		
Governmental organisations (except for first responders)		
NGOs (except for first responders)		
Industry/SME		
Research		



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Consultancy		
Standardisation bodies		
Others		

**SDOs**

3. Besides the formal national standardisation organisations, are there any other national organisations (SDOs) developing standards (or de-facto standards) in the area of security / crisis management / disaster resilience? (please fill in one table per organisation):

About the SDO
Name of national SDO:
Translation of the name in English:
Scope of this SDO:
How are standards developed? Are there any subgroups?:

4. Please specify the composition of the persons that are involved in the SDO in developing the standards (please fill in one table per group that you have mentioned before):

Name of national SDO:		
About the persons involved in developing the standards		
Total number of persons involved:		
Please indicate below the distribution of persons involved		
Type of stakeholder:	No of members:	Remarks:
First responders		
Governmental organisations (except for first responders)		
NGOs (except for first responders)		
Industry/SME		
Research		
Consultancy		
Standardisation bodies		
Others		

## Annex 5. Overview of excluded national standardisation committees (included in D2.1, not further analysed in D2.2)

The result on national standardisation committees that were found interesting in D2.1 but not further analysed in D2.2 are listed below:

- Czech Republic
- Finland
- Spain

### Czech Republic

In the Czech Republic, standardisation is coordinated by UNMZ, the Czech Office for Standards, Metrology and Testing.

#### **Standardisation framework**

Standardisation efforts regarding disaster resilience and crisis management are merged within one national committee, the *TNK 148 'Crime prevention and protection of the population'*. The scope of this committee includes standardisation within the fields of crime prevention through building, facility and area design and protection of the population. Fire detection systems and alarm systems are excluded. The chair of this committee is held by a representative of the Ministry of interior of the Czech Republic; thus a governmental organisation. In total 23 members are part of this committee, while most of them are from governmental organisations, industry/SME and consultancies, and to a minor extent from first responders, research and standardisation bodies.

This committee mirrors currently the following three European and international Technical Committees:

- CEN/TC 325 'Crime prevention through building, facility and area design'
- CEN/TC 391 'Societal and citizen security'
- ISO/TC 292 'Security and resilience'

In addition to the main committee the subcommittee *TNK 148/SK 1 'Healthcare facilities'* needs to be mentioned. This committee scopes the protection of the population in healthcare facilities and is mirroring the activities of the CEN/TC 391/WG 1 'Healthcare Facilities'. The chairperson of this committee comes from the stakeholder type consultancy, and from the seven members of this committee the major part is from governmental organisations as well as industry and to a minor extent from consultancies and standardisation bodies. Two persons of this committee(s) are representing the Czech Republic in the corresponding European Technical Committee CEN/TC 391 (WG1).

Apart from the formal standardisation body there is also another national organisation handling the topic of disaster resilience and crisis management. The *'Fire Rescue Service of the Czech Republic'* has a committee on *'Civil Emergency Planning'* and several subcommittees. The main committee has about 24 persons involved.

#### **Stakeholder involvement**

The national committee *TNK 148 'Crime prevention and protection of the population'* and the subcommittee dealing with security in healthcare facilities *TNK 148/SK 1* consist of a total of 30 members, representing a variety of stakeholder types.

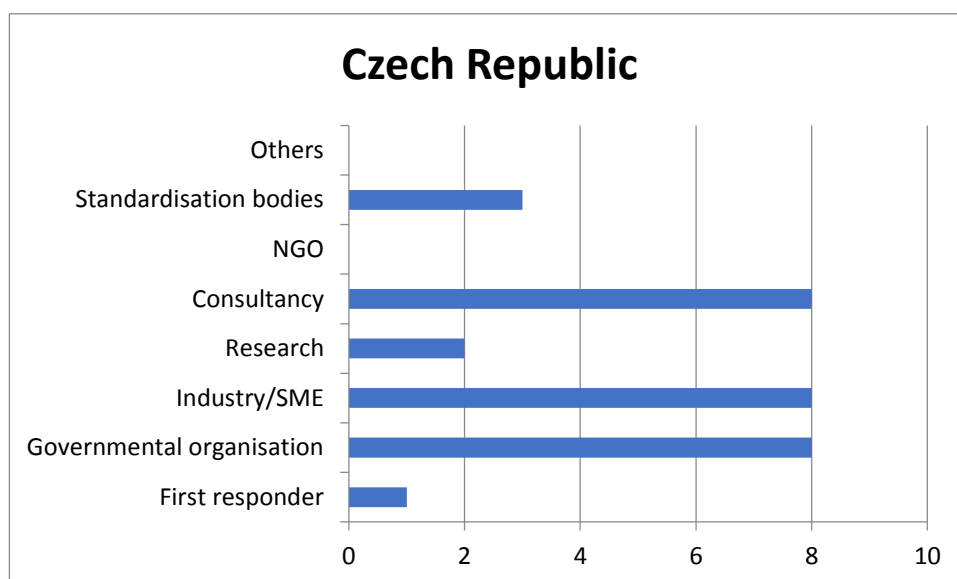


Figure 24: National standardisation committee - Distribution of stakeholder groups – Czech Republic

## Finland

In Finland, standardisation is facilitated by three standardisation bodies. These are the Finnish Standards Association (SFS) for business areas covered by ISO and CEN, the Finnish Communications Regulatory Authority (Ficora) for all telecom standardisation and the Finnish Electro technical Standards Association (SESKO) for all standards concerning electrical, electronic and related technologies. SFS represents Finland in international standardisation within ISO and CEN. In Finland there exists a so called decentralised standardisation system, where SFS has nominated and authorized 12 sectorial organisations to act for and on behalf of SFS by mutual agreement. The Societal Security Standardisation activities have not been delegated to any of those SDOs. The task of SFS is to co-ordinate the standardisation activities amongst all stakeholders who have identified a need of consensus for developing products and services. The clients of SFS and the 12 SDOs (Members of National Mirror Committees) are a cross-section of Finland's private sector and public sector organisations, including global businesses, government agencies, local authorities and county councils, trade associations and voluntary organisations. National SFS-Standards are developed by various SFS and SDO committees, who's main task is also to follow the European and International standardisation (There are no national standards in the field of Societal security).

### Standardisation framework

In the case of Societal Security and critical infrastructure there exists a National Mirror Committee on CEN/TC 391 and ISO/TC 229. The scope of this National Mirror Committee *SFS/SR 211 "Societal Security"* is:

- The follow up on the activities in CEN/TC 391 and ISO/TC 292 (previous ISO/TC 223) and to represent the Finnish interest in the development of international and European standards in the field of Societal security, as defined in the scope of CEN/TC 391.
- The translation of adopted EN standards into the Finnish language, if needed.

The following CEN deliverables have been translated into Finnish language:

- CEN/TS 16595 "CBRN. Vulnerability Assessment and Protection of People at Risk"
- EN ISO 22300 "Societal security. Terminology"
- EN ISO 22301 "Societal security. Business continuity management systems. Requirements"
- EN ISO 22313 "Societal security. Business continuity management systems. Guidance"

In addition the promotion of the ongoing work of CEN/TC 391 and ISO/TC 292 at National level by organizing National conferences, when necessary. The latest was held on 6.10.2015.

### Stakeholder involvement

The committee consists of 6 members, of which 3 are from NGO's, 2 represent Industry/SME and 1 represents Consultancy. Two of the Finnish experts are also active in CEN and ISO committees.



Figure 25: National standardisation committee - Distribution of stakeholder groups – Finland

## Spain

In Spain, standardisation is facilitated by UNE, the 'Asociación Española de Normalización y Certificación' (Standardisation and Certification Spanish Association). UNE is responsible for standardisation activities as well as other activities, such as certification and training.

### Standardisation framework

Standardisation activities related to disaster resilience, are carried out by the national standardisation committee *AEN/CTN 196 – Citizens protection and safety*.

Structure: *SC1 Infrastructure and critical services continuity*

International Relations: *ISO/TC 223 Citizens safety*  
*CEN/WS44 Emergency services management*  
*CEN/BT/WG 161 Citizen protection and safety*  
*CEN/TC 391 Citizens protection and safety*

According to UNE, CTN 196 also does the follow-up of ISO/TC 292 and other groups like CEN Workshops and CEN/BT/WG. Spain is a Participating country in ISO/TC 292.

### Stakeholder involvement

Right now *CTN 196* is undergoing a restructuring process due to inactivity, during this period the merge of many TCs into the new ISO/TC 292 took place. Therefore some ISO/TC 292 activities are followed by other groups in UNE like *GET 21 "Measures against fraud and forgery"* and *GET 17 "Private security services"* (GET are like CTNs but with a limited work program).

Due to the restructuring of the national mirror committee, no information regarding the numbers and types of stakeholders participating is available.

## Annex 6. National standardisation committees – Interview questions (used in D2.2)

### *Aim of interview*

*In-depth interviews to understand the national standardisation committee structure, the stakeholders involved, and the national standards in the area of disaster resilience.*

### *Targeted interviewee*

*Secretary of national mirror committee*

## INTERVIEWS QUESTIONS

### Roll call and introduction to project (approx. 10 minutes)

*Antti introduces the project briefly.*

### Structure of national standardisation committee(s) (approx. 15 minutes)

1. Please describe how standardisation in the area of disaster resilience is organised in your country, and are there specific interests or actions in this field by the NSB (e.g. strategic reasons)?
2. Some desk research has been done previously; this information has been sent to you. Can you indicate to what extent anything is missing in this description?
3. Could you elaborate on the structure of the national mirror committee(s) on disaster resilience? How are these organised and why?
4. Does the mirror committee focus on both ISO and CEN standardisation, or just one of them? What are the reasons for this?

### Involved stakeholders (approx. 15 minutes)

5. How many members are active in the mirror committee(s)? Do you think that the mirror committee is a good reflection of the market?
6. Which type of stakeholder is most active and which is missing? (stakeholder categories identified in the project: first responders/ governmental /industry/ research/ consultancy/ standardisation)
7. Are members (of national mirror committees) represented in ISO and CEN working groups? If yes, what incentives/motivations are there for stakeholders to participate in standardisation?

### National standards and initiatives in the area of disaster resilience (approx. 5 minutes)

8. Do you have national standards or national standardisation projects/activities in the area of disaster resilience?
  - a. If so, what type of standards (main topic and scope)?
  - b. What are the reasons for setting national standards?
9. Are there any ISO standards that are not adopted nationally and why ?
10. Are there any mandatory standards in national regulation in the area of disaster resilience?

**Other relevant national initiatives in the area of disaster resilience (approx. 10 minutes)**

11. Which other organisations in your country are developing (informal) standards with regard to disaster resilience and is there any coordination between the NSB and these organisations?
12. In which topics are these standards developed and why?

**Future of standardisation in disaster resilience (approx. 5 minutes)**

13. What are your expectations regarding the future of standardisation in disaster resilience (will standardisation play a bigger role, will it develop more on European or international level)?
14. What are the challenges for standardisation work/NSBs in the future?

**Invitation to join the SAG**

*(No interview question, but final question after interview)*

15. An Standards Advisory Group (SAG) is part of the ResiStand project. The role of the SAG is to support the ResiStand work, and specifically to provide feedback on tools developed as part of the ResiStand process (such as the assessment framework for possible standardisation projects). Due to your commitment in the field of disaster resilience standardisation, we would like to invite you to join the SAG. Will you be interested and willing to further help with the ResiStand project? More information regarding the SAG can be send to you.

## Annex 7. Overview of organisations whose work pertains to standardisation (from Annex in D2.1)

Table 89 provides an overview of all of the organisations that are listed in Section 3 of D2.1 as well as those organisations that are affiliated and potentially useful to include in developing standards but that do not directly provide guidelines (or whose guidelines are not publicly available) or standards. These latter organisations are also discussed in detail below.

Table 89: Overview of organisations and those that are related to standardisation efforts (D2.1)

Stakeholder	Type of organisation	Area of expertise	Level of involvement	Type of activities
UNISDR	International Organisation	Disaster Risk	Worldwide	Standards, Guidelines, Operational, Education
International Civil Aviation Organisation	International Organisation	Aviation	Worldwide	Standards, Guidelines
European Aviation Safety Agency	International Organisation	Aviation	Europe	Standards, Regulations, Education
EUROCONTROL	International Organisation	Aviation	Europe	Guidelines, Regulations
FRONTEX	International Organisation	Border Management	Europe	Operational
European Maritime Safety Agency	International Organisation	Maritim Safety	Europe	Guidelines, Operational
IACP	International Organisation	Law Enforcement	Worldwide	Education
WorldBank	International Organisation	Disaster Risk	Worldwide	Standards, Guidelines
UN Habitat	International Organisation	City Resilience	Worldwide	Standards, Guidelines
UNOPS	International Organisation	Disaster Risk	Worldwide	Guidelines, Operational
UN ESCAP	International Organisation	Disaster Risk	Regional	Guidelines, Education
EUROCAE	NGO	Aviation	Europe	Standards
IEEE	NGO	ICT	Worldwide	Standards, Education
Water New Zealand	NGO	Water	National	Guidelines
Global City Indicators Facility	NGO	City Resilience	Worldwide	Standards, Guidelines
Ceres	NGO	City Resilience	Worldwide	Guidelines
ICLEI	NGO	City Resilience	Worldwide	Guidelines
International Risk Governance Council	NGO	Risk	Worldwide	Guidelines
Global Infrastructure Basel	NGO	Infrastructure	Worldwide	Standards, Guidelines
American Water Works Association	NGO	Water	National	Standards
ERNCI	EU program	Infrastructure	Europe	Guidelines
DG Migration and Home Affairs	EU program	Infrastructure	Europe	Guidelines
CIIP	EU program	ICT	Europe	Guidelines
ENLETS	EU program	Law Enforcement	Europe	Guidelines
CIWIN	EU program	ICT	Europe	Guidelines
CIPRNet	EU program	Infrastructure	Europe	Guidelines
HAZUR® Resilient Systems	Industry	City Resilience	Worldwide	Guidelines, Education
FPC Risk	Industry	Fire	Worldwide	Guidelines, Operational
PwC	Industry	Risk Management	Worldwide	Operational, Education
WSP and Parsons Brinckerhoff	Industry	Construction Resilience	Worldwide	Guidelines, Operational
Insurance Council of Australia	Industry	Construction Resilience	National	Guidelines
ACEA	Industry	Automobile	Europe	Guidelines
American Petroleum Association	Industry	Oil & Gas	National	Standards, Guidelines
Australia Emergency Management Victoria	Government	Emergency Management	National	Guidelines, Regulations, Operational
NASA	Government	Space & Aeronautics	National	Standards, Guidelines, Operational, Education
UK – Civil Contingencies Secretariat	Government	Infrastructure	National	Guidelines
USA – National Infrastructure Advisory Coun	Government	Infrastructure	National	Guidelines
New Zealand - National Infrastructure Unit	Government	Infrastructure	National	Guidelines
Global Initiative on Disaster Risk Manageme	Government	Infrastructure & Climate	Worldwide	Standards, Guidelines

**International organisations*****United Nations International Strategy for Disaster Reduction UNISDR***

UNISDR was established in 1999 as a dedicated secretariat to facilitate the implementation of the International Strategy for Disaster Reduction (ISDR).<sup>106</sup> It is mandated by the United Nations General Assembly resolution (56/195), to serve as the focal point in the United Nations system for the coordination of disaster reduction and to ensure synergies among the disaster reduction activities of the United Nations system and regional organisations and activities in socio-economic and humanitarian fields. UNISDR defines itself through its multi-stakeholder coordination approach based on the relationships it has developed with national and local governments, intergovernmental organisations and civil society, including the private sector, and by its mode of operating through a network of global partners. UNISDR has five regional offices – in Asia (Bangkok), Africa (Nairobi), Europe (Brussels), Arab States (Cairo) and Americas and the Caribbean (Panama). The UNISDR Headquarters is located in Geneva.

UNISDR is promoting a global initiative to build national disaster databases with a well-defined methodology. For this purpose it uses the DesInventar free, open source methodology and software, which enables the collection of detailed and homogeneous data about disasters at all scales. It allows not only the homogeneous capture of disaster information that is space and time-stamped, but also the analysis of disaster loss and damage through graphic representation of information on disasters through charts, maps and statistical reports. This standard methodology for recording disaster impacts enables the comparison between countries and regions that have joined the initiative. The tool helps countries to understand disaster trends, patterns and impacts in a systematic manner. Through the increased understanding of the disaster impacts, better prevention, mitigation and preparedness measures can be planned to reduce disaster risk<sup>107</sup>.

Given the absence of a global database which monitors all scales of disasters without the establishment of data entry thresholds, standardized national disaster loss databases will contribute to generate the baseline and the continuous data required to monitor global Sendai Framework targets over the 15 years of the Framework until 2030.

Representatives from Africa, Asia-Pacific, the Americas and Europe exchanged experience and knowledge on how to implement tangible disaster risk reduction projects through seven work-streams: disaster risk management strategies, investment metrics, benchmarking and standards, education and training, legal and regulatory, urban risk reduction & resilience, and insurance. UNISDR also supported a Hotel Resilient Initiative study which found significant demand for disaster resilience standards, which are due to be developed in 2016.

In Europe, the European Commission Directorate-General for Humanitarian Aid and Civil Protection, in cooperation with the Regional Office for Europe (ROE), has developed and shared guidelines for the development and implementation of a national disaster loss database aligned with standards set by UNISDR and has promoted its adoption in 32 participating states as well as in countries on the road to European Union membership and other neighbouring countries. The ROE assisted in the establishment of disaster loss databases and staff training in Belarus, Kosovo (under UNSCR 1244/99) and Serbia. Furthermore, the office supported the initial implementation of the database to achieve the “minimum standard” status in seven additional countries: Austria, Czech Republic, Finland, France, Italy, Portugal and Sweden. Probabilistic risk models have been already developed and implemented by Germany, The Netherlands and Spain, and support was provided to Spain for the implementation of the national disaster losses database.

- The year 2015 was a landmark for UNISDR with the agreement of the Sendai Framework for Disaster Risk Reduction 2015-2030 at the Third UN World Conference on Disaster Risk Reduction on 18 March 2015 in Sendai, Japan and its adoption by all Member States through General Assembly Resolution 69/284 in June 2015.

<sup>106</sup> <http://www.unisdr.org/>

<sup>107</sup> Annual Report 2015, p. 20, [http://www.unisdr.org/files/48588\\_unisdrannualreport2015evs.pdf](http://www.unisdr.org/files/48588_unisdrannualreport2015evs.pdf)



- The Sendai Framework clearly suggests in Priority 1 that countries “Systematically evaluate, record, share and publicly account for disaster losses and understand the economic, social, health, education, environmental and cultural heritage impacts...”
- <http://www.wcdrr.org/> (Sendai 2015)
- [http://rks-kommission.dgfk.net/UN\\_Sendai\\_Rahmenwerk\\_Hearing\\_Bonn\\_20160212.pdf](http://rks-kommission.dgfk.net/UN_Sendai_Rahmenwerk_Hearing_Bonn_20160212.pdf)
- <http://www.preventionweb.net/english/hyogo/GP/>
- <https://www.gfdr.org/> (Global Facility of Disaster Reduction and Recovery)
- [https://www.bmz.de/de/themen/naturkatastrophen/internationale\\_vereinbarungen/index.html](https://www.bmz.de/de/themen/naturkatastrophen/internationale_vereinbarungen/index.html)
- [http://www.preventionweb.net/files/45270\\_unisdrscienceandtechnologyroadmap.pdf](http://www.preventionweb.net/files/45270_unisdrscienceandtechnologyroadmap.pdf)
- [http://www.preventionweb.net/files/33663\\_33663posthfaprinciplesandrecommenda.pdf](http://www.preventionweb.net/files/33663_33663posthfaprinciplesandrecommenda.pdf)

### **World Bank**

“Over the past 10 years, the World Bank has emerged as the global leader in disaster risk management (DRM), supporting client countries to assess exposure to hazards and address disaster risks. It provides technical and financial support for risk assessments, risk reduction, preparedness, financial protection, and resilient recovery and reconstruction.

In providing support for DRM, the WBG promotes a comprehensive, multi-sector approach to managing disaster risk.

The Social, Urban, Rural and Resilience Global Practice (GSURR) houses the World Bank’s core DRM specialists and leads engagement with client countries on disaster risk and resilience... The Global Facility for Disaster Reduction and Recovery (GFDRR), a global partnership managed by the World Bank and supported by 34 countries and 9 international institutions, acts as a financing and technical body that supports DRM across the World Bank Group.

Thematic programs targeting areas such as Small Island States, disaster resilience analytics, and hydrometeorology are central to delivering the work of the DRM operational group with high technical quality. The Small Island States program is rapidly building a community of practice among internal and national experts working on DRM and climate adaptation and delivering scaled-up and more harmonized support for resilience to Small Island States.

The disaster resilience analytics program provides technical expertise in the production of disaster risk profiles and risk information for DRM and offers assistance with the valuation of cities, post-disaster loss assessments, economic loss models/cost-benefit analysis, and training workshops. The hydromet program offers a mechanism for sharing lessons and experiences from World Bank operations involving hydromet modernization, weather, water and climate services, and resilience, as well as discussing cutting-edge thinking on these issues. It also aims to foster links between Bank operations and research/policy institutions and promote a culture of joint learning with partner countries.”<sup>108</sup>

The World Bank’s Environmental and Social Framework, revised in 2016, “introduces comprehensive labor and working condition protection; an over-arching non-discrimination principle; community health and safety measures that address road safety, emergency response and disaster mitigation; and a responsibility to include stakeholder engagement throughout the project cycle.”<sup>109 110</sup>

<sup>108</sup> <http://www.worldbank.org/en/topic/disasterriskmanagement/overview#2>

<sup>109</sup> <http://www.worldbank.org/en/news/press-release/2016/08/04/world-bank-board-approves-new-environmental-and-social-framework>

<sup>110</sup> [http://consultations.worldbank.org/Data/hub/files/consultation-template/review-and-update-world-bank-safeguard-policies/en/materials/the\\_esf\\_clean\\_final\\_for\\_public\\_disclosure\\_post\\_board\\_august\\_4.pdf](http://consultations.worldbank.org/Data/hub/files/consultation-template/review-and-update-world-bank-safeguard-policies/en/materials/the_esf_clean_final_for_public_disclosure_post_board_august_4.pdf)

### ***European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union FRONTEX***

Frontex promotes, coordinates and develops European border management in line with the EU fundamental rights charter applying the concept of Integrated Border Management.<sup>111</sup> Frontex plans, coordinates, implements and evaluates joint operations conducted using Member States' staff and equipment at the external borders (sea, land and air).

Eurosur is the information-exchange framework designed to improve the management of Europe's external borders. It aims to support Member States by increasing their situational awareness and reaction capability in combating cross-border crime, tackling irregular migration and preventing loss of migrant lives at sea. The backbone of Eurosur is a network of National Coordination Centres (NCCs). Each member state establishes an NCC, which groups the authorities responsible for border control in a given member state. The main role of the NCC is to coordinate the border surveillance activities on national level and serve as a hub for the exchange of information.

### ***European Maritime Safety Agency (EMSA)***

EMSA is one of the EU's decentralised agencies. Based in Lisbon, the Agency provides technical assistance and support to the European Commission and Member States in the development and implementation of EU legislation on maritime safety, pollution by ships and maritime security. It has also been given operational tasks in the field of oil pollution response, vessel monitoring and in long range identification and tracking of vessels.

### ***UNOPS***

"UNOPS strives to increase the resilience of nations and communities to such hazards by integrating a risk-based culture into all our activities around the world." Their Disaster Risk Reduction for Resilience (DRR4R) approach is widely promoted by the UNISDR.

### **Non-Governmental Organisations (NGOs)**

#### ***European Organisation for Civil Aviation Equipment EUROCAE***

The European Organisation for Civil Aviation Equipment is a non-profit organisation dedicated to aviation standardisation since 1963.<sup>112</sup> To develop EUROCAE Documents (ED), the organisation coordinates multiple Working Groups (WG), which gather experts working on a voluntary basis. WG members usually come from the organisation's members, though outsiders may be accepted as well under specific conditions.

The European Commission recognised EUROCAE as the competent technical body in Europe to provide support to the European Standardisation Organisations (ESOs) in fulfilling their tasks to develop and maintain Community Specifications (CS) in support of the "Single European Sky". Specific agreements have been signed with CEN, CENELEC and ETSI.

Cooperation with RTCA and SAE (USA Standardisation bodies) exists through many joint groups and strong coordination on all levels and topics of mutual interest. Formal agreements have been signed with both entities and are continually reviewed and updated as needed.

SESAR Joint Undertaking (SJU) and EUROCAE complement each other when moving from Research and Development (R&D) to standardisation needs: the collaboration is based on an active Memorandum of Cooperation (MoC).

A search of the documents in their eshop, i.e. mostly standards, using the key words "crisis" or "disaster" resulted in no hits. Searching for "management" gave 13 hits, yet none of them were relevant to the work of ResiStand.

<sup>111</sup> <http://frontex.europa.eu/>

<sup>112</sup> <https://www.eurocae.net/>

***EU – DG Migration and Home Affairs***

The DG for Migration and Home Affairs “manage policies that aim at ensuring that all activities necessary and beneficial to the economic, cultural and social growth of the EU may develop in a stable, lawful and secure environment. More specifically, we work to build an open and safer Europe.”<sup>113</sup> As part of this overall mission, HOME also deals with crisis and terrorism in the field of critical infrastructure. In order to fulfill this role, they launched the European Programme for Critical Infrastructure Protection (EPCIP). The programme includes a set of measures aimed at improving the protection of critical infrastructure in Europe, across all EU States and in all relevant sectors of economic activity. One of its central pillars is the 2008 Directive on European Critical Infrastructure, which establishes a procedure for identifying and designating European Critical Infrastructures (ECI) and a common approach for assessing the need to improve their protection.<sup>114</sup>

***EU Initiative on Critical Infrastructure Protection (CIIP)***

The EU initiative on Critical Information Infrastructure Protection (CIIP) aims to strengthen the security and resilience of vital Information and Communication Technology (ICT) infrastructures.<sup>115</sup>

***European Network of Law Enforcement Technology Services (ENLETS)***

ENLETS supports front line policing and the fight against serious and organised crime by gathering user requirements, scanning and raising awareness of new technology and best practices, benchmarking and giving advice. It is active in joint initiatives, sharing information and networking between law enforcement agencies, industry and research organisations. It is a point of contact to access European law enforcement technical organisations.

***Critical Infrastructure Warning Information Network (CIWIN)***

The CIWIN network has been developed as a Commission owned protected public internet based information and communication system, offering recognised members of the EU’s CIP community the opportunity to exchange and discuss CIP-related information, studies and/or good practices across all EU Member States and in all relevant sectors of economic activity. The CIWIN portal, following its prototype and pilot phases, has been up and running since mid-January 2013.<sup>116</sup>

***Critical Infrastructure Preparedness and Resilience Research Network (CIPRNet)***

CIPRNet performs research and development that addresses a wide range of stakeholders including (multi)national emergency management, critical infrastructure operators, policy makers, and the society. By integrating resources of the CIPRNet partners acquired in more than 60 EU co-funded research projects, CIPRNet will create new advanced capabilities for its stakeholders. A key technology for the new capabilities will be modelling, simulation and analysis for CIP. CIPRNet builds a long-lasting virtual centre of shared and integrated knowledge and expertise in CIP. This virtual centre shall provide durable support from research to end users. It will form the foundation for the European Infrastructures Simulation & Analysis Centre (EISAC) by 2020.<sup>117</sup>

<sup>113</sup> [http://ec.europa.eu/dgs/home-affairs/who-we-are/about-us/index\\_en.htm](http://ec.europa.eu/dgs/home-affairs/who-we-are/about-us/index_en.htm)

<sup>114</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:345:0075:0082:EN:PDF>

<sup>115</sup> <https://ec.europa.eu/jrc/en/research-topic/critical-infrastructure-protection>

<sup>116</sup> [http://ec.europa.eu/dgs/home-affairs/what-we-do/networks/critical\\_infrastructure\\_warning\\_information\\_network/index\\_en.htm](http://ec.europa.eu/dgs/home-affairs/what-we-do/networks/critical_infrastructure_warning_information_network/index_en.htm)

<sup>117</sup> [http://cordis.europa.eu/news/rcn/125360\\_de.html](http://cordis.europa.eu/news/rcn/125360_de.html); <https://www.ciprnet.eu/summary.html>

## **Industry & Business**

### ***FPC Risk***

FPC Risk is an internationally operating consultancy that works on fire risk consulting, fire risk engineering and emergency management.<sup>118</sup> As part of this portfolio, they also work towards implementing a modular crisis resilience action plan for buildings.

### ***PwC***

PwC is a worldwide operating consultancy firm covering a wide range of topics from risk management to cyber security to audit and assurance services. As part of their services, PwC runs their own Resilience Journal with academic articles as well as a Risk Insights Blog.<sup>119</sup>

### ***WSP and Parsons Brinckerhoff***

WSP and Parsons Brinckerhoff is an engineering professional services consulting firm. They “provide services to transform the built environment and restore the natural environment. Our expertise ranges from environmental remediation to urban planning, from engineering iconic buildings to designing sustainable transport networks, and from developing the energy sources of the future to enabling new ways of extracting essential resources.”<sup>120</sup>

WSP has a specific unit that deals with “multi-hazard resilience engineering”.<sup>121</sup> They also produce a technical journal ‘Network’ that has consistently featured discussions of resilience in engineering.<sup>122</sup>

## **Government**

### ***Australia State Government Victoria & Australia Emergency Management Victoria***

“Emergency Management Victoria (EMV) was established in July 2014 and plays a key role in implementing the Victorian Government’s emergency management reform agenda. We do this by:

- maximising the ability of the emergency management sector to work together and achieve joined up outcomes that are community focused
- leading and facilitating key initiatives focused on system-wide reform with integrated policy, strategy, planning, investment and procurement
- ensuring a stronger emphasis on shared responsibility, community resilience, consequence management and post emergency recovery activities
- embedding emergency management across government, agencies and business
- leading and coordinating emergency preparedness, response and recovery with the emergency management sector and community.

EMV supports the Emergency Management Commissioner, who has overall responsibility for coordination before, during and after major emergencies including management of consequences of an emergency.”<sup>123</sup>

One of the tasks of the EMV is to build resilience of critical infrastructure.<sup>124</sup> The new Victorian Critical Infrastructure Model comprises several elements:

- “A new definition for Victoria’s critical infrastructure moving towards an ‘all hazards’ resilience model which includes a focus on terrorism
- Use of a standardised criticality assessment methodology to determine the criticality of infrastructure, and its significance not just for commercial operations but also in delivering the State’s essential services

<sup>118</sup> <http://fpcrisk.com/index.php>

<sup>119</sup> <http://www.pwc.com/gx/en/services/advisory/consulting/risk/resilience.html>

<sup>120</sup> <http://www.wsp-pb.com/en/Who-we-are/About-us/>

<sup>121</sup> <http://www.wsp-pb.com/en/WSP-USA/Who-we-are-USA/Newsroom/News-Releases/2016/Sissy-Nikolaou-to-Lead-Seismic-Design-and-Multi-Hazard-Resilience-Practice/>

<sup>122</sup> <http://network.wsp-pb.com/tag/resilience?pageSize=24>

<sup>123</sup> <https://www.emv.vic.gov.au/about-us/our-role/>

<sup>124</sup> <https://www.emv.vic.gov.au/our-work/critical-infrastructure-resilience/>

- Categorisation of critical infrastructure as either ‘local’, major’, ‘significant’ or the highest category of ‘vital’.
- The establishment of the Critical Infrastructure Register which will record all Victorian critical infrastructure designated as vital, or assessed as major or significant
- A partnership approach between industry and government in building resilience for the continued delivery of essential services, with formal engagement mechanisms enshrined in legislation and the Critical Infrastructure Resilience Strategy
- Clearly defined roles and responsibilities for industry, portfolio departments, EMV, relevant Ministers and the Minister for Emergency Services, as well as establishing Sector Resilience Networks and Plans
- A focus on continuous improvement through:
  - Mandatory obligations for critical infrastructure assessed as ‘vital’, by completing a Resilience Improvement Cycle. This helps industry and government articulate the emergency risks to the supply of essential services to the Victorian community, and to develop risk management strategies to manage and mitigate those risks.
  - Owners and/or operators of non-‘vital’ critical infrastructure are encouraged to develop best practice emergency risk management strategies and practices based on the obligations for ‘vital’ critical infrastructure
- A performance measurement and assurance framework”<sup>125</sup>

#### ***New Zealand – National Infrastructure Unit***

“The National Infrastructure Unit was established in 2009 to deliver the government’s objectives relating to infrastructure. The Unit is based within Treasury, and its responsibilities include:

- Formulating, and monitoring progress on, a 20-year National Infrastructure Plan (NIP);
- Establishing robust and reliable cross-government frameworks for infrastructure project appraisal and capital asset management, and monitoring the implementation and use of those frameworks;
- Providing support to, and acting as a secretariat for, the new National Infrastructure Advisory Board.

The Unit does not duplicate the role of other infrastructure-related government agencies. It works in co-operation with other government agencies and takes a cross sector, high level view of New Zealand infrastructure.”<sup>126</sup> The latest resilience report is the New Zealand Infrastructure Plan 2015, which has as its vision that “[b]y 2045 New Zealand’s infrastructure will be resilient and coordinated, and contribute to a strong economy and high living standard.”<sup>127</sup>

#### **IT organisations**

##### ***Internet Research Task Force (IRTF)***

The Information-Centric Networking Research Group (ICNRG)<sup>128</sup> looks into research challenges for coping with natural or human-generated, large-scale disasters. In particular, an Internet draft published in February 2016<sup>129</sup> discusses potential directions for applying Information Centric Networking (ICN) to address these challenges. This concept of ICN embraces moving the Internet paradigm from perpetual connectivity and end-to-end principle to a “named information” one which becomes the focal point of the Internet architecture.

<sup>125</sup> Ibid.

<sup>126</sup> <http://www.infrastructure.govt.nz/aboutniu>

<sup>127</sup> <http://www.infrastructure.govt.nz/plan/2015/>

<sup>128</sup> <https://trac.tools.ietf.org/group/irtf/trac/wiki/icnrg>

<sup>129</sup> <https://tools.ietf.org/html/draft-irtf-icnrg-disaster-00>

## Annex 8. Overview of excluded European and international organisations (included in D2.1, not further analysed in D2.2)

This annex provides an overview of European and international organisations identified and included in D2.1, but do not have guidelines available or accessible:

- European Organisation for the Safety of Air Navigation EUROCONTROL
- International Association of Chiefs of Police (IACP)
- Water New Zealand
- Global City Indicators Facility (GCIF)
- American Water Works Association (AWWA)
- HAZUR® Resilient Systems
- Insurance Council of Australia
- American Petroleum Institute
- UK – Civil Contingencies Secretariat
- USA – DHS – National Infrastructure Advisory Council (NIAC)
- Global Initiative on Disaster Risk Management
- Global Infrastructure Basel
- UN Habitat – City Resilience Profiling Programme

### European Organisation for the Safety of Air Navigation EUROCONTROL

EUROCONTROL is an intergovernmental organisation with 41 States, committed to building, together with its partners, a Single European Sky that will deliver the air traffic management (ATM) performance required for the twenty-first century and beyond.<sup>130</sup>

EUROCONTROL chairs the European Aviation Crisis Coordination Cell (EACCC), the main role of which is to support coordination of the response to network crisis situations impacting adversely on aviation, in close cooperation with corresponding structures in States. This includes proposing measures and taking initiatives to coordinate a response to crisis situations and, in particular, acquiring and sharing information with the aviation community (decision makers, airspace users and service providers) in a timely manner.

The Single European Sky (SES) framework regulation establishes a harmonised regulatory framework in conjunction with the airspace, service provision and interoperability regulations and calls for the adoption of implementing rules by the European Commission. EUROCONTROL develops specifications that can act as Means of Compliance (MoC) to SES regulations. EUROCONTROL also develops guidance material and provides implementation support activities to its stakeholders. Under the SES framework, the European Commission may develop the implementing rules themselves, but may also issue a mandate to an organisation which is then tasked with implementing rule drafting. EUROCONTROL is one such organisation and has developed numerous draft regulations which were submitted by the EC to the Single Sky Committee (SSC) for its formal opinion.

The specific guidelines were not accessible for public and therefore could not be taken into account in the further analysis.

<sup>130</sup> <https://www.eurocontrol.int/>

### International Association of Chiefs of Police (IACP)

IACP is a dynamic organisation that serves as the professional voice of law enforcement.<sup>131</sup> The IACP addresses cutting edge issues confronting law enforcement through advocacy, programs and research, as well as training and other professional services. IACP is a comprehensive professional organisation that supports the law enforcement leaders of today and develops the leaders of tomorrow. The IACP Center for Police Leadership, its Police Chief Mentoring program, and numerous other training and educational opportunities are designed to prepare tomorrow's leaders for the changes they will face.

Unlike most of the work of the stakeholders in this review, the IACP has linked resilience to psychological rather than physical well-being. Training material for officers discusses resilience of the psyche, i.e. how officers can better deal with the mental demands associated with being exposed to violence and high levels of stress. Given that actors in crisis management are frequently exposed to human suffering, dangerous situations and thus high levels of stress, it would be useful for ResiStand to discuss if standards need to be developed to encompass the psychological dimension of resilience.

### Water New Zealand

"Water New Zealand is a national not-for-profit sector organisation comprising approximately 1500 corporate and individual members in New Zealand and overseas. Water New Zealand is the principal voice for the water sector, focusing on the sustainable management and promotion of the water environment and encompassing the three waters: fresh, waste and storm waters."<sup>132</sup>

Water New Zealand has published a guideline on Infrastructure Resilience: What does it mean for my agency / organisation?<sup>133</sup>: the objective of this updated version on Infrastructure Resilience is to further inform the Infrastructure Recovery Technical Standards and Guidelines (IRTSG) which provide guidance and direction to the Stronger Christchurch Infrastructure Reconstruction Team (SCIRT). This document is focused on the technical aspects of infrastructure resilience, in support of community resilience. While the focus is not on community resilience, infrastructure does include consideration of the natural environment. Simply put, infrastructure resilience is the ability of a system to withstand or quickly recover from significant disruption. Resilience does not guarantee uninterrupted service, but should promise quick restoration of service, recognising that there is a high cost for any large interruption. To achieve this, the infrastructure must be robust, yet flexible. Quick restoration of service is highly desired following any disruption, recognising that "quick" can mean different things to different people. This document provides a target schedule for the restoration of various services from a design level event (in Christchurch this is nominally a seismic event which creates ground acceleration of 0.4g). Clearly the extent of damage has a significant influence over the ability to achieve targets. It must be noted that this design level event may be the significant service restoration event for some asset owners whilst other events will be more pressing for other asset groups (e.g wind and snow may be more important design events for power distribution networks). To construct resilience, this paper outlines indicative metrics for each infrastructure type. While some infrastructure is well represented in this draft, others require addition input and coordination. This document provides an outline definition of the following: Existing Materials / Infrastructure, Modern Materials / Infrastructure, Resilience Measures, Improvements (Beyond those covered above)

### Global City Indicators Facility (GCIF)

"The Global City Indicators Facility is a program of the Global Cities Institute (GCI). As one of the anchor programs of the GCI, the GCIF hosts a network of 255 cities across 82 countries committed to building standardized city indicators for performance management including a database of comparable statistics that allow cities to track their effectiveness on everything from planning and economic growth to transportation, safety and education. With initial backing from the World Bank, this fully integrated University of Toronto project has resulted in the creation of ISO 37120 – the first international standard on indicators for

<sup>131</sup> <http://www.iacp.org/>

<sup>132</sup> [https://www.waternz.org.nz/Category?Action=View&Category\\_id=893](https://www.waternz.org.nz/Category?Action=View&Category_id=893)

<sup>133</sup> [https://www.waternz.org.nz/Folder?Action=View%20File&Folder\\_id=99&File=Infrastructure\\_Resilience\\_Ver2.2.pdf](https://www.waternz.org.nz/Folder?Action=View%20File&Folder_id=99&File=Infrastructure_Resilience_Ver2.2.pdf)



sustainable cities. The GCIF global network, supports the newly constituted World Council on City Data – a sister organisation of the GCI/GCIF – which allows for independent, third party verification of ISO 37120 data.”<sup>134</sup> The World Council on City Data information can be accessed online and it provides various types of information (Economy, Shelter, Transportation, etc.) on several cities worldwide.<sup>135</sup>

No specific guidelines are openly accessible though.

#### **American Water Works Association (AWWA)**

“Established in 1881, the American Water Works Association is the largest nonprofit, scientific and educational association dedicated to managing and treating water, the world’s most important resource. With approximately 50,000 members, AWWA provides solutions to improve public health, protect the environment, strengthen the economy and enhance our quality of life.”<sup>136</sup> The AWWA produced the first standard on Risk and Resilience Management of Water and Wastewater Systems.<sup>137</sup> They have several emergency preparedness publications for sale<sup>138</sup>:

- Emergency Power Source Planning for Water and Wastewater;
- Security and Emergency Planning for Water and Wastewater Utilities;
- M19, Emergency Planning for Water Utilities, Fourth Edition;
- AWWA G440-11 Emergency Preparedness Practice.

Unfortunately the guidelines could not be analysed because they were not available for free.

#### **HAZUR® Resilient Systems**

“HAZUR® is a piece of software designed to support the design, implementation and management of cities’ resilience strategy.”<sup>139</sup> Their Hazur Academy provides training for the software. Unfortunately, no further analysis was possible because the details were not accessible.

#### **Insurance Council of Australia<sup>140</sup>**

The Insurance Council of Australia has set up a specific Australian Resilience Taskforce, which “is intended as a platform for collaboration, and alignment across government, industry and non-government organisations to enable increased resilience in Australian communities.”<sup>141</sup> The taskforce has created a Building Resilience Rating Tool, which people can use to assess their resilience needs. In addition, they also developed a Building Resilience Knowledge Database, which informs on disasters and the level of resilience provided by specific building products.

No further analysis was possible because the guideline/tool is not an open source product.

#### **American Petroleum Institute**

“The American Petroleum Institute (API) is the only national trade association that represents all aspects of America’s oil and natural gas industry. Our 650 corporate members, from the largest major oil company to the smallest of independents, come from all segments of the industry. They are producers, refiners, suppliers, marketers, pipeline operators and marine transporters, as well as service and supply companies that support all segments of the industry.”<sup>142</sup>

“For more than 85 years, API has led the development of petroleum and petrochemical equipment and operating standards. These represent the industry’s collective wisdom on everything from drill bits to environmental protection and embrace proven, sound engineering and operating practices and safe, interchangeable equipment and materials. API maintains 685 standards and recommended practices. Many

<sup>134</sup> <http://www.cityindicators.org/>

<sup>135</sup> <http://www.dataforcities.org/global-cities-registry/>

<sup>136</sup> <http://www.awwa.org/about-us.aspx>

<sup>137</sup> <http://www.awwa.org/store/productdetail.aspx?productid=21625>

<sup>138</sup> <http://www.awwa.org/resources-tools/water-knowledge/emergency-preparedness.aspx>

<sup>139</sup> <http://opticits.com/#opticits>

<sup>140</sup> <https://www.resilient.property/>

<sup>141</sup> <http://www.buildingresilience.org.au/about-us>

<sup>142</sup> <http://www.api.org/about>



have been incorporated into state and federal regulations; and increasingly, they're also being adopted by the International Organization for Standardization, a global federation of more than 100 standards groups."<sup>143</sup> One section of its standards focusses on safety and fire protection.<sup>144</sup> API has two standards that might be useful to ResiStand: Std 780: Security Risk Assessment Methodology for the Petroleum and Petrochemical Industries; RP 754: Process Safety Performance Indicators for the Refining and Petrochemical Industries.

Within this section a lot of guidelines are listed, concerning Security Risk Assessment Methodology for the Petroleum and Petrochemical Industries as well as guidelines on fatigue management of personnel and many different diverse guidelines. Only a short description of the guidelines is given, which impedes any categorisation into the crisis management phases and tasks.

API has two standards that might be useful to ResiStand: Std 780: Security Risk Assessment Methodology for the Petroleum and Petrochemical Industries; RP 754: Process Safety Performance Indicators for the Refining and Petrochemical Industries.

#### **UK – Civil Contingencies Secretariat**

The Infrastructure Resilience programme, led by the Civil Contingencies Secretariat, was established in March 2011 to enable public and private sector organisations to build the resilience of their infrastructure, supply and distribution systems to disruption from all risks (hazards and threats) as set out in the National Risk Assessment.

The guide "Keeping the country running: natural hazards and infrastructure"<sup>145</sup> provides advice on:

- identifying and assessing risks from natural hazards
- standards of resilience
- business continuity and corporate governance
- guidance for economic regulated sectors
- information sharing
- understanding interdependencies

"'Keeping the country running' was drawn up in consultation with government departments and agencies, infrastructure owners and operators, trade and professional associations, and regulators. It provides a model of resilience that does not depend on additional regulation or standard-setting, but shares best practice and advice to enable owners and operators of the UK's critical infrastructure to improve the security and resilience of their assets, with support from the regulators where relevant."<sup>146</sup>

The Infrastructure Resilience programme covers nearly all tasks within the mitigation and preparedness phase.

#### **USA – DHS – National Infrastructure Advisory Council (NIAC)**

According to its revised charter of 2013, the "NIAC shall advise the President through the Secretary of Homeland Security on issues related to the security and resilience of the Nation's critical infrastructure sectors and their functional systems, physical assets, and cyber networks. NIAC shall draw on the expertise of its members to provide advice and make recommendations to:

- a) Enhance the partnership between the public and private sectors in securing and enhancing the security and resilience of critical infrastructure and their functional systems, physical assets and cyber networks, and providing reports on this issue to the President through the Secretary of Homeland Security, as appropriate;

<sup>143</sup> Ibid.

<sup>144</sup>

<sup>145</sup> [http://www.api.org/~media/Files/Publications/Catalog/2016\\_catalog/07%20Safety%20and%20Fire%20Protection.pdf](http://www.api.org/~media/Files/Publications/Catalog/2016_catalog/07%20Safety%20and%20Fire%20Protection.pdf)

<sup>146</sup> <https://www.gov.uk/government/publications/keeping-the-country-running-natural-hazards-and-infrastructure>

<https://www.gov.uk/guidance/resilience-in-society-infrastructure-communities-and-businesses>

- b) Propose and develop ways to encourage private industry to perform periodic risk assessments and implement risk reduction programs;
- c) Monitor the development and operations of critical infrastructure sector coordinating councils and their information sharing mechanisms and provide recommendations to the President through the Secretary of Homeland Security on how these organisations can best foster improved cooperation among the sectors, the Department of Homeland Security (DHS), and other Federal Government entities;
- d) Report to the President through the Secretary of Homeland Security who shall ensure appropriate coordination with the Assistant to the President for Homeland Security and Counterterrorism, the Assistant to the President for Economic Policy, and the Assistant to the President for National Security Affairs; and,<sup>2</sup>
- e) Advise sector specific agencies with critical infrastructure responsibilities, to include issues pertaining to sector and government coordinating councils and their information sharing mechanisms.”<sup>147</sup>

In 2009, the NAIC published their report on critical infrastructure resilience.<sup>148</sup> The NIAC initiated the Critical Infrastructure Resilience Study to recommend how government and industry can integrate resilience and protection into a comprehensive risk-management strategy. To achieve this, the NIAC sought to identify and address key questions about the role of resilience in the public-private partnership for infrastructure protection.

It mostly addresses the issues of cooperation and risk management with regard to critical infrastructure and resilience.

#### Global Initiative on Disaster Risk Management

The Initiative was founded by the German Government and is headed by the Federal Ministry for Economic Cooperation and Development. In cooperation with the public and private sector, academia and civil society, the Initiative aims to improve disaster risk management worldwide. The initiative supports four activities:

- Hotel Resilient – Strengthening Resilience in the Tourism Sector;
- Integrated Fire Prevention and Safety in Industry Clusters;
- Local Flood Early Warning System – LFEWS;
- Strengthening resilience of Small and Medium-sized Enterprises.

Especially noteworthy is the approach in Hotel Resilient to develop a set of standards for reducing risks associated with natural and technological hazards. Also, the LFEWS project is developing standardized alert levels for water levels.

Unfortunately, the homepage of the Global Initiative on Disaster Risk Management was not accessible and could therefore not be analysed or categorised.

#### Global Infrastructure Basel

“Global Infrastructure Basel (GIB) Foundation is a Swiss foundation based in Basel working to promote sustainable and resilient infrastructure through sustainable infrastructure design and financing on a global scale. Active since 2008, GIB works with multiple stakeholders ranging from city representatives to project developers and infrastructure financiers.”<sup>149</sup> GIB has developed several tools and standards: Two of them also focussing on disaster management, specifically on risk assessment:

- SuRe® Standard<sup>150</sup>: The Standard for Sustainable and Resilient Infrastructure is a global voluntary standard which integrates key criteria of sustainability and resilience into infrastructure development and upgrade, through 14 themes covering 65 criteria across governance, social and environmental factors. The standard aims to establish a common language and understanding of sustainable and resilient infrastructure projects between project developers, financiers, local authorities; and to provide guidance on how to manage those aspects from both a risk management and a benefit creation

<sup>147</sup> <https://www.dhs.gov/sites/default/files/publications/niac-charter-renewal-cmotbs-final-11-13-13.pdf>

<sup>148</sup> <https://www.dhs.gov/sites/default/files/publications/niac-critical-infrastructure-resilience-final-report-09-08-09-508.pdf>

<sup>149</sup> <http://www.gib-foundation.org/gib-foundation/>

<sup>150</sup> <http://www.gib-foundation.org/content/uploads/2017/01/SuRev0.3final.pdf>

perspective, and starting from as early as possible in the project's life cycle. As such, SuRe® can be used to leverage both public and private investments in infrastructure in a way that ensures cost-effective access to critical services while strengthening resilience, maximising social benefits and limiting the environmental footprint. SuRe® applies to infrastructure projects across different types of infrastructure and relies on independent verification and certification by third parties. It is meant to be user-friendly and to facilitate the clear communication of a project's macro-benefits while enabling project comparability. SuRe® builds upon existing work advancing sustainability standards and is based on GIB's Grading for Sustainable Infrastructure which has been used since 2012 as a self-assessment tool for over 150 infrastructure projects.

- SuRe® Underwriting: Together with its partner Santam, a leader in the African insurance market based in Cape Town, GIB is currently in the development phase of SuRe Underwriting – A Sustainable and Resilient Underwriting Standard. GIB sees this as a further step in aligning players in sustainable and resilient infrastructure financing and development. Based on the SuRe® Standard, SuRe Underwriting will scrutinise several infrastructure project related risks from an environmental, social and governance (ESG) perspective, thereby providing better insights into residual risks that insurers eventually insure. SuRe Underwriting will take into account, and where applicable build upon, existing standards like the UNEP FI Principles for Sustainable Insurance (PSI). Thus, GIB and Santam are striving to implement the essence of these global and institutional standards in a complementary way on a project level in the respective regions. SuRe Underwriting strives to improve existing risk assessment standards and to identify new and possible project-inherent mitigation measures. Considering ESG factors in the underwriting process is likely to lead to improved building resilience, reduced risks on the ground as well as to new products, access and affordability of insurances. This will no doubt incite other players in the financial community to also pursue ESG benefits, and might contribute in the future to an adjusted and fairer premium calculation for projects which respect ESG aspects. SuRe Underwriting strives to improve existing risk assessment standards and to identify new and possible project-inherent mitigation measures. Considering ESG factors in the underwriting process is likely to lead to improved building resilience, reduced risks on the ground as well as to new products, access and affordability of insurances. This will no doubt incite other players in the financial community to also pursue ESG benefits, and might contribute in the future to an adjusted and fairer premium calculation for projects which respect ESG aspects. In strict adherence to the ISEAL Code of Good Practice for Setting Social and Environmental Standards, GIB is seeking third-party financial support to develop SuRe Underwriting in an unbiased way and eventually release it for common use. In strict adherence to the ISEAL Code of Good Practice for Setting Social and Environmental Standards, GIB is seeking third-party financial support to develop SuRe Underwriting in an unbiased way and eventually release it for common use.

#### UN Habitat – City Resilience Profiling Programme

"The City Resilience Profiling Programme (CRPP) focuses on providing national and local governments with tools for measuring and increasing resilience to multi-hazard impacts, including those associated with climate change. Working through partnerships with stakeholders including international agencies such as UNISDR, academic and research institutes, private sector actors, and NGOs, the CRPP will develop a comprehensive and integrated urban planning and management approach for profiling and monitoring the resilience of any city to all plausible hazards."<sup>151152</sup> The programme works towards four tangible accomplishments:

1. "Research on Operational Framework: An adaptable urban systems model suitable for all human settlements. The urban systems model will [be] adaptable to any settlement, cover all aspects of urban systems (physical, organisational, spatial and functional); and include attributes for multi hazards, risk, vulnerability and preparedness.
2. Indexing and profiling: A set of indicators, standards, and profiles to support cities for calibrating urban systems ability to withstand and recover from crisis. The project will produce a set of profiles and indices

<sup>151</sup> <http://unhabitat.org/urban-initiatives/initiatives-programmes/city-resilience-profiling-programme/>

<sup>152</sup> <https://www.cityresilience.org/CRPP>

allowing calibration of resilience, based on a factored evaluation of: all hazards; risk; vulnerabilities; and, preparedness leading to urban resilience scores that can be used to base future planning and development trajectories in urban areas.

3. Tools/Software Development: Software systems that produce city resilience profiles. In order to analyse, quantify and determine outcomes from a limited number of key indices, and a very high number of data inputs, appropriate, accessible and reliable computer software will be developed, and provided on request for use by urban managers.
4. Normative Guidance: Global standards set for urban resilience. Most current development standards including building codes and regulations, planning standards, infrastructure and development regulations attempt to balance risk reduction with cost. All risk management tools focus on specific hazard-risk calculations. The programme will produce an integrated urban systems based set of planning and development standards specifically measuring settlements-based resilience.<sup>153</sup>

Especially the development of standards will be interesting for ResiStand. According to their timetable, the launch of global standards for urban resilience was to be expected for 2016.

The CRPP has not been published so the analysis could only focus on the described expectations and plans. It will most likely cover actions concerning different disaster management tasks and phases.

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<sup>153</sup> <https://www.cityresilience.org/CRPP>

## Annex 9. Analysis of identified CBRN Standards

### Introduction

The threat of somebody using CBRN agents continues to pose a risk. Standardisation within the CBRN field is one step towards effective national and international interoperability and increased societal resilience against CBRN incidents. Excising standards for CBRN have been investigated and clustered regarding the disaster management cycle. CBRN standards cover standards for detection, protective clothing, guidelines, sample collection and determination of different radiological compounds. There are developed a number of standards for RN detectors, however, for C detectors only few standards have been developed.

### Standards

The standards are organised in the following way:

- *European standards*

There are few CBRN standards developed by CEN technical groups. There are two standards in TC 391 under development and these are guidance for security of CBRNE substances lifecycle in health care facilities and CBRNE glossary. Cen workshop agreement (CWA) about protective clothing, biosafety and laboratory bio-risk management has been published. The European CBRN standards are listed in Table 90.

- *International standards*

A number of standards published by IEC deals with radiation detection instruments. However, no international standards in the CB field were investigated. One ISO standard water quality (ISO 13165-1) and one for implementing a respiratory protective devices program (ISO/TS 16975-2).

- *US and national standards*

Several national CBRN standards were identified and clustered. There are some GOST standards covering occupational safety standards, chemical detection and chemical weapon destruction. A set of standards from UNI have been developed for determination of different radioactive compound in urine. AFNOR has published two standards relevant for CBRN preparedness, which are covering test methods for protective clothing and the use of portable nuclear and radiological detection and identification equipment in the field of global security.

Several US national CBRN related standards were identified. These are mainly developed by ASTM, IEEE/ANSI and few standards are developed by NFPA. These standards cover chemical threat detection, sample collection, protective clothing, a few biological standards are identified and a number of radiation related standards were identified. The US national standards are listed in a separate table in the annex.

### Summary

The majority of the published CBRN related standards are US national standards, other national standards and a few European CEN standards. Only two relevant ISO standards were identified. Six out of 70 of the US national CBRN standards were clustered to the mitigation phase, 37 were clustered in the prepared phase and 27 standards were clustered to the response phase of the disaster management cycle. The majority of the other national, European, international and NATO standards 11 of the 78 were clustered to the mitigation phase, 35 in the preparedness phase and 31 were clustered to the response phase.

The below list is the full list of all CBRN standards. The overview below includes the most basic information. A more extensive data collection for each of the standards is saved in a separate file and will be included in the web catalogue. Table 90 shows the data with regard to the standard. Table 91 shows the categorisation for each of the standard in one or more phases of the Disaster Management Cycle.

Table 90: List of identified CBRN standards in the area of disaster resilience

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
AJMEDP-7ED.A	ALLIED JOINT MEDICAL DOCTRINE FOR SUPPORT TO CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR (CBRN) DEFENSIVE OPERATIONS	2015-08-25		Published	NATO	COMEDS	MCMedSB, MedStd CBRNMed
AJP-3.8 Ed: A	ALLIED JOINT DOCTRINE FOR CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR DEFENCE	2012-03-30		Published	NATO	Military Committee Joint Standardisation Board (MCJSB)	Chemical, Biological, Radiological and Nuclear Defence Operations Working Group (CBRN WG)
AMEDP-7.3 ED.A	TRAINING OF MEDICAL PERSONNEL FOR CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR (CBRN) DEFENCE			Published	NATO	COMEDS	MCMedSB, MedStd CBRNMed
AMedP-7.4 Ed.: A	REGULATIONS FOR ESTABLISHMENT AND EMPLOYMENT OF MRIIT (MEDICAL RADIOLOGICAL INCIDENT INVESTIGATION TEAMS)			Published	NATO		
AMedP-7.8 Ed.: A	RECORDING OF OPERATIONAL IONIZING RADIATION EXPOSURE FOR MEDICAL PURPOSES AND MANAGEMENT OF DOSIMETERS			Published	NATO		
ANSI N 13.22	Bioassay Program for Uranium	2013-00-00	US	published	ANSI		
ANSI/NFPA 1994	Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents	2011-00-00	US	published	ANSI		
ANSI/NFPA 472	Standard for Competence of Responders to Hazardous	2012-00-00	US	published	ANSI		

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
	Materials/Weapons of Mass Destruction Incidents						
ANSI/NSF 49 (i48r7)	Biosafety Cabinetry: Design, Construction, Performance, and Field Certification	2014-00-00	US	published	ANSI		
ASTM C 1000	Standard Test Method for Radiochemical Determination of Uranium Isotopes in Soil by Alpha Spectrometry	2011-00-00	US	published	ASTM		
ASTM C 1189	Standard Guide to Procedures for Calibrating Automatic Pedestrian SNM Monitors	2011-00-00	US	published	ASTM		
ASTM C 1238	Standard Guide for Installation of Walk-Through Metal Detectors	1997-00-00	US	published	ASTM		
ASTM D 7597	Standard Test Method for Determination of Diisopropyl Methylphosphonate, Ethyl Hydrogen Dimethylamidophosphate, Ethyl Methylphosphonic Acid, Isopropyl Methylphosphonic Acid, Methylphosphonic Acid and Pinacolyl Methylphosphonic Acid in Water by Liquid Chromatography/Tandem Mass Spectrometry	2016-00-00	US	published	ASTM		
ASTM D 7598	Standard Test Method for Determination of Thiodiglycol in Water by Single Reaction Monitoring Liquid Chromatography/Tandem Mass Spectrometry	2016-00-00	US	published	ASTM		
ASTM D 7599	Standard Test Method for Determination of Diethanolamine, Triethanolamine, N-Methyldiethanolamine and N-Ethyldiethanolamine in Water by Single Reaction Monitoring Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)	2016-00-00	US	published	ASTM		
ASTM D 7600	Standard Test Method for Determination of Aldicarb, Carbofuran, Oxamyl and Methomyl by Liquid Chromatography/Tandem Mass Spectrometry	2016-00-00	US	published	ASTM		

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
	Spectrometry						
ASTM E 181	Standard Test Methods for Detector Calibration and Analysis of Radionuclides	2010-00-00	US	published	ASTM		
ASTM E 2458	Standard Practices for Bulk Sample Collection and Swab Sample Collection of Visible Powders Suspected of Being Biological Agents from Nonporous Surfaces	2010-00-00	US	published	ASTM		
ASTM E 2520	Standard Practice for Measuring and Scoring Performance of Trace Explosive Chemical Detectors	2015-00-00	US	published	ASTM		
ASTM E 2542	Standard Specification for Portable Water Heaters Used at Personnel Decontamination Stations	2008-00-00	US	published	ASTM		
ASTM E 2543	Standard Specification for Portable Air Heaters Used at Personnel Decontamination Stations and Shelters	2008-00-00	US	published	ASTM		
ASTM E 2739	Standard Specification for Personnel Decontamination System to be Used During a Chemical Event	2010-00-00	US	published	ASTM		
ASTM E 2770	Standard Guide for Operational Guidelines for Initial Response to a Suspected Biothreat Agent	2010-00-00	US	published	ASTM		
ASTM E 2805	Standard Practice for Measurement of the Biological Activity of Ricin	2011-00-00	US	published	ASTM		
ASTM E 2885	Standard Specification for Handheld Point Chemical Vapor Detectors (HPCVD) for Homeland Security Applications	2013-00-00	US	published	ASTM		
ASTM E 2933	Standard Specification for Stationary Point Chemical Vapor Detectors	2013-00-00	US	published	ASTM		



Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
	(SPCVD) for Homeland Security Applications						
ASTM E2411.07	Standard Specification for Chemical Warfare Vapor Detector (CWVD)		US	Withdrawn replaced by ASTM E2933-13	ASTM		
ASTM E2458 - 10	Standard Practices for Bulk Sample Collection and Swab Sample Collection of Visible Powders Suspected of Being Biological Agents from Nonporous Surfaces		US	Published	ASTM	ASTM E54	Sub committee E54.01
ASTM E2770 - 10	Standard Guide for Operational Guidelines for Initial Response to a Suspected Biothreat Agent		US	Published	ASTM	ASTM E54	Sub committee E54.01
ASTM E2800 - 11	Standard Practice for Characterization of Bacillus Spore Suspensions for Reference Materials		US	Published	ASTM	ASTM E54	Sub committee E54.01
ASTM E2885-13	Standard Specification for Handheld Point Chemical Vapor Detectors (HPCVD) for Homeland Security Applications		US	Published	ASTM	E54.01	
ASTM E2933-13	Standard Specification for Stationary Point Chemical Vapor Detectors (SPCVD) for Homeland Security Applications		US	Published	ASTM		
ASTM WK37674	New Practice for Standard Practice for Collection of Particulates by Wipe Sampling for Subsequent Determination of Wipe Collection Efficiency		US	Under development	ASTM	ASTM E54	Sub committee E54.01
ASTM WK42642	New Practice for Standard Practice for Field Evaluation of On-Site Biological Assessment		US	Under development	ASTM	ASTM E54	Sub committee E54.01
ASTM WK46895	New Specification for Standard Specification for Biodetection Instruments and Assays for Homeland Security Applications		US	Under development	ASTM	ASTM E54	Sub committee E54.01

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
ASTM WK54941	Standard Practices for Bulk Sample Collection and Swab Sample Collection of Visible Powders Suspected of Being Biological Agents from Nonporous Surfaces		US	Under development	ASTM		
ASTM WK54942	Revision of E2770 - 10 Standard Guide for Operational Guidelines for Initial Response to a Suspected Biothreat Agent		US	Under development	ASTM	ASTM E54	Sub committee E54.01
ASTM WK55101	New Specification for Immunoassays for Biological Agent Screening of Suspicious Visible Powders		US	Under development	ASTM	ASTM E54	Sub committee E54.01
ASTM WK57098	Revision of E2805 - 11 Standard Practice for Measurement of the Biological Activity of Ricin		US	Under development	ASTM		
ASTM WK57099	Revision of E2800 - 11 Standard Practice for Characterization of Bacillus Spore Suspensions for Reference Materials		US	Under development	ASTM	ASTM E54	Sub committee E54.01
BS 8468-7:2012	Respiratory protective devices for use against chemical, biological, radiological and nuclear (CBRN) agents. Closed-circuit breathing apparatus. Specification (British Standard)		GB	Published	BSI		
CAN/CGSB/CSA-Z1610-11	Protection of first responders from chemical, biological, radiological, and nuclear (CBRN) events	2011-03-01	CA	published			
Preliminary work item 00391012	Guidance for the security of CBRNE substances lifecycle in healthcare facilities		IX	Under development	CEN	TC 391	WG 1N 82
CEN/TS 16595:2013	CBRN - Vulnerability Assessment and Protection of People at Risk. German version	2014-09-01	IX	Published	CEN		

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
CEN/TS 391 WI=00391010	Glossary CBRNE		IX	Under development	CEN		
CWA 15517:2011	European Handbook for Defence Procurement	2012-10-12	IX	Published	CEN	M/423	
CWA 15793	Laboratory biorisk management	2011-09-00	IX	published	CEN		
CWA 16106:2010 (E)	PPE for Chemical, Biological, Radiological and Nuclear, (CBRN) hazards		IX	Published	CEN		
CWA 16335	Biosafety professional competence	2011-09-01	FA	published	CEN		
CWA 16393	Laboratory biorisk management - Guidelines for the implementation of CWA 15793:2008	2012-01-00	IX	published	CEN		
EN 14126	Protective clothing - Performance requirements and tests methods for protective clothing against infective agents	2003-09-00	IX	published	CEN		
EN 14126/AC	Protective clothing - Performance requirements and tests methods for protective clothing against infective agents	2004-09-00	IX	published	CEN		
EN 62327	Radiation protection instrumentation - Hand-held instruments for the detection and identification of radionuclides and for the indication of ambient dose equivalent rate from photon radiation (IEC 62327:2006, modified)	2011-07-00	IX	published	CEN		
GOST R 12.4.296	Occupational safety standards system. Clothing for protection against biological hazards (insects and arachnids). General technical requirements. Test methods	2013-00-00	RU	published	GOST		

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
GOST R 22.9.15	Safety in emergencies. Technical means of chemical detection. Test methods	2014-00-00	RU	published	GOST		
GOST R 22.9.21	Technical means of chemical detection. Classification. General technical requirements	2014-00-00	RU	published	GOST		
GOST R 42.2.01	Civil Defence. Assessment of the state of hazardous facilities, defence and security facilities exposed to the damaging factors of conventional weapons. Calculation methods	2014-00-00	RU	published	GOST		
GOST R 8.632	State system of ensuring the uniformity of measurements. Metrological ensuring of the chemical weapons destruction. Basic principles	2013-00-00	RU	published	GOST		
GOST R 8.639	State system for ensuring the uniformity of measurements metrological ensuring of the chemical weapons destruction. Terms and definitions	2013-00-00	RU	published	GOST		
IEC 60973*CEI 60973	Test procedures for germanium gamma-ray detectors	1989-06-00	IX	published	IEC		
IEC 62401*CEI 62401	Radiation protection instrumentation - Alarming personal radiation devices (PRD) for detection of illicit trafficking of radioactive material	2007-07-00	IX	published	IEC		
IEC 62463*CEI 62463	Radiation protection instrumentation - X-ray systems for the screening of persons for security and the carrying of the illicit items	2010-06-00	IX	published	IEC		
IEC 62484*CEI 62484	Radiation protection instrumentation - Spectroscopy-based portal monitors used for the detection and identification of illicit trafficking of radioactive material	2010-05-00	IX	published	IEC		
IEC 62533*CEI	Radiation protection instrumentation - Highly sensitive hand-held	2010-06-00	IX	published	IEC		

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
62533	instruments for photon detection of radioactive material						
IEC 62534*CEI 62534	Radiation protection instrumentation - Highly sensitive hand-held instruments for neutron detection of radioactive material	2010-06-00	IX	published	IEC		
IEC 62709*CEI 62709	Radiation protection instrumentation - Security screening of humans - Measuring the imaging performance of X-ray systems	2014-02-00	IX	published	IEC		
IEEE 309*ANSI N 42.3	Test procedures and bases for Geiger-Mueller counters	1999-00-00	US	published	IEEE		
IEEE/ANSI N 42.28*ANSI N 42.28	American National Standard Calibration of Germanium Detectors for In-Situ Gamma-Ray Measurements	2002-00-00	US	published	IEEE		
IEEE/ANSI N 42.32*ANSI N 42.32	American National Standard Performance Criteria for Alarming Personal Radiation Detectors for Homeland Security	2016-00-00	US	published	IEEE		
IEEE/ANSI N 42.33*ANSI N 42.33	American National Standard for Portable Radiation Detection Instrumentation for Homeland Security	2006-00-00	US	published	IEEE		
IEEE/ANSI N 42.34*ANSI N 42.34	American National Standard Performance Criteria for Handheld Instruments for the Detection and Identification of Radionuclides	2015-00-00	US	published	IEEE		
IEEE/ANSI N 42.35*ANSI N 42.35	American National Standard for Evaluation and Performance of Radiation Detection Portal Monitors for Use in Homeland Security	2016-00-00	US	published	IEEE		

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
IEEE/ANSI N 42.37*ANSI N 42.37	American National Standard for Training Requirements for Homeland Security Purposes Using Radiation Detection Instrumentation for Interdiction and Prevention	2006-00-00	US	published	IEEE		
IEEE/ANSI N 42.41	American National Standard Minimum Performance Criteria for Active Interrogation Systems Used for Homeland Security	2007-01-01	US	published	ANSI; IEEE		
IEEE/ANSI N 42.43*ANSI N 42.43	American National Standard Performance Criteria for Mobile and Transportable Radiation Monitors Used for Homeland Security	2016-00-00	US	published	IEEE		
IEEE/ANSI N 42.44*ANSI N 42.44	American National Standard for the Performance of Checkpoint Cabinet X-Ray Imaging Security Systems	2008-00-00	US	published	IEEE		
IEEE/ANSI N 42.46*ANSI N 42.46	American National Standard for Determination of the Imaging Performance of X-Ray and Gamma-Ray Systems for Cargo and Vehicle Security Screening	2008-00-00	US	published	IEEE		
IEEE/ANSI N 42.47*ANSI N 42.47	American National Standard for Measuring the Imaging Performance of X-ray and Gamma-ray Systems for Security Screening of Humans	2010-00-00	US	published	IEEE		
IEEE/ANSI N 42.48*ANSI N 42.48	American National Standard Performance Requirements for Spectroscopic Personal Radiation Detectors (SPRDs) for Homeland Security	2008-00-00	US	published	IEEE		
IEEE/ANSI N 42.49B*ANSI N 42.49B	American National Standard for Performance Criteria for Non-alarming Personal Emergency Radiation Detectors (PERDs) for Exposure Control	2013-00-00	US	published	IEEE		

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
IEEE/ANSI N 42.53*ANSI N 42.53	American National Standard Performance Criteria for Backpack-Based Radiation-Detection Systems Used for Homeland Security	2013-00-00	US	published	IEEE		
ISA-TR92.06.03	Feasibility of Chlorine Detection Instrument Testing	2008-00-00	IX	published	International Society of Automation		
ISO 13165-1	Water quality - Radium-226 - Part 1: Test method using liquid scintillation counting	2013-04-00	US	published	ISO		
ISO/TS 16975-2	Respiratory protective devices - Selection, use and maintenance - Part 2: Condensed guidance to establishing and implementing a respiratory protective device programme	2016-05-30	IX	Published	ISO	ISO/TC 94	SC 15
NF S74-550*NF EN 14126	Protective clothing - Performance requirements and test methods for protective clothing against infective agents	2004-12-01	FA	published	AFNOR		
NF X52-121	Security and protection of citizens - CBRN - Use of portable nuclear and radiological detection and identification equipment in the field of global security	2015-05-15	FA	published	AFNOR		
NFPA 1991-2016	NFPA 1991 Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies, 2016 edition	1905-07-08	US	Published	NFPA		
NFPA 1994-2007	NFPA 1994: Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents, 2007 Edition	1905-06-29	US	Published	NFPA		

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
NFPA 1994-2012	Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents, 2012 Edition	1905-07-04	US	Published	NFPA		
NFPA 1999-2008	NFPA 1999: Standard on Protective Clothing for Emergency Medical Operations, 2008 Edition		US	Published	NFPA		
PAS 127:2014	Checkpoint security screening of people and their belongings. Guide	2014-02-28	GB	published	BSI		
TS 8375	Military protective boot- Against, nuclear, biological and chemical (NBC) weapons	1990-04-12	TR	published	TSE		
TS 8376	Military protective glove- Against, nuclear, biological and chemical (NBC) weapons	1990-04-12	TR	published	TSE		
TS 8861	Gas mask	1991-02-28	TR	published	TSE		
UNI 11261:2008	Water quality - 222Rn activity determination in water by means of liquid scintillation	2008-04-17	IT	published	UNI		
UNI 8322:1981	Determination of tritium present in urine as hto.	1981-12-31	IT	published	UNI		
UNI 8324:1981	Determination of natural uranium in urine. Fluorimetric method.	1981-12-31	IT	published	UNI		
UNI 8325:1981	Determination of plutonium in urine.	1981-12-31	IT	published	UNI		
UNI 8562:1984	Determination of enriched uranium in urine.	1984-01-31	IT	published	UNI		
UNI 8563:1984	Determination of radium 226 in urine.	1984-01-31	IT	published	UNI		
UNI 8564:1984	Determination of thorium in urine. Colorimetric method.	1984-01-31	IT	published	UNI		



Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
UNI 8693:1985	Determination of strontium 90 in urine.	1985-09-30	IT	published	UNI		
UNI 8694:1985	Determination of phosphorus 32 in urine.	1985-09-30	IT	published	UNI		

Table 91: Analysis of identified CBRN standards - Categorised in disaster management phases and related tasks

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational			Supporting					
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
AJMEDP-7ED.A					1																								
AJP-3.8 Ed: A					1																								
AMEDP-7.3 ED.A					1																								
AMedP-7.4 Ed.: A					1																								
AMedP-7.8 Ed.: A					1																								
ANSI N 13.22	1				1										1														
ANSI/NFPA 1994	1				1																								
ANSI/NFPA 472	1				1																								
ANSI/NSF 49 (i48r7)		1			1																1								
ASTM C 1000	1				1										1														
ASTM C 1189					1																								

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational			Supporting					
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ASTM C 1238					1																								
ASTM D 7597					1	1									1						1								
ASTM D 7598					1	1									1						1								
ASTM D 7599					1	1									1						1								
ASTM D 7600					1	1									1						1								
ASTM E 181					1	1									1						1								
ASTM E 2458					1																	1							
ASTM E 2520					1	1									1						1								
ASTM E 2542											1													1					
ASTM E 2543											1													1					
ASTM E 2739					1						1											1							

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response										Recovery										
	Operational		Supporting		Operational		Supporting		Operational						Supporting				Operational			Supporting							
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ASTM E 2770					1			1														1							
ASTM E 2805					1	1															1	1							
ASTM E 2885					1	1															1								
ASTM E 2933					1	1															1								
ASTM E2411.07																													
ASTM E2458 - 10												1				1			1		1	1							
ASTM E2770 - 10	1				1																								
ASTM E2800 - 11						1															1								
ASTM E2885-13												1										1							
ASTM E2933-13					1	1						1									1	1							
ASTM WK37674						1									1	1					1	1							

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational			Supporting					
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ASTM WK42642																													
ASTM WK46895					1																								
ASTM WK54941																													
ASTM WK54942																													
ASTM WK55101																													
ASTM WK57098																													
ASTM WK57099																													
BS 8468-7:2012										1		1			1														
CAN/CGSB/CSA-Z1610-11												1			1		1												
Preliminary work item 00391012					1										1														
CEN/TS 16595:2013					1																								

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational			Supporting					
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
CEN/TS 391 WI=00391010					1					1								1	1										
CWA 15517:2011																													
CWA 15793	1														1														
CWA 16106:2010 (E)												1			1		1												
CWA 16335	1																												
CWA 16393	1														1														
EN 14126					1										1														
EN 14126/AC					1										1														
EN 62327					1	1									1						1								
GOST R 12.4.296					1																								
GOST R 22.9.15					1																								

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response										Recovery										
	Operational		Supporting		Operational		Supporting		Operational						Supporting				Operational			Supporting							
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
GOST R 22.9.21					1																								
GOST R 42.2.01					1																								
GOST R 8.632					1																								
GOST R 8.639					1																								
IEC 60973*CEI 60973					1	1									1						1								
IEC 62401*CEI 62401					1	1									1						1								
IEC 62463*CEI 62463					1	1									1						1								
IEC 62484*CEI 62484					1	1									1						1								
IEC 62533*CEI 62533					1	1									1						1								
IEC 62534*CEI 62534					1	1									1						1								
IEC 62709*CEI 62709					1	1									1						1								

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational				Supporting				
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
IEEE 309*ANSI N 42.3					1																								
IEEE/ANSI N 42.28*ANSI N 42.28					1																								
IEEE/ANSI N 42.32*ANSI N 42.32					1	1						1																	
IEEE/ANSI N 42.33*ANSI N 42.33					1	1																							
IEEE/ANSI N 42.34*ANSI N 42.34							1																						
IEEE/ANSI N 42.35*ANSI N 42.35					1	1																							
IEEE/ANSI N 42.37*ANSI N 42.37					1																								
IEEE/ANSI N 42.41						1								1							1								



	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational				Supporting				
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
IEEE/ANSI N 42.43*ANSI N 42.43							1																						
IEEE/ANSI N 42.44*ANSI N 42.44							1																						
IEEE/ANSI N 42.46*ANSI N 42.46							1																						
IEEE/ANSI N 42.47*ANSI N 42.47							1																						
IEEE/ANSI N 42.48*ANSI N 42.48							1																						
IEEE/ANSI N 42.49B*ANSI N 42.49B							1																						
IEEE/ANSI N 42.53*ANSI N 42.53							1																						
ISA-TR92.06.03					1	1						1									1	1							

## Annex 10. Analysis of identified international and European standards

The below list is the full list of all International and European standards in the area of disaster resilience that are found according to the methodology described in Section 2. The overview below includes the most basic information. A more extensive data collection for each of the standards is saved in a separate file and will be included in the web catalogue.

Table 92 shows the data with regard to the standard. Table 93 shows the categorisation for each of the standard in one or more phases of the Disaster Management Cycle.

Table 92: List of identified International and European standards in the area of disaster resilience

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
CEN/TS 16595	CBRN - Vulnerability Assessment and Protection of People at Risk	2013-09-00	IX	published	CEN	391	-
CEN/TS 16850	Societal and Citizen Security - Guidance for managing security in healthcare facilities	2015-09-00	IX	published	CEN	391	-
EN 15602	Security service providers - Terminology	2008-01-00	IX	published	CEN	439	1
EN 15975-1+A1	Security of drinking water supply - Guidelines for risk and crisis management - Part 1: Crisis management	2015-12-00	IX	published	CEN	164	15
EN 15975-2	Security of drinking water supply - Guidelines for risk and crisis management - Part 2: Risk management	2013-08-00	IX	published	CEN	164	15
EN 16082	Airport and aviation security services	2011-08-00	IX	published	CEN	439	1
EN 16747	Maritime and port security services	2015-09-00	IX	published	CEN	439	1
EN ISO 22300	Societal security - Terminology (ISO 22300:2012)	2014-07-00	IX	published	CEN	391	-
EN ISO 22301	Societal security - Business continuity management systems - Requirements (ISO 22301:2012)	2014-07-00	IX	published	CEN	391	-
EN ISO 22311	Societal security - Video-surveillance - Export interoperability (ISO 22311:2012)	2014-11-00	IX	published	CEN	391	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
EN ISO 22313	Societal security - Business continuity management systems - Guidance (ISO 22313:2012)	2014-11-00	IX	published	CEN	391	-
ISO 12931	Performance criteria for authentication solutions used to combat counterfeiting of material goods	2012-06-00	IX	published	ISO	292	-
ISO 16678	Guidelines for interoperable object identification and related authentication systems to deter counterfeiting and illicit trade	2014-07-00	IX	published	ISO	292	-
ISO 18788	Management system for private security operations - Requirements with guidance for use	2015-09-00	IX	published	ISO	292	-
ISO 22300	Societal security - Terminology	2012-05-00	IX	published	ISO	292	-
ISO 22301	Societal security - Business continuity management systems - Requirements	2012-05-00	IX	published	ISO	292	-
ISO 22311	Societal security - Video-surveillance - Export interoperability	2012-11-00	IX	published	ISO	292	-
ISO 22313	Societal security - Business continuity management systems - Guidance	2012-12-00	IX	published	ISO	292	-
ISO 22315	Societal security - Mass evacuation - Guidelines for planning	2014-12-00	IX	published	ISO	292	-
ISO 22320	Societal security - Emergency management - Requirements for incident response	2011-11-00	IX	published	ISO	292	-
ISO 22322	Societal security - Emergency management - Guidelines for public warning	2015-05-00	IX	published	ISO	292	-
ISO 22324	Societal security - Emergency management - Guidelines for colour-coded alerts	2015-06-00	IX	published	ISO	292	-
ISO 22325	Security and resilience - Emergency management - Guidelines for capability assessment	2016-10-00	IX	published	ISO	292	-
ISO 22397	Societal security - Guidelines for establishing partnering arrangements	2014-07-00	IX	published	ISO	292	-
ISO 22398	Societal security - Guidelines for exercises	2013-09-00	IX	published	ISO	292	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
ISO 24518	Activities relating to drinking water and wastewater services - Crisis management of water utilities	2015-08-00	IX	published	ISO	224	-
ISO 28000	Specification for security management systems for the supply chain	2007-09-00	IX	published	ISO	292	-
ISO 28001	Security management systems for the supply chain - Best practices for implementing supply chain security, assessments and plans - Requirements and guidance	2007-10-00	IX	published	ISO	292	-
ISO 28002	Security management systems for the supply chain - Development of resilience in the supply chain - Requirements with guidance for use	2011-08-00	IX	published	ISO	292	-
ISO 28003	Security management systems for the supply chain - Requirements for bodies providing audit and certification of supply chain security management systems	2007-08-00	IX	published	ISO	292	-
ISO 28004-1 Technical Corrigendum 1	Security management systems for the supply chain - Guidelines for the implementation of ISO 28000 - Part 1: General principles; Technical Corrigendum 1	2012-08-00	IX	published	ISO	292	-
ISO 28004-1*ISO 28004-1:2012	Security management systems for the supply chain - Guidelines for the implementation of ISO 28000	2007-10-00	IX	published	ISO	292	-
ISO 28004-2	Security management systems for the supply chain - Guidelines for the implementation of ISO 28000 - Part 2: Guidelines for adopting ISO 28000 for use in medium and small seaport operations	2014-02-00	IX	published	ISO	292	-
ISO 28004-3	Security management systems for the supply chain - Guidelines for the implementation of ISO 28000 - Part 3: Additional specific guidance for adopting ISO 28000 for use by medium and small businesses (other than marine ports)	2014-02-00	IX	published	ISO	292	-
ISO 28004-4	Security management systems for the supply chain - Guidelines for the implementation of ISO 28000 - Part 4: Additional specific guidance on implementing ISO 28000 if compliance with ISO 28001 is a management objective	2014-02-00	IX	published	ISO	292	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
ISO 31000	Risk management - Principles and guidelines	2009-11-00	IX	published	ISO	262	-
ISO Guide 73	Risk management - Vocabulary	2009-11-00	IX	published	ISO	262	-
ISO/DIS 22316	Security and resilience - Guidelines for organizational resilience	2016-04-00	IX	published	ISO	292	-
ISO/DIS 22319	Security and resilience - Guidelines for planning the involvement of spontaneous volunteers	2016-04-00	IX	published	ISO	292	-
ISO/DIS 34001	Security and resilience - Security management system for organizations assuring authenticity, integrity and trust for products and documents	2016-09-00	IX	published	ISO	292	-
ISO/IEC 31010*IEC/ISO 31010	Risk management - Risk assessment techniques	2009-11-00	IX	published	ISO	262	-
ISO/TR 22312	Societal security - Technological capabilities	2011-07-00	IX	published	ISO	292	-
ISO/TR 22351	Societal security - Emergency management - Message structure for exchange of information	2015-09-00	IX	published	ISO	292	-
ISO/TR 31004	Risk management - Guidance for the implementation of ISO 31000	2013-10-00	IX	published	ISO	262	-
ISO/TS 22317	Societal security - Business continuity management systems - Guidelines for business impact analysis (BIA)	2015-09-00	IX	published	ISO	292	-
ISO/TS 22318	Societal security - Business continuity management systems - Guidelines for supply chain continuity	2015-09-00	IX	published	ISO	292	-
(WI=00391010)	Glossary CBRNE		IX	under development	CEN	391	-
(WI=00391011)	Indicators for quality of service for societal safety/security		IX	under development	CEN	391	-
EN 16763:2017	Services for fire safety systems and security systems		IX	under development	CEN/CLC	4	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
IEC/CD 31010	Risk management -- Risk assessment techniques		IX	under development	ISO	262	-
ISO/AWI 19998	Security and resilience -- Requirements for the content, security and issuance of excise tax stamps		IX	under development	ISO	292	-
ISO/AWI 20325	Service activities relating to drinking water supply and wastewater systems -- Guidelines for stormwater management in urban areas		IX	under development	ISO	224	-
ISO/AWI 22320	Security and resilience -- Emergency management -- Guidelines for incident response		IX	under development	ISO	292	-
ISO/AWI 22327	Security and resilience -- Emergency management -- Community-based landslide early warning system		IX	under development	ISO	292	-
ISO/AWI 22375	Security and resilience ç Guideline for complexity assessment process to improve security and resilience.		IX	under development	ISO	292	-
ISO/AWI 22396	Security and resilience -- Community resilience -- Guidelines for information exchange between organizations		IX	under development	ISO	292	-
ISO/AWI 31022	Guidelines for Implementation of Enterprise Legal Risk Management		IX	under development	ISO	262	-
ISO/AWI TR 24525	Service activities relating to drinking water supply systems and wastewater systems -- Crisis management -- Examples of practiced crisis management		IX	under development	ISO	224	-
ISO/AWI TS 22330	Security and resilience -- Business continuity management systems -- Guidelines for people aspects of business continuity		IX	under development	ISO	292	-
ISO/AWI TS 22331	Security and resilience -- Business continuity management systems -- Guidelines for business continuity strategy		IX	under development	ISO	292	-
ISO/CD 19564	Security and resilience -- Product fraud countermeasures and control -- General principles		IX	under development	ISO	292	-
ISO/CD 20229	Security and resilience -- Guidelines for establishing interoperability among object identification systems		IX	under development	ISO	292	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
	to deter counterfeiting and illicit trade						
ISO/CD 22326	Security and resilience -- Emergency management -- Guidelines for monitoring facilities with identified hazards		IX	under development	ISO	292	-
ISO/CD 22395	Security and resilience -- Community resilience -- Guidelines for supporting community response to vulnerable people		IX	under development	ISO	292	-
ISO/DIS 22300	Security and resilience -- Terminology		IX	under development	ISO	292	-
ISO/DIS 31000	Risk management -- Guidelines		IX	under development	ISO	262	-
ISO/DIS 34001.4	Security and resilience -- Security management system for organizations assuring authenticity, integrity and trust for products and documents		IX	under development	ISO	292	-
ISO/DTS 24520	Service activities relating to drinking water supply systems and wastewater systems -- Crisis management -- Good practice for technical aspects		IX	under development	ISO	224	-
ISO/FDIS 22316	Security and resilience -- Organizational resilience -- Principles and attributes		IX	under development	ISO	292	-
ISO/PRF 22319	Security and resilience -- Community resilience -- Guidelines for planning the involvement of spontaneous volunteers		IX	under development	ISO	292	-
prCEN/TS 17091(WI=00391013)	Crisis Management - Developing a strategic capability		IX	under development	CEN	391	-
prEN ISO 22300 rev(WI=00391016)	Societal security - Terminology		IX	under development	CEN	391	-
prEN ISO 22315(WI=00391015)	Societal security - Mass evacuation - Guidelines for planning		IX	under development	CEN	391	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
prEN ISO 22397(WI=00391014)	Societal security - Guidelines for establishing partnering arrangements		IX	under development	CEN	391	-
CWA 15537	Network Enabled Abilities - Service-Oriented Architecture for civilian and military crisis management	2006-04-00	IX	withdrawn	CEN	-	-
CWA 15931-1	Disaster and emergency management - Shared situation awareness - Part 1: Message structure	2009-02-00	IX	withdrawn	CEN	-	-
CWA 15931-2	Disaster and emergency management - Shared situation awareness - Part 2: Codes for the message structure	2009-02-00	IX	withdrawn	CEN	-	-
ISO/TR 19083-1	Intelligent transport systems - Emergency evacuation and disaster response and recovery - Part 1: Framework and concept of operation	2016-10-00	IX	published	ISO	-	-
ISO 11320	Nuclear criticality safety - Emergency preparedness and response	2011-10-00	IX	published	ISO	85	SC 5
ISO 8201	Acoustics; Audible emergency evacuation signal	1987-12-00	IX	published	ISO	43	-
CWA 17008	Cultural guidelines for humanitarian demining	2016-03-00	IX	published	CEN	-	-



Table 93: Analysis of identified International and European standards - Categorised in disaster management phases and related tasks

	Disaster Management Phases and related tasks																												
	Mitigation			Preparedness				Response												Recovery									
	Operati onal	Support ing		Operati onal	Supporting			Operational								Supporting				Operational				Supporting					
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
CEN/TS 16595	1																												
CEN/TS 16850		1																											
EN 15602					1					1									1										
EN 15975-1+A1					1											1								1				1	
EN 15975-2	1																												
EN 16082							1	1																					
EN 16747							1	1																					
EN ISO 22300					1					1									1										
EN ISO 22301					1		1	1										1								1	1		
EN ISO 22311	1					1																							

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational			Supporting					
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
EN ISO 22313					1		1	1										1									1	1	
ISO 12931		1																											
ISO 16678		1																											
ISO 18788	1			1	1																								
ISO 22300					1					1																			
ISO 22301					1		1	1										1									1	1	
ISO 22311	1					1																							
ISO 22313					1		1	1										1									1	1	
ISO 22315					1																								
ISO 22320																		1		1		1							
ISO 22322					1					1																			

	Disaster Management Phases and related tasks																												
	Mitigation			Preparedness				Response										Recovery											
	Operational	Supporting		Operational	Supporting			Operational							Supporting			Operational			Supporting								
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ISO 22324					1					1																			
ISO 22325	1																												
ISO 22397					1																								
ISO 22398					1																								
ISO 24518					1																								
ISO 28000		1																											
ISO 28001		1																											
ISO 28002		1																											
ISO 28003		1																											
ISO 28004-1 Technical Corrigendum 1		1																											
ISO 28004-1*ISO 28004-1:2012		1																											

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational				Supporting				
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ISO 28004-2		1																											
ISO 28004-3		1																											
ISO 28004-4		1																											
ISO 31000	1																												
ISO Guide 73					1					1																			
ISO/DIS 22316					1																								
ISO/DIS 22319																		1											
ISO/DIS 34001				1																									
ISO/IEC 31010*IEC/ISO 31010	1																												
ISO/TR 22312	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
ISO/TR 22351					1															1									

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational				Supporting				
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ISO/TR 31004	1																												
ISO/TS 22317	1			1																									
ISO/TS 22318	1				1			1																					
(WI=00391010)					1					1																			
(WI=00391011)				1																									
EN 16763:2017							1	1																					
IEC/CD 31010	1																												
ISO/AWI 19998		1																											
ISO/AWI 20325		1																											
ISO/AWI 22320																		1		1		1							
ISO/AWI 22327										1																			

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational			Supporting					
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ISO/AWI 22375	1																												
ISO/AWI 22396																			1										
ISO/AWI 31022	1																												
ISO/AWI TR 24525					1																								
ISO/AWI TS 22330					1		1																						
ISO/AWI TS 22331					1																								
ISO/CD 19564		1																											
ISO/CD 20229		1																											
ISO/CD 22326		1		1																									
ISO/CD 22395					1																								
ISO/DIS 22300					1					1																			

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational				Supporting				
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ISO/DIS 31000	1																												
ISO/DIS 34001.4				1																									
ISO/DTS 24520					1																								
ISO/FDIS 22316					1																								
ISO/PRF 22319																		1											
prCEN/TS 17091(WI=00391013)																											1		
prEN ISO 22300 rev(WI=00391016)					1					1									1										
prEN ISO 22315(WI=00391015)					1																								
prEN ISO 22397(WI=00391014)					1																								
CWA 15537					1																								
CWA 15931-1					1					1																			

	Disaster Management Phases and related tasks																												
	Mitigation			Preparedness			Response													Recovery									
	Operati onal	Support ing		Operati onal	Supporting		Operational								Supporting					Operational			Supporting						
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
CWA 15931-2					1					1																			
ISO/TR 19083-1					1								1										1						
ISO 11320					1																								
ISO 8201										1																			
CWA 17008																									1				



## Annex 11. Analysis of identified IT standards

The below list is the full list of all IT standards in the area of disaster resilience. The overview below includes the most basic information. A more extensive data collection for each of the standards is saved in a separate file and will be included in the web catalogue.

Table 94 shows the data with regard to the standard. Table 95 shows the categorisation for each of the standard in one or more phases of the Disaster Management Cycle.

Table 94: List of European and international IT standards in the area of disaster resilience

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
ISO/IEC TR 19791:2010	Information technology -- Security techniques -- Security assessment of operational systems	2010-04-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 19792:2009	Information technology -- Security techniques -- Security evaluation of biometrics	2009-08-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC CD 19896-1	Information technology -- Security techniques -- Competence requirements for information security testers and evaluators -- Part 1: Introduction, concepts and general requirements		IX	Under development	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC CD 19896-2	Information technology -- Security techniques -- Competence requirements for information security testers and evaluators -- Part 2: Knowledge, skills and effectiveness requirements for ISO/IEC 19790 testers		IX	Under development	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC CD 19896-3	Information technology -- Security techniques -- Competence requirements for information security testers and evaluators -- Part 3: Knowledge, skills and effectiveness requirements for ISO/IEC 15408 evaluators		IX	Under development	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC NP 19989	Information technology -- Security techniques -- Criteria and methodology for security evaluation of biometric systems		IX	Under development	ISO/IEC	ISO/IEC JTC 1/SC	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
						27	
ISO/IEC NP 19989-1	Information technology -- Security techniques -- Criteria and methodology for security evaluation of biometric systems -- Part 1: Performance		IX	Under development	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC NP 19989-2	Information technology -- Security techniques -- Criteria and methodology for security evaluation of biometric systems -- Part 2: Presentation attack detection		IX	Under development	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC TR 20004:2015	Information technology -- Security techniques -- Refining software vulnerability analysis under ISO/IEC 15408 and ISO/IEC 18045	2015-12-15	IX	published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC WD 20085-1	Test tool requirements and test tool calibration methods for use in testing noninvasive attack mitigation techniques in cryptographic modules -- Part 1: Test tools and techniques		IX	Under development	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC AWI 20085-2	Test tool requirements and test tool calibration methods for use in testing noninvasive attack mitigation techniques in cryptographic modules -- Part 2: Test calibration methods and apparatus		IX	Under development	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC NP TS 20540	Information technology -- Security techniques -- Guidelines for testing cryptographic modules in their operational environment		IX	Under development	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 24745:2011	Information technology -- Security techniques -- Biometric information protection	2011-06-15	IX	published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27000:2016	Information technology -- Security techniques -- Information security management systems --	2016-02-15	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
	Overview and vocabulary					27	
ISO/IEC 27001:2013	Information technology -- Security techniques -- Information security management systems -- Requirements	2013-10-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27002:2013	Information technology -- Security techniques -- Code of practice for information security controls	2013-10-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27003:2010	Information technology -- Security techniques -- Information security management system implementation guidance	2010-02-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27004:2016	Information technology -- Security techniques -- Information security management -- Monitoring, measurement, analysis and evaluation	2016-12-15	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27005:2011	Information technology -- Security techniques -- Information security risk management	2011-06-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27006:2015	Information technology -- Security techniques -- Requirements for bodies providing audit and certification of information security management systems	2015-10-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27007:2011	Information technology -- Security techniques -- Guidelines for information security management systems auditing	2011-11-15	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC PDTS 27008	Information technology -- Security techniques -- Guidelines for the assessment of information		IX	Under development	ISO/IEC	ISO/IEC JTC 1/SC	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
	security controls					27	
ISO/IEC TR 27008:2011	Information technology -- Security techniques -- Guidelines for auditors on information security controls	2011-10-15	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27010:2015	Information technology -- Security techniques -- Information security management for inter-sector and inter-organizational communications	2015-11-15	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27011:2016	Information technology -- Security techniques -- Code of practice for Information security controls based on ISO/IEC 27002 for telecommunications organizations	2016-12-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27013:2015	Information technology -- Security techniques -- Guidance on the integrated implementation of ISO/IEC 27001 and ISO/IEC 20000-1	2015-12-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC TR 27015:2012	Information technology -- Security techniques -- Information security management guidelines for financial services	2012-12-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27017:2015	Information technology -- Security techniques -- Code of practice for information security controls based on ISO/IEC 27002 for cloud services	2015-12-15	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC TR 27019:2013	Information technology -- Security techniques -- Information security management guidelines based on ISO/IEC 27002 for process control systems specific to the energy utility industry	2013-07-15	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC DIS 27019	Information technology -- Security techniques -- Information security controls for the energy utility	2013-07-01	IX	Under development	ISO/IEC	ISO/IEC JTC 1/SC	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
	industry					27	
ISO/IEC 27031:2011	Information technology -- Security techniques -- Guidelines for information and communication technology readiness for business continuity	2011-03-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27035-1:2016	Information technology -- Security techniques -- Information security incident management -- Part 1: Principles of incident management	2016-11-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27035-2:2016	Information technology -- Security techniques -- Information security incident management -- Part 2: Guidelines to plan and prepare for incident response	2016-11-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
ISO/IEC 27043:2015	Information technology -- Security techniques -- Incident investigation principles and processes	2015-03-01	IX	Published	ISO/IEC	ISO/IEC JTC 1/SC 27	-
TR 103 305-1	Critical Security Controls for Effective Cyber Defence; Part 1: The Critical Security Controls	2016-08-01	IX	Published	ETSI	ETSI TC Cyber	-
TR 103 305-2	Critical Security Controls for Effective Cyber Defence; Part 2: Measurement and auditing	2016-08-01	IX	Published	ETSI	ETSI TC Cyber	-
TR 103 305-3	Critical Security Controls for Effective Cyber Defence; Part 3: Service Sector Implementations	2016-08-01	IX	Published	ETSI	ETSI TC Cyber	-
TR 103 305-4	Critical Security Controls for Effective Cyber Defence; Part 4: Facilitation Mechanisms	2016-08-01	IX	Published	ETSI	ETSI TC Cyber	-
TR 103 303	Protection measures for ICT in the context of Critical Infrastructure	2016-04-01	IX	Published	ETSI	ETSI TC	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
						Cyber	
TR 103 305	Critical Security Controls for Effective Cyber Defence	2015-05-01	IX	Published	ETSI	ETSI TC Cyber	-
TS 122 268	Digital Cellular telecommunications systems (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Public Warning System (PWS) requirements	2014-10-01	IX	Published	ETSI	ETSI TC EMTEL	-
TS 102 181	Emergency Communications (EMTEL); Requirements for communication between authorities/organizations during emergencies	2008-02-01	IX	Published	ETSI	ETSI TC EMTEL	-
TS 102 182	Emergency Communications (EMTEL); Requirements for communications from authorities/organizations to individuals, groups or the general public during emergencies	2006-12-01	IX	Published	ETSI	ETSI TC EMTEL	-
TR 102 410	Emergency Communications (EMTEL); Basis of requirements for communications between individuals and between individuals and authorities whilst emergencies are in progress	2007-08-01	IX	Published	ETSI	ETSI TC EMTEL	-
TR 102 445	Emergency Communications (EMTEL); Overview of Emergency Communications Network Resilience and Preparedness	2006-10-01	IX	Published	ETSI	ETSI TC EMTEL	-
ITU-T E.106	International Emergency Preference Scheme (IEPS) for disaster relief operations	2003-10-01	IX	Published	ITU-T	ITU-T SG2	-
ITU-T E.107	Emergency Telecommunications Service (ETS) and interconnection framework for national implementations of ETS	2013-06-01	IX	Published	ITU-T	ITU-T SG2	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
ITU-T E.119	Requirements for Safety Confirmation and Broadcast Message Service for Disaster Relief	1972-12-15	IX	Superseeded	ITU-T	ITU-T SG2	-
ITU-T E.412.1	Assessing the impact of resource discontinuity in transport networks on service availability	2007-12-01	IX	Published	ITU-T	ITU-T SG2	-
ITU-T M.495	Transmission restoration and transmission route diversity: terminology and general principles	1988-11-01	IX	Published	ITU-T	ITU-T SG2	-
ITU-T M.496	Functional organization for automatic transmission restoration	1988-11-01	IX	Published	ITU-T	ITU-T SG2	-
ITU-T K.11	Principles of protection against overvoltages and overcurrents	2009-01-01	IX	Published	ITU-T	ITU-T SG5	-
ITU-T K.46	Protection of telecommunication lines using metallic symmetric conductors against lightning-induced surges	2012-05-29	IX	Published	ITU-T	ITU-T SG5	-
ITU-T K.47	Protection of telecommunication lines against direct lightning flashes	2005-05-01	IX	Published	ITU-T	ITU-T SG5	-
ITU-T K.56	Protection of radio base stations against lightning discharges	2010-01-01	IX	Published	ITU-T	ITU-T SG5	-
ITU-T K.57	Protection measures for radio base stations sited on power line towers	2016-06-01	IX	Published	ITU-T	ITU-T SG5	-
ITU-T K.72	Protection of telecommunication lines using metallic conductors against lightning – Risk management	2011-06-01	IX	Published	ITU-T	ITU-T SG5	-
ITU-T K.115	Mitigation methods against electromagnetic security threats	2015-11-01	IX	Published	ITU-T	ITU-T	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
						SG5	
ITU-T K.118	Requirements for Lightning Protection of Fibre To The distribution point (FTTd) Equipment	2016-12-14	IX	Published	ITU-T	ITU-T SG5	-
ITU-T K Suppl. 5	ITU-T K.81 - Estimation examples of the high-power electromagnetic threat and vulnerability for telecommunication systems	2016-04-01	IX	Published	ITU-T	ITU-T SG5	-
ITU-T Y.2705	Minimum security requirements for the interconnection of the Emergency Telecommunications Service (ETS)	2013-03-01	IX	Published	ITU-T	ITU-T SG 13	-
ITU-T Y.2740	Security requirements for mobile remote financial transactions in next generation networks	2011-01-28	IX	Published	ITU-T	ITU-T SG 13	-
ITU-T Y.2760	Mobility security framework in NGN	2011-05-20	IX	Published	ITU-T	ITU-T SG 13	-
ITU-T E.409	Incident organization and security incident handling: Guidelines for telecommunication organizations	2004-05-28	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1036	Framework for creation, storage, distribution and enforcement of policies for network security	2007/11/13	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1051	Information technology - Security techniques - Code of practice for Information security controls based on ISO/IEC 27002 for telecommunications organizations	2016-04-29	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1052	Information security management framework	2011-05-29	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1054	Information technology - Security techniques - Governance of information security	2012-09-07	IX	Published	ITU-T	ITU-T SG 17	-



Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
ITU-T X.1055	Risk management and risk profile guidelines for telecommunication organizations	2008-11-13	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1056	Security incident management guidelines for telecommunications organizations	2009-01-13	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1057	Asset management guidelines in telecommunication organizations	2011-05-29	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1086	Telebiometrics protection procedures – Part 1: A guideline to technical and managerial countermeasures for biometric data security	2008-11-13	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1207	Guidelines for telecommunication service providers for addressing the risk of spyware and potentially unwanted software	2008-04-18	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1208	A cybersecurity indicator of risk to enhance confidence and security in the use of telecommunication/information and communication technologies	2014-01-24	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1210	Overview of source-based security troubleshooting mechanisms for Internet protocol-based networks	2014-01-24	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1211	Techniques for preventing web-based attacks	2014-09-26	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1631	Information technology - Security techniques - Code of practice for information security controls based on ISO/IEC 27002 for cloud services	2015-07-14	IX	Published	ITU-T	ITU-T SG 17	-
ITU-T X.1642	Guidelines of operational security for cloud computing	2016-03-23	IX	Published	ITU-T	ITU-T SG 17	-
CEPT/ECC/REC/(08)04	The identification of frequency bands for the implementation of broad band disaster relief (BBDR) -	2008-10-00	IX	published	CEPT		-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
	Radio applications in the 5 GHz frequency range						
CEPT/ECC/REC/(11)10	Location tracking application for emergency and disaster situations	2011-10-00	IX	published	CEPT		-
ETSI TR 102410 V 1.1.1	Emergency Communications (EMTEL) - Basis of requirements for communications between individuals and between individuals and authorities whilst emergencies are in progress	2007-08-00	IX	published	ETSI	EMTEL	-
ETSI TR 102445 V 1.1.1	Emergency Communications (EMTEL) - Overview of Emergency Communications Network Resilience and Preparedness	2006-09-00	IX	published	ETSI	EMTEL	-
ETSI TR 102485 V 1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM) - Technical characteristics for Broadband Disaster Relief applications (BB-DR) for emergency services in disaster situations - System Reference Document	2006-07-00	IX	published	ETSI	ERM	-
ETSI TR 102496 V 1.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM) - Short Range Devices (SRD) - Technical characteristics for indoor Location Application for Emergency Services (LAES) in disaster situations operating within the frequency range from 3 GHz to 5 GHz - System Reference Document	2005-06-00	IX	published	ETSI	ERM	-
ETSI TR 102496 V 2.1.1	Electromagnetic compatibility and Radio spectrum Matters (ERM) - System Reference Document - Short Range Devices (SRD) - Technical characteristics for Location tracking Applications for Emergency Services (LAES) in disaster situations operating within the frequency range from 3,4 GHz to 4,8 GHz	2009-05-00	IX	published	ETSI	ERM	-
ETSI TR 103229 V 1.1.1	Environmental Engineering (EE) - Safety Extra Low Voltage (SELV) DC power supply network for ICT devices with energy storage and grid or renewable energy sources options	2014-07-00	IX	published	ETSI	EE	-
ETSI TR 103303 V 1.1.1	CYBER - Protection measures for ICT in the context of Critical Infrastructure	2016-04-00	IX	published	ETSI	CYBER	-
ITU-R BO.1774-2*ITU-R BO.1774	Use of satellite and terrestrial broadcast infrastructures for public warning, disaster mitigation and relief	2015-10-00	IX	published	ITU-T	FG-DR&NRR	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
ITU-R M.1042-3*ITU-R M.1042	Disaster communications in the amateur and amateur-satellite services	2007-03-00	IX	published	ITU-T	FG-DR&NRR	-
ITU-R M.1637-0*ITU-R M.1637	Global cross-border circulation of radiocommunication equipment in emergency and disaster relief situations	2003-06-00	IX	published	ITU-T	ITU-T SG 5	-
ITU-R M.1826-0*ITU-R M.1826	Harmonized frequency channel plan for broadband public protection and disaster relief operations at 4 940-4 990 MHz in Regions 2 and 3	2007-10-00	IX	published	ITU-T	ITU-T SG1	-
ITU-R M.1854-1*ITU-R M.1854	Use of mobile-satellite service in disaster response and relief	2012-01-00	IX	published	ITU-T		-
ITU-R M.2009-1*ITU-R M.2009	Radio interface standards for use by public protection and disaster relief operations in some parts of the UHF band in accordance with Resolution 646 (Rev.WRC-012)	2015-02-00	IX	published	ITU-T		-
ITU-T E.108	Requirement for disaster relief mobile message service	2016-01-29	IX	Published	ITU-T	ITU-T SG2	-
ITU-T H.785.0	Digital signage: Requirements of disaster information services	2014-10-14	IX	published	ITU-T	ITU-T SG16	-
ITU-T L.390	Disaster management for outside plant facilities	2012-10-29	IX	published	ITU-T	ITU-T SG15	-
ITU-T L.391	Monitoring systems for outside plant facilities	2009-11-13	IX	published	ITU-T	ITU-T SG15	-
ITU-T L.392	Disaster management for improving network resilience and recovery with movable and deployable information and communication technology (ICT) resource units	2016-04-00	IX	Under development	ITU-T	ITU-T SG15	-
ITU-T Q.761 AMD 3	Support for the International Emergency Preference Scheme	2006-01-27	IX	published	ITU-T	ITU-T	-

Document No.	Title	Date of publication	Origin Code	Status (published/under development/withdrawn)	SDO	Author (TC No)	Author (WG No)
						SG11	
ITU-T Q.762 AMD 3	Support for the International Emergency Preference Scheme	2002-12-29	IX	published	ITU-T	ITU-T SG11	-
ITU-T Q.1902.4 AMD 3	Support for the International Emergency Preference Scheme	2006-01-27	IX	published	ITU-T	ITU-T SG11	-
ITU-T Y.4102	Requirements for Internet of things devices and operation of Internet of things applications during disasters	2015-01-13	IX	published	ITU-T	ITU-T SG20	-

Table 95: Analysis of identified International and European IT standards - Categorised in disaster management phases and related tasks

	Disaster Management Phases and related tasks																												
	Mitigation			Preparedness			Response											Recovery											
	Operational	Supporting		Operational	Supporting		Operational							Supporting				Operational			Supporting								
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ISO/IEC TR 19791:2010	1																												
ISO/IEC 19792:2009	1																												
ISO/IEC CD 19896-1							1																						
ISO/IEC CD 19896-2							1																						
ISO/IEC CD 19896-3							1																						
ISO/IEC NP 19989	1																												
ISO/IEC NP 19989-1	1																												
ISO/IEC NP 19989-2	1																												
ISO/IEC TR 20004:2015	1																												
ISO/IEC WD 20085-1							1																						
ISO/IEC AWI 20085-2							1																						

	Disaster Management Phases and related tasks																												
	Mitigation		Preparedness		Response												Recovery												
	Operational	Supporting	Operational	Supporting	Operational								Supporting				Operational			Supporting									
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ISO/IEC NP TS 20540			1																										
ISO/IEC 24745:2011	1																												
ISO/IEC 27000:2016							1																						
ISO/IEC 27001:2013							1																						
ISO/IEC 27002:2013							1																						
ISO/IEC 27003:2010							1																						
ISO/IEC 27004:2016			1																										
ISO/IEC 27005:2011	1																												
ISO/IEC 27006:2015						1																							
ISO/IEC 27007:2011						1																							
ISO/IEC PDTS 27008			1																										

	Disaster Management Phases and related tasks																												
	Mitigation			Preparedness			Response											Recovery											
	Operational	Supporting		Operational	Supporting		Operational							Supporting				Operational				Supporting							
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ISO/IEC TR 27008:2011							1																						
ISO/IEC 27010:2015								1																					
ISO/IEC 27011:2016				1																									
ISO/IEC 27013:2015		1																											
ISO/IEC TR 27015:2012				1																									
ISO/IEC 27017:2015				1																									
ISO/IEC TR 27019:2013				1																									
ISO/IEC DIS 27019				1																									
ISO/IEC 27031:2011								1																					
ISO/IEC 27035-1:2016	1		1	1															1	1	1					1	1	1	
ISO/IEC 27035-2:2016					1																								

	Disaster Management Phases and related tasks																												
	Mitigation			Preparedness				Response										Recovery											
	Operational	Supporting		Operational	Supporting			Operational							Supporting			Operational				Supporting							
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ISO/IEC 27043:2015				1															1										
TR 103 305-1				1		1																							
TR 103 305-2				1																									
TR 103 305-3				1																									
TR 103 305-4	1																												
TR 103 303		1																											
TR 103 305				1		1														1	1								
TS 122 268								1																					
TS 102 181																		1											
TS 102 182										1																			
TR 102 410								1																					



	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational			Supporting					
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
TR 102 445					1																								
ITU-T E.106							1																						
ITU-T E.107					1																								
ITU-T E.119																		1											
ITU-T E.412.1	1																												
ITU-T M.495																										1			
ITU-T M.496																											1		
ITU-T K.11		1																											
ITU-T K.46		1																											
ITU-T K.47		1																											
ITU-T K.56		1																											

	Disaster Management Phases and related tasks																												
	Mitigation		Preparedness		Response												Recovery												
	Operational	Supporting	Operational	Supporting	Operational								Supporting				Operational			Supporting									
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ITU-T K.57	1																												
ITU-T K.72	1																												
ITU-T K.115			1																										
ITU-T K.118	1																												
ITU-T K Suppl. 5	1																												
ITU-T Y.2705	1																												
ITU-T Y.2740	1																												
ITU-T Y.2760	1																												
ITU-T E.409						1																							
ITU-T X.1036			1																										
ITU-T X.1051							1																						

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational				Supporting				
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ITU-T X.1052								1																					
ITU-T X.1054								1																					
ITU-T X.1055	1							1																					
ITU-T X.1056								1																					
ITU-T X.1057								1																					
ITU-T X.1086								1																					
ITU-T X.1207	1							1																					
ITU-T X.1208	1																												
ITU-T X.1210																						1							
ITU-T X.1211		1																											
ITU-T X.1631				1																									

	Disaster Management Phases and related tasks																												
	Mitigation		Preparedness		Response												Recovery												
	Operational	Supporting	Operational	Supporting	Operational								Supporting				Operational			Supporting									
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ITU-T X.1642	1						1																						
CEPT/ECC/REC/(08)04		1																											
CEPT/ECC/REC/(11)10		1																											
ETSI TR 102410 V 1.1.1										1																			
ETSI TR 102445 V 1.1.1		1																											
ETSI TR 102485 V 1.1.1							1																						
ETSI TR 102496 V 1.1.1							1																						
ETSI TR 102496 V 2.1.1							1																						
ETSI TR 103229 V 1.1.1							1																						
ETSI TR 103303 V 1.1.1		1																											
ITU-R BO.1774-2*ITU-R BO.1774										1																			

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational				Supporting				
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ITU-R M.1042-3*ITU-R M.1042										1																			
ITU-R M.1637-0*ITU-R M.1637																						1							
ITU-R M.1826-0*ITU-R M.1826								1																					
ITU-R M.1854-1*ITU-R M.1854								1																					
ITU-R M.2009-1*ITU-R M.2009								1																					
ITU-T E.108										1																			
ITU-T H.785.0								1																					
ITU-T L.390		1																											
ITU-T L.391				1																									
ITU-T L.392		1																											
ITU-T Q.761 AMD 3								1																					

	Disaster Management Phases and related tasks																												
	Mitigation			Preparedness			Response												Recovery										
	Operational	Supporting		Operational	Supporting		Operational								Supporting				Operational				Supporting						
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ITU-T Q.762 AMD 3							1																						
ITU-T Q.1902.4 AMD 3							1																						
ITU-T Y.4102																				1									

## Annex 12. Analysis of identified national standards

The below list is the full list of all International and European standards in the area of disaster resilience that are found according to the methodology described in Section 2. The overview below includes the most basic information. A more extensive data collection for each of the standards is saved in a separate file and will be included in the web catalogue.

Table 96 shows the data with regard to the standard. Table 97 shows the categorisation for each of the standard in one or more phases of the Disaster Management Cycle.

Table 96: List of identified national standards in the area of disaster resilience

Document No.	Title	Date of publication	ICS Classification	Origin Code	Author	Status (published/ under development/ withdrawn)	SDO
BP Z74-700	Plan de Continuité d'Activité (PCA) (English : Business Continuity Plan (BCP))	2011-03-00	03.100.01 13.200 35.020	FA	AFNOR CN Sécurité et Resilience	Published	AFNOR
FD X 50-259	Management du risque — Plan de continuité d'activité (PCA) — Démarche de mise en place et de maintien (English : Risk management — Business continuity plan — Implementation and maintenance procedure)	2014-01-00	03.100.01 13.200	FA	AFNOR CN Sécurité et Resilience	Published	AFNOR
ANSI/APCO/NENA 1.105.2	Standard for Telecommunicator Emergency Response Taskforce (TERT) Deployment		13.200	US	US88292022	published	ANSI
ANSI/APCO/NPSTC 1.104.1	Standard Channel Nomenclature for the Public Safety Interoperability Channels		13.200 33.060.01	US	US83512019	published	ANSI
ANSI/ASCE/EWRI 56	Guidelines for the Physical Security of Water Utilities	2011-00-00	13.060.20 13.200	US	ANSI	published	ANSI
ANSI/ASIS SPC.2	Auditing Management Systems - Risk, Resilience, Security and Continuity - Guidance for Application	2014-00-00	03.100.01	US	ANSI	published	ANSI

Document No.	Title	Date of publication	ICS Classification	Origin Code	Author	Status (published/ under development/ withdrawn)	SDO
			03.100.70				
ANSI/ASSE A 10.26	Emergency Procedures for Construction and Demolition Sites	2011-00-00	13.200 91.010.01	US	ANSI	published	ANSI
ANSI/ASTM E 1546	Guide for Development of Fire-Hazard-Assessment Standards	2015-00-00	13.220.01	US	ANSI	published	ANSI
ANSI/ATIS 0500002	Emergency Services Messaging Interface (ESMI)	2008-00-00	13.200 33.040.35	US	ANSI	published	ANSI
ANSI N 42.26	Radiation Protection Instrumentation - Monitoring Equipment - Personal Warning Devices for X and Gamma Radiations	1995-00-00	13.280	US	ANSI	published	ANSI
ANSI/NFPA 424	Guide for Airport/Community Emergency Planning	2012-00-00	13.200 93.120	US	ANSI	published	ANSI
ANSI/NFPA 1600	Standard on Disaster/Emergency Management and Business Continuity Programs	2015-00-00	13.200	US	ANSI	published	ANSI
ASTM E 2413	Standard Guide for Hospital Preparedness and Response	2004-00-00	13.200	US	ASTM	published	ASTM
ASTM E 2541	Standard Guide for Stakeholder-Focused, Consensus-Based Disaster Restoration Process for Contaminated Assets	2010-00-00	13.200	US	ASTM	published	ASTM
ASTM E 2640	Standard Guide for Resource Management in Emergency Management and Homeland Security	2010-00-00	13.200	US	ASTM	published	ASTM
ASTM E 2653	Standard Practice for Conducting an Interlaboratory Study to Determine Precision Estimates for a Fire Test Method with Fewer Than Six Participating Laboratories	2015-00-00	13.220.01	US	ASTM	published	ASTM
ASTM E 2668	Standard Guide for Emergency Operations Center (EOC) Development	2010-00-00	13.200	US	ASTM	published	ASTM



Document No.	Title	Date of publication	ICS Classification	Origin Code	Author	Status (published/ under development/ withdrawn)	SDO
ASTM E 2915	Standard Guide for Emergency Operations Center (EOC) Management	2013-00-00	13.200	US	ASTM	published	ASTM
ASTM F 2685	Standard Guide for Training of a Land Search Team Leader (STL)	2014-00-00	13.200	US	ASTM	published	ASTM
ASTM F 2751	Standard Guide for Training of a Land Search and Rescue Team Member	2016-00-00	13.200	US	ASTM	published	ASTM
AWWA G 440	Emergency Preparedness Practices	2011-00-00	13.060.01	US	ASTM	published	ASTM
EIA/TIA-1196	Multimedia Priority Service (MMPS) for MMD-based Networks-Stage 1 Requirements	2011-07-00	33.040.99	US	EIA	published	EIA
EIA JESD 246	Customer Notification Process for Disasters	2014-01-00	03.100.01	US	EIA	published	EIA
NFPA 1600	Standard on Disaster/Emergency Management and Business Continuity/Continuity of Operations Programs	2016-00-00	13.200	US	NFPA	published	NFPA
BIP 2217:2011	Business continuity management for small and medium sized enterprises. How to survive a major disaster or failure	27-1-2012	03.100.01	GB	ZBIP/5	published	BSI
BIP 2034:2008	Disaster and emergency management systems	9-10-2008	03.100.70 03.120.10 13.200	GB	ZBIP/5	published	BSI
BS 11200:2014	Crisis management. Guidance and good practice	31-5-2014	03.100.01	GB	SSM/1	published	BSI
BIP 2185:2012	Business continuity communications. Successful incident communication planning with ISO 22301	30-6-2012	03.100.01	GB	ZBIP/5	published	BSI
BS 12999:2015	Damage management. Code of practice for the organization and management of the stabilization, mitigation and restoration of properties, contents, facilities and assets following incident damage	30-11-2015	03.100.01 13.200	GB	CAR/1/-/6	published	BSI

Document No.	Title	Date of publication	ICS Classification	Origin Code	Author	Status (published/ under development/ withdrawn)	SDO
BS 10175:2011+A1:2013	Investigation of potentially contaminated sites. Code of practice	31-3-2011	13.080.01 19.040 91.200	GB	EH/4	published	BSI
BS 7982:2001	Guidance on the environmental impact of large-scale fires involving plastics materials	31-8-2001	13.020.30	GB	PRI/26	published	BSI
BS 65000:2014	Guidance on organizational resilience	30-11-2014	03.100.01	GB	SSM/1/6	published	BSI
PAS 2015:2010	Framework for health services resilience	21-10-2010	03.100.01 11.020.01	GB	-	published	BSI
16/30342526 DC	BS 31111. Cyber risk and resilience. Guide	5-10-2016	35.040.01	GB	RM/1	under development	BSI
DIN 4063	Signs for civil defense	2016-03-00	01.080.99	DE	Firefighting and Fire Protection Standards Committee	published	DIN
DIN 77200	Static guarding and mobile patrol services - Requirements	2008-05-00	03.080.20 13.310	DE	Services Standards Committee	published	DIN
DIN SPEC 14660	Firefighting and fire protection - Personal protective devices 230 V/16 A and 400 V/16 A for rescue teams	2015-12-00	29.160.40	DE	Firefighting and Fire Protection Standards Committee	published	DIN
DIN SPEC 35220	Adaption to climate change - Projections on climate change and ways for handling uncertainties	2015-11-00	13.020.01	DE		published	DIN

Document No.	Title	Date of publication	ICS Classification	Origin Code	Author	Status (published/ under development/ withdrawn)	SDO
DIN SPEC 91282	Terminology for security management transport infrastructures	2012-11-00	01.040.03 03.220.01	DE	DIN SPEC (PAS, CWA)	published	DIN
DIN SPEC 91291	Emergency concept for the protection of sensitive logistics hubs - Configuration, simulation and implementation	2013-12-00	03.100.10	DE	DIN SPEC (PAS, CWA)	published	DIN
DIN SPEC 91296	Classification of threats to buildings by acts of terrorism	2013-06-00	13.310 91.040.01	DE	DIN SPEC (PAS, CWA)	published	DIN
DIN SPEC 91330	Terminology relating to events in pipeline- and cable-based infrastructures	2015-08-00	01.040.03 03.100.01	DE	DIN SPEC (PAS, CWA)	published	DIN
DIN SPEC 91331	Classification of risks for international large-scale projects	2015-11-00	03.100.01	DE	DIN SPEC (PAS, CWA)	published	DIN
DIN VDE V 0827-1*VDE V 0827-1	Emergency und danger systems - Part 1: Emergency and danger response systems - Basic requirements, duties, responsibilities and activities	2016-07-00	13.320	DE	German Commission for Electrical, Electronic and Information Technologies of DIN and VDE	published	DKE
DIN VDE V 0827-2*VDE V 0827-2	Emergency and danger systems - Part 2: Emergency and danger response systems - Additional requirements for Emergency- and Hazard-Intercom	2016-07-00	13.320	DE	German Commission for Electrical, Electronic and Information Technologies of DIN and VDE	published	DKE

Document No.	Title	Date of publication	ICS Classification	Origin Code	Author	Status (published/ under development/ withdrawn)	SDO
DVGW G 1001	Security of gas supply - Risk management of gas infrastructures under operational conditions	2015-03-00	91.140.40	DE	DVGW Deutscher Verein des Gas- und Wasserfaches e. V. - Technisch-wissenschaftlicher Verein	published	DVGW
DVGW G 1002	Security in Gas Supply; Organisation and Management in Crisis	2015-02-00	91.140.40	DE	DVGW Deutscher Verein des Gas- und Wasserfaches e. V. - Technisch-wissenschaftlicher Verein	published	DVGW
VDE-AR-N 4140	Cascading of measures for the system security of electrical energy supply networks	2017-02-00	29.240.01	DE	Forum Netztechnik/ Netzbetrieb im VDE (FNN)	published	VDE
VDI 4055	Operational safety management	2015-11-00	03.100.01 13.100	DE	VDI Society Energy and Environment	published	VDI
UNI 11656:2016	Attività professionali non regolamentate - Professionista della Protezione Civile (Disaster Manager) - Requisiti di conoscenza, abilità e competenza	17-11-2016	03.100.30	IT	UNI/CT 043	Published	UNI

Table 97: Analysis of identified national standards - Categorised in disaster management phases and related tasks

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operati onal		Support ing		Operati onal		Supporting		Operational								Supporting				Operational			Supporting					
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
BP Z74-700	1				1		1	1		1								1									1		
FD X 50-259	1				1					1								1									1		
ANSI/APCO/NENA 1.105.2					1					1		1						1	1										
ANSI/APCO/NPSTC 1.104.1					1					1		1						1	1										
ANSI/ASCE/EWRI 56	1				1																								
ANSI/ASIS SPC.2	1				1																								
ANSI/ASSE A 10.26	1				1																								
ANSI/ASTM E 1546	1				1																								
ANSI/ATIS 0500002	1				1																								
ANSI N 42.26					1	1																							
ANSI/NFPA 424					1																								
ANSI/NFPA 1600					1		1																						

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational	Supporting			Operational	Supporting			Operational								Supporting				Operational			Supporting					
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
ASTM E 2413	1				1																								
ASTM E 2541					1		1	1																					
ASTM E 2640					1															1									
ASTM E 2653					1			1																					
ASTM E 2668					1		1																						
ASTM E 2915					1		1																						
ASTM F 2685					1																								
ASTM F 2751					1																								
AWWA G 440	1																												
EIA/TIA-1196							1			1																			
EIA JESD 246	1							1																					
NFPA 1600										1																			
BIP 2217:2011					1																						1		

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational			Supporting					
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
BIP 2034:2008						1	1	1											1										
BS 11200:2014	1				1	1												1											
BIP 2185:2012	1									1									1										
BS 12999:2015	1				1					1									1										
BS 10175:2011+A1:2013	1														1														
BS 7982:2001																									1				
BS 65000:2014	1				1				1										1								1		
PAS 2015:2010	1				1		1															1		1					
16/30342526 DC	1				1														1								1		
DIN 4063								1		1													1						
DIN 77200							1																						
DIN SPEC 14660								1			1											1							
DIN SPEC 35220	1		1	1																									

	Disaster Management Phases and related tasks																												
	Mitigation				Preparedness				Response												Recovery								
	Operational		Supporting		Operational		Supporting		Operational								Supporting				Operational			Supporting					
Document No.	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data collection	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of recovery programme
DIN SPEC 91282							1		1			1							1										
DIN SPEC 91291					1			1												1									
DIN SPEC 91296	1							1																					
DIN SPEC 91330							1		1	1		1								1		1						1	
DIN SPEC 91331	1																												
DIN VDE V 0827-1*VDE V 0827-1										1												1							
DIN VDE V 0827-2*VDE V 0827-2										1												1							
DVGW G 1001	1			1			1			1		1							1										
DVGW G 1002										1		1						1	1			1	1					1	
VDE-AR-N 4140			1			1																							
VDI 4055					1		1	1																					
UNI 11656:2016							1																						



## Annex 13. Analysis of identified European and international guidelines

The below list is the full list of all European and international guidelines in the area of disaster resilience that are found according to the methodology described in Section 3. The overview below includes the most basic information. A more extensive data collection for each of the standards is saved in a separate file and will be included in the web catalogue. Table 98 shows the relevant guidelines per organisation, including the categorisation in one or more phases of the Disaster Management Cycle.

Table 98: List of identified guidelines in the area of disaster resilience

		Disaster Management Phases and related tasks																												
		Mitigation				Preparedness				Response												Recovery								
		Operat ional		Support ing		Operat ional		Supporting		Operational								Supporting				Operational				Supporting				
Title	Date of publication	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis c ommunication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/ Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and Implementation of
Global Initiative on Disaster Risk Management																														
Global Initiative on Disaster Risk Management	unkno wn																													
American Water Works Association																														
Emergency Power Source Planning for Water and Wastewater	2004																													
Security and Emergency Planning for Water and Wastewater Utilities	2010																													

		Disaster Management Phases and related tasks																												
		Mitigation				Preparedness				Response												Recovery								
		Operat ional		Support ing		Operat ional		Supporting		Operational								Supporting				Operational				Supporting				
Title	Date of publication	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personnell Management	Asset Management	(international) Cooperation	Warning/Crisis c ommunication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/ Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of Infrastructure	Establishment of recovery organisation structure	Determination and implementation of
M19 Emergency Planning for Water Utilities, Fourth Edition	2001																													
AWWA G440-11 Emergency Preparedness Practice.	2011																													
Ceres																														
Best Practices in Climate Change Risk Analysis for the Electric Power Sector	1-10-2006	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Building Climate Resilience in Cities: Priorities for Collaborative Action	1-11-2013	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Building Resilient Cities: From Risk Assessment to Redevelopment	1-11-2013	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BuildingResilientCitiesToolkit CURRICULUM GUIDE & APPROACH FOR BREAK-OUT GROUPS	2013	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

		Disaster Management Phases and related tasks																												
		Mitigation				Preparedness				Response												Recovery								
		Operat ional		Support ing		Operat ional		Supporting		Operational								Supporting				Operational			Supporting					
Title	Date of publication	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis c ommunication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/ Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of
ERNCIP																														
Biometrics, surveillance and privacy	8-2-2017	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Video surveillance standardisation activities, process and roadmap	8-2-2017	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Overview of standards/guidelines and current practices for vulnerability assessment of drinking water security in the European Union	20-6-2016	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
European Aviation Safety Agency																														
Rules and Guidance Material - Volcanic Ash		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0

		Disaster Management Phases and related tasks																													
		Mitigation				Preparedness				Response												Recovery									
		Operat ional		Support ing		Operat ional		Supporting		Operational								Supporting				Operational				Supporting					
Title	Date of publication	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(International) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/ Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/ Data	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of Infrastructure	Establishment of recovery organisation structure	Determination and implementation of	
ADVANCE NOTICE OF PROPOSED AMENDMENT (A-NPA) NO 2011-06 ‘Consultation on the ICAO IVATF paper about the management of flight operations with known or forecast volcanic cloud contamination’	03.05. 2011	1	1	0	1	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
NPA 2015-13 Loss of control prevention and recovery training	1-9-2015	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
GIB Foundation																															
SuRe	unkno wn	1	0	1	1	1	1	1	1	0	1	0	1	0	1	0	1	0	0	0	1	1	1	0	0	0	0	0	0	0	0
Global Infrastructure Basel																															
SuRe Underwriting	unkno wn	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

		Disaster Management Phases and related tasks																												
		Mitigation				Preparedness				Response												Recovery								
		Operat ional		Support ing		Operat ional		Supporting		Operational								Supporting				Operational				Supporting				
Title	Date of publication	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/ Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/ Data	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation
SuRe Standard	27-7- 2016	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ICLEI – Local Governments for Sustainability																														
Resilient City Agenda	1-9- 2015	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Islands Climate Tesilience Toolkit	unkno wn																													
Building Adaptive and Resilient Communities (BARC)	unkno wn																													
ICLEI ACCCRN Process	unkno wn																													
Plan de Acción Climática Municipal (PACMUN)	unkno wn																													

		Disaster Management Phases and related tasks																												
		Mitigation				Preparedness				Response												Recovery								
		Operat ional		Support ing		Operat ional		Supporting		Operational								Supporting				Operational			Supporting					
Title	Date of publication	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis c ommunication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/ Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/ Data	Operations support	Logistics	Humanitarian Impact recovery	Environmental Impact recovery	Economic Impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and Implementation of
Reconciling Adaptation, Mitigation and Sustainable Developmentf or Cities (RAMSES)	unkno wn																													
Sustainable Urban Resilient (SURE) Water for Africa	unkno wn																													
International Civil Aviation Organization (ICAO)																														
Crises and Response Programme	unkno wn																													
ICAO Crisis Management Framework	2014	1	1	0	1	1	1	1	1	1	0	0	1	0	0	0	0	0	1	1	1	1	1	1	0	0	0	1	1	0
Volcanic Ash ICAO’s international airways volcano watch (IAVW)	2004	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		Disaster Management Phases and related tasks																													
		Mitigation				Preparedness				Response												Recovery									
		Operat ional		Support ing		Operat ional		Supporting		Operational								Supporting				Operational				Supporting					
Title	Date of publication	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis c ommunication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/ Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of Infrastructure	Establishment of recovery organisation structure	Determination and implementation of	
Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation (CAPSCA)	2004	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0
Global aviation Safety Plan "GASP", STRATEGY ON DISASTER RISK REDUCTION AND RESPONSE MECHANISMS IN AVIATION	27-6-2016	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IRGC - International Risk Governance Council																															
IRGC Resource Guide on Resilience	2016	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
NASA																															
NASA-STD-2804 Minimum Interoperability Software Suite	24-6-2008	0	0	0	0	0	0	0	1	0	0	0	0		0	0		0	0	0		0	0	0	0	0	0	0	0	0	0

		Disaster Management Phases and related tasks																												
		Mitigation				Preparedness						Response												Recovery						
		Operat ional		Support ing		Operat ional		Supporting				Operational								Supporting				Operational				Supporting		
Title	Date of publication	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personell Management	Asset Management	(international) Cooperation	Warning/Crisis communication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/ Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/ Data	Operations support	Logistics	Humanitarian Impact recovery	Environmental Impact recovery	Economic Impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and Implementation of
NASA-HDBK-7005 Dynamic Environmental Criteria	13-3- 2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NASA-STD-7009 Standard for Models and Simulations	unkno wn																													
NASA-HDBK-8709.24: NASA Safety Handbook	23-11- 2015	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NASA-HDBK-8739.18 Procedural Handbook for NASA Program and Project Management of Problems, Nonconformances, and Anomalies	unkno wn																													
NASA-STD-8719.11 SAFETY STANDARD FOR FIRE PROTECTION	19-11- 2008	0	1	0	1	1	1	1	0	1	1	1	1	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	0	0
NASA-STD-8719.13: NASA SOFTWARE SAFETY STANDARD	5-7- 2013	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



		Disaster Management Phases and related tasks																												
		Mitigation				Preparedness				Response												Recovery								
		Operat ional		Support ing		Operat ional		Supporting		Operational								Supporting				Operational				Supporting				
Title	Date of publication	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personnell Management	Asset Management	(international) Cooperation	Warning/Crisis c ommunication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/ Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of Infrastructure	Establishment of recovery organisation structure	Determination and implementation of
NASA-STD-8729.1 PLANNING, DEVELOPING AND MANAGING AN EFFECTIVE RELIABILITY AND MAINTAINABILITY (R&M) PROGRAM	1-12- 1998	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NASA-STD-8719.7 FACILITY SYSTEM SAFETY GUIDEBOOK	1-1- 1998	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NIAC																														
National Infrastructure Advisory Council	8-9- 2009	1	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UK - Civil Contingencies Secretariat																														
Keeping the country running: natural hazards and infrastructure	1-10- 2011	1	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UN ESCAP																														

		Disaster Management Phases and related tasks																													
		Mitigation				Preparedness				Response												Recovery									
		Operat ional		Support ing		Operat ional		Supporting		Operational								Supporting				Operational				Supporting					
Title	Date of publication	Risk assessment	Exposure reduction	Trend analysis	Monitoring and review	Capacity development	Monitoring / Detection	Personnell Management	Asset Management	(International) Cooperation	Warning/Crisis c ommunication	Disaster causes elimination	Rescue operations	Security/Law enforcement	Evacuation and Shelter	Emergency Health Care	Disaster area clearance	Basic needs Supply/ Restoration	Command, Control and Coordination	Situation assessment	Information management	Monitoring/Data	Operations support	Logistics	Humanitarian impact recovery	Environmental impact recovery	Economic impact recovery	Re-establishment of infrastructure	Establishment of recovery organisation structure	Determination and implementation of	
Resilient Business for Resilient Nations and Communities	11.3.2015	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Building resilience to natural disasters and major economic crises	1-4-2014	1	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
UN Habitat																															
City Resilience Profiling Programme	unknown	1	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Water New Zealand																															
Infrastructure Resilience: What does it mean for my agency / organisation?	15-3-2013	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1

## Annex 14. Web catalogue - example

The database will display the data through the so called “list view option”. This option will display the data by following their main attributes specified in the excel files:







1. Web catalogue example Document No.
2. International Correspondence
3. Title
4. Abstract/Scope
5. Standard keywords
6. Date of publication
7. ICS Classification
8. Origin Code
9. Legal connection
10. Number of Pages
11. Author
12. AC-Code
13. Status - 1)published, 2)under development,3 )withdraw
14. SDO
15. Author (WG No)
16. Disaster Management Phases and related tasks
  - a. Mitigation
    - i. Risk Assessment
    - ii. ...
  - b. Preparedness
    - i. Capacity development
    - ii. ..
  - c. Response
    - i. Warning/Crisis communication
    - ii. ...
  - d. Recovery
    - i. Humanitarian impact recovery
    - ii. ..
17. Type of Standard
  - a. Basic Standard
  - b. Process Standard
  - c. Product Standard
  - d. Service Standard
  - e. Terminology Standard
  - f. Testing Standard

An example of the display of data is shown in the Figure 25.

Records found: 10

+ Add New Resilience Indicator

Refresh | X W

Edit	#	Name of Indicator	Description	Measurement	Nature	Company Name of the Indicator Provider	Reference and source	% of populated fields
	1	Are resilience-related responsibilities clearly defined?	Are the responsibilities for resilience clearly defined?	<High> Established for all management personnel, defined in every manager's job description and included as an important consideration in their regular appraisals <Medium> Established for all management personnel, defined in every manager's job description and have no consideration in their regular appraisals <Low> Only established for all management personnel <Non-existent>	Scale/Range (values)	USTUTT (ZIRIUS)	American Petroleum Institute RP 581 (2000). (3rd ed.) Risk based inspection methodology, Washington	 40
	2	Average amount of resilience related training imparted to operators?	What is the average amount of infrastructure resilience related (simulators, table-top, preparedness) training given to each operations employee per year, averaged over all grades? (Choose one)	<High> 10 days/year or more <Medium> 7-9 days/year <Average> 3-6 days/year <Low> less than 3 days/year <No training>	Scale/Range (values)	USTUTT (ZIRIUS)	American Petroleum Institute RP 581 (2000). (3rd ed.) Risk based inspection methodology, Washington Glen, K., Massaiu, S., Timmannsvik, R. K., & Starzec, E. (2010, June). Development of early warning indicators based on resilience engineering. In Submitted to PSAM10, International Probabilistic Safety Assessment and Management Conference	 35
	3	Content of the resilience related training module?	Does the training described in MSEQ 7.1 & 7.2 require that the infrastructure resilience related training include the following?	<High> An overview of the resilience policy guidelines for the infrastructure, ultimately embed resilience within everyday activities: training in specific procedures to understand risk (e.g. process safety knowledge, Hazard identification), training to anticipate/prepare for an emerging risk (e.g. emergency management, business continuity management aspects), training to absorb/withstand a shock to the infrastructures (e.g. redundancy measures such as managing alternate sites/ resources during an event), training to respond (e.g. knowledge about plan for restoration) and adapt/learn from past to prepare for future events (e.g. lessons learnt), other appropriate basic skills <Medium> An overview of the resilience policy guidelines for the infrastructure, training in specific procedures	Scale/Range (values)	USTUTT (ZIRIUS)	American Petroleum Institute RP 581 (2000). (3rd ed.) Risk based inspection methodology, Washington	 40

Edit  
 Standard Title  
 International correspondance  
 Abstract  
 Phase  
 Type of Standard  
 Remarks  
 Keywords

Figure 26: Web catalogue - Example of a data structure in the database

Analysis of the data in later stages of the project could be represented in different types of chart (e.g. donut chart,) or heat maps, etc. (See Figure 27).

Percentage of standards in Disaster Management Phases

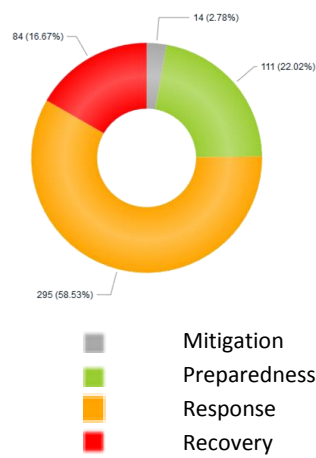


Figure 27: Web catalogue - Example of a representation of data

## Annex 15. standards Advisory Group (SAG) - Tasks and membership

Note: the work for the SAG is ongoing and insights on tasks and membership may change in the course of the project.

### Tasks

The main tasks in which SAG members will be involved are described in Table 99 .

Table 99: Standards Advisory Group – Main tasks in ResiStand to involve SAG

Task number	Task description	Requested input from SAG
<b>T1.3</b>	Review of the proposed ResiStand Assessment Framework (RAF)	Commenting RAF with respect to applicability to current practices
<b>T5.1 and T5.2</b>	Critical evaluation of the potential of standards to increase EU disaster resilience and validation of standardisation gaps	Participate in WP5 Joint Workshop planned for 11 September, 2017 in Brussels, Belgium
<b>T5.3</b>	Review of the proposed standardisation roadmap	Validating the roadmap
<b>T6.3</b>	Exploitation strategy and implementation plan	Contribute to the declaration regarding take-up of the ResiStand Process
<b>T7.5</b>	Final conference	Participate in Final conference

### Membership

As the members of the SAG are of great importance to the ResiStand project the aim is not to have as many people in the SAG as possible; instead aim to have a very dedicated group of members who are all committed to contribute to the ResiStand project.

The following stakeholder groups were considered as relevant for participation in the SAG:

- National standardisation bodies (NSBs):
  - Members of CEN/BT (or other representatives). CEN/BT is the body which controls the full standards programme and promotes its speedy execution by the Technical Committees (TC), the CEN-CENELEC Management Centre (CCMC), and other bodies.
  - Standardisation project managers dealing with disaster resilience standardisation committees

Although the aim is to involve as many NSBs as possible, the following specific NSBs were specifically targeted due to their leading roles in international disaster resilience standardisation and/or specific strategies or national situations: Germany, UK, France, Sweden, Italy, Czech, Spain, Netherlands, Finland. Currently Germany, UK and France have signed up and the other countries were personally invited and are still considering membership of the SAG.
- Chairs, convenors and secretaries of disaster resilience related international and European technical committees and related groups:
  - CEN/TC 391 Societal and citizen securities

- CEN/TC 439 Private security services
- CEN/TC 164 WG15 Security of drinking water supply
- ISO/TC 292 Security and resilience
- ISO/TC 262 Risk management
- CEN/CENELEC/ETSI Cyber Security Coordination Group

As CEN/TC 391 is of particular relevance for ResiStand, the chairperson will be approached to take up a leading role in the SAG, with specific contributions within the scope of the Task 6.2). These contributions will include the involvement in the development of the ResiStand Roadmap as well as assisting the ResiStand team in testing the ResiStand Process. For the testing of the ResiStand Process a topic of the Roadmap will be selected and prior to the CEN/TC 391 meeting at the end of 2017 a drafting session of a NWIP or a CWA business plan will be conducted. For this drafting session relevant experts, e.g. from ResiStand communities, will be invited to participate, which will result in the proposal for a new standard deliverable for the specific topic of interest.

Linking the drafting session to the CEN/TC 391 meeting will provide ResiStand with access to an adequate forum for drafting such documents. In return ResiStand will actively contribute to the standard development of the TC and will support experts with required expertise that are willing to attend. These experts could become members of the Working Groups actually developing the standards and participate in the future CEN/TC 391 meetings.

- Other organisations developing standards, outside of the 'formal' standardisation organisations:
  - NATO Committee for standardisation
  - European Defence Agency
  - EC/DG HOME
  - EC/JRC-IRMM
  - EC/JRC-ERNICIP
- Some specific experts very active in contributing to standardisation work (who are formally not related to standardisation)