Teamaware

TEAM AWARENESS ENHANCED WITH ARTIFICIAL INTELLIGENCE AND AUGMENTED REALITY

Deliverable 2.1

Conceptual Analysis and System Requirements

Document Information

Editor(s):	Peter Glerum, Dave Ramscar, Gordon Macmillan
Responsible Partner:	The Resilience Advisors Network
Status-Version:	Final - v1.0
Date:	02/11/2021
Distribution level (CO, PU):	Public

Project Details

Project Number:	GA 101019808
Project Title:	TeamAware

Deliverable Details

Title of Deliverable:	Conceptual Analysis and System Requirements
Due Date of Delivery to the EC:	31/10/2021

Editors, contributors and reviewers

Work package responsible for the Deliverable:	WP2 - System Architecture Specification and Design
Editor(s):	Resilience Advisors Network
Contributor(s):	Peter Glerum Gordon MacMillan Dave Ramscar
Reviewer(s):	HAVELSAN, DUNE
Approved by:	SIMAVI

Recommended/mandatory readers:	WP3-14

Additional info

Abstract:	Analysis of the strategic and operational context (TL: RAN, Participants: All): This task conducts an analysis on the strategic and operational context of first responders when addressing severe natural and manmade disasters. In this concept, the International (i.e., INSARAG, UCPM, and IFAFRI) and national policy framework as well as guidelines, handbooks, protocols, and literature from the consortium countries will be reviewed. The analysis will be structured around four blocks: scenario (e.g., type of disasters and the relevant environments), operational doctrines (strategies and protocols, management procedures, etc. for the preparedness, response and post-crisis recovery), tools (e.g., available IT systems, technologies and equipment, communication channels), and socio-economic aspects (e.g., policy and social context, use of resources, prevention and recovery mechanisms, resilience to disasters, etc.).
Keyword List:	First responders, scenario, operational doctrines, protocols, management procedures, tools, technologies and equipment, communication channels, socio-economic aspects
Licensing information:	-
Disclaimer	This deliverable reflects only the author's views and the Commission is not responsible for any use that may be made of the information contained therein.

Document Description

Document Revision History

Version	Date	Modifications Introduced	
		Modification Reason	Modified by
V0.1	19. 07. 2021	First working draft with tasks allocated in red text.	Gordon Macmillan
V0.2	20.07.2021	Following meeting on 19.06 - added Section 3 Socio economic aspects e.g., overview of policy and social context, use of resources, prevention and	Gordon Macmillan

		recovery mechanisms, resilience to disasters, etc. Reviewed Vademecum but not too useful. All info taken from Driver+ docs.	
V0.3	13.09.2021	TeamAware formatting	Peter Glerum
V0.4 still	05.10.2021	Proofread to the end by Gordon. Added in chapter 1, improved chapter 3 (introductions and references) Updated content table.	Gordon MacMillan/Peter Glerum
V0.5	06.10.2021	Additional text added for Romania & Ireland. 3.2. & Annex 1 added. Review partly accepted.	Dave Ramscar/ Peter Glerum
V0.6	06.10.2021	Reviewed and updated and added new parts	Dave Ramscar
V0.7	07.10.2021	V0.6 downloaded, all track changes accepted and proofread. Re uploaded as v0.7.	Gordon MacMillan
V0.8	07.10.2021	V07 downloaded, inserted abbreviation and made some further detailed improvements.	Peter Glerum
V0.9	08.10.2021	V0.8 downloaded for further proof reading. All footnotes now size 10. "Table xx" above all tables. Figure xx below all figures. Text size for Table xx and Figure xx to be Calibri 11. All bullet points now Roman numerals. 5 additions to the abbreviations table. NOT YET COMPLETE more work required.	Gordon MacMillan
V0.91	10.10.2021	Final fixes sent to team to fix.	Peter Glerum
V0.92	11.10.2021	Email reply to Peter with progress on 11th. Spell check and fixed all Zs to S where appropriate for example Organisation. Minor details changed, as well as ECPM changed in UCPM	Gordon MacMillan/ Peter Glerum
V0.94	23.10.2021	Added chapter 2 and 5.3.5 (Austria) and table and figure list. Section 2.3 added + some additional referencing added in chapter 5 First review of "Austria Policies".	Gordon Mac Millan/Dave Ramscar
V0.95	24.10.2021	Referenced inserted. Chapter 2 aligned. Minor details solved.	Peter Glerum/Dave Ramscar/Gordon Macmillan

V0.96	25.10.2021	Final version for review.	Peter Glerum, Reviewed by Dune and Havelsan
V1.0	30.10.2021	Version improved after internal project review	Peter Glerum/Dave Ramscar/Gordon McMillan

Table of Contents

List of Figures

List of Tables

Terms and abbreviations

AF	Armed Forces
AFAD	The Disaster and Emergency Management Presidency (of Turkey)
AGES	Austrian Agency for health and food safety
AGS	An Garda Síochána (of Ireland)
AMP	Advanced medical post
AMP-S	Advanced medical post with surgery
ANDR	National Commission for Nuclear Activities Control, General Inspectorate for Emergency Situation and Nuclear and Radioactive Waste Agency (of Romania).
ANPC/ANEPC	National authority for Civil protection (of Portugal)
APCIP	Austrian Plan for Critical Infrastructure Protection
ARGOS	The Danish Emergency Management Agency uses the computer program ARGOS to calculate the spread of radioactive substances in the atmosphere
BoO	Base of Operations
BMGF	Ministry of Health (Austria)
BMI	Ministry of Interior (Austria)
BMSGPK	Ministry of social affairs and consumer protection (Austria)
BWZ	Bundes Warne Zentrale (Austria, national warning centrum)
CBRN	Chemical, Biological, Radiological and Nuclear
CBRNDET	CBRN detection and sampling
CBRNUSAR	USAR in CBRN conditions
CD	Civil Defence
CECIS	Common Emergency and Information System
CEN	Comité Européen de Normalisation
CI	Critical Infrastructure
CIP	Critical Infrastructure Protection
CIR	Critical Infrastructure Resilience
CMT	Crisis Management Team
CNCAN	National Commission for Nuclear Activities Control (of Romania)
CNCAN	National Commission for Nuclear Activities Control (of Romania).
CNSSU	National Committee for Special Emergency Situations (of Romania)
CODU	orientation centre for medical emergencies (Portugal)
COMAH	Control of Major Accident Hazard
COS	Relief Operations Commander (in Portugal)
CPA	Civil Protection Agent (in Portugal)
CRM	Crisis Management Team
HLPG	Department of Housing, Local Government and Heritage (Ireland)
DAFM	Department of Agriculture, Food and Marine (Ireland)
DCOK	Central Operational Communication Staff (of DEMA)
DECIR	Operational Directive
DEMA	Danish Emergency Management Agency
DG ECHO	Directorate-General for European Civil Protection and Humanitarian Aid Operations
DG HOME	Directorate-General for Migration and Home Affairs
DHC	Department of Health and Children
DIOPS	Integrated Operations Device Protection and Relief (of Portugal)
DON	National Operational Directive (of Portugal)
DRMNK	Disaster Risk Management Knowledge Network
DRR	Disaster Risk Reduction

DSP	Public Health (of Romania).
DWT	Dead Weight Tonnage
EAFRD	European Agricultural Fund for Rural Development
EC	European Commission
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EEA	European Environment Agency
EERC	European Emergency Response Capacity
EFAS	European Flood Alert System
EFFIS	European Forest Fire Information System
EKAB	National Centre of Emergency Care (of Greece)
EMAK	Special Unit for Disaster Management (of Greece)
EMS	Emergency Mapping Service
EMSA	European Maritime Safety Agency
EMSC	European Mediterranean Seismological Centre
EMT	Emergency Medical team
EMT1 fixed	Emergency medical team type 1: Outpatient Emergency Care – fixed
EMT1 mobile	Emergency medical team type 1: Outpatient Emergency Care - mobile
EMT2	Emergency medical team type 2: Inpatient Surgical Emergency Care
EMT3	Emergency medical team type 3: Inpatient Referral Care
EOC	Emergency Operations Centre
EOP	Emergency operations Plan
EPA	Environmental Protection Agency
EPCIP	European Programme for Critical Infrastructure Protection
EPM	Emergency Pre-Hospital Medicine
ERC	Emergency Relief Coordinator (of the United Nations)
ERCC	Emergency Response Coordination Centre
ERDF	European Regional Development Fund
ERDF	European Regional Development Fund
ERS	Emergency Response Section (of the United Nations Office for the Coordination of Humanitarian Affairs)
ESB	Emergency Services Branch
ESRI	Economic and Social Research Institute
ESY	Hellenic National Health System (of Greece)
ETC	Emergency Temporary Camp
ETIC	Imaging Technique School of Image and Communication (in Portugal)
ETIK	Special Department of Disaster Medicine (of Greece)
EU	European Union
EU HNSG	EU-Host Nation Support Guidelines
EUCPM	European Civil Protection Mechanism
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
EUMWF	European Centre for medium-range Weather Forecasts
FC	Flood containment
FCSS	Field Coordination Support Section (of the United Nations Office for the Coordination of Humanitarian Affairs)
FFDN	Forest Fire Danger Notices
FFFH	Aerial forest firefighting module using helicopters
FFFP	Aerial forest fire fighting module using planes
FHOS	Field hospital

FRB	Flood rescue with boats
FWI	Met Eireann Fire Weather Index (of Ireland)
GA	General Assembly (of the United Nations)
GDACS	Global Disaster Alert and Coordination System
SATAME	General Plan for Dealing with Large-Scale Technological Accidents (of Greece)
GEO	Group on Earth Observations
GFFF	Ground forest fire fighting
GFFF-V	Ground forest fire fighting using vehicles
GIES	General Inspectorate for Emergency Situations (of Romania)
GloFAS	Global Flood Awareness System
GNR	National gendarmerie force of Portugal.
GSCP	General Secretariat for Civil Protection (in Greece)
GSCP	General Secretariat for Civil Protection (of Greece)
GWIS	Global Wildfire Information Systems
ha	Hectare = $10{,}000^2$ M
HCP	High-Capacity Pumping
HILP	High Impact/Low Probability
HN	Host Nation
HSE	Health Service Executive (of Ireland)
HUSAR	Heavy urban search and rescue
I-131	radioisotope of iodine
ICT	Information Communication Technology
IDRL	International Disaster Response Law
IEC	INSARAG External Classification
IER	INSARAG External Reclassification
IFAFRI	International Forum to Advance First Responder Innovation
IFRC	International Federation of Red Cross and Red Crescent Societies
IGSU	General Inspectorate for Emergency Situation (of Romania)
IHL	International Humanitarian Law
INSARAG	International Search and Rescue Advisory Group
INSP	Environmental Guard, National Institute of Public Health (of Romania)
IOS	International Operational Staff
ISAC	Interagency Standing Committee (of UN-OCHA)
JRC	Joint Research Centre (European Commission)
KEMEA	The Safety Study Centre (of Greece)
KEPY	Committee on First Reception Centers (Greece)
LA	Local Authorities
LEMA	Local Emergency Management Authority
LGD	Lead Government Department
LO	Liaison Officer
LR2	Crude tanker Long Range - ranges in size from 105,000 to 115,000
MEM	The Framework for Major Emergency Management
MEVAC	Medical aerial evacuation of disaster victims
MoH	Ministry of Health
MUSAR	Medium Urban Search and Rescue
NATO	North Atlantic Treaty Organisation
NCP	National Contact Points
NDFEM	National Directorate for Fire and Emergency Management
NDMO	National Disaster Management Organisation

NGO	Non-Government Organisation
NORMAN	The Nordic authorities publish a Nordic emergency manual on co-operation between the authorities in the event of nuclear accidents and other radiological incidents. The manual is called The Nordic Manual or simply NORMAN
NOST	National Operational Staff
NPHO	National Public Health Organisation (of Greece)
NPP	Nuclear Power Plant
NRA	National Risk Assessment
NWG	National Working Group
OCHA	United Nations - Office for the Coordination of Humanitarian Affairs
OES	Operators of Essential Services
OPW	Office of Public Works
OSOCC	On-Site Operations Coordination Centre
PEExt	Preparation of External Emergency Plans
PES	Principle Emergency Services
PHEIC	Public Health Emergency of International Concern
PRAs	Principle Response Agencies
PROCIV	Newsletter that monthly provides news about national and international actions, agents, technical dossiers, key legislation, and a schedule of events within the civil protection (in Portugal). Also see PROCIV below.
PROCIV	Working Party on Civil Protection of the European Council
PSP	The national civil police force of Portugal.
RC	Resident Coordinator (of the United Nations)
RDC	Reception and Departure Centre
RISKAM	Environmental Hazard and Risk Assessment and Management research group (of Portugal)
RVA	Risk and Vulnerability Analysis
SAFE	Stay Alert Fully Educated (of Greece)
SAKOM	Health Disaster Coordination Centre (of Turkey)
SAR	Search and Rescue
SARS	Severe acute respiratory syndrome
SEM	Strategic Emergency Management, National Structures & Framework Document
SERG	Strategic Emergency Planning Guide (of Ireland)
SGO	Operations Management System (of Portugal)
SGO	Operations Management System (in Portugal)
SIEM	Integrated Medical Emergency System (of Portugal)
SIOPS	Integrated System for Relief Operations (of Portugal
SKKM	State Crisis management Centrum (of Austria)
SN	Sending Nation
SNMSU	National System for the Management of Emergency Situations (of Romania)
SNPC	National System of Civil Protection (Sistema Nacional de Protecção Civil0 in Portugal
SOP	Standard Operational Plan
SPP	Protection and Guard Services (of Romania)
STC-CON1	A standardised international scenario from the international atomic agency (IAEA), describing the effect of a sever incident in a nuclear power plant
SWAT	Severe Weather Assessment Team
TAMP	Turkey Disaster Response Plan
TAST	Technical Assistance and Support Team
TENMAK	Turkish Energy, Nuclear and Mining Research Institute
TN	Transit Nation

TOKI	Ministry of Environment and Urbanisation, Mass Housing and Public Partnership Administration (of Turkey)
TRAC	The Association of Radio Amateurs (of Turkey)
UCPM	Union Civil Protection Mechanism
UK	United Kingdom
UMKE	National Medical Rescue Teams (of Turkey)
UNDAC	United Nations Disaster Assessment Coordination
UNDP	United Nations Development programme
UNDRR	UNDRR (formerly UNISDR) is part of the United Nations Secretariat and it supports the implementation & review of the Sendai Framework for Disaster Risk Reduction
UNICEF	United Nations Children's Fund, formerly (1946–53) United Nations International Children's Emergency Fund
UNISDIR	UNDRR (formerly UNISDR) is part of the United Nations Secretariat and it supports the implementation & review of the Sendai Framework for Disaster Risk Reduction
UNSAR	the Romanian insurer’s professional body
USAR	Urban Search and Rescue
VO	Virtual On-Site Operations Coordination Centre
WHO	World Health Organisation
WMO	World Meteorological Organisation
WP	Work Package
WP	Water purification
ZAMG	Zentral Anstalt fur Meteorology and Geodynamic (Austria)

Executive Summary

This deliverable gives and overview and analysis of the emergency management in Europe based on a detailed description of seven European countries (Turkey, Romania, Portugal, Ireland, Greece, Denmark and Austria) who represent together a picture of the emergency management in Europe as a whole.

Europe is as such a relative safe continent, nevertheless it is still vulnerable to a wide range of disasters. The most pertinent disaster risks according to risk assessments conducted are:

i) flooding,
ii) extreme weather,
iii) forest fires,
iv) earthquakes,
v) medical emergencies (pandemic),
vi) chemical incidents,
vii) radiological incidents,
viii) failure of critical infrastructure.

The risk of those disasters varies throughout the described countries. Whereby Denmark and Ireland are relatively disaster-safe countries, while Greece and Turkey are on a broad range of risks disaster-prone countries.

The organisation of emergency management varies throughout Europe, from a very centralised system in Turkey and Romania to a very locally organised system in Denmark and Austria.

Through the European Civil protection Mechanism and the UN INSARAG system, but also because of the similar challenges of first responder the operational command and coordination structures are similar throughout Europe.

However, as disaster and emergency management is a national responsibility, the structures within government are not aligned on the European level.

This deliverable functions as a background document for the further work in WP 2 and for the WPs 3-11 giving the developers of new tools for the first responders an up-to-date overview of the work environment of first responders. It meanwhile gives the input for the scenarios which will be developed for the demonstration and validation in WP13.

1 Introduction

1.1 About this deliverable

This deliverable provides an analysis of the strategic and operational context of the work of the first responders, for which the tools of the TeamAware projects will be developed.

It describes the operational and strategic documents, handbooks and policy framework regarding the situation and trends in disaster management relevant for the TeamAware project.

This context will drive the system and scenario design in other WP2 tasks and will be the basis for the scenarios in the validation trials of WP13.

The document is meant to be a reference document for the multiple entities working on the development of the tools.

The description is guided by the European overview of man-made and natural disasters which gives and overview of the common disaster risk in Europe. This overview of risk is a summarisation and analysis of the national risk assessments of the member states of the European Union.

The information is gathered based on a triangulation of available policy documents, literature guidelines and handbooks and information from the countries from which first responders and law enforcement agencies are involved in the project[1]. As no Northern European Country was involved in the project, we included one additional country (Denmark) in the descriptions to provide a wider European overview.

The deliverable contains an analysis of the general international and national policy frameworks, guidelines, handbooks, protocols, and operational doctrines relevant for first responders. These cover both the generic relevant frameworks as well as the scenario specific frameworks.

The tools (the available IT systems, technologies and equipment) as described in the description of work for the task 2.1 will be reported in deliverables deliverable D2.2. and D2.3. The system requirements as mentioned as part of the content of the deliverable will be described in deliverables D2.2 and D2.3.

1.2 Document structure

In chapter 2 a summarised overview of the scenarios, socio-economic situation and doctrine for first responders is given. This summarised overview is made to establish a common ground/ common overview of the scenarios, socio-economic overview, and operational doctrines within Europe.

This summarised overview is based on an analysis of the detailed information given in the following chapters.

[1]

Turkey	Bursa municipality & Bursa Ambulance service
Greece	Hellenic Society of Emergency Prehospital Care PREHOSPITAL CARE
Portugal	Associacao Humanitaria dos Bombeiros Voluntarios de Peniche
Romania	Sevicciul de protective si Paza
Austria	Johanniter-Unfall-Hilfe
Ireland	Resilience Advisors Network

In chapter 3, an overview of the most relevant scenarios for the first responders in Europe is given. Starting with the scenarios most relevant within the European Union based on documents provided by the European Union, followed by details for the seven end user countries within the study.

In chapter 4, an overview of the socioeconomic situation in the seven end user countries is given. Starting with a European overview followed by an overview per end user country.

In chapter 5, an overview of the doctrines used within Europe is given. It starts with the international UN standards applied within Europe, followed by the European structure: the Union Civil Protection Mechanism and ending with an overview of each of the end user countries.

The report ends with conclusions (chapter 6).

Added to the report is APPENDIX 1: Terminology for first responders and disaster risk management, an overview of definitions relevant for disaster and emergency management. It is not a required element of the report, but as there was discussion on definitions within the project participating organisations, there is considerable “add value” to develop a common set of definition and included this set of definitions to the current report.

1.3 Relation with other tasks and deliverables

The document is based on literature analysis and interviews with the end users within the project.

The report is meant as background reference document for the development of the TeamAware tools within the project in the WP 3-11. Together with the other deliverables of WP2 it will guide WPs3-11 to ensure the development of first responder focussed tools.

Report 2.1 describes which working environment the tools need to be used. Report 2.1 also delivers input for the testing of the tools in WP12 as well as giving background to the circumstances in which the tools need to be used. Report 2.1. is the basis for the development of the scenarios for validation. The headlines of the scenarios will be presented in deliverable 2.4 while further detailing will be done in WP13.

2 Overview of Scenarios, Socio-Economic Aspects and Operational Doctrines for first responders in Europe

This chapter gives an overview and Analysis of Scenarios, Socio-Economic aspects Operational Doctrines and of first responders in Europe. In the following chapters (3-5) a detailed overview will be given on each of the aspects at European/International level, followed by a description for each of the seven countries selected for this report.

2.1 Scenarios

Based on the regular national risk assessments, which are obligatory for the member states of the European Union[2] the European Commission makes an European overview of the national risk assessment[3]. This report gives a good overview of the relevant disaster scenarios for Europe.

In the overview of 2018, a top 12 of possible disaster risks based on the amount of EU countries in which the disaster risk is mentioned in the national risk assessment is presented:

i) Extreme weather
ii) Flood
iii) Drought
iv) Wildfires
v) Geophysical Risk
vi) Epidemics/pandemics
vii) Animal and plant diseases
viii) Nuclear and radiological accidents
ix) Disruption of critical infrastructure
x) Industrial accidents
xi) Terrorism
xii) Cyber threats

Those disaster risks are the scenarios that first responders throughout Europe are confronted with. However, the chance of each type of a disaster and the magnitude of a possible disaster varies throughout Europe.

In a capacity assessment report for the Union Civil protection Mechanism[4], 9 disaster scenarios are presented in the form of a planning assumption, giving and overview of the most pertinent disaster scenarios for which international assistance within the European Union can be needed.

Based on previous research, expert assessment and discussions with the European Commission, a list of nine “worst credible events” was created, which represent the overwhelming majority of incidents that would require an activation of the UCPM within the territory of the EU:

i) Flooding
ii) Extreme weather
iii) Forest fire
iv) Earthquake
v) International medical emergency
vi) Chemical incident

[2] European Union decision 2021/836 amending Decision No 1313/2013/EU on a Union Civil Protection Mechanism
[3] European Commission SWD (2020) 330 Overview of natural and man-made disaster risks the European Union may face
[4] Evaluation Study of Definitions, Gaps and Costs of Response Capacities for the Union Civil Protection Mechanism: Center for Strategy and Evaluation services 2019

vii) Radiological event
viii) Marine pollution
ix) Critical infrastructure disruption

On the country level or even on the regional or local level all of the scenarios are not pertinent.

There is within Europe an enormous variety in the risk of disasters.

The European Union and the Interagency Standing Commission form the United Nations, have developed an analytical Tool (INFORM)[5] which gives an overview of the hazard, the vulnerability and the coping capacity of the countries.

For the studied countries, this leads to the calculated nation risk levels for national hazards.

Table 1 Information from national hazard risk level for the partner countries

Country	Risk level for Natural hazards
Austria	2.5
Denmark	1,2
Greece	5.9
Ireland	2.2
Portugal	3.3
Romania	2.6
Turkey	6.1

From the countries which are part of this research Turkey and Greece are very prone to the natural disasters while Denmark is a country with very low risk on severe disasters.

2.2 Socio Economic Aspects

This paragraph gives an overview of the organisational structures of the seven studied countries. An overview highlighting the differences in the organisational structures in which first responders are working.

Turkey

Turkey ranks third in the world in terms of earthquake-related casualties and eighth in the world , with regard to the total number of people possibly affected. Every year, the country experiences at least one earthquake with magnitude 5 — making the proper management and coordination of disasters crucial.

The 1999 Marmara earthquake, however, marked the turning point in the area of disaster management and coordination. This devastating disaster clearly demonstrated the need to reform

[5] https://drmkc.jrc.ec.europa.eu/inform-index

disaster management and compelled the country to establish a single government institution to single-handedly coordinate and exercise legal authority in cases of disaster and emergencies. In line with this approach, the Turkish Parliament passed Law No.5902 in 2009 to form the Disaster and Emergency Management Authority (AFAD) under the Prime Ministry and abolish various agencies under whose jurisdiction the issue previously fell. Presidential Decree No. 4, which was published in the Official Gazette on July 15, 2018, and the Disaster and Emergency Management Authority (previously an agency under the office of Prime Ministry) re-formed as an agency under the Ministry of Interior.

The Disaster and Emergency Management Authority, an institution working to prevent disasters and minimize disaster-related damages, plan and coordinate post-disaster response, and promote cooperation among various government agencies. In this regard, the Disaster and Emergency Management Authority introduced a novel disaster management model which prioritizes Turkey's transition from crisis management to risk management – which came to be known as the Integrated Disaster Management System.

AFAD currently has 81 provincial branches across Turkey in addition to 11 search and rescue units.

Notwithstanding its position as the sole authority on disasters and emergencies, AFAD cooperates with a range of government institutions and non-governmental organizations depending on the nature and severity of individual cases.[6]

Greece

Civil protection in Greece is organised as a coordinated resource system where national, regional, and local authorities work together with local and public institutions and services. The Greek bodies responsible for the implementation of civil protection measures include the General Secretariat for Civil Protection (GSCP) and several authorities, organisations, and institutions; e.g., the ministries, the fire service, the Hellenic police, the armed forces, health authorities, the decentralised administrations, the regions, and the municipalities.

The mission of GSCP is to protect the citizen's life, health, and property from natural, technological, and other major hazards.

The GSCP studies, plans, organises, and coordinates the country's policy concerning issues of public awareness, prevention, and confrontation of natural or man-made disasters. It coordinates the actions of the public services and the civil protection volunteers.[7]

Portugal

The Portuguese civil protection system can be characterised as a multi-level system with responsibilities at national, district and local (municipal) level. Within this system, the municipal level is the principal actor in designing and implementing disaster risk management (DRM) measures. At national level, a set of guidelines was designed to support DRM activities that are also partly overseen by the national government, for example the development of emergency plans. The district level plays an intermediate role in this system, a role based on guidance and coordination. By following the principle of subsidiarity, this set-up is very efficient and allows local specificities to be considered. At

[6] https://en.afad.gov.tr/about-usus
[7] https://ec.europa.eu/echo/what/civil-protection/disaster-management/greece/en

the same time, however, the set-up is dependent on the availability of local resources and capabilities and hence the actual status of DRM measures varies according to the local context. [8]

Romania

At national level, the National Committee for Special Emergency Situations – CNSSU (inter-ministerial body), is responsible for emergency management. The CNSSU is headed by the Minister of Internal Affairs and is composed of ministers and directors of central public administration.

At strategic level, the Department for Emergency Situation (DSU) has coordinating powers for prevention and management of emergencies, ensuring and coordinating the human, material, financial and other resources necessary to cope with emergencies, including qualified first aid and emergency medical assistance within emergency units and emergency compartments.

In December 2004, the General Inspectorate for Emergency Situations (IGSU) was created by merging the Military Fire-fighters Corps and the Civil Protection Command, under the Ministry of Internal Affairs. IGSU is managed by a General Inspector. As integrator of the National Emergency Management System, a concept created also in 2004, IGSU coordinates all institutions involved in the process of emergency management and also works as a national point of contact for all relevant international governmental and non-governmental organisations.[9]

Austria

As a federal republic, Austria is comprised of 9 independent federal states (also referred to as provinces) and 2,100 municipalities. Disaster management is a task which is shared between all levels of government.

Disaster prevention is controlled at the national level by the responsible federal ministries in cooperation with the federal states and municipalities. The main responsibility for disaster response lies within the federal states. The legal basis for response is provided by the disaster relief acts of the federal states, which determine the declaration of the state of disaster and the operational direction of response at municipal, district, and federal state level. Operational capacities are mainly provided by voluntary response organisations (fire brigades, Red Cross, mountain rescue and others), which act as governmental services in the event of a disaster. On the national level, the responsibility for disaster management coordination lies with the Ministry of the Interior. Coordination is ensured by a national coordinating committee, which is chaired and managed by the Ministry of the Interior. The Ministry of the Interior is also responsible for cross-border cooperation and international disaster relief.[10]

Ireland

The first response to major emergencies in Ireland is led by three principal emergency services. An Garda Síochána (police force), the ambulance service, the fire service and the Irish coast guard. These principal agencies are responsible for the response to an emergency situation up to and including a major emergency in Ireland. At national level, the Government Task Force on Emergency Planning co-ordinates and oversees the emergency management policy and activities of all government departments and agencies under their aegis. The lead government department has the mandate and

[8] https://ec.europa.eu/echoecho/sites/default/files/peer_review_-_report_portugal_finalfinal.pdf
[9] https://ec.europa.eu/echo/what/civil-protection/disaster-management/romania_en
[10] https://ec.europa.eu/echo/what/civil-protection/disaster-management/austria_en

responsibility to co-ordinate all national level activity for its assigned emergency. The National Emergency Co-ordination Group is the central government platform established as part of the response to a threatened or ongoing national level emergency and is convened and chaired by the relevant lead government department.

The Office of Emergency Planning, Department of Defence, provides a key support role to the Government Task Force on co-ordination and oversight of emergency planning.[11]

Denmark

The national crisis management system serves to provide government coordination of the response to incidents in Denmark or abroad. It consists of the following.

i) The Government Security Committee, which includes the prime minister (chair) and the ministers of Foreign Affairs, Justice, and Defence.
ii) The Senior Officials Security Committee, which includes permanent secretaries of the 4 above-mentioned ministries and the heads of the Defence Intelligence Service (DDIS) and Security Intelligence Service (PET).
iii) The National Operational Staff (NOST) which includes the Danish National Police (chair), Danish Emergency Management Agency (DEMA), Danish Health Authority, Defence Command, PET, DDIS, Ministry of Foreign Affairs, and Danish Transport, Construction and Housing Authority. Other authorities may participate ad hoc.
iv) The International Operational Staff (IOS) which includes the Ministry of Foreign Affairs (chair), Prime Minister's Office, Ministry of Justice, Ministry of Defence, Ministry of Health, National Police, DEMA, Danish Health Authority and Defence Command. Other authorities, travel and insurance industry representatives may participate ad hoc.
v) 12 local operational staff with standing members from the police districts (chair), DEMA, the Home Guard, the regions and the municipalities. Ad hoc participants often include providers of public transport and utilities.
vi) Local incident command, made up of on-scene police, fire & rescue, and health preparedness incident commanders.[12]

2.3 Operational Doctrines

This paragraph gives an overview of operational doctrines, which are leading during international response. In the chapter 5, the doctrines on the national level are added to this. The different governmental structures alignment of the operational structures based on the frameworks described in this paragraph.

> *Though little discussed, legal barriers can be as obstructive to effective international disaster relief operations as high winds or washed-out roads. At the same time, the absence of regulation where it is needed can contribute to a response that is uncoordinated, wasteful, and inadequately respectful to beneficiaries and domestic relief actors. These problems often lead to disaster-affected communities not receiving the right aid at the right time, delivered in the right way.*[13]

Over the three decades, a field known as International Disaster Response Law (IDRL) has emerged, seeking to address some of the challenges related to cross-border relief following natural disasters.

[11] https://ec.europa.eu/echo/what/civil-protection/disaster-management/ireland_en
[12] https://ec.europa.eu/echo/what/civil-protection/disaster-management/denmark_en
[13] IFFRC, law and legal Issues in international disaster response: A Desk Sturdy (2007) - https://disasterlaw.ifrc.org/sites/default/files/media/disaster_law/2020-08/113600-idrl-deskstudy-en.pdf

This has also seen the development of international standards and methodologies for the co-ordination of first responders and relief agencies reacting to such events. This is in turn helps to ensure that any assistance is delivered in the most effective way possible without being a burden on the already disaster struck community.

UNDAC

The United Nations Disaster Assessment Coordination (UNDAC)[14] is the primary co-ordination methodology in the international emergency response system for sudden-onset and deteriorating emergencies. The UNDAC system is designed to assist the United Nations and Governments of a crisis-affected country in the initial response phase, primarily in the areas of on-site coordination of incoming international relief; coordinated assessments and needs analysis; and information management. It is capable of deploying at very short notice (24-48 hours) anywhere in the world and is provided free of charge to the disaster-affected country. It also advises and strengthens national and regional disaster response capacity.

The system was established in 1993 and today consists of over 230 national emergency managers from more than 80 participating countries, together with staff from OCHA, international and regional organisations, including UN agencies, funds, and programmes. The UNDAC system comprises of several regional teams: Africa, the Americas (including the Caribbean), Asia, The Commonwealth of Independent States, Europe, Middle East, and the Pacific. In major international emergencies, UNDAC teams are drawn from the global membership, whereas in more localised disasters, they are normally drawn from the affected region.

The UNDAC system consists of four components:

i) Staff: professional and experienced emergency managers and humanitarians;
ii) Methodology: pre-defined methods for establishing coordination structures, and for organising and facilitating assessments and information management during the first phase of a sudden-onset disaster or emergency;
iii) Procedures: proven systems to mobilise and deploy an UNDAC team to arrive at the disaster in a timely manner; and
iv) Equipment: personal and mission equipment for UNDAC teams to be self-sufficient in the field when deployed for disasters/emergencies.

When required, an UNDAC team may support, establish or run On-Site Operations Coordination Centre (OSOCC) and a Reception Departure Centre (RDC) to act as a link between international responders and national authorities, to facilitate coordination of international response, and to provide a platform for cooperation, coordination and information management amongst international humanitarian agencies. An OSOCC is a rapid response tool that may serve as a bridge from emergency response to longer-term relief and may become the foundation of an OCHA field office.

The OSOCC structure, including an RDC at entry points for international emergency teams, will almost always be established in earthquake situations where international Urban Search and Rescue (USAR) teams are assisting in the rescue of survivors.

[14] https://www.unocha.org/our-work/coordination/un-disaster-assessment-and-coordination-undac

UNDAC produces a periodically and freely available handbook[15] which is intended as an easily accessible reference guide for members of an UNDAC team before and during a mission to a disaster or emergency.

The handbook is not an authoritative instruction manual but rather represents an accumulation of institutional memory related to processes and procedures for coordination as seen in the scope of the UNDAC terms of reference. It gives guidance on coordination functions and structures as well as helping "trouble shoot" coordination barriers that may be encountered. It provides an insight into coordination resources, partners, and important contextual information that may contribute to UNDAC effectiveness.

INSARAG

The International Search and Rescue Advisory Group (INSARAG) which predates UNDAC was established in 1991 under the general United Nations umbrella within the Office for the Coordination of Humanitarian Affairs (OCHA) in Geneva which functions as the INSARAG Secretariat was the first organisation to posit the concept of an OSSOC within its operational guidelines.

INSARAG's primary purpose is to facilitate coordination between the various international USAR teams who make themselves available for deployment to countries experiencing devastating events of structural collapse due primarily to earthquakes. It is now a global network consisting of over 90 Member states and organisation which have developed the INSARAG Guidelines,

These Guidelines provide a methodology to assist countries affected by a sudden-onset disaster causing large-scale structural collapse, as well as international USAR Teams responding in the affected country.

The Guidelines also outline the role of the UN in assisting affected countries in on-site coordination through the concept of an On-Site Operations Coordination Centre (OSOCC) intended to improve the coordination of international assistance in support of the Government of an affected country, specifically for coordination of international urban search and rescue (USAR) operations.

Once again, these Guidelines are a living document which represent an accumulation of international good practice with the latest version published in 2020.[16] The guidelines consist of three volumes which give information on:

i) The INSARAG methodology for international urban search and rescue (USAR) operations and the policy that underpins it;
ii) Practical guidance and procedures for USAR Teams and an explanation of the methodology, minimum standards and correct procedures for developing and maintaining an USAR Team; and
iii) An Operational Field Guide providing field and tactical information for responding USAR Team members in trainings and missions.

WHO

Following concerns about the effectiveness of the then existing guidelines for Emergency Medical Teams a working group was set up under the auspices of the World Health Organisation (WHO), the FMT Working Group was tasked with:

[15] https://www.unocha.org/sites/unocha/files/dms/Documents/UNDAC%20Handbook_interactive.pdf
[16] https://www.insarag.org/methodology/insarag-guidelines/

Developing a simple classification system and registration form to define type, capacities, services, and minimum deployment standards for EMTs that want to respond to the immediate aftermath of a sudden onset disaster.

In 2013 the group published the WHO global Emergency Medical Teams (EMT) Initiative[17] to assist organisations and WHO Member States by coordinating the deployment of verified medical teams in emergencies, whenever disaster strikes, or an outbreak occurs the more rapid the response the better the outcome. That is why the EMT Initiative places a strong focus on helping every country develop its own teams, which can arrive where they are needed in the shortest time.

The initiative also places a strong emphasis on the need for responding medical teams to be integrated into the existing coordination mechanism (RDC and OSSOC) for the first days or weeks, before the broader health sector emergency coordination is functioning, and/or the health clusters becomes operational.

UCPM

The UCPM is a framework for cooperation in disaster risk management among national civil protection authorities within the European Union. There is also a mechanism to allow for associate membership for non-European Union Member states, called Participating States, which includes at the moment Iceland, Norway, Montenegro, North Macedonia, Serbia and Turkey.

The EU's Civil Protection legislation was revised in December 2013 to bring together the various aspects needed for a comprehensive disaster management policy: disaster prevention, disaster preparedness and improved response arrangements (European Commission 2013)

Article 1(1) of Decision No 1313/2013/EU sets out the mechanism's general objective and subject matter. Article 3(1) of the Decision, states that the UCPM is intended to "support, complement and facilitate coordination of Member States" action in pursuit of the following common specific objectives:

To achieve a high level of protection against disasters by preventing or reducing their potential effects, by fostering a culture of prevention and by improving cooperation between the civil protection and other relevant services:

i) To enhance preparedness at Member State and Union level to respond to disasters;
ii) To facilitate rapid and efficient response in the event of disasters or imminent disaster; and
iii) To increase public awareness and preparedness for disasters.

To deliver the aims of the framework several tools have been developed to assist the UCPM.

i) The Emergency Response Coordination Centre (ERCC) - During emergencies, the ERCC serves as a communications hub, provides information and supports co-ordination, available on a 24/7 basis. The Centre uses a range of monitoring and communication tools to monitor events and operationalise their response capacities. These include the following.

    a. The Common Emergency and Information System (CECIS), a web-based alert and notification application that is tasked with ensuring communication and effective sharing of information between the MIC and national contact points.
    b. European Flood Alert System (EFAS) – monitors and forecasts floods across Europe, in

[17] http://www.who.int/hac/global_health_cluster/EMT_guidelines_september2013.pdf?ua=1

particular, in the large transnational river basins.

c. European Forest Fire Information System (EFFIS) – a modular web geographic information system that provides near real-time and historical information on forest fires and forest fires regimes in the European, Middle Eastern, and North African regions
d. Global Disaster Alerts and Coordination System (GDACS)- a cooperation framework between the UN and the EC. It provides real-time access to web-based disaster information systems and related coordination tools worldwide, with the aim to address information and coordination gaps in the first phase of major disasters.
e. European Mediterranean Seismological Centre (EMSC) a system for rapid determination of the European and Mediterranean earthquake epicentres.
f. The Copernicus Emergency Management Service is part of the Copernicus Programme, which is an EU Programme managed by the European Commission (EC) and implemented in partnership with the UCPM Member States, the European Space Agency (ESA), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the European Centre for medium-range Weather Forecasts (ECMWF), EU Agencies and Mercator Océan. The Programme is aimed at developing a set of European information services based on satellite Earth Observation and in situ (non-space) data.

ii) A training program including training courses, the organisation of joint exercises, and an exchange of experts among the UCPM member states.
iii) The European Emergency Response Capacity (EERC) (or 'voluntary pool') which has brought together a range of relief teams, experts and equipment grouped as modules from a number of UCPM member states and participating states.
iv) According to Decision No 1313/2013/EU[18], "module" means a self-sufficient and autonomous predefined task- and needs-driven arrangement of Member States' capabilities or a mobile operational team of the Member States, representing a combination of human and material means that can be described in terms of its capacity for intervention or by the task(s) it is able to undertake.
v) The EC has created a quality criteria, certification, and registration process to ensure that the capacities committed to the Pool meet "common high standards". 'Certification' includes the participation of the capacities in disaster simulation exercises in order for peers and teams to train together in emergency response scenarios. This also improves the ability of European response capacities to operate efficiently during deployments.

The Commission Implementing Decision 2014/762/EU, as amended by Commission Implementing Decisions 2018/142 and 2019/570 ("the Implementing Decision"), sets out the requirements for self-sufficiency, interoperability and training amongst others.

Whilst there is some granularity provided in terms of self-sufficiency, the Implementing decision is light on the specific requirements for training and in terms of what is required by 'inter-operability', however article 13 does require that in terms of inter-operability that:

> *'Modules and technical assistance and support teams, when deployed outside the Union, are able to operate with international disaster response capabilities supporting the affected country'*

[18] Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism

This would tend to infer that internationally recognised operating procedures should be adopted and as such UCPM modules should be training and operate in with the UNDAC methodology.

The EU also issues guidance for countries requesting assistance through the UCPM, The EU Host Nation Support Guidelines were adopted in January 2012 and build on existing international recommendations and practices. They specifically target the facilitation of assistance operations under the UCPM Third countries that are likely to request and receive assistance in case of need under this framework are also encouraged to take these non-binding guidelines into account and they provide a useful baseline for these countries to develop their own rules and protocols.

3 Scenarios for first responders and law enforcement agencies in Europe

In this chapter an overview of the Scenarios relevant for first responders is given. The chapter starts with the European overview based on the risk assessment of the member states of the European Union. This provides an overview which is disaster risk reduction and disaster risk management focused. The work of the first responder is not covered here. It is followed by an overview based on Evaluation Study of Definitions, Gaps and Costs of Response Capacities for the Union Civil Protection Mechanism of 2019 which focused on response capacities and is through this first responder focused.

The chapter ends with a paragraph giving a short risk overview per country.

3.1 European overview of scenarios

3.1.1 Overview of natural and man-made disaster risks the European Union

The EU civil protection legislation sets out obligations for both the European Commission and the EU Member States. Every three years, EU Member States must assess their disaster risks and their risk management capabilities, and they must share the summary of this assessment with the Commission. In the same spirit, the Commission has the obligation to regularly publish a "cross-sectoral overview of natural and man-made disaster risks the EU may face, taking a coherent approach across different policy areas that may address or affect disaster prevention and taking due account of the likely impacts of climate change" The last overview published by the EU in 2021 is the basis for this section. In this overview the EU focusses on 12 risks which are European wide and the most prominent risks relevant for civil protection within the European Union. Those 12 risks are each described in the coming sub paragraphs.

3.1.1.1 Extreme weather

Extreme weather is understood to include heatwaves, cold waves, droughts, heavy snowfall, storms, and cyclones. There are some differences in the types of extreme weather events most likely to affect different countries in Europe. Storms resulting from warm subtropical air meeting polar air in the Atlantic are a significant risk to western and central Europe (less frequently, these may progress to southern and south-eastern Europe). Drought and heatwaves are a particular risk for countries located in the Mediterranean, however national risk assessments underline a much broader geographic scope for drought risk (including across central Europe).

According to the European Environment Agency, extreme weather and climate related events caused 90,325 fatalities across its member states[19] between 1980 and 2017. During the same period, weather and climate-related extremes also caused economic losses of approximately EUR 453 billion (in 2017 Euro value), which accounted for 81% of total losses caused by natural hazards.[20] Climate change is a significant exacerbating factor in extreme weather events. Recent data shows that floods and other hydrological events have quadrupled in frequency since 1980, while climatological events (including extreme temperatures, droughts, and forest fires) have more than doubled in frequency over the same period. Global temperatures for June 2019 were 2 degrees Celsius above average across Europe, making it the hottest month in Europe since weather records began. It is expected that climate change will lead to increased frequency and intensity of extreme weather events going forward.

[19] The European Environment Agency consists at the moment of the 27 EU member states and Iceland, Liechtenstein Norway, Switzerland and Turkey

[20] European Environment Agency (2019), Economic losses from climate-related extremes in Europe.

EU policy related to addressing the risks and effects of extreme weather falls under the EU Strategy on adaptation to climate change.[21] A recent evaluation concluded that more action is needed to build the resilience of Europe and especially vulnerable regions.[22] The Water Framework Directive is also a significant piece of legislation in addressing the impacts of droughts.[23]

The length, intensity, and frequency of heatwaves in Europe is rising. A heatwave is generally defined as a period of excessively hot temperatures, lasting for several days. The severity of a heatwave depends on a number of factors, including its duration, its relative intensity (how much hotter than normal) and its absolute intensity (the absolute temperature and the period during which this happens). Extreme temperatures are often connected to droughts, as dry soil reduces evaporative cooling[24] and thus increases the scale of a heatwave. Heatwaves can also worsen droughts as they exacerbate soil moisture deficits and low flows in rivers. Extreme heat can also conversely be linked to the increased frequency and intensity of heavy precipitation events (including hailstorms); warmer air can hold a greater quantity of water.

People in the EU are particularly vulnerable to heatwaves as three quarters of the EU Member States population lives in urbanised areas. The 'urban heat island' effect, caused by the built environment absorbing more heat than its rural surroundings, exacerbates the impacts of heatwaves. Cities in central and north-western Europe are being increasingly affected[25], worsened by built environments that are not adapted to such temperature extremes.

Additionally, having a high proportion of elderly people, who tend to be more vulnerable to significant temperature changes (heat or cold), living in cities can make the impact greater in those cities. In addition to the elderly, those with chronic diseases and disadvantaged groups also have a heightened risk of heat-related mortality.

[21] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: An EU Strategy on adaptation to climate change; COM (2013) 216 final.

[22] Report From The Commission to the European Parliament and the Council on the implementation of the EU Strategy on adaptation to climate change; COM/2018/738 final.

[23] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

[24] Evaporative cooling is the conversion of liquid water into vapour using the thermal energy in the air, resulting in a lower air temperature.

[25] The European Environment Agency. Climate change impacts and vulnerability in Europe. An indicator-based report. EEA Report No. 1/2017. Available at https://www.eea.europa.eu/publications/climate-changeimpacts-and-vulnerability-2016

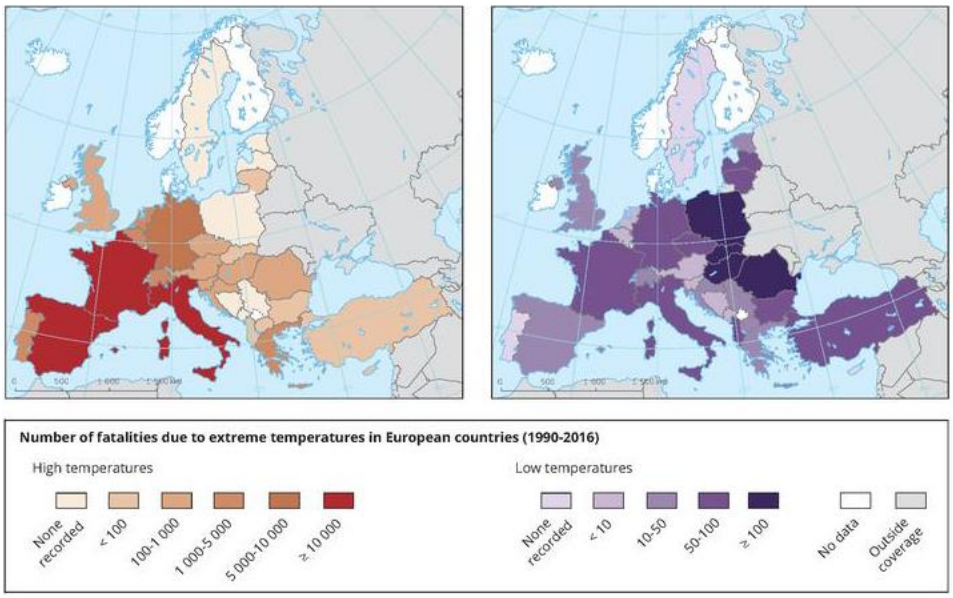


Figure 1 Number of fatalities due to extreme temperatures in Europe between 1990 and 2016

In terms of impacts on life and health, there is some debate over whether extreme highs are more dangerous than extreme lows. Figure 1 shows the number of fatalities due to extreme temperatures in European countries between 1990 and 2016. The number of fatalities in that period due to the heat was heavily affected by the heatwaves of 2003. The number of fatalities due to the cold includes both victims of 'cold waves' and 'extreme winter conditions.

Temperature extremes can disrupt critical infrastructure networks, particularly transport and energy supply. Extreme heat is detrimental to water availability and consequently the energy sector, which depends on a secure water supply for cooling and energy production. The repeated heatwaves of 2019 across Europe, with record-breaking temperatures, led to several nuclear power plants in various parts of Europe temporarily closing and affected hydropower output and stocks in France, Spain, the Balkans, and Scandinavia. Existing transport networks (roads, railways, and bridges) are also vulnerable to heatwaves, particularly in southern and eastern Europe, as they are not designed to withstand extreme heat, while still being faced with cold conditions in the winter in some places. Transport infrastructure in northern Europe is in turn affected by cold spells and snow[26].

3.1.1.2 Flooding

Flooding is perhaps the primary risk faced by EU Member States in terms of both frequency and severity. In national risk assessments provided to DG ECHO by EU Member States, nearly all rank flooding as a major risk. The most common source of historical flood events is river flooding (66%), followed by extreme rain (20%) and coastal flooding (16%).[27]

The economic impact of flooding in the EU is significant, with the EU Solidarity Fund having mobilised over EUR 1.9 million in response to flood events since 2002[28]. The disruption caused by flooding is expected to be further exacerbated by climate change, with the socio-economic impact of fluvial (river)

[26] The European Environment Agency. Unequal exposure and unequal impacts: social vulnerability to air pollution, noise and extreme temperatures in Europe. Report No 22/2018. Available at https://www.eea.europa.eu/publications/unequal-exposure-and-unequal-impacts

[27] National Risk Assessments, as reviewed by CSES/RAN

[28] European Commission (2017), Evaluation of the European Union Solidarity Fund 2002-2017

floods in Europe projected to increase by an average of 220% by the end of the century[29]. Climate change is also expected to increase the probability and impact of pluvial (rain) floods, particularly flash floods, whilst rising sea levels will increase the risk of coastal floods. In addition to man-made climate change, other interventions such as the location of assets within floodplains, a reduction in water-retaining surfaces and interventions to watercourses or their surroundings all contribute to an increase in the likelihood and adverse impact of flood events.

At policy level, flooding is addressed by Directive 2007/60/EC on the assessment and management of flood risks ('the Flood Directive'). This requires EU Member States to identify river basins and coastal areas at significant risk of flooding and to prepare flood hazard maps, flood risk maps and flood risk management plans for these areas to reduce the occurrence and impact of flooding.

In November 2017, catastrophic floods in western Attica, Greece, killed more than 20 people, and caused injuries and damage to homes and infrastructure[30].

In September 2017, heavy rainfall of almost 280 mm in 24 hours fell in Zadar, Croatia, causing damaging floods in the city. This was more than twice the amount of rain that usually falls in Zadar over the entire month of September. October and November 2019 were the worst months in terms of number of notifications issued since the beginning of the European Flood Awareness System (EFAS) in 2012. In total there were 54 formal, 39 informal and 587 flash flood notifications issued during the period. Most of them were in November and in southern Europe, which was hit by a series of storms and floods during this period, with Italy, southern Spain, and southern France in particular badly affected.

Flooding remains the most common risk within the national risk assessments, with all EU Member States mentioning it. It is notable that the magnitude of impact and likelihood (on the 5-point scale when available) of floods is similarly assessed among EU Member States, suggesting that the risk of flooding is perceived similarly across Europe. There has been little to no change in assessed risk levels compared to the 2015 national risk assessments.

3.1.1.3 Drought

Drought has been a recurrent feature of Europe's climate, not only limited to southern Europe or some EU outermost regions. Droughts have severe consequences for people and for most economic sectors, including agriculture, forestry, energy production, industry, river transport (waterways) and public water supply.

Compared to other natural disasters that unfold over a matter of hours, drought is a natural phenomenon characterised by a slow onset and can often last a long time. It can have a variety of possible impacts that can last for months or years after the event ends[31]. Droughts can be meteorological, agricultural, hydrological, or socioeconomic, occurring on different time scales and with different impacts. Meteorological droughts can begin and end relatively quickly and occur when dry weather dominates an area, leading to low soil moisture. They may be exacerbated by high temperatures (heatwaves). Hydrological droughts are more severe and long lasting and usually occur after many months of meteorological drought, taking place in areas with low groundwater levels and affecting watercourses, water resources, and natural ecosystems. Water scarcity can be affected by the rate of abstraction for agriculture and different socioeconomic needs.

[29] Joint Research Centre (2018), Technical Report Task 7 – River Floods, available at: http://publications.jrc.ec.europa.eu/repository/bitstream/JRC110308/task_7_floods_final_report_dec2018.pdf

[30] R.Davies. Case study: Floods in the Attica Region, Greece, November 2017. 22 November 2017 – available at https://www.efas.eu/en/news/case-study-floods-attica-region-greece-november-2017

[31] Spinoni J., Naumann G., Vogt J.V. (2017): Pan-European seasonal trends and recent changes of drought frequency and severity. Global and Planetary Change: 148, 113-130.

The severity and frequency of droughts have increased in Europe: in summer and autumn in southern and eastern Europe and in winter and spring in northern Europe.

Drought affected most of central Italy in 2017, causing major agricultural losses, water restrictions in urban areas and increased forest fires. It was exacerbated by the heatwave in June and July 2017.

Severe and prolonged summer drought was seen in central and northern Europe in 2018. An intense dry spell beginning in May 2018, combined with heatwaves, led to:

i) reduced agricultural production;
ii) restricted supply of public water;
iii) low transportation capacities on major rivers;
iv) impacts on water quality and fish populations; and
v) unprecedented wildfires in Scandinavia[32].

While the spring and summer of 2018 saw drought conditions in central and northern Europe, southern Europe experienced unusually wet conditions. This 'water seesaw' helped offset the negative impacts of the drought on agricultural yields, However, such water seesaw conditions have been rare, and are becoming rarer[33].

Several regions spanning from north-east to western Europe experienced drought in August 2019. This drought resulted from a combination of drivers, with different weight depending on location:

i) the long-tail influence of the 2018 drought;
ii) the heatwaves of June/July 2019; and
iii) below-average precipitation in spring 2019.

3.1.1.4 Wildfires

Forest fires are a recurrent phenomenon in the EU. Latest figures from the EU's Joint Research Centre show that forest fires and other wildfires in the EU in 2017 burned more than 1.2million hectares of natural lands (of which 25% was located within the Natura 2000 network), killed 127 people (including firefighters and civilians) and caused losses of €10bn. According to this source, the countries with the highest risk from forest fires are located in Southern Europe (Portugal, Spain, France, Italy and Greece account for 85% of the total burnt area in Europe).

As climate change is predicted to exacerbate both the frequency and severity of forest fires, a key issue of concern at EU level is the likelihood of forest fires occurring in multiple countries simultaneously. Indeed, the trend towards dryer and hotter seasons linked to man-made climate change means forest fires are an increasing risk in Northern Europe. Forest fire is identified as a risk in 24 of the national risk assessments provided to DG ECHO by EU Member States. This risks overstretching the European response capacity in this area.

The EU Forest Strategy represents the European framework on forest management. One of the priorities of this strategy is the protection of forests from different threats. Prevention of fire is also identified as a priority area where EU Member States need to make progress. Significant financial resources have also been allocated for the prevention of forest fires and the restoration of affected areas. Investments by the European Agricultural Fund for Rural Development (EAFRD) during 2014-2020 include EUR 1.7 billion for prevention of damage to forests and EUR 780 million for restoration

[32] Drought in Central-Northern Europe: July 2018. European Drought Observatory (EDO) analytical report – available at https://edo.jrc.ec.europa.eu/documents/news/EDODroughtNews201807_Central_North_Europe.pdf
[33] Toreti et al. The exceptional 2018 European water seesaw calls for action on adaptation. Earth's Future, 7 (6): 652–663.

of damages from forest fires and natural disasters. Funds are also available in 2014-2020 from the European Regional Development Fund (ERDF) and the Cohesion Fund.

In 2017, Portugal experienced an extremely devastating fire season. A total of 112 people lost their lives. Almost 6% of the country's surface was burnt, exceeding the yearly average by five times.

The 2018 Attica Forest fires in Greece killed 102 people and burnt 1,276 ha. These have been the second deadliest wildfires of the 21st century so far, after the 2009 Black Saturday bushfires in Australia that killed 180 people.

In 2018, Sweden fought unprecedented fires that burnt an area 10 times larger than the yearly average. Other parts of Scandinavia, the UK, Ireland, Latvia and Germany also witnessed higher than usual fire activity.

In 2019, both the number of fires and the area burnt within Europe exceeded the averages of the past decade.

National risk assessments reflect the fact that wildfires are a widespread problem throughout Europe. 25 countries from different regions of the continent include wildfires among their national disaster risks. The terminology used slightly differs, depending on national definitions and local characteristics of the fire landscape: the reports refer to the risk of 'forest fires', 'wildfires', 'vegetation fires', 'rural fires', 'landscape fires', 'forest and peat fires', etc.

3.1.1.5 Geophysical Risk

Earthquakes are sudden movements of the earth caused by an abrupt release of energy that has accumulated over time due to the friction caused by the movement of tectonic plates. This means that earthquakes tend to be concentrated in areas that lie on or close to tectonic plate boundaries. Earthquakes are a particular concern in south-eastern Europe, due to the location of a major fault line where the Eurasian and African tectonic plates meet. In 2017, 19 EU Member States cited earthquakes as a risk in the national risk assessments delivered to DG ECHO.

Research has shown that there was no statistically significant increase in the frequency of large magnitude earthquakes from 1900 to 2011.[34] However, increasing urbanisation and a concurrent increase in population density – particularly in cities located close to fault lines – may have increased the impact of such events in terms of fatalities and structural damage. This problem is further exacerbated by poor quality housing and infrastructure, with 75% of earthquake-related deaths attributed to collapsing buildings. As well as the direct destruction wrought on local infrastructure, earthquakes can trigger significant secondary disasters, such as fires, landslides, tsunamis and floods. Since 2002, the EU Solidarity Fund has mobilised over Euro 1.2 billion in financial assistance related to earthquakes affecting EU countries.[35]

In 2016, four regions of central Italy - Lazio, Abruzzo, Umbria, and Marche – were struck by the Amatrice-Norcia seismic sequence. The impact of these earthquakes highlighted the different levels of resilience of masonry constructions depending on the preventive actions carried out after previous earthquakes. Although damaged, the masonry buildings in the historical centre of Norcia (Umbria region) fared significantly better than those in other regions. The interventions to strengthen buildings carried out after the earthquakes of 1971, 1979 and 1997 greatly helped masonry aggregates in the

[34] Shearer, P., and Stark, P., (2012), Global risk of big earthquakes has not recently increased, Proceedings of the National Academy of Sciences. January 17, 2012, 109 (3) 647-648.

[35] European Commission (2017), Evaluation of the European Union Solidarity Fund 2002-2017

historical centre to cope with seismic activity, as it sustained limited damage and a low number of collapsed structures.

3.1.1.6 Epidemics/pandemics

In general, the risk of an international medical emergency can be expected to be intertwined with other scenarios, such as earthquakes or forest fires, which can cause many casualties and overwhelm local healthcare provision. A further issue which may trigger the need for a coordinated EU-level medical response is the possibility of a mass casualty incident such as a terrorist attack – this could relate to trauma (such as gunshot wounds) or the potential deployment of chemical or biological weapons.

The most significant stand-alone medical risk relates to epidemics or pandemics. 23 EU Member States cite epidemic or pandemic as a moderate to severe risk in their national risk assessments. Recently the World Health Organisation (WHO) declared the current Ebola epidemic in Democratic Republic of the Congo as a public health emergency of international concern. The most likely projected pandemic scenario relates to a model strain of influenza A, to which there is limited or no immunity in the human population. Although pandemics reoccur on average every 30-40 years, it is very difficult to predict with any certainty the likelihood or severity of such an outbreak. Recent outbreaks, including the West Africa Ebola outbreak in 2014 and the H1N1 pandemic in Canada in 2009, have highlighted weaknesses about Europe's ability to produce and distribute vaccines. Growing antimicrobial resistance and the re-emergence of historic infectious diseases, such as smallpox, are also causes for concern. World Bank models suggest that a "Spanish flu-like" outbreak today would kill more than 33 million people in 250 days, costing more than EUR 3.4 trillion, or 4.8% of global GDP.[36]

In any of the circumstances described above, a wide variety of medical responses may be required alone or in combination. These include evacuation, diagnosis, decontamination, trauma response and strategic stockpiling of commonly required medicines, antidotes, and antibiotics. Within the EU, the Member States are responsible for public health, whilst an EU agency, the European Centre for Disease Prevention and Control (ECDC)[37], is an EU agency aimed at strengthening Europe's defense against infectious diseases. The core functions cover a wide spectrum of activities: surveillance, epidemic intelligence, response, scientific advice, microbiology, preparedness, public health training, international relations, health communication, and the scientific journal Eurosurveillance.[38]

At the end of December 2019, a novel coronavirus (SARS-CoV-2), not previously known to infect humans, was identified in Wuhan, China. It is believed to have been originally transmitted to people from an animal, but the source had not been established at the time of writing.[39] The virus can be transmitted from person to person via droplets and fomites, i.e., objects or materials likely to carry infection, such as clothes, utensils, and furniture. As there is no pre-existing immunity in the population against the new coronavirus, potentially everyone is susceptible to infection. For most infected people, the disease is mild, but in more severe cases, it can lead to pneumonia and death393. The likelihood of hospitalisation, severe illness and death is significantly higher in people over 65 and those with pre-existing health conditions.

By 11 March 2020, when the World Health Organisation (WHO) declared a global pandemic, the virus has spread to 114 countries, infected more than 118,000 people and caused 4,281 deaths[40]. By that

[36] World Bank (2017), Pandemic Emergency Financing Facility (PEF): Proposed Financing From IDA.
[37] https://www.ecdc.europa.eu/en/about-ecdc
[38] https://www.eurosurveillance.org
[39] Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19)
[40] WHO Director-General's opening remarks at the media briefing on COVID-19 – 11 March 2020 – available at https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-oncovid-19---11-march-2020

time, Europe had become the new epicentre of the disease. The number of cases and deaths was growing exponentially in all EU Member States. Confronted with the rapid spread of the infection and the threat of exceeding the capacity of healthcare systems, EU Member States introduced social distancing measures as well as travel and trade restrictions.

In some EU Member States, the public health emergency coincided with other disaster events and concurrent pressures. In Croatia, the strongest earthquake in 140 years hit in the midst of the pandemic, triggering the evacuation of hospitals. In the Mediterranean, increased migration flows at the time of the pandemic posed further challenges for containing the spread of the virus. In some countries, the ongoing influenza season[41]and dengue epidemic in several EU outermost regions put an extra strain on hospitals and intensive care units.

Even in advanced healthcare systems and with special measures taken, the pandemic created immense stress. The capacity of intensive care units was exceeded in some of the hardest-hit places. Countries struggled with widespread disruptions in supply of critical resources such as ventilators, testing materials and personal protective equipment. Ensuring occupational safety for medical staff has been a challenge, as COVID-19 cases have been identified among healthcare workers[42]. Faced with the shortages of personal protective equipment and medicines, some EU Member States have taken national measures restricting their export, thus preventing essential goods from reaching other affected areas across Europe.

3.1.1.7 Animal and plant diseases

Animals and food production can be exposed to a variety of serious infectious diseases. Some animal diseases are confined to a single species, while others can spread from one species to another. A distinction is made between epizootic diseases which cannot be transmitted to humans (e.g., foot-and-mouth disease) and zoonotic diseases which can be transmitted naturally from animals to humans (e.g., avian influenza).

Since some animal-borne diseases can be transmitted to humans and because of food safety concerns, animal diseases are considered to be a major threat to public health. Besides human and animal health implications, disease outbreaks can have many other negative effects, such as:

i) costs to livestock farmers and related industries;
ii) business disruption;
iii) loss of markets;
iv) potential changes in consumption patterns; and
v) high public sector costs related to disease eradication and monitoring action.

Highly transmissible animal diseases easily spread across borders and can lead to an international emergency. Countries with an industrialised agricultural sector are highly vulnerable to the spread of diseases. Many animal diseases affect wildlife and may have a negative impact on the environment (e.g., biodiversity loss). Infected wildlife, in turn, can play a role in the recurrence of outbreaks and in transmitting pathogens to both domestic animals and human beings.

In 2016-2017, European poultry farms were hit by an epidemic of a highly pathogenic avian influenza. The epidemic was the largest ever recorded in the EU in terms of number of poultry outbreaks,

[41] The European Centre for Disease Prevention and Control. Coronavirus disease 2019 (COVID-19) pandemic: increased transmission in the EU/EEA and the UK – seventh update. Rapid Risk Assessment –https://www.ecdc.europa.eu/sites/default/files/documents/RRA-seventh-update-Outbreak-of-coronavirusdisease-COVID-19.pdf

[42] The European Centre for Disease Prevention and Control. Coronavirus disease 2019 (COVID-19) pandemic: increased transmission in the EU/EEA and the UK – sixth update. Rapid Risk Assessment –https://www.ecdc.europa.eu/sites/default/files/documents/RRA-sixth-update-Outbreak-of-novel-coronavirusdisease-2019-COVID-19.pdf

geographical extent, and number of dead wild birds[43]. Between October 2016 and November 2017, there were several thousand outbreaks in 25 EU Member States, affecting millions of birds.

Avian influenza virus is primarily a bird disease, but elsewhere in the world there have been cases of affected humans who came into close contact with infected birds. Therefore, the disease is a threat not only to poultry production, but also to public health. While in the 2016-2017 epidemic, no transmission to humans occurred, the general concern is that avian influenza viruses have the potential to mutate into a strain which could be transmitted to humans, and subsequently between humans. This in turn could lead to a human influenza pandemic.

3.1.1.8 Nuclear and radiological accidents

A nuclear event is a specific type of radiological event. It can be defined as uncontrolled nuclear fission, for example due to a breakdown in the control mechanisms in a nuclear reactor. This can lead to a release of radioactive elements and the contamination of the surrounding area. The European Union currently houses 130 nuclear reactors, grouped on 55 sites in 14 EU Member States.[44] In addition, the Russian Federation has a number of nuclear installations operating close to the boundaries of the EU. Risks associated with nuclear power plants include explosions or leaks at the sites themselves, as well as leaks not originating from the plants such as the transportation of radiological material, issues with installations handling reactor fuel, nuclear-powered engines, storage materials and industrial use of radioactive material. Nuclear accidents are named as a risk in 25 of the national risk assessments provided to DG ECHO by EU Member States. Nuclear accidents can be considered as high impact/low probability (HILP) events. Given the number of nuclear reactors in Europe, an incident in one of the reactors would be a credible, albeit low probability, event.

Although the likelihood of a major nuclear incident occurring is low, the predicted human, environmental and economic impacts would be severe. This may include land/water contamination, health implications for human and animal populations related to exposure to radiation, and economic losses related to impacts on agriculture, tourism, and industry. There is also a risk of nuclear events related to terrorism. While nuclear power plants tend to be heavily protected, the consequences of radiological material falling into the hands of hostile actors and being released in public areas or turned into a 'dirty bomb' could have far-reaching negative impacts which could require international assistance.

The 1957 Euratom Treaty covers the use of nuclear fission in energy development within the European Union. Following the Fukushima accident in Japan, a risk and safety assessment (a so-called "stress-test") of all nuclear power plants in the EU was carried out by the European Commission. Findings from this review were positive overall, but further upgrades were recommended to ensure consistent standards across all EU Member States. In 2014, Directive 2014/87/Euratom updated European safety rules for nuclear installations with the requirement that EU Member States install an emergency management system for nuclear incidents to ensure cooperation between relevant services.

The risk of nuclear and radiological accidents receives considerable attention in national disaster risk assessments. 25 EU member states covered this risk in their latest reports. Two of them included the risk for the first time in their reporting under the EU civil protection legislation.

All countries with nuclear reactors on their territories assess the risk of a nuclear accident.

[43] European Food Safety Authority. Avian influenza. Available at https://www.efsa.europa.eu/en/topics/topic/avian-influenza
[44] http://www.euronuclear.org/info/encyclopedia/n/nuclear-power-plant-europe.htm

Furthermore, a number of countries with no domestic nuclear installations also assess the risk, taking into account potential incidents abroad: across the border and/or on the continent.

Besides accidents in nuclear power plants, other scenarios analysed include:

i) emergencies involving research reactors;
ii) nuclear fuel cycle facilities;
iii) nuclear-powered vessels in national waters; and
iv) multiple incidents with radiological substances.

3.1.1.9 Disruption of critical infrastructure

Critical infrastructure refers to physical and information technology facilities, networks, services, and assets that, if disrupted or destroyed, would have a serious impact on the health, safety, security or economic well-being of citizens or the effective functioning of governments in EU Member States. Critical infrastructure extends across many sectors of the economy, including banking and finance, transport and distribution, energy, utilities, health, food supply and communications, as well as key government services.[45] The ability of such services to withstand and recover from shocks is essential for the provision of many societal functions and for ensuring an effective and efficient response to emergencies. Many critical infrastructure services are interconnected, meaning that disruption to one service can have knock-on effects on others. For example, a disruption to electricity provision can disrupt telecommunication networks or medical facilities, which cannot function without a power supply. The risk of critical infrastructure disruption is named in 24 of the country risk assessments provided to DG ECHO by EU Member States. As well as risks due to accidents or natural phenomena (such as falling trees), critical infrastructure networks are also vulnerable to targeted attacks by hostile actors.

Electricity provision is a good example to help understand the impact of critical infrastructure disruption, as it is required for a number of other services to function. In general, the European electricity network is very safe and reliable, with the average EU customer experiencing only 136 minutes without power per year.[46] Most power outages are limited to local impacts, however major power outages (caused by a failure in the main power grid or problems in power plants) have the potential to cause large-scale, cross-border blackouts leaving millions of people without power. In these situations, usual standby options (such as rerouting power supplies or using generators as standby capacity) are not sufficient and can lead to other services coming to a standstill. Consequences range from people being trapped in lifts, to transport problems due to traffic lights not functioning or civil unrest due to city-wide power cuts. With rising temperatures related to climate change, a disruption to the power grid during a heatwave could have critical effects in terms of increasing the number of casualties. Especially vulnerable people will have a higher death rate as soon as air conditioning will not work during heat waves.[47]

European policy regarding critical infrastructure is governed by the Directive to enhance the protection of European Critical Infrastructure (2008/114). Currently, this applies only to the energy and transport sectors. The Directive requires EU Member States to adopt legislation aimed at protecting critical infrastructure and to work to identify potential European critical infrastructures. The Directive is also one pillar of the European Programme for Critical Infrastructure Protection (EPCIP). In 2013, the

[45] Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection.
[46] DG ENER (2018), Study on the quality of electricity market data of transmission system operators, electricity supply disruptions, and their impact on the European electricity markets, p.82.
[47] Keatinge W. R. (2003). Death in heat waves. BMJ (Clinical research ed.), 327(7414), 512–513.

European Commission published a working document (SWD (2013/318) with a new approach for critical infrastructure giving more attention to their interdependencies.

An evaluation of the Directive 2008/114 was published in 2019, The evaluation confirms the continued relevance of Directive. However, the document states that it would be only partially relevant today in view of technological developments and evolving threats (drones, cyber, insider threats) since 2008. Also, its added value would be limited by the considerably heterogeneous interpretation of the Directive in the different Member States. As a result, the European Commission cannot exclude that actual levels of Critical Infrastructure Protection (CIP) vary across Member States and proposes, among others, the following improvements:

i) widening the scope of the Directive to other Critical Infrastructure as well as their interdependencies on system-, not sector-level;
ii) provision of more detailed and new definitions/terms;
iii) more precise definition and description of Operator Security Plans and the roles and responsibilities of Security Liaison Officers; and
iv) more detailed reporting and provided risk assessments from the Member States to the European Commission.

Disruption of critical infrastructure[48] is a complex theme, with different approaches used across the national risk assessments to address the issue. As a rule, it is considered among the impacts stemming from other risks: for example, power outage due to an earthquake or cyberattack. In this case, the implications and cascading effects of the disruption itself are usually not examined in detail. In contrast, several national reports focus on critical infrastructure disruption as a theme in its own right, focusing on the impacts and knock-on effects a failure might trigger, irrespective of the event causing it. In the latest cycle, one country even took the protection of vital societal functions as a point of departure and organised the entire risk assessment around them, rather than around individual hazards or threats. Lastly, many national submissions assess events that are not specifically labelled as critical infrastructure disruptions, but which could be discussed under this heading. For example, national reports assess the risk of transport accidents, disruptions in the supply of energy, water, food and pharmaceuticals, ICT and satellite services or financial services. Among those, incidents in the transport and energy sectors receive the most attention.

3.1.1.10 Industrial accidents

While small-scale industrial incidents are not uncommon in Europe, major industrial incidents are rare. However, the possibility of such an incident is listed in 26 of the national risk assessments provided to DG ECHO by EU Member States. There is, besides this, a significant risk of toxic materials being released with malicious intent by terrorists or state actors. One example of such an event was the Novichok attack, which took place in Salisbury (UK) in 2018, resulting in six contaminated individuals (one fatality) and a year-long decontamination process. In 1995, a Sarin attack on the subway in Tokyo (Japan) resulted in 12 deaths, 50 injuries and temporary loss of vision for almost 1,000 others. Severe industrial incidents tend to have higher death tolls and wider impacts than chemical attacks. The Seveso Disaster in 1976, for example, caused long-term health implications for numerous victims and had significant impacts on local wildlife.

The main impacts of chemical incidents caused by an industrial accident could be broadly similar to those caused by malicious release of toxic material. They can include fatalities and injuries, damage to

[48] Council Directive 2008/114/EC defines critical infrastructure as 'an asset, system or part thereof located in Member States which is essential for the maintenance of vital societal functions, health, safety, security, economic or social well-being of people, and the disruption or destruction of which would have a significant impact in a Member State as a result of the failure to maintain those functions.'

property, disruption of local services, long-term environmental contamination, and substantial economic losses. Climate change also has indirect effects on the likelihood and severity of industrial accidents, as increased flood, fire and extreme weather risks can weaken or damage key infrastructure, causing an increased likelihood of explosions, industrial fires and the release of dangerous substances.

Major accident hazards related to dangerous substances are governed at EU level through the Seveso III Directive[49]. This covers prevention, preparedness and response to industrial accidents involving hazardous substances. EU Member States are obliged to ensure that operators have a policy in place to prevent major accidents. Operators handling dangerous substances are obliged to notify the relevant national competent authorities of their activities, submit safety reports, establish a safety management system and set up an internal emergency plan. National competent authorities are also required to draw up emergency plans for the surrounding areas and carry out regular inspections

Historical accidents like Seveso (Italy, 1976), Bhopal (India, 1984), Schweizerhalle (Switzerland, 1986), Enschede (the Netherlands, 2000), Toulouse (France, 2001), Buncefield (UK, 2005) and Gorni Lom (Bulgaria, 2014) showed that such accidents can have serious consequences. The impacts of industrial accidents, irrespective of their cause, may include:

i) fatalities and injuries of workers on-site and the surrounding population;
ii) damage to property and infrastructure on-site and in the surrounding area;
iii) disruption of essential services and transport networks;
iv) environmental contamination and potential cross-border pollution;
v) health hazards (e.g., caused by the release of acute toxic substances);
vi) physical hazards (e.g., highly flammable substances, hazards caused by the release of explosives);
vii) substantial economic losses that may lead to bankruptcy or job losses; and
viii) transboundary environmental and health impacts.

3.1.1.11 Terrorism

National disaster risk assessments differ depending on whether their scope covers or excludes man-made malign threats. As regards terrorism, 19 national submissions analyse this threat. In most cases, the detailed assessment of scenarios is considered to be confidential information. In general terms, the reports analyse a range of recently seen and potential threats: attacks targeting groups of people (crowded places or selected social groups), critical infrastructure or high-risk installations. The threat is linked both to international terrorism and domestic extremism. Potential perpetrators can be either state or non-state groups, 'lone wolves', small groups or structured networks of terrorist organisations. Weapons and technologies that could be employed vary. The reviews of recent terrorist attacks note that the majority of them relied on low-cost methods, such as the use of vehicles and bladed weapons. Other conventional weapons – explosives and firearms – can and have been used. The use of unmanned aerial vehicles cannot be excluded as they are easy to use and are of low cost. Several national submissions also consider threats related to CBRN substances, but overall, these do not feature prominently. Some of the scenarios mentioned include the 2018 Novichok nerve agent attack in Salisbury in the UK or the potential explosion of a 'dirty bomb' that combines conventional explosives with radioactive material.

[49] Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances,

3.1.1.12 Cyber threats

National risk assessments focus on different forms of cyber threats and/or use different terminology. Below is a non-exhaustive list of examples of threats covered in the national risk assessments.

i) Cyberattacks – attempts to attack computers with malicious intent. Cyberattacks can take many forms. Examples mentioned include denial-of-service attacks, data burglary, disinformation, information network intelligence operations and other interferences with information networks targeting state and society;
ii) Cyberespionage – a supplementary tool to classical types of covert intelligence gathering that may target public authorities or private entities, high-tech and research-intensive industries. The risk is deemed very high, with attacks occurring increasingly;
iii) Cybercrime – using information technologies to commit criminal acts against public authorities, businesses or individuals, often for economic gain. These types of activities occur daily. Examples include blackmailing through ransomware attacks and 'crime-as-a service', whereby expertise on how to carry out cyberattacks is sold for criminal purposes, both which are increasing. The financial sector is an attractive target for cyber-criminals;
iv) Cyberterrorism – using information technologies to attract attention to the terrorist cause, inciting acts aimed at physical destruction or killing;
v) Hacktivism – hacking the infrastructure of public institutions based on ideological beliefs;
vi) Disinformation - information warfare and propaganda; also seen as part of hybrid threats. This aims to systematically stir the public debate, fade out the boundaries between truth and lies, and weaken society's trust in public authorities or democratic values. This can be carried out by state or non-state groups or individuals;
vii) Digital sabotage or disruption of the internet - attacks on central functioning of the internet. This can potentially have far-reaching consequences for internet capacity and paralyze critical infrastructure, domestically and abroad. This can be carried out by remotely operated computers and is considered a relatively new threat reflecting the increased competence of the attacker; and
viii) Digital warfare and cyber conflicts are considered under geopolitical threats in some assessments.

3.1.2 Evaluation Study of Definitions, Gaps and Costs of Response Capacities for the Union Civil Protection Mechanism

In 2019 the evaluation study was published of definitions, gap and costs of response capacities for the union Civil protection Mechanism.

Based on nine selected scenarios an analysis is made of the available and needed European civil protection response capacities to these scenarios.

The selection of scenarios is based on the European overview of risks (version 2017) and earlier capacity analysis report. The scenarios are selected as they represent the most common response scenarios within the civil protection Mechanism. Covering all the scenarios to which response deployments have taken place since the start of the European Union civil protection mechanism in 2004.

The study delivered planning assumptions based on an expert analysis of the potential magnitude of disasters within Europe. The nine planning assumptions are given in the next sub chapters.

As the planning assumptions are civil protection response oriented, this leads to a list differing from the 12 risks from the European overview of risk. The expert team assessed that with the nine risks the need for civil protection response capacities for all risks can be covered.

3.1.2.1 Flooding

An area of low pressure is formed and causes heavy rainfall in a major river basin in Europe. Due to atmospheric blocking, the amount of rainfall is extreme in this river basin, resulting in flooding in an area of approximately 200 by 600 kilometres along a major river and its tributaries. The flooding area is spread over five European countries. Two of those countries are severely affected, while the other three countries are less affected.

The flooding starts in the upper part of the catchments leading to landslides and flash flooding. In one or two days, the water moves downstream leading to large scale flooding in the valleys along the rivers. The water level in the river recedes after approximately two weeks.

In the affected area, several bridges collapse due to the force of the water and large areas of farmland are flooded as well as several cities and villages. The water levels in most flooded areas are between 10 cm and two metres, flooding only the ground floor of houses. In some lower areas, the water level can be up to five metres.

3.1.2.2 Extreme weather = heatwave

The planning assumption is based on a heatwave, as these are on top of the list in terms of deadliest disasters in Europe since 2000 and the other most important extreme weather events are covered in other planning assumptions.

i) In a critical infrastructure event, the effects of black ice and storms are taken into account.
ii) In a flooding event, the effects of heavy rainfall are taken into account.
iii) A heatwave can also lead to large scale forest fire, this is taken into account in a separate scenario.

A heatwave with extreme temperatures takes place in Europe affecting 10 countries in the south of Europe. In these countries, temperatures reach close to record levels previously registered. The heatwave lasts three weeks before temperatures start to drop. The countries in the planning assumption are based on earlier heatwaves (for example, the heatwave in 2003). Due to the length of the heatwave and the fact that high temperatures persist at night, the impact is considered to be severe.

3.1.2.3 Forest fire

A long heatwave hits several European countries at the same time. Already there have been multiple outbreaks of forest fires. Every country in the zone of the heatwave is facing outbreaks and all capacities are in a state of alert or already deployed.

One of the fires (or several close to each other) starts to become overwhelming for the local and national capacities because of a blazing storm of dry air. The wind speed combined with forests that are not historically prone to fire but are now because of the arid weather conditions (high fuel) cause a severe forest fire that spreads quickly to more urbanised areas.

The direction of movement and speed of the fire challenges the predictions, and several villages are cut off, before evacuation can be effectuated. The disturbed spontaneous evacuation leads to fatalities and victims with severe burns.

The planning assumption specifies the number of casualties, which is about twice the worst event in modern times in the Western world.

3.1.2.4 Earthquake

The Earthquake planning assumptions outlined have been defined using the following approach:

i) Historical comparison with past European earthquakes, to understand what has previously happened, and how this could inform what may happen in the future.
ii) A high-level Seismic Risk Assessment of European cities, considering hazard, vulnerability and exposure. This is to define the likely frequency and severity of casualties and damage due to future earthquakes, informed by historical events but also considering possible scenarios outside of recent historical experience.

As a basis for the planning assumption, an earthquake in one of the smaller EU Member States is used. This is because the large earthquake-prone countries have the capability to build more capacities and reduce in that way the likelihood that the UCPM is activated. By the same line of reasoning, an urbanised area is chosen. Urbanised areas are more vulnerable on a large scale and the impact is more likely to overwhelm the country's own capacities

3.1.2.5 International medical emergency = pandemic

The International medical emergency event concerns the otherwise unaddressed effects of a pandemic or epidemic. Pandemic escalation is a major disaster risk of concern to most national authorities across the EU.

As influenza is the most commonly assessed form of pandemic risk within the EU, the figures of the SARS outbreak with lethal percentages etc. have been used as the basis for the medical planning assumption.

3.1.2.6 Chemical incident = industry related

This plan assumes a release of a cocktail of up to 40,000 different toxic chemicals involved in fire due to an industrial accident (although a chemical attack could produce similar effects and thus require the same kind of response). The scenario is made worse by unfavourable weather conditions assisting plume travel across large populations and multiple countries. A contaminated gas cloud disperses to the surrounding area affecting people, livestock, farmland and water bodies. The gas cloud will lead to effects in one other country, while pollution of the water will lead to the pollution of water in another neighbouring country. The assumption considers the direct medical effect on people as well as indirect effects such as pollution of drinking water supplies.

The need for local evacuation of those closest to the incident is assumed along with short and medium-term decontamination of people and infrastructure.

3.1.2.7 Radiological event

A chain of events in a nuclear power plant causes a discharge of radioactive material. The starting event leads to a failure of the cooling of the fuel rods. The fuel rods overheat so they become damaged and partially melt. This leads to pressure build-up in the reactor core. Within two hours of the cooling failures, a small fraction of the reactor core will be released in both the reactor vessel and the cooling system. The fraction consists of radioactive iodine isotopes and radioactive noble gases. The released iodine (I-131) poses the greatest threat. Due to damage to the cooling system, the radioactive substances within the safety containment (reactor vessel) of the nuclear power plant are released. In

a few hours the pressure builds in this containment and leads, 24 hours after the cooling failed, to a discharge of a large quantity of radioactive material that lasts 4 hours.

The discharge consists of a wide range of different radioactive elements, such as iodine, caesium, and rare gases. The radioactive material spreads in the south-western direction within a few hours in the direction of the EU border. The reactor is about 60km from the EU border. Ultimately, the radioactive material will disperse over a distance of many hundreds of kilometres in Europe.

This is based on a standardised scenario for emission from a failing nuclear power reactor called STC-CON1[50]. At that time, the highest quantity of radioactive materials is released. The release contains, inter alia, 1% of the iodine isotopes (I-131) from the core inventory. The duration of this emission is 4 hours. The weather is either the local annual average or the weather type D5 (average day with little sun and a lot of wind up to 5 m/s). The scenario is divided into three parts:

i) the early release phase (2 hours after cooling failure) where mostly noble gases and a small amount of iodine (highest risk) are discharged;
ii) the 'real' discharge (24 hours after cooling failure with a duration of 4 hours), the discharge of a cloud with a lot of different nuclides; and
iii) phase after discharge: there is a contaminated area.

3.1.2.8 Marine pollution (not further taken into account)

The planning assumption consists of an event in which oil pollution reaches the shoreline. The focus is on the shoreline response as civil protection is mainly involved in oil pollution when it reaches the shoreline. However, coordination with at sea response is an important challenge in this situation. The European Maritime Safety Agency (EMSA) will conduct in 2019 a stress test for the marine oil pollution capacity in Europe, which will focus on the offshore capacities.

An oil crude tanker LR2 class of 115,000 DWT collides with a cruise ship carrying 500 passengers close to the shoreline (within 10 miles) of an EU Member State. The collision leads to a large leak and fire on the crude tanker resulting in severe pollution. The passenger ship can reach a nearby harbour on its own and the oil tanker is fully evacuated. The crude oil has a high sulphur percentage, which leads to large scale complaints about the smell and respiratory irritation.

3.1.2.9 Critical infrastructure disruption = failure of a critical infrastructure

An emergency stop in one of the power plants leads to a cascading effect in the network causing a large blackout in which more than 20 million people are affected across several countries. The network operator is able to restore most of the network within a few hours. However, a part of the network covering an area in which approximately 1 million people are living cannot be restored quickly, as the cascading effect has led to physical damage in the network. A fire has destroyed a critical transformer station and, due to the ongoing repair works, rerouting is not possible. After 24 hours, it becomes clear that restoring the power for approximately 1 million people in this area will take at least a week.

3.2 Country specific scenarios

In this paragraph an overview of the relevance of the seven of the nine planning assumptions given in paragraph 3.1.2 will be given per country.

[50] is a term for a scenario in which the last barrier fails 24-hours after the start of the chains of events at a nuclear power reactor for electricity production

A Pandemic, as the current COVID 19 pandemic has proved, is not a single country risk but is a risk for all countries. Critical infrastructure disruption will, in all probability, be a multi country risk rather than affecting a single country.

3.2.1 Turkey

Table 2 Overview of disaster risks in Turkey

Scenario	Overview
Flooding	Flooding in Turkey is pre-dominantly river flood, to be characterized as flash flooding due to extensive rainfall. Especially the provinces on the Black Sea Coast are vulnerable. While the large cities are also vulnerable for direct flooding due to extreme rainfall.
Heatwave	Extreme heath is a regular and due to climate changes more frequently re-occurring phenomena in Turkey.
Forest fires	Forest fires occur throughout the whole country Forest fires are especially in the western and southern part due to droughts in the summer a huge risk.
Earthquakes	Turkey is very prone to earthquakes and as several of the major cities are built on or close to the fault lines a strong earthquake can lead to a very large-scale disaster.
Chemical incidents	Industrial areas can be found throughout the countries with a concentration in the areas east of Istanbul and around major harbours like Izmir and Adana.
Radiological	Turkey has one nuclear power plant in the development phase (operational in 2023 while a nuclear power plant in Armenia also could have direct impact on Turkey.
Marine pollution	As Turkey has a long traffic intensive coastline it is especially in the Bosporus area which is very traffic intense vulnerable for marine pollution.

3.2.2 Greece

Table 3 Overview of disaster risks in Greece

Scenario	Overview
Flooding	Greece is vulnerable for flash flooding and direct flooding from heavy rainfall. Due to the elevation the risk of coastal flooding is limited.
Heatwave	Extreme heath is a regular and due to climate changes more frequently re-occurring phenomena in Greece.
Forest fires	Forest fires are a high risk throughout the whole of Greece. In many areas the impact of forest fires has increased due to the urbanisation and the higher amount of people living in or bordering forested areas.

Earthquakes	Greece is very prone to earthquakes and as the capital region with almost the half of the population of Greece is built on fault lines a strong earthquake can lead to a very large-scale disaster.
Chemical incidents	Industry is concentrated in areas around Athens and Thessaloniki, smaller industrial areas are present throughout the country.
Radiological	The nuclear/radiological risk in Greece is low. Greece has neither nuclear power plants, nor nuclear power plants close to the Greek borders in neighbouring countries.
Marine pollution	As Greece has a long coastline and many Islands with regular sea transport it is vulnerable for marine pollution.

3.2.3 Portugal

Table 4 Overview of disaster risks in Portugal

Scenario	Overview
Flooding	Flooding in Portugal is pre-dominantly river flood partly to be characterised as flash flooding due to extensive rainfall but also river flooding in the larger rivers. Coastal flooding is a risk too, be it limited in scale seen the average elevation of the country.
Heatwave	Extreme heath is a regular and due to climate changes more frequently re-occurring phenomena in Portugal.
Forest fires	Forest fires occur throughout the whole country Forest fires are a very high risk in Portugal also due to the composition of the forest in Portugal (a high percentage of acacia trees).).
Earthquakes	Portugal is prone to earthquakes and as several of the major cities are built on or close to the fault lines a strong earthquake can lead to a very large-scale disaster.
Chemical incidents	Industrial areas can be found throughout the countries with a concentration in the areas around the major cities of Porto and Lisbon.
Radiological	Portugal has no nuclear power plants and the nuclear power plants in Spain are built at a distance from the border which makes the possible impact less severe.
Marine pollution	As Portugal has a long traffic intensive coastline it is vulnerable for marine pollution.

3.2.4 Romania

Table 5 Overview of disaster risks in Romania

Scenario	Overview
Flooding	Flooding in Romania is pre-dominantly river flood from the Danube and its tributaries. Romania is also one of the most flood-prone countries in Europe, with significant damage from floods occurring several times per decade. In the

	mountainous areas also flash flooding can occur, while coastal flooding is to a certain extent possible at the black sea coast.
Heatwave	Extreme heath is possible in Romania and due to climate change a more frequently re-occurring phenomena affecting the south-western and north-eastern provinces the most, with a likely increase in the number of drought events into the future.
Forest fires	Forest fires can occur throughout the whole country. The risk on forest fires is high and due to climate change the amount of forest fires is increasing. In the case of high temperatures against the background of a significant long-term water deficit, meteorological factors can become a trigger for forest fires, especially in the case of extreme weather events.
Earthquakes	Romania is one of the countries most at risk from earthquakes in the EU and Bucharest is built in and earthquake prone zone an earthquake can lead to a very large-scale disaster.
Chemical incidents	Industrial areas can be found throughout the country with a concentration in the coastal areas and around Bucharest. Also the chemical industry in Romania is a traditional branch – more than 4 500 companies operate in the sector.
Radiological	Romania has one nuclear power plant located in Cernavoda and alsothere is a radiological risk to the nuclear power plant in Kozlodui - Bulgaria who have direct impact on Romania and the nuclear power plant “Paks Nuclear Plant” located in Hungary could have anan impact to the Romanian territory.
Marine pollution	Romania has a 243 km coastline with the Black Sea where marine pollution is possible. Marine pollution it can also be due to oil or gas extractions and naval accidents. In Black Sea are 8 areas of oil and gas extraction.

3.2.5 Austria

Table 6 Overview of disaster risks in Austria

Scenario	Overview
Flooding	Flooding in Austria can be river flood, for example, of the main river the Danube, or flash flooding in one of the tributaries of the Danube due to extensive rainfall.
Heatwave	Extreme heat is possible and due to climate changes a more frequently re-occurring phenomena in Austria.
Forest fires	Forest fires can occur throughout the whole country, due to the climate and type of forest the risk is compared to many countries limited.
Earthquakes	The earthquake risk of Austria is limited, however earthquakes of a magnitude leading to structural damage can occur.
Chemical incidents	Industrial areas are relatively limited in size but can be found throughout the country with a concentration in the areas around the major cities.

Radiological	Austria has no nuclear power plants, but several power plants are present in the direct vicinity of Austria, for example, in the neighbouring countries of Germany, Czechia and Slovakia.
Marine pollution	Austria has no coastal areas.

3.2.6 Ireland

Table 7 Overview of disaster risks in Ireland

Scenario	Overview
Flooding	Flooding in Ireland is pre-dominantly river flood, due to excessive rainfall. Coastal flooding is a risk especially for some urban areas around Dublin and Cork.
Heatwave	Extreme heat due to the impact of the ocean in Ireland is very limited.
Forest fires	The forest fire risk is limited due to the climate and low amount of large, forested areas.
Earthquakes	The earthquake risk of Ireland is very low.
Chemical incidents	Industrial areas which are limited in scale can be found throughout the countries with a concentration in the areas around Cork and Dublin.
Radiological	Ireland has no nuclear power plants and the closest nuclear power plants are across the Irish sea which could only lead to a limited impact.
Marine pollution	As Ireland has a long coastline of the Irish Sea, sea traffic is intensive; it is vulnerable for marine pollution.

3.2.7 Denmark

Table 8 Overview of disaster risks in Denmark

Scenario	Overview
Flooding	Flooding in Denmark is pre-dominantly coastal flood, due to storm surge. The risk of river flood or direct run of flood due to extreme rainfall is present but limited.
Heatwave	Extreme heat is due to the climate in Denmark is limited, but also due to climate change, relative extreme heath is increasing.
Forest fires	The forest fire risk is limited due to the climate and the low amount of large, forested areas.
Earthquakes	The earthquake risk of Denmark is very limited.
Chemical incidents	Industrial areas, which are limited in scale, can be found throughout the countries with a concentration in the areas around the major harbour cities.

Radiological	Denmark has no nuclear power plants, but power plants are present in neighbouring Countries, for example Sweden. Also, nuclear powered vessels visit its territorial waters.
Marine pollution	Demark is a traditional maritime nation with a strategically important location. Its territorial waters are heavily trafficked by international vessels. There are 17 oil fields in the Danish Sector of the North Sea, with 48. Denmark is vulnerable to marine pollution

4 Socio economic aspects

4.1 European Overview

This chapter mentions the governance arrangements in place for each country, the policies in place and the years that these policies were introduced.

Table 9 Overview of country profiles

Conventional short form country name	Population (July 2021 est.)	Governance	Size sq km	No of	Area Comparison Map
Turkey	82,482,383	Presidential republic	783,562	81 Provinces	
Greece	10,569,703	Parliamentary republic	131,957	13 Regions	
Portugal	10,263,850	Semi-presidential republic	92,090	18 Districts	
Romania	21,230,362	Semi-presidential republic	238,391	41 Counties	

Austria	8,884,864	Federal parliamentary republic	83,871	9 States	
Ireland	5,224,884	Parliamentary republic	70,273	28 Counties and 3 cities	
Denmark	5,894,687	Parliamentary constitutional monarchy	43,094	5 Regions	

The following two tables (Table 10 and Table 11) provide a strategic summary and the subsequent country specific information provides the detail. Table 10 below shows the strategic of the six countries Civil Protection management systems. Four of the countries Turkey, Greece, Portugal and Romania operate with a single national agency leading with a cascaded management system to regional, provincial and local actors.

Austria operates a decentralised and federal model.

Ireland has a whole of government approach with lead departments depending on the emergency.

Table 10 Overview of country disaster management systems

Country	Civil Protection Governance
Turkey	The Disaster and Emergency Management Presidency (AFAD), the national level competent authority concerning disasters and emergencies. The AFAD Presidency undertakes the coordination function at the centre, while the responsibility for implementing the policies and operations lies with the provincial organisations – the Provincial Disaster and Emergency Directorates.
Greece	Civil protection in Greece is organised as a co-ordinated resource system whereby national, regional, provincial, and local authorities work together with local and public institutions and services. Each of these authorities and institutions has developed its own part of the national civil protection plan (Xenokratis) and makes its own contribution towards achieving the aims of civil protection.

Portugal	Civil protection is an activity developed by the Government, the autonomous regions, local authorities, the citizens and all the public entities, which main goals are to avoid accidents or disasters, and protect and rescue people. Decentralised without prejudice to mutual support between organisations and the same level entities or through higher levels. The CP structure is organised at the national, regional and municipal levels.
Romania	At county level, County Inspectorates for Emergency Situations operate in the 41 counties and in Bucharest. They are subordinated to the General Inspectorate for Emergency Situations (GIES) and provide - in their areas of competence - guidance and control of prevention and management of emergencies.
Austria	The Crisis and Disaster Protection Management of Austria is continuously decentralised and organised on a federal basis. This approach considers that the different political levels hold various competences and know-how, which are suitable to manage issues more efficiently.
Ireland	The most important principles are that all government departments and agencies are obliged to participate in a coordinated approach, planning is to operate on an 'all hazards' basis and a lead agency is to be assigned coordinating responsibility for all identified national risks.
Denmark	The Minister of Defence is responsible for producing and revising the National Crisis Management Plan according to the Emergency Management Act. The Plan contains an overview of the national crisis management system, including its organisation, the allocation of responsibilities and competences, a description of the general expectations to each authority's contribution to the crisis management process and additionally establishes the overall procedures in relation to major accidents and disasters.

Table 11 below shows the most recent major policy implementations in relation to civil protection of the six countries. These are listed in date order with the most recent first.

Table 11 Overview of Civil protection policy in the study countries

Country	Civil Protection Policy
Ireland	The Strategic Emergency Management (SEM) National Structures and Framework document and the associated Annexes were approved by Government on 26 July **2017.**
Greece	In **2011** Greece's administrative system was drastically overhauled according to the Kallikratis Plan[51], a major administrative reform in Greece, introducing 7 decentralised administrations, which group from one to three regions under a government-appointed general secretary. Greece is also divided into 13 regions and 325 municipalities.
Turkey	While the reforms introduced in **2009** transferred significant responsibility for DRR and disaster response to the provincial and municipal levels, both of which now come under the responsibility of the province and district, this has not been implemented in practice. The system may therefore be termed both central and decentralised but is coordinated from central bodies and functions through AFAD.
Romania	In December **2004,** the General Inspectorate for Emergency Situations (GEIS) was founded by merging the Military Fire-fighters Corps and the Civil Protection Command, under the Ministry of Internal Affairs.
Austria	In **2003**, the Ministry of the Interior became the main responsible federal organisation for the coordination of disaster protection management, crisis management and international disaster relief.

[51] "Kallikratis Plan", last modified on 20 December 2015, https://en.wikipedia.org/wiki/Kallikratis_Plan

Portugal	The National System of Civil Protection (Sistema Nacional de Protecção Civil, SNPC) was founded in 1975, and the structure and the duties were established under the Decreto-Lei 510/80 (Decree-Law 510/80) on October 25, **1975**.
Denmark	The national crisis management system is described in the National Crisis Management Plan. The purpose of the plan is to determine the framework and the procedures, etc. that apply to authorities when many different actors collaborate in the management of a major accident or a disaster.

4.2 Country Specific information

4.2.1 Turkey

Policy: The disaster management structure of Turkey underwent an important shift in 2009 with the establishment of the Disaster and Emergency Management Presidency (AFAD), the national level competent authority concerning disasters and emergencies. The AFAD Presidency undertakes the coordination function at the centre, while the responsibility for implementing the policies and operations lies with the provincial organisations – the Provincial Disaster and Emergency Directorates. AFAD is responsible for coordinating nearly all phases of disaster management including disaster risk reduction (DRR) at the national level, and installs rules, regulations, and guidelines for preparation of DRR plans at sub-national levels. The operating administrative level becomes higher as the extent and severity of disaster grows in scale and scope. While the reforms introduced in 2009 transferred significant responsibility for DRR and disaster response to the provincial and municipal levels, both of them now come under the responsibility of the province and district, this has not been implemented in practice. The system may therefore be termed both central and decentralised but is coordinated from central bodies and functions through AFAD.

Social Context: Turkey is prone to a range of complex emergencies – including both natural and manmade (industrial) disasters, due to its tectonic, seismic topographical and climactic structure. Turkey is subject to floods, landslides, avalanches, forest fires and, most importantly, earthquakes. In Turkey, the policy framework concerning natural disasters was conceived in the aftermath of the Erzincan Earthquake of 1939 with the "Measures and Assistances to Be Put into Effect Regarding Natural Disasters Affecting the Life of the General Public" no.7269 of 1959.

Use of Resources: The Provincial Directors for Disaster and Emergency are the authorities responsible for the coordination and mobilisation of human, material and monetary resources inside and outside of the province (Law No. 7269). They are responsible for:

i) Determining hazards and risks at the provincial level;
ii) preparing provincial emergency aid and response plans for the province with the help of the Provincial Search and Aid Groups and in cooperation with the Provincial Turkish Red Crescent Units (Law No. 5902);
iii) implementing and monitoring emergency and response plans in times of disasters;
iv) managing the logistic services at the time of disaster and emergency;
v) undertaking loss and damage assessments of the province;
vi) accrediting civil society organisations involved in disasters (e.g., search and rescue teams);
vii) managing the Provincial Disaster and Emergency Management Centre; and
viii) educating the public (UNDP/WMO, 2011).

Prevention and Recovery Mechanisms: The AFAD Strategic Plan 2013-2017, adopted in 2013, introduced a new disaster management model in Turkey, shifting the priority from ‘‘Crisis

Management'' to ''Risk Management''. The new model, today called the ''Integrated Disaster Management System'':

> *provides for identification of hazards and risks in advance to mitigate the losses caused by disasters and emergencies, taking measures to prevent or minimize possible losses before the disaster takes place, ensuring effective response and coordination, and carrying out post-disaster recovery works in an integrated manner.*[52]

The integrated disaster management system consists of 4 axes: ***Mitigation, Preparedness, Response, and Recovery*.**

The Recovery approach in Turkey focuses not only on reconstruction of damaged buildings, but also it engages in an integrated approach that covers the disaster area as a whole, including infrastructure, schools, hospitals, road, parks and physical and social environments. The recovery activities incorporate risk reduction measures for a resilient recovery and aim to reduce necessary recovery activities in the future through strengthening infrastructure and retrofitting (UNDP/WMO, 2011).

At the central level, AFAD's Department of Recovery is the lead entity responsible for the coordination of relief and recovery operations.

Resilience to Disasters: Turkey's approach to the concept of resilience is based on increasing disaster awareness through education (educational campaigns in 2013) with the aim to build a more resilient society. This is considered to be an important component of Turkey's overall approach to DRR. AFAD is responsible for education, training, and awareness-raising activities in the field of disaster risk reduction.

No specific international standard is pursued; rather, standardisation is sought through the application of the relevant regulations and circulars. AFAD undertakes the role of accrediting the NGOs and organises awareness raising meetings with the private sector representatives. However, they do not have a regulatory or auditing power on the standards for different stakeholders.

4.2.2 Greece

Policy: In 2011 Greece's administrative system was drastically overhauled according to the Kallikratis Plan[53], a major administrative reform in Greece, introducing 7 decentralised administrations, which group from one to three regions under a government-appointed general secretary. Greece is also divided into 13 regions and 325 municipalities. Civil protection in Greece is organised as a co-ordinated resource system whereby national, regional, provincial and local authorities work together with local and public institutions and services. Each of these authorities and institutions has developed its own part of the national civil protection plan (Xenokrates) and makes its own contribution towards achieving the aims of civil protection.

Social Context: In Greece key risks areas of concern are earthquakes, landslides/mudslides, forest fires, severe weather phenomena, floods, volcanic eruptions, technological hazards, Chemical, Biological, Radiological and Nuclear (CBRN) accidents and anthrax incidents.

The General Secretariat for Civil Protection (GSCP) is responsible for directing and coordinating all actions related to prevention, control and management of crises. Decision-making responsibilities lie with the General Secretariats of the competent ministries.

[52] AFAD website: www.AFAD.gov.tr
[53] "Kallikratis Plan", last modified on 20 December 2015, https://en.wikipedia.org/wiki/Kallikratis_Plan

Earthquakes are a very common phenomenon in Greece. Greece ranks first in Europe in terms of seismicity and the sixth worldwide. Its geographical position coincides with the area of the planet where big Geo tectonic phenomena occur such as convergence with the African Euro-Asian lithospheric plate resulting in high seismicity observed in the region.[54]

Use of Resources: The General Secretariat for Civil Protection which is responsible for the preparation and approval of plans drawn up by the relevant central and regional bodies and utilities, planning, organisation and coordination of action on the prevention, preparedness, information and response to natural, technological, and other disasters or emergencies, preparation of resources and instruments for Civil Protection of the country to address the destructive phenomena in the context of the projects per category, the utilisation of research plans and information, the coordinating all phases of the project and disaster restoration and editing, designing and monitoring the implementation of civil protection within the government´s guidelines.

Prevention and Recovery Mechanisms: According to the principal national legislation for civil protection (Law 3013/2002, Ministerial Decree 1299/2003) the basic goals of the civil protection system (protection of life, health and property of citizens from natural and manmade disasters) are met through working out prevention plans and programmes for all kinds of risks (natural and manmade), taking appropriate measures of preparedness and undertaking prevention, preparedness, response and recovery actions. These plans and programmes are elaborated with all the component authorities in national, regional and local level. GSCP collaborates with the competent Ministries and relevant institutions for drafting regulations and specifications to prevent natural, manmade and other disasters, while being responsible for approving all regional and local plans of civil protection, per category of risk.[55]

Disaster recovery is carried out in cooperation of the central level authorities (Ministries) with the regional and local authorities. In principle GSCP, except from the approval of the national planning for the civil protection in Greece, is also responsible for the reporting of the application of the governmental recovery measures after different types of disasters.

Resilience to Disasters: Crisis management and disaster response has been given a more important role in Greece after the adoption of the Civil Protection Law 3013/2002 and especially by the introduction of National plans for every disaster and hazard issued by the GSCP. The Greek civil protection system is highly decentralised since each administrative level (Decentralised Administrations, Regions and Municipalities), is tasked to draw its own regional and local plans to ensure resistance against hazards. They include emergency and contingency plans for all kinds of natural and/ or manmade disasters and hazards aiming to build resilience, take appropriate preparedness measures and undertake prevention, preparedness, response and recovery actions. These plans and programs are adopted after extensive and sophisticated cooperation of all competent authorities involved in disaster reduction and disaster management and upon adoption become binding for all stakeholders involved. They are available publicly online on the web portal of GSCP.

4.2.3 Portugal

Overview Policy: In Portugal, civil protection is an activity developed by the Government, the autonomous regions, local authorities, the citizens and all the public entities which main goals are to avoid accidents or disasters and protect and rescue people.

[54] Source: Papazachos & Papazachou. 1999. Earthquakes in Greece

[55] The Hellenic National Platform for Disaster Risk Reduction (HNP-DRR), United Nations Office for Disaster Risk Reduction, Accessed February 2, 2016, https://www.unisdr.org/partners/countries/grc.

Civil protection activity is permanent, multidisciplinary and multisector, fitting to all agencies and departments of the Public Administration to promote the necessary conditions for its implementation in a decentralised manner, without prejudice to mutual support between organisations and the same level entities or through higher levels.

The National System of Civil Protection (Sistema Nacional de Protecção Civil, SNPC) was created in 1975, and the structure and the duties were established under the Decreto-Lei 510/80 (Decree-Law 510/80) on October 25, 1975.

The civil protection structure is organised at the national, regional, and municipal levels.

Overview. Social Context: Portugal is vulnerable to various types of natural risks. The erosion of the Portuguese coastline has worsened over the last century, placing people and properties at risk, as well as natural heritage. In the centre and north of the country, the main areas at risk of coastal erosion are located between the mouth of the River Douro and Nazaré, the Espinho-Ovar and Aveiro–Areão stretches in particular, as well as that from Caminha to the mouth of the Douro. In the south of the country, of note is the stretch between Vilamoura and the mouth of the River Guadiana, where the cliffs have receded, and sea breaches have been verified.

Around the 35% of continental Portugal is at risk of desertification. The most susceptible areas are in the Alentejo, the Algarve coast, Vale do Douro, Trás-os-Montes and the Raia area in Beira Baixa.

Flooding also constitutes a natural risk deserving of attention.

Drought situations are frequent in continental Portugal, temporary natural phenomena that are distinguished from other catastrophes as they occur more imperceptibly, their advance is verified more slowly, they last for longer periods of time, can extend over far larger surface areas and recovery from them is much slower, at times causing significant socioeconomic impacts, particularly on agriculture and cattle farming and, also, on energy production.

Wildfires represent the greatest risk to Portugal's forests and they have led to a high number of personal accidents and significant economic losses. The area affected by wildfires in Portugal every year has been larger than the forest area and this has been an important contributing factor to desertification.

Use of Resources: The different local and regional government have their own resources and means to tackle emergencies.

The Operations Management System (SGO) is a form of operational organisation that develops a modular configuration, according to the importance and type of occurrence, applying whenever a force of any Civil Protection Agent (CPA) or institution with special duty of cooperation is driven to an instance in which the head of the first team to reach the site immediately assumes the command of the operation - Relief Operations Commander (COS) - and we build an evolutionary command and control system appropriate to the current situation.

Prevention and Recovery Mechanisms: In Portugal, the Autoridade Nacional de Proteccao Civil (ANPC) edited the collection of 21 booklets called Prevention and Protection directed to the public and children and youth seeking knowledge and adoption of prevention and self-protection against a range of risks.

16 audio spots were produced as Prevention and Self-protection tools through partnership with the Imaging Technique School of Image and Communication (ETIC) to multiply the information tools provided by ANPC.

The ANPC produced two cards (one for adults and another for children), which let people know all the booklets of the ANPC and the prevention and self-protection measures related to collective risks of natural and technological origin.

The ANPC also created PROCIV which is a newsletter that monthly provides news about national and international actions, agents, technical dossiers, key legislation and a schedule of events within the civil protection.

Crisis management is to solve a series of critical situations that arise suddenly or gradually. The critical situation that occurs slowly can be averted. According to the Environmental Hazard and Risk Assessment and Management (RISKAM) research group.

Some of the rules related to monitoring, support and preparedness in emergency situations are:

i) Mastering the critical situation and start of recovery, i.e., the implementation of stabilisation methods that are based on national habits (in each stage or nodal point, it is necessary to carry out risk assessments and evaluate their potential impacts, to ensure prevention of losses during response and recovery; and
ii) Execution of reconstruction and triggering of other effective preventive measures to increase resiliency of organisational unit.

Resilience to Disasters: The competent ministries and agencies execute their activities using their budget. The public administration dedicates part of its budget investing in Disaster Risk Reduction (DRR) for resilience that includes public and private investment to prevent and reduce losses, for example ensuring the safety of critical facilities such as hospitals, power plants, roads and schools.

Government also has to emphasize the importance of disaster preparedness and building back better after a disaster strikes. Good preparedness involves all groups of society male or female, old and young.

4.2.4 Romania

Policy: Romania is highly vulnerable to catastrophic natural disasters. It is situated in a seismically active region and has a history of devastating and deadly earthquakes, including the one with strongest impact, in Vrancea in 1977. Furthermore, the Bucharest area has experienced a number of tremors of varying intensities, and the probability that a severe and damaging earthquake will occur is high. Romania is also at risk by other natural and technological hazards. More specifically, the 2010 floods revealed weaknesses of the civil protection system and triggered a process of improvement. Of the former group, floods, drought and heat/cold waves have been experienced frequently, while the most affecting example of a man-made disaster has been the accident at the Baia Mare gold processing plant, in 2000, 100,000 cubic meters of toxic wastewater spilled out and flooded into the Danube River, affecting Romania, Hungary, Ukraine, Serbia, and Bulgaria.

At national level, the National Committee for Special Emergency Situations – CNSSU (inter-ministerial body), is responsible for emergency management. The CNSSU is headed by the Minister of Internal Affairs and is composed of ministers and directors of central public administration.

At strategic level, the Department for Emergency Situation (DSU) has coordinating powers for prevention and management of emergencies, ensuring and coordinating the human, material, financial and other resources necessary to cope with emergencies, including qualified first aid and emergency medical assistance within emergency units and emergency compartments.

In December 2004, the General Inspectorate for Emergency Situations (IGSU) was created by merging the Military Fire-fighters Corps and the Civil Protection Command, under the Ministry of Internal Affairs. IGSU is managed by a General Inspector. As integrator of the National Emergency Management System, a concept created also in 2004, IGSU coordinates all institutions involved in the process of emergency management and also works as national point of contact for all relevant international governmental and non-governmental organisations.

Romania adopted the Sendai Framework for Disaster Risk Reduction in 2015, which aims at substantial reduction of disaster risk and losses of lives, livelihoods, and health, and in the economic, physical, social, cultural, and environmental assets of persons, businesses, communities, and countries. As part of this commitment, the government has been actively working to establish a National Platform for Disaster Risk Reduction. This platform is organised and operates as a national multi-sectoral and interdisciplinary mechanism, consisting of the National Committee for Special Emergency Situations (NCSES) members, the technical and scientific support groups and NGO representatives, the associative structures of local authorities, professional associations, trade unions, higher education institutions, and research institutes, cultural institutions of religious denominations, and associations recognized by law and mass media.

Social Context: According to the National Strategy on Civil Protection, Romania emphasises disaster risk reduction and emergency management policy as one of the pillars of national security. Recently, it is focused on a combination of legislative and organisational measures, capability building and training efforts and actions in cases of emergencies. In a long-term perspective, the strategy is directed towards building a culture of safety and resilience. To achieve such progress, national, regional and local development programs and projects are and will be subsumed to the principles of sustainable development, environmental impact prevention and reduction, responsibility and protection of citizens against disasters.[56]

The policymaking and implementation mechanism is established around the following main phases: risk assessment, analyses, monitoring, alerting, decision making, and interventions.

According to national legislation, all institutions have the obligation to draw up plans to provide the basis for emergency management, on their field of interest. The process is coordinated by the National Committee for Special Emergency Situations (CNSSU). Prevention activities are coordinated at national level by the General Inspectorate for Emergency Situations (IGSU) through its specialized structure called the Prevention Inspection. Prevention activities are undertaken in cooperation with experts from the ministries/agencies, depending on the types of risk.

Use of Resources: Ministries and the local and central public authorities are forced by law to provide funds for prevention and mitigation of disaster effects. According to Emergency Ordinance No 21/15.04.2004, the National Committee has the main duty to examine and propose to the Government for approval a national plan for ensuring human, material and financial resources for the purposes of emergency management, elaborated by the General Inspectorate for Emergency Situations. Further, the Committee proposes to the Government the inclusion of funds in the annual state budget, necessary for emergency management.

[56] National Strategy on Civil Protection (Published in Official Gazette no. 600 as of 12 July 2005).

Prevention and Recovery Mechanisms: At county level, County Inspectorates for Emergency Situations operate in the 41 counties and in Bucharest. They are subordinated to the General Inspectorate for Emergency Situations (GIES) and provide - in their areas of competence - guidance and control of prevention and management of emergencies.

The policy for relief and recovery is formulated as "post-disaster measures and activities,"[57] which are organised and performed in short-, medium- and long-term frameworks.

The main executive administrative body is the General Inspectorate for Emergency Situations (GIES), which coordinates plans and operational activities in cases of natural and man-made emergency situations. Specific plans are prepared at all administrative levels. Funding is provided through the state and local budgets though they are used mostly for post-disaster recovery and less for preventive measures.

There are a number of hazards acknowledged in Romanian legislation and considered, on historical basis, as being likely to occur on Romanian territory. Ten types of hazards were selected from this list as subject of assessment, based upon scientific evaluations of historical data regarding the impact of each risk, as well as specific assessments developed at the level of relevant institutions.

The main risks in Romania are: flooding, drought, forest fires, landslides, earthquakes, nuclear and radiological accidents, chemical accidents, the risks of major accidents involving collapses of buildings, installations and dangerous substances, epidemics, animal epidemics and zoonosis.

The constituents of the National Emergency Management System are identified based on the provisions of G.D. no. 557/3 August 2016 – referring to risks management. According with this regulation, there are several types of activities falling under 5 categories: prevention, preparedness, response, post-event assessment, restoration.

These activities cover the process of risk management and are developed under the responsibilities of various institutions from central and local public administrations. The General Inspectorate for Emergency Situations (IGSU) is the authorised body that develops regulations in this domain and responsible for oversight of public and private institutions as well as economic operators (private companies) which need to have contingency plans for the identified risks.

In Romania, early warning systems consists of detection stations with analytics software, alarm stations, email, fax and phone to alert local authorities and cell broadcast messages systems (the emergency warning system "RO-ALERT"), television, radio, and alarm sirens.

For example, in case of earthquakes, within the emergency operation centre there is a software application for monitoring and sending rapid notifications in case of strong earthquakes. The population receives post-earthquake information messages on the recommended measures (cell broadcast messages via RO-ALERT and voice messages via electronic sirens).).

Resilience to Disasters: During the decade after 2004, Romania has been very active reforming inherited ineffective civil protection service using the paradigm of resilience: to addresses the loss of life, property and economic productivity caused by weather extremes and other natural hazards in the context of the implementation of the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters. To that end, Romania has three focus areas:

i) hydro meteorological forecasting, data sharing and early warning;

[57] Ibid, National Strategy on Civil Protection, p. 8.

ii) coordination of disaster mitigation, preparedness and response; and
iii) financing of disaster losses, reconstruction and recovery, and disaster risk transfer (disaster insurance).

4.2.5 Austria

Policy: The Crisis and Disaster Protection Management of Austria is continuously decentralised and organised on a federal basis. This approach considers that the different political levels hold various competences and know-how, which are suitable to manage issues more efficiently. Interrelationships between levels and actors with vague divisions of responsibilities present a challenge for analysing roles and the actors' spheres of influence (Benz and Zimmer 2010). As in other legal materials in Austria, also in disaster management there is a three-way division of competence. The state is assuming the key part in defining prevention measures and establishing a framework for the implementation and the financing of mitigation measures (Jachs 2011b). The response to disasters mainly falls within the remit of the provinces. While the federal provinces are engaged in establishing a preparedness structure and planning of the response to disasters, as executive units local authorities (municipalities) are mainly responsible for carrying out these response missions.

Social Context: In 2003, the Ministry of the Interior became the main responsible federal organisation for the coordination of disaster protection management, crisis management and international disaster relief. In this context, the Federal Crisis and Disaster Protection Management was established and became a major pillar of civil defence in Austria. It defines the measures and responsibilities in crisis and disaster case on the basis of two fundamental principles: the principle of subsidiarity and the principle of solidarity. The first principle is a political maxim specifying that intervention measures must be implemented in the sense of self-help acting on the lowest possible level, e.g., the local level. This implies a bottom-up principle ensuring that measures necessary to manage crisis and disasters, are as long as possible performed by local organisations. The second principle ensures that in a case of an event, which exceeds the capacities at the local level, the community mechanism to overcome the crisis and disasters will be activated, ensuring that challenges are tackled with the help from the next higher organisational level.

Use of Resources: One characteristic of the Austrian Crisis and Disaster Protection Management is the strong involvement of voluntary organisations, which enable an easy access to a huge number of human resources. Because there is no single organisation in Austria, which will be mainly responsible for the response to disasters, related duties will be organised by voluntary organisations. The Austrian Fire Brigades as well as the rescue services have gained the most attention in this area. Regarding the possibility to request assistance from the Austrian Armed Forces, if the capacities are insufficient, the Law concerning the military service, where it has been defined, that in the case of major emergencies, the provincial governor, the head of the district, regulates their deployment or the Major of a municipality are authorised to request assistance.

Prevention and Recovery Mechanisms: It is noteworthy that like in other legal matters in Austria, and thereby also in disaster management, there is a three-way division of competence. The state is not assuming overall responsibility but the key part in defining prevention measures and establishing a framework for the implementation and the financing of mitigation projects while the federal provinces are primarily engaged in establishing a preparedness structure and planning the response to disasters. The local authorities (municipalities) as executive units are mainly responsible for carrying out these response missions on the first intervention level and for that purpose they also provide the majority of response resources. The preparedness phase and the response phase rather constitute priorities for the state's level.

After an event, the reconstruction and stabilisation has top priority. There are some possibilities to fund certain recovery measures by the disaster relief fund or the solidarity fund of the European Union. The disaster relief fund is dedicated to finance prevention measures as well as recovery measures. The settlement is processed by an official request of the provinces, which take 40% of the total amount.

Resilience to Disasters: Within the Austrian Security Strategy (2013), the security policy referred to the concept of resilience as "restoring the proper functioning of the state and society in the aftermath of crisis". Resilience has not become a conventional term in the Austrian linguistic usage.

Regarding the Hyogo Framework for Action, where an emphasis is on the strengthening of the local resilience, Austria is fully on schedule. The well-established principle of sovereignty and subsidiarity is fostering the self-capacities on the community level. The community-based approach is supported by a strong civil society and effects a comprehensive protection against the impacts of natural disasters. A huge part of the initiatives at the local level are concerning preparedness activities, and therefore, the national resilience concept is strongly related to that phase.

4.2.6 Ireland

Policy: The core policy divides strategic and ongoing considerations from implementation. A substantial focus is on developing strong basic emergency services and then ensuring that they are capable of coordinating and upscaling to deal with exceptional situations. The priority is to embed key assessment and preparation steps within organisations rather than to develop separate stand-alone organisations or capabilities.

The Minister for Defence is responsible to the Government for the overall strategic policy in this field, convenes the permanent planning structures and hosts the crisis coordination centre. The Strategic Emergency Planning Guide (SERG) and its revisions detail the national strategic-level roles, responsibilities and guiding principles.[58] The most important principles are that all government departments and agencies are obliged to participate in a coordinated approach, planning is to operate on an 'all hazards' basis and a lead agency is to be assigned coordinating responsibility for all identified national risks.

Overview. Social Context: While Ireland has experienced a number of significant emergencies, it has not suffered disasters of the severity and scale witnessed by other EU member states. Its geographic position means it has limited vulnerability to most high-impact natural disasters. Flooding and sustained winter storms are the principal events for which coordinated crisis management procedures have been deployed. The EU's Solidarity Fund has been used to assist Ireland only once – for flooding in 2009.

In the national risk assessment procedure, the Irish authorities have identified the country's exposure in relation to energy supplies and ICT infrastructure as having particular potential to have severe impact. In the same context, a major disruption of maritime trade has been identified as representing a potential severe crisis.

Use of Resources: Each principal response agency has a Standard Operating Procedure/s (SOPs) which cover ordinary and extraordinary procedures as well as the inter-operability aspect of major emergency response. An Emergency Operations Plan (EOP) is a detailed document that outlines the personnel, roles, responsibilities, actions and processes to be followed in the event of an emergency. It may detail the resources available and when and where personnel will be called on to perform a strategy of mitigating actions to avert further deterioration of the situation and protect and stabilise

[58] www.emergencyplanning.ie

the organisation and people affected by the emergency, and it is the responsibility of each region to ensure that they have a working emergency plan.

Prevention and Recovery Mechanisms: Ireland does not have a separate prevention strategy. In general, responsibility for the mitigation of specific hazards lies with the organisations and companies, which own and operate the facilities and services where the relevant hazards are found, such as airlines, railway companies, chemical manufacturers, etc. Such organisations are referred to as "risk holders". There are also statutory provisions, which provide for regulation/risk management, and bodies which hold responsibility in this regard are called "risk regulators".

Sectoral preparedness, response and recovery strategies are published by lead agencies in their core areas. The lead role for planning the State's response to an emergency rest with the functional Minister and his or her Government Department, with support from other key departments and public authorities. The functional Department has the lead role in the areas of risk assessment, prevention, mitigation, response, maintenance of public confidence and recovery, working in association with other Government Departments and public authorities.

Resilience to Disasters: Local authorities are substantially responsible for building resilience in local communities however, the budget for this varies in each area and it is generally larger in areas that have experienced some form of significant emergency. The document "*Preparing for Major Emergencies*"[59], issued to each household in the country during 2008 by the Office of Emergency Planning, provides important information for individuals on how to prepare for a major emergency and what to do in the event of a major emergency.

4.2.7 Denmark

Policy: In 2009, Denmark adopted the Emergency Management Act. This act details all aspects of crisis management. The crisis management approach of Denmark assumes the local level to be better placed to tackle local crisis situations than the national level (Subsidiarity). In case of an emergency the municipal fire and rescue service is the first to respond to the emergency together with the local police and ambulance services. If the emergency is too large for the responders in a single municipality to combat, these services can ask assistance from services in neighbouring municipalities. In a situation in which specialised equipment or skills are required to sufficiently combat the emergency; local authorities can turn to the national level for assistance. This assistance will be provided by the Danish Emergency Management Agency or DEMA[60]. This division of tasks and responsibilities is laid down in the Emergency Management Act, the main crisis management act in Denmark.

Private organisations, volunteers and NGO's participate in Danish crisis management. In particular, Falck Redningskorps Ltd[61]., a large private Danish rescue and fire company operates on a contractual basis within many of the Danish municipalities.

Danish Civil Protection League is also supporting, as a non-profit organisation, with 5,000 members. Also, the Danish Red Cross acts in crisis situations. But the major national organisation, also international contact point, is DEMA. It handles different aspects of the crisis management policy cycle.

DEMA is organised in four core areas, each covering a part of the Danish emergency response from **prevention** (inspection, counselling, supervision and development of national rules and laws preventing fires and explosions, **Emergency planning** (supervision of other governments and private

[59] Office of Emergency Planning; "Preparing for Major Emergencies", 2008, Available from: www.mem.ie
[60] www.brs.dk/eng/
[61] https://www.falck.com/en/

companies on preparedness planning), **Operational** (National Division, International Division, Chemical Division and Nuclear Division and **training** (via the centre for **Education** and **HR Development**).

Social Context: In the World Risk Report 2014[62] Denmark is qualified as a rather safe country compared to other (EU) countries. On the world risk index Denmark is ranked 149th out of 171 countries. Neighbouring countries Norway and Sweden score even a bit better. Germany scores a little lower, especially on exposition. The main natural hazard for Denmark is flooding, as the country consists of a long coastline and many islands. Flooding is mainly a seasonal risk and occurs in some parts of the country. Parts mostly at risk are Jutland (Juelland) and parts along the southern coast of the island Lolland. Besides these two major parts under threat, other parts of the country are at risk for flooding as well, as the country consists of around 400 islands of which 82 are inhabited with Jutland, Zaelland (Sjaelland) and Funen (Fyn) being the largest ones, both in terms of km^2 and number of inhabitants. The country as an overall coastline of 7,314 km (UNU, 2014).

The main threats, in addition to flooding, identified for Denmark are: fires, storms, snow storms, oil spills, man-made and technical disasters[63]. Although the highest risk of the country is flooding, the disasters causing the highest number of causalities and economic damages are storms and transport accidents.

Use of Resources: In order to mitigate the potential impact of the risks described above frequent risk assessments are conducted. Conducting risk assessments was previously mainly done by private companies and local public bodies. Since the Danish National Vulnerability Evaluation (conducted in 2004) also general risk assessments are carried at the central governmental level.

The Danish Emergency Management Agency (DEMA), more specifically its Centre for Resilience and Contingency Planning, developed a methodology to assess the potential risks. The model conducts a risk and vulnerability analysis (RVA model) which forms the basis for all preparedness planning at the central governmental level. As risk and vulnerability planning is rarely required by law, the DEMA model is used on a voluntary basis.[64]

The RVA model mainly considers potential effects of a crisis on critical functions. These critical functions refer to all activities and services which are indispensable for society. The model assumes a function to be critical if their partial or entire loss will cause grave consequences for life, health, property or the environment. For each of the functions the model assesses what will happen to it in case of simulated large-scale disturbances, accidents or outright catastrophes. The figure below outlines the different model steps.

Prevention and Recovery Mechanisms: Danish crisis management is based on five over-arching principles. These principles apply to all phases of crisis management, ranging from prevention and preparedness to response and recovery. Some of the principles are laid down in legislation, e.g. in the Emergency Management Act (refer to following paragraph), while others are not. The principles are[65]:

- *Sector responsibility:* this principle indicates that each department/agency which has a responsibility for a specific sector also remain responsible during a crisis. For example, because

[62] United Nations university & Alliance Developments Work 'World risk report 2014' https://i.unu.edu/media/ehs.unu.edu/news/4070/11895.pdf

[63] https://ec.europa.eu/echo/what/civil-protection/vademecum-for-civil-protection_en , Denmark (2014)

[64] DEMA, Approach to Risk and Vulnerability Analysis for Civil Contingency Planning' https://brs.dk/globalassets/brs---beredskabsstyrelsen/dokumenter/krisestyring-og-beredskabsplanlagning/2020/-background-paper-on-demas-approach-to-risk-and-vulnerability-analysis-.pdf

[65] DWMA crisis management in Denmark ' https://brs.dk/globalassets/brs---beredskabsstyrelsen/dokumenter/krisestyring-og-beredskabsplanlagning/2021/-crisis-management-in-denmark-.pdf

the Ministry of Health is responsible for public health in general, the Ministry will also be responsible in case of a pandemic outbreak.

- *Similarity:* according to this principle the crisis management setup should resemble the daily setup as much as possible in order to minimise the changes needed in case the crisis management system is activated.
- *Subsidiarity:* refers to a situation where crisis management activities are conducted on the lowest organisational level possible. This principle refers to the decentralised crisis management approach used in Denmark.
- *Cooperation:* organisations involved in crisis management should cooperate with other relevant organisation when they are planning their crisis management activities. This principle is especially important for maintaining critical infrastructure.
- *Precaution:* relates to the establishment of a crisis management organisation that may respond in case of an emergency. The organisation needs to be established before something actually happens.

Resilience to Disasters: The concept of resilience in civil protection, in terms of country's capacity to withstand shocks due to natural and other disasters, to rebuild itself with efficiency, and to improve on the pre-existing state wherever, has not been explicitly established by law or another normative act. However, several public educations campaigns have been organised in which the public has been informed on what to do in case of a crisis situation. Special attention in these campaigns was paid to flooding. The aim was to improve homeowner's resilience towards storms, storm surges, torrential rain, groundwater flooding etc.

5 Frameworks, doctrines, guidelines and protocols

This chapter gives an overview of the frameworks, doctrines, and guidelines in places for disaster management in Europe. It starts with an overview of the international and European frameworks followed by country specific frameworks.

5.1 European and international frameworks

The growing number of disasters and their humanitarian impacts has prompted the need for a framework that addresses the responsibilities of states and humanitarian agencies in disaster settings. This has led to the emergence of international disaster response laws, rules and principles, International Disaster Response Law (IDRL), comprised of a collection of international instruments addressing various aspects of post-disaster humanitarian relief. It aims to cover a broad range of rules, including issues related to initiation of disaster assistance, consent, access, conditions of assistance, and movement of personnel and materials. Many of these principles feed into or are replicated by National Laws or Rules relating to disaster response.

IDRL is not a comprehensive or unified framework. There are no core international treaties, such as the Geneva Conventions and Additional Protocols under International Humanitarian Law (IHL). Rather, it consists of a fragmented and piecemeal collection of various international, regional and bilateral treaties, non-binding resolutions, declarations, codes, guidelines, protocols and procedures. This includes relevant provisions of international treaties in other areas of law, such as international human rights law, international refugee law and IHL (in the case of conflict situations).

Treaties: These largely comprise bilateral treaties, covering various areas such as technical assistance, mutual assistance and agreements regulating humanitarian relief between the two state parties. The latter two tend to involve formal rules for the initiation and termination of assistance; and provisions for reducing regulatory barriers (involving e.g., visas and work permits and customs control for relief personal and goods). Regional treaties have largely been adopted for mutual disaster assistance and are in place in the Americas, Asia and Europe.

International Custom: It can be argued that there is a right to receive humanitarian assistance in disaster situations under customary international law. Sources relied upon include the 'Code of Conduct for the International Red Cross and Turkish Red Crescent Movement and NGOs in Disaster Relief' which states that there is a right to receive and to offer humanitarian assistance. In addition, the right to a healthy environment as an aspect of the fundamental right to life has been relied upon not only to demonstrate a right to assistance under IHRL but also as part of customary international law.

UN resolutions (soft law): The instruments with the broadest scope in IDRL are non-binding recommendations, declarations and guidelines. This includes the 'Measures to Expedite International Relief', endorsed by the UN General Assembly and the International Conference of the Red Cross in 1977. The General Assembly also passed Resolution 36/225 in 1981, which called for strengthening the UN's capacity to respond to disasters; and Resolution 46/182 in 1992, which called for a 'strengthening of the coordination of emergency humanitarian assistance of the United Nations system'. Around the same time, the office that would later become the Office for the Coordination of Humanitarian Affairs (OCHA) was founded In 2002, the General Assembly adopted Resolution 57/150, which reaffirmed resolution 46/182 and provided for strengthening the effectiveness and coordination of international urban search and rescue assistance.

IDRL Guidelines: The International Federation of Red Cross and Turkish Red Crescent Societies adopted in 2007 the 'Guidelines for the Domestic Facilitation and Regulation of International Disaster Relief and

Initial Recovery Assistance'. They are a significant development to the IDRL framework, with the potential to contribute to the development of norms under customary international law.

5.1.1 General/Over-arching

5.1.1.1 UNDAC[66]

United Nations Disaster Assessment Coordination (UNDAC) is part of the international emergency response system for sudden-onset and deteriorating emergencies. The UNDAC system is designed to assist the United Nations and Governments of a crisis-affected country in the initial response phase, primarily in the areas of on-site coordination of incoming international relief; coordinated assessments and needs analysis; and information management. It is capable of deploying at very short notice (24-48 hours) anywhere in the world and is provided free of charge to the disaster-affected country. It also advises and strengthens national and regional disaster response capacity. The UNDAC System is managed by the Emergency Response Section (ERS) of the UN Office for the Coordination of Humanitarian Affairs (OCHA) in Geneva.

The UNDAC system was established in 1993 and today consists of over 230 national emergency managers from more than 80 participating countries, together with staff from OCHA, international and regional organisations, including UN agencies, funds and programmes. The UNDAC system comprises of several regional teams: Africa, the Americas (including the Caribbean), Asia, The Commonwealth of Independent States, Europe, Middle East, and the Pacific. In major international emergencies, UNDAC teams are drawn from the global membership, whereas in more localised disasters, they are normally drawn from the affected region.

Mandate

The UNDAC team is a key component of OCHA's rapid response mechanisms for sudden-onset disasters and is central to OCHA's mandate to ensure that the relief provided is effective, not to provide effective relief. OCHA's original mandate for natural disaster response stems from the United Nations General Assembly (GA) Resolution 2816 (XXVI) of 14 December 1971 which authorises it to "mobilise, direct and coordinate" international assistance.

In December 1991, the United Nations General Assembly, through its resolution 46/182 recognised the need to strengthen and make more effective the collective efforts to provide humanitarian assistance. The resolution supported a strengthened leadership role of the Secretary-General to ensure better preparation for, as well as rapid and coherent response to, natural disasters and other emergencies.

The resolution called for the Secretary-General to designate an Emergency Relief Coordinator (ERC) at the level of Under-Secretary General for Humanitarian Affairs and specified that the ERC should be supported by a secretariat; this is OCHA. GA Resolution 46/182 incorporates the mandate given in the original GA Resolution 2816 (XXVI) of 14 December 1971.

The responsibilities assigned to the ERC and their secretariat, OCHA, are essentially coordination, advocacy and information. This should include the following.

i) Coordinating, facilitating, and mobilising the humanitarian assistance of the United Nations system in those emergencies that require a coordinated response;
ii) Providing services that maximize the efficient use of resources for humanitarian assistance, such as consolidating, managing and disseminating information including situation reports, early warning data and needs assessments;

[66] https://www.unocha.org/sites/unocha/files/dms/Documents/UNDAC%20Handbook_interactive.pdf

iii) Mobilising resources through the preparation of interagency appeals, management of response funds, and financial tracking of donor responses;
iv) Promoting competent staff through training programs and other staff development activities;
v) Acting as focal point for advocacy on humanitarian concerns, for maximising opportunities for preventative action and for securing access to people affected by conflict;
vi) Ensuring that relief contributes to future development and that development plans incorporate measures for disaster mitigation, preparedness and prevention; and
vii) Supporting and strengthening national capacity for emergency response.

When required, an UNDAC team may support, establish or run On-Site Operations Coordination Centre (OSOCC) and a Reception Departure Centre (RDC) to act as a link between international responders and national authorities, to facilitate coordination of international response, and to provide a platform for cooperation, coordination and information management amongst international humanitarian agencies. An OSOCC is a rapid response tool that may serve as a bridge from emergency response to longer-term relief and may become the foundation of an OCHA field office.

The OSOCC structure, including an RDC at entry points for international emergency teams, will usually be established in earthquake situations where international Urban Search and Rescue (USAR) teams are assisting in the rescue of survivors.

UNDAC System

The UNDAC system consists of four components.

i) Staff: Professional and experienced emergency managers and humanitarians made available for UNDAC missions by their respective Governments, international/regional (inter-governmental or non- governmental) organisations, United Nations agencies, funds and programmes, together with OCHA staff. UNDAC team members are specially trained and equipped for their task;
ii) Methodology: Pre-defined methods for establishing coordination structures, and for organising and facilitating assessments and information management during the first phase of a sudden-onset disaster or emergency;
iii) Procedures: Proven systems to mobilise and deploy an UNDAC team to arrive at the disaster or emergency site within 12-48 hours of the request, and
iv) Equipment: Personal and mission equipment for UNDAC teams to be self-sufficient in the field when deployed for disasters/emergencies.

The United Nations Disaster Assessment and Coordination, (UNDAC) handbook is intended as an easily accessible reference guide for members of an UNDAC team before and during a mission to a disaster or emergency.

The handbook is not an authoritative instruction but rather represents an accumulation of institutional memory related to processes and procedures for coordination as seen in the scope of the UNDAC terms of reference. Its focus is on the “how to” of coordination but also includes sufficient context to ground the user in the Office for Coordination of Humanitarian Affairs’ (OCHA) mandate. It gives guidance on coordination functions and structures as well as helping “troubleshoot” coordination barriers that may be encountered. It provides an insight into coordination resources, partners, and important contextual information that may contribute to UNDAC effectiveness.

5.1.1.2 United Nations On-Site Operations Coordination Centre

The On-Site Operations Coordination Centre (OSOCC) is a rapid response tool that provides a platform for the coordination of international response activities in the immediate aftermath of a sudden-onset

emergency or a rapid change in a complex emergency. It is at the same time both a methodology and a physical location for on-site emergency response coordination. The OSOCC is designed to work in support of the Government of the affected country and is a tool promoted and supported by the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) to carry out its mandate of coordination and information management in emergency response, particularly at the field level.

The nature of the OSOCC enables the concept to be utilised by other organisations when responding to emergencies, including Governments, international and regional response organisations. It is a concept that can be internalised entirely by national emergency management structures who are in the lead of coordinating the assistance to populations affected by emergencies in their countries. These OSOCC Guidelines are intended for use of Governments through their Local Emergency Management Authority (LEMA), organisations or response teams who may be establishing and managing an OSOCC, e.g., United Nations Disaster Assessment and Coordination (UNDAC) teams, organisations or teams who may work within an OSOCC, such as regional organisations, sector/cluster coordinators, Urban Search and Rescue (USAR) teams, and Emergency Medical Teams (EMTs).

Historical Context

The International Search and Rescue Advisory Group (INSARAG) was established in 1991 and developed the INSARAG Guidelines, which describe a concept for an On-Site Operations Coordination Centre (OSOCC) intended to improve the coordination of international assistance in support of the Government of an affected country, specifically for coordination of international urban search and rescue (USAR) operations. The United Nations General Assembly, in Resolution 57/150 of 16 December 2002 on “Strengthening the Effectiveness and Coordination of International Urban Search and Rescue Assistance”, endorsed the INSARAG Guidelines and stressed the importance of UN Member States following these Guidelines for coordination of international USAR assistance, thereby also endorsing the OSOCC concept. The Resolution also commended the work of UNDAC teams in facilitating rapid need assessments and assisting UN Member States to organise the on-site coordination of international USAR operations.

The functional organisational model the OSOCC is built upon can trace its origins back to the Roman Empire through the Napoleonic wars, and numerous emergency management organisations have used variations of the functional approach in their plans and structure throughout history. INSARAG and OCHA originally developed the OSOCC concept to assist affected countries in coordinating international USAR efforts following an earthquake.

However, the emergency management principles of the OSOCC concept make it a valuable tool in any sudden-onset disaster or complex emergency requiring the on-site coordination of international relief resources in the absence of other existing and functioning coordination systems. Since its inception, the OSOCC concept has been successfully implemented numerous times in situations ranging from regional emergency events to major international disasters.

Many Governments have integrated the OSOCC concept or components of it into their national emergency management plans, enabling them to establish and resource OSOCC components or related coordination cells, e.g., Reception Departure Centre (RDC), USAR or Emergency Medical Team (EMT) coordination cells, etc., when a disaster strikes, and international assistance is requested

Humanitarian Context

The OSOCC concept and the value it provides during a disaster are understood better within the humanitarian context in which it operates. The following sections introduce the humanitarian system as it relates to disaster response and its applicability to the OSOCC.

Humanitarian Principles

Humanitarian assistance is an extension of the desire to help others through a systematic mobilisation of resources. Assistance is provided to population groups based on rights and needs to save lives and alleviate suffering. International humanitarian assistance is provided in accordance with a set of humanitarian principles which have long guided the work of the International Committee of the Red Cross and the Red Cross/Turkish Red Crescent Movement, and which were endorsed by United Nations General Assembly Resolutions 46/182 (1991) and 58/114 (2004). The principles are:

i) Humanity – Human suffering must be addressed wherever it is found. The purpose of humanitarian action is to protect life and health and ensure respect for human beings;
ii) Neutrality – Humanitarian actors must not take sides in hostilities or engage in controversies of a political, racial, religious, or ideological nature;
iii) Impartiality – Humanitarian action must be carried out based on need alone, making no distinctions based on nationality, race, gender, religious belief, class, or political opinions; and
iv) Independence – Humanitarian action must be autonomous from the political, economic, military, or other objectives that any actor may hold in relation to areas where humanitarian action is being implemented.

The humanitarian principles are central to the work of OCHA and numerous international response organisations. They are an essential element of coordination activities and are applicable to the OSOCC as a mechanism supporting principled humanitarian assistance to all those in need.

United Nations General Assembly Resolution 46/182 states that the Government of each Member State is responsible for meeting the needs of its people, including requesting assistance if needed and facilitating the work of humanitarian organisations. Assistance is never forced upon a State unless the United Nations Security Council deems it necessary to preserve international peace and security. To do so without being invited can be considered a violation of international conventions. Consequently, all international humanitarian assistance is conducted in support of, and at the request of, national authorities.

An OSOCC may operate under one of three general models.

i) Direct coordination of response activities at the request of a government;
ii) Coordination of specific aspects and support of others in cooperation with the Government; and
iii) In support of the Resident Coordinator/ Humanitarian Coordinator (RC/HC).

In most instances, the OSOCC will be established and operated by an UNDAC team on behalf of OCHA in support of the Government and the RC/HC.

The OSOCC concept provides a platform and methodology for operational coordination on- site in a disaster area when other structures for international assistance and coordination, such as clusters or a nationally established structure that incorporates international actors, are not yet functioning.

The OSOCC concept was developed as a rapid response tool that works in close cooperation with the affected Government to provide a system for coordinating and facilitating the activities of international relief efforts at the site of a disaster. It is primarily used in sudden-onset disasters, and particularly in large-scale emergencies, however, is applicable in other contexts including complex emergencies and in smaller scale emergencies where a mechanism for operational field coordination does not exist or requires enhancement.

OSOCC Purpose

The OSOCC has two core objectives.

i) To provide a means to rapidly facilitate on-site cooperation, coordination, and information management between international responders and the Government of the affected country in the absence of an alternate coordination system; and
ii) To establish a physical space and act as a single point of service provision for incoming response teams.

The OSOCC is intended to serve as a conduit for information exchange between the Government and the various relief providers to facilitate cooperation with, and coordination of, international humanitarian assistance; and to provide a platform for coordination amongst actors who do not normally work in close collaboration. The OSOCC supports on-site coordination and information exchange and facilitates a broader coordination platform that extends well beyond the physical OSOCC.

To optimize its effectiveness, the OSOCC should be established in the immediate aftermath of a disaster requiring international assistance or when indicated by a change in situation of an existing emergency. Wherever possible, the OSOCC should be near the disaster site and relevant national government authorities. The timeliness of set-up and the appropriateness of location are both critical in sudden-onset disasters to ensure optimal rescue and relief efforts.

Although an OSOCC is intended as a short-term response tool for the immediate lifesaving and relief phases of a disaster, it should be established with enough flexibility and foresight to adjust to the magnitude and complexity of an emergency as it unfolds. When an OSOCC becomes fully engaged in the coordination of international humanitarian response, its role and activities may be extended to meet the changing requirements dictated by an evolving situation. It is expected that an OSOCC in some form would be operational during the relief phase of an emergency until the Government of the affected country, together with United Nations agencies and NGOs if required, can resume the responsibility of coordination of international resources through its own structures and offices.

OSOCC Context

When established, the OSOCC works within the existing humanitarian system both internationally and in the affected country, as illustrated below..

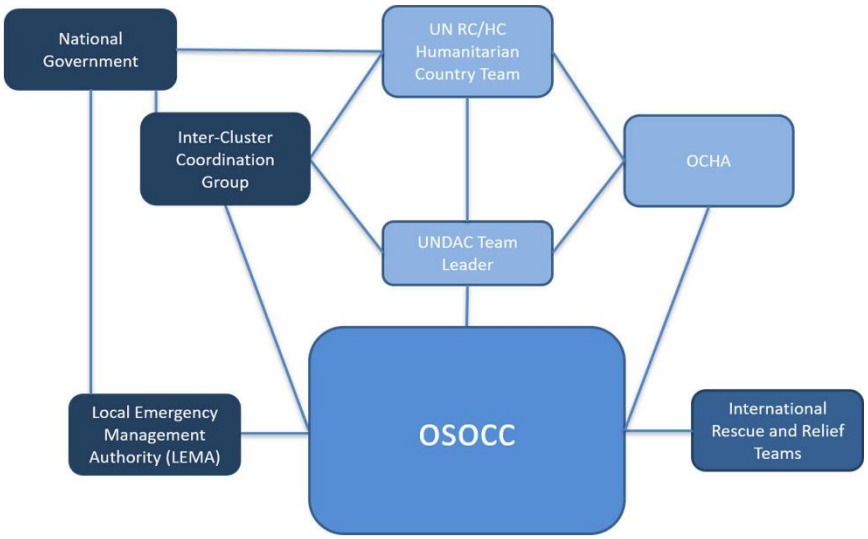


Figure 2 A strategic overview of the OSOCC system

The OSOCC generally reports to the UNDAC Team Leader, who in turn ensures that activities of the OSOCC are aligned with the strategic direction of the RC/HC and the HCT and supported by OCHA. In cases where an UNDAC Team is not deployed, the OSOCC may report directly to the RC/HC and/or the Government. In cases where the OSOCC is established and operated by regional coordination teams, they may also report to their sending organisation.

The OSOCC works in support of the affected Government in coordinating the efforts of international response organisations. Within the affected country, the LEMA is responsible for the overall command, coordination and management of the response operation, thus the OSOCC maintains a strong connection to the LEMA throughout operations.

In addition to the entities within OCHA and within the affected country, the OSOCC supports and collaborates with cluster coordinators and responding teams. This can be done through integration into the OSOCC structure, including a physical presence in the OSOCC facility, and/or through formal or informal liaison.

OSOCC Principles

The OSOCC is an effective response tool that is proven to facilitate coordination amongst international response organisations in support of provision of timely and efficient humanitarian assistance in a disaster. While the impact of a given disaster and the nature of the response will determine the specifics of OSOCC operations, the following principles are consistent with and fundamental to the OSOCC concept.

Respect for existing mandates and structures

The OSOCC operates in a manner that respects the authorities, mandates, capacities and capabilities that exist both within the Government of the affected country and the broad humanitarian system. The efforts of the OSOCC are intended to provide operational support to a strategic lead, e.g., the national Government, United Nations agencies or other entities, in a disaster situation.

Coordination

The strength of the OSOCC is derived from its ability to encourage agreement and foster trust and cooperation between all parties to advance the provision of humanitarian relief for a disaster-affected population. Coordination is conducted in a cooperative manner that supports facilitation of activities

rather than a directive approach. Information management and sharing of information plays a key role in this.

Functional approach

The OSOCC employs a functional approach to its structure whereby responsibilities belong to a function rather than a position or person. This approach allows the OSOCC to carry out the response activities required utilizing the resources available while ensuring functional responsibilities are met.

Flexibility

The functions of an OSOCC may expand and contract throughout its period of existence. Not all functions may be activated during a response, depending on the specific needs of the disaster. The responsibilities of the functions not activated may still need to be considered by the OSOCC to ensure that there are no gaps and to enable the system to adapt to the changing situation.

Scalability

The OSOCC functions are scalable to the needs of the response. Functions can be expanded in terms of staff and structure without compromising their core purpose and scope.

These principles are present in all aspects of OSOCC operations and contribute to its success as a rapid response tool in a period characterised by chaos, uncertainty, and lack of information. The practical application of these principles to the operational aspects of the OSOCC system is outlined in Part II of these Guidelines.

OSOCC as a national emergency management tool

Disaster response capacities vary by region and country. Many disaster-prone countries face coordination, communication, and information management challenges at national, provincial and field levels, which may be exacerbated by economic and technological factors, as well as human resource limitations. Equally problematic are systemic barriers to effective coordination related to rigid national disaster management structures and their constituent bodies.

Government and other emergency management related organisations tend to be structured in a traditional command and control format with defined, vertical reporting lines. Where they exist, national emergency operations centres are also generally designed using this model, many with provincial- and/or local-level supporting incident command posts. In many ways, command and control is well suited to disaster management as, in theory, it enables swift, decisive action. However, as the number of actors involved in a larger response grows, the importance of inter-agency coordination increases, and collaboration enabled by systemic flexibility and adaptability becomes imperative for effective action. Organisations with closed, vertical systems are often challenged when having to interact laterally with actors that fall outside their command structure.

In multi-agency emergency responses, ‘siloed’ organisational activity tends to result in gaps and duplications, while competing mandates and unclear designation of roles and responsibilities in the larger response system aggravate these issues and their consequences. Inter-agency coordination can present significant obstacles, especially in developing-country contexts where communications and reporting links within and between underfunded organisations and across sectors are often weaker.

The OSOCC model, focusing on facilitation of coordination and collaboration through service provision and sharing of information, rather than command and control, offers this option and is sometimes included in national preparedness programmes and response planning.

National authorities in many countries have adopted and implemented (elements of) the OSOCC concept to coordinate domestic disaster relief and humanitarian assistance at the field level. The decision to deploy the OSOCC would come from the National Disaster Management Organisation (NDMO) but staffing would strive to be representative of the local context and would include a variety of governmental and non-governmental actors.

Regarding structures, only the functions and cells that serve a purpose in specific national contexts would be utilised.

Like the international OSOCC model, the OSOCC for national use is not intended to replace or even parallel pre-existing emergency management structures at local, provincial or national levels, but rather serve in a supplemental capacity, augmenting overall, systemic coordination capacity between the LEMA and non-government response organisations. The purpose of a local OSOCC should provide the NDMO with an instrument to implement policy decisions and facilitate coordination of relief resources at a disaster site.

5.1.1.3 The UN Cluster System

In 2005, a major reform of humanitarian coordination, known as the Humanitarian Reform Agenda, introduced several new elements to improve the predictability, timeliness, inclusiveness, and effectiveness of international humanitarian response. As part of this process, the Cluster Approach was endorsed to strengthen response capacity and effectiveness in the main sectors of response.

Under the system, recognised sectors of humanitarian activity are organised in clusters in which humanitarian organisations collaborate in common areas of work towards agreed humanitarian objectives at both the global and country levels. The Cluster Approach ensures clear leadership, predictability, and accountability in the international response to humanitarian emergencies by clarifying the division of labour among organisations and better defining their roles and responsibilities within the different sectors of response.

Cluster partners may include United Nations agencies, national organisations, the Red Cross/Turkish Red Crescent Movement, and international non-governmental organisations (NGOs). At the country level, government ministries/departments will ideally co-lead the respective cluster along with a globally or locally identified Cluster Lead Agency. Global Cluster Lead Agencies, who report to the ERC, have been designated by the Interagency Standing Committee (IASC) for 11 sectors of humanitarian activity:

through the ERC to the IASC Principals (i.e., heads of agency/organisation) and Global Cluster Leads.

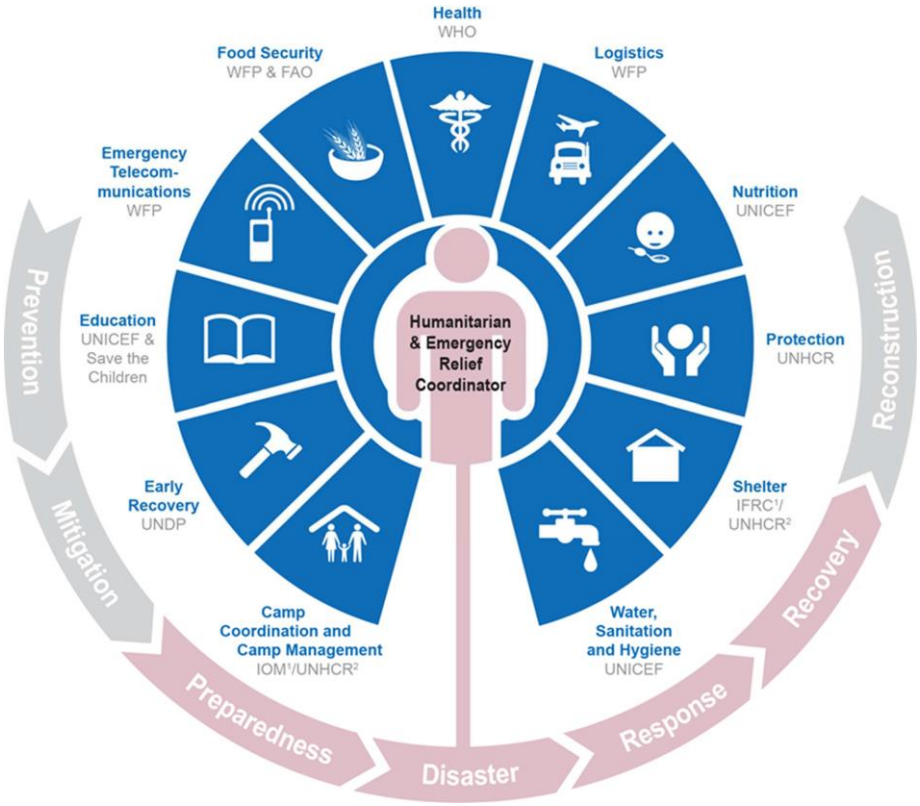


Figure 3 The UN cluster system

As a coordination platform, the OSOCC provides an opportunity for clusters to plug into an established coordination mechanism as soon as they arrive on-site. In some cases, functions that are initially carried out under the umbrella of the OSOCC may transfer to a cluster coordinator once established on-site. Other coordination cells may already be set up under the umbrella of national coordination mechanisms, such as EMT coordination with the Ministry of Health (MoH), and only link up with the OSOCC for information exchange.

5.1.1.4 Virtual On-Site Operations Coordination/VOSSOCC.

The Virtual On-Site Operations Coordination Centre (VO) is a web-based information management tool developed by the Field Coordination Support Section (FCSS) of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), Geneva. The VO is an integral partner of the Global Disaster Alert and Coordination System (GDACS). The GDACS provides near real-time alerts of natural disasters around the world to facilitate response coordination, including media monitoring, map catalogues and the VO.

The VO is designed as an on-line information portal for the facilitation of information exchange between responders and affected counties before, during and after sudden-onset disasters. Access to the VO is password restricted to disaster managers from governments and disaster response organisations

5.1.2 European Union Civil Protection Mechanism (UCPM)

The UCPM is a framework for cooperation in disaster risk management among national civil protection authorities within the European Union. There is also a framework to allow for associate membership within the mechanism for non-European Union Member states, called Participating States, which includes at the moment Iceland, Norway, Montenegro, North Macedonia, Serbia, and Turkey.

In the document for countries involved in the UCPM, EU member states and UCPM participating states, the term UCPM member states will be used.

Mandate

The EU's Civil Protection legislation was revised in December 2013 to bring together the various aspects needed for a comprehensive disaster management policy: disaster prevention, disaster preparedness and improved response arrangements (European Commission 2013).).

Article 1(1) of Decision No 1313/2013/EU sets out the mechanism's general objective and subject matter. Article 3(1) of the Decision, states that the UCPM is intended to "support, complement and facilitate coordination of Member States" action in pursuit of the following common specific objectives.

To achieve a high level of protection against disasters by preventing or reducing their potential effects, by fostering a culture of prevention and by improving cooperation between the civil protection and other relevant services:

i) to enhance preparedness at Member State and Union level to respond to disasters;
ii) to facilitate rapid and efficient response in the event of disasters or imminent disaster;
iii) to increase public awareness and preparedness for disasters.

UCPM Toolkit

To deliver the aims of the framework several tools have been developed to assist the UCPM.

The Emergency Response Coordination Centre (ERCC) is available on a 24/7 basis. Any country affected by a major disaster – inside or outside the EU – can launch a request for assistance through the ERCC. During emergencies, the ERCC serves as a communications hub, provides information and supports co-ordination. The process flow is represented in **Figure 4** below.

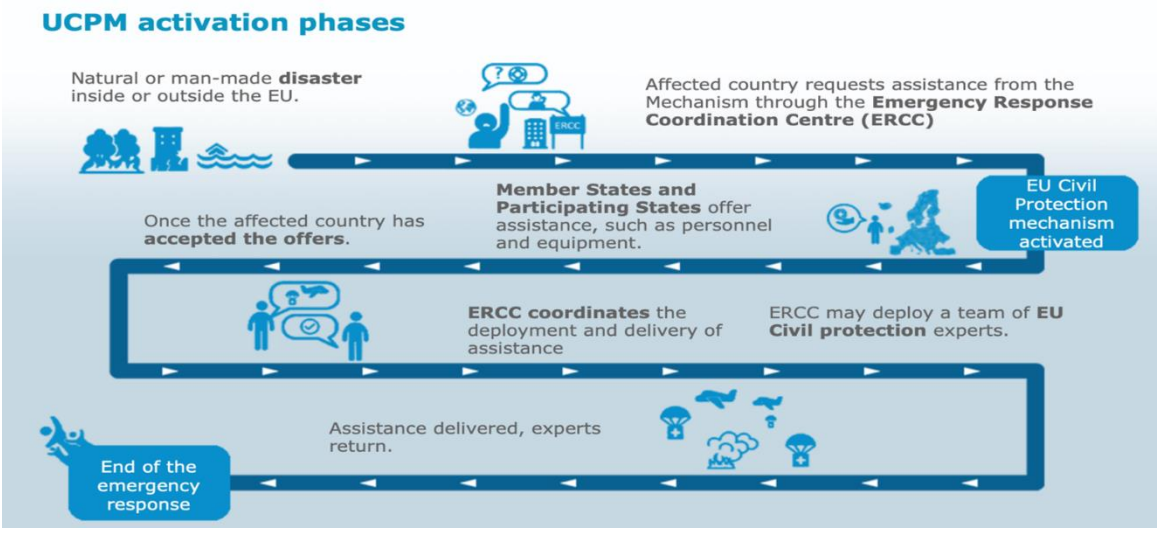


Figure 4 UCPM activation phases

The Common Emergency and Information System (CECIS), a web-based alert and notification application that is tasked with ensuring communication and effective sharing of information between the MIC and national contact points.

A training program including training courses, the organisation of joint exercises, and an exchange of experts among the UCPM member states. The purpose is to ensure that the deployed teams and resources from the national civil protection institutions can cooperate effectively in line with the accepted standards and methodologies, despite divergent approaches to civil protection.

In alignment with international commitments, such as the Sendai Framework for Disaster Risk Reduction 2015 – 2030, the UCPM committed to growing the Union Civil Protection Knowledge Network as part of the 2019 revisions. In addition to supporting experts, practitioners, trainers, and volunteers, the Disaster Risk Management Knowledge Network (DRMNK) is intended to be a platform for relevant national structures, centres of excellence, researchers, universities, knowledge centres, international organisations, and third-party countries that are not a Member or Participating State of the UCPM.

The European Emergency Response Capacity (EERC) (or 'voluntary pool') has brought together a range of relief teams, experts and equipment from a number of UCPM member states and participating states. These assets were made available as soon as needed for EU civil protection missions all over the world. Since its launch in October 2014, 25 UCPM member states of the UCPM have committed a total of 74 response resources, or 'capacities', to the pool. In 2016 a certification process for register capacities was introduced to provide a process to assure the predictability of capacities based on defined principles to ensure that nations requested assistance received the type of capacity they were expecting. It also ensured that all responding capacities were self-sufficient for a defined number of days and were able to operate within an agreed operational methodology.

The EC has created a quality criteria, certification, and registration process to ensure that the capacities committed to the Pool meet "common high standards". Certification includes the participation of the capacities in disaster simulation exercises in order for peers and teams to train together in emergency response scenarios. This also improves the ability of European response capacities to operate efficiently during deployments.

UCPM Member states participating in the pool could benefit from EU financial support to upgrade the offered national response assets (adaptation grants), to pay for certification and training costs and to cover up to 85 % of the costs related to the transport of teams and assets to disaster areas. It can be seen in the overview in Figure 5 below.

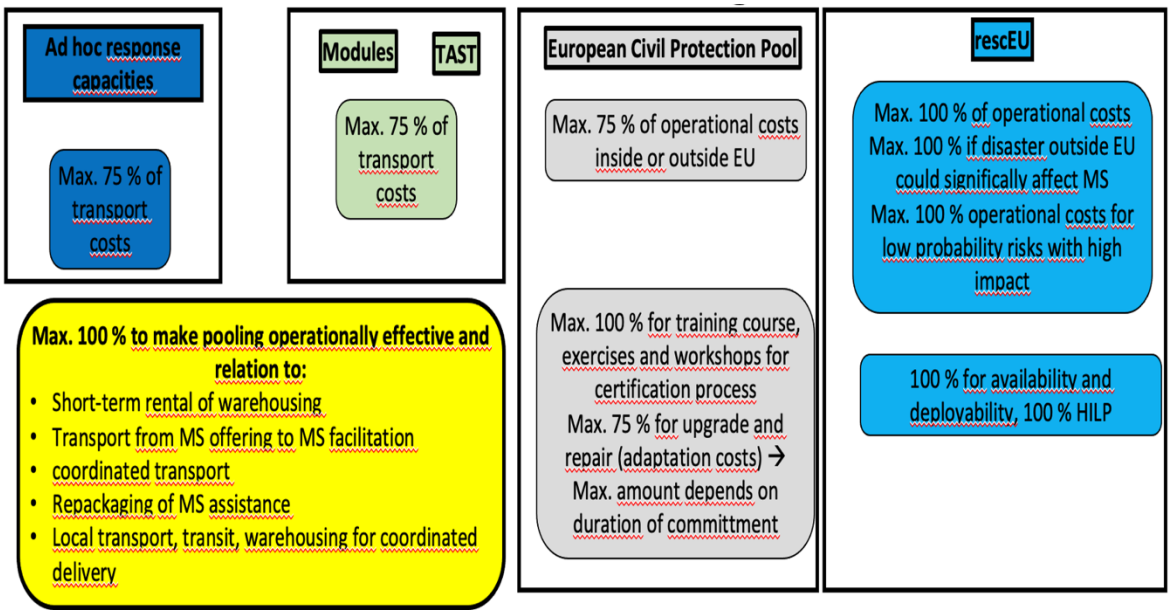


Figure 5 Overview of the financial support available for the UCPM response capacities

In 2019 the commission passed legislation to allow the enhancement of the EERC through the establishment of rescEU, which provided a reserve of operational resources within UCPM member states, funded centrally by the commission, that can be called upon by any member or participating state. The reserve includes a fleet of firefighting planes and helicopters, medical evacuation planes, as well as a stockpile of medical equipment and field hospitals that can respond to health emergencies, and chemical, biological, radiological, and nuclear incidents, European Civil Protection (2019).

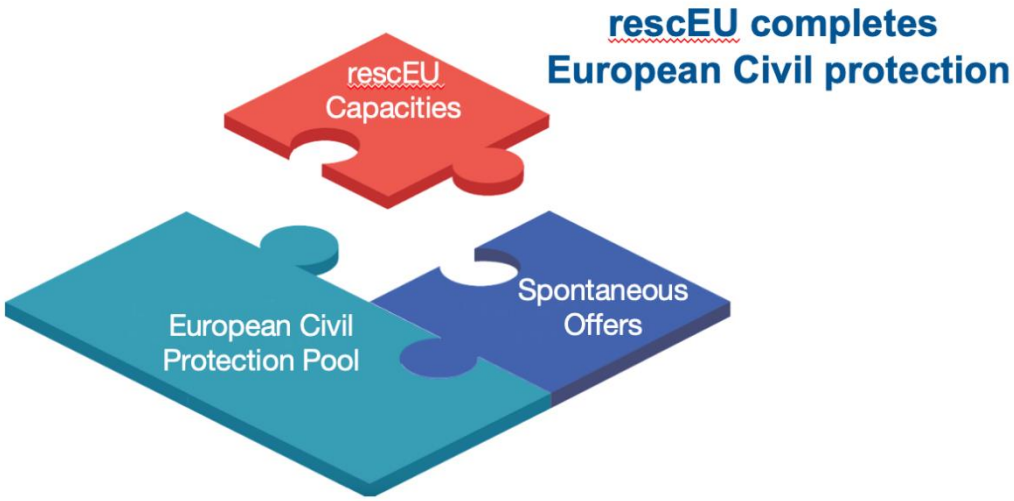


Figure 6 Illustrating how RescEU completes EU civil protection

The EUCPM has also been heavily involved during 2020/21 in assisting UCPM member states response to the COVID-19 Pandemic, through the deployment of the medical stockpile within rescEU and coordinating requests for assistance from member and participating states.

5.1.2.1 Modules

According to Decision No 1313/2013/EU[67], "module" means a self-sufficient and autonomous predefined task- and needs-driven arrangement of Member States' capabilities or a mobile operational team of the Member States, representing a combination of human and material means that can be described in terms of its capacity for intervention or by the task(s) it is able to undertake.

The general requirements of each type of module are defined in the Commission Implementing Decision 2014/762/EU or its subsequent amendment Commission Implementing Decision (EU) 2018/142 of 15 January 2018, which lay down rules for the implementation of Decision No 1313/2013/EU of the European Parliament and of the Council on a Union Civil Protection Mechanism.

A module or group of modules combined to have an effect are described as a capability; e.g.,., a MUSAR module when deployed or combined becomes part of a USAR capability.

The number of modules provided for a particular event is described as a capacity and the total number of modules provided to support planned-for events across the entire UCPM is described as a capacity goal.

Table 12 Modules currently defined within the UCPM

Code	Module
AMP	Advanced medical post
AMP-S	Advanced medical post with surgery
CBRNDET	CBRN detection and sampling
CBRNUSAR	USAR in CBRN conditions
EMT1 fixed	Emergency medical team type 1: Outpatient Emergency Care – fixed
EMT1 mobile	Emergency medical team type 1: Outpatient Emergency Care - mobile
EMT2	Emergency medical team type 2: Inpatient Surgical Emergency Care
EMT3	Emergency medical team type 3: Inpatient Referral Care
ETC	Emergency Temporary Camp
FC	Flood containment
FFFH	Aerial forest firefighting module using helicopters
FFFP	Aerial forest fire fighting module using planes
FHOS	Field hospital
FRB	Flood rescue with boats
GFFF	Ground forest fire fighting
GFFF-V	Ground forest fire fighting using vehicles
HCP	High-Capacity Pumping

[67] Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism

HUSAR	Heavy urban search and rescue
MEVAC	Medical aerial evacuation of disaster victims
MUSAR	Medium urban search and rescue
TAST	Technical Assistance and Support Team
WP	Water purification

5.1.2.2 UCPM Activation

Since 2001, the UCPM has been activated more than 420 times. It can be deployed inside and out-side the EU. Any country in the world, as well as UN agencies and other relevant international organisations, can call on the UCPM for help.

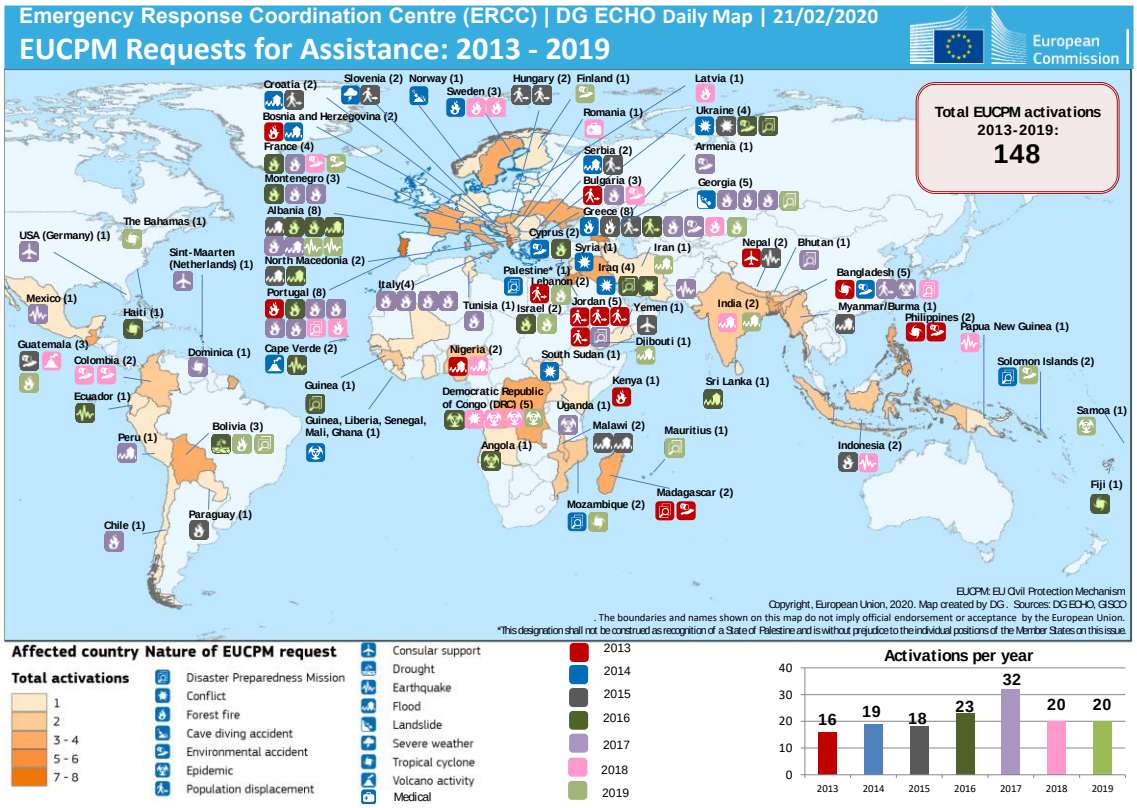


Figure 7 Overview of request for UCPM assistance 2013-2019

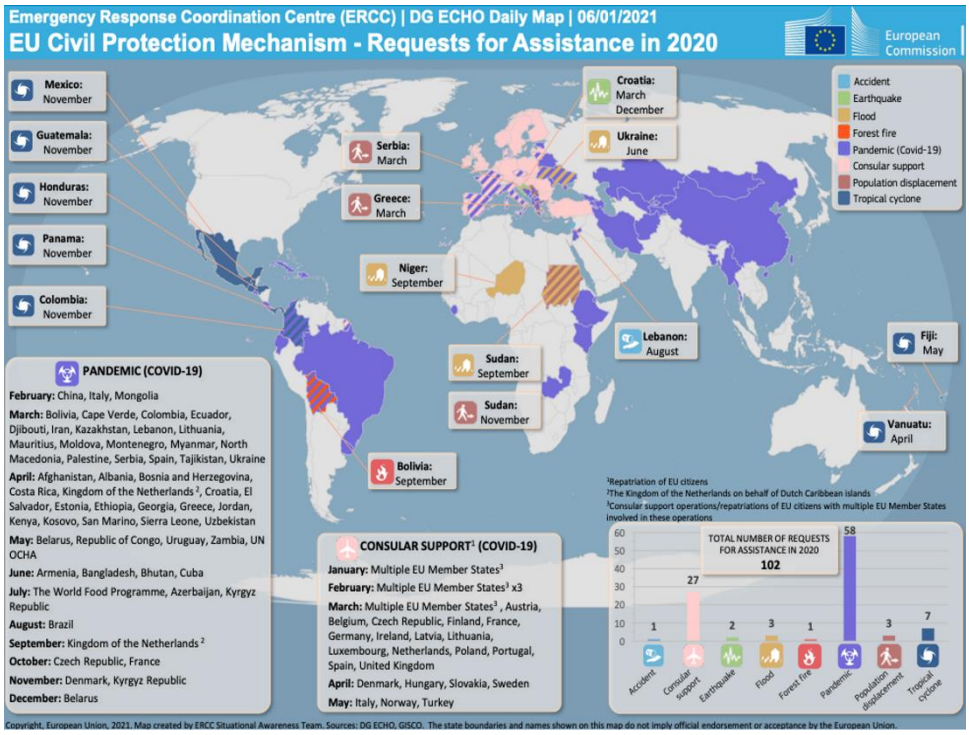


Figure 8 UCPM requests for assistance 2020

The Mechanism is activated when a disaster overwhelms a country's response capacity and a request for assistance is made through the ERCC.

The ERCC then coordinates the deployment of expertise and delivery of assistance offered by UCPM Member States with resources committed.

The ERCC is located in the premises of DG ECHO in Brussels. It has a fully staffed and trained duty system with circa 40 staff, which operates 24 hours a day 7 days a week to ensure real-time monitoring of events around the world. The Centre acts as a coordination hub between all UCPM Member States, the affected country, and civil protection and humanitarian aid experts.

The Centre ensures rapid deployment of emergency support through direct links with national civil protection authorities and by drawing on the resources pre-committed by UCPM Member States to the Pool and rescEU. The Centre then coordinates the delivery of this assistance to countries in need.

Operationally, the Centre is enhanced by its collaboration with the Copernicus Emergency Management Service, which provides geospatial information via satellite maps to assist the planning of disaster relief operations. The UCPM can also be activated for marine pollution emergencies. In such cases, the Centre mobilises oil recovery capacity and expertise from UCPM member states and the European Maritime Safety Agency.

The Centre uses a range of monitoring and communication tools to monitor events and operationalise their response capacities. These include the:

Common Emergency Communication and Information System (CECIS) – a web-based alert and notification system that enables real-time information sharing between the ERCC and UCPM Member States. When resource capacities committed by UCPM Member States are accepted and certified by the Pool, it is registered via CECIS in a common database system.

European Flood Alert System (EFAS) – monitors and forecasts floods across Europe; in particular in the large transnational river basins. It provides complementary, added-value information (e.g., probabilistic, medium range flood forecasts, flash flood indicators, or impact forecasts) to relevant national and regional authorities, as well as the ERCC.

European Forest Fire Information System (EFFIS) – consists of a modular web geographic information system that provides near real-time and historical information on forest fires and forest fires regimes in the European, Middle Eastern, and North African regions. Monitoring in EFFIS comprises the full fire cycle, providing information on the pre-fire conditions and assessment of post-fire damage.

Global Disaster Alerts and Coordination System (GDACS)- a cooperation framework between the UN and the EC. It provides real-time access to web-based disaster information systems and related coordination tools worldwide, with the aim to address information and coordination gaps in the first phase of major disasters.

European Mediterranean Seismological Centre (EMSC) a system for rapid determination of the European and Mediterranean earthquake epicentres. EMSC receives seismological data from more than 65 national seismological agencies, mostly in the Euro-Mediterranean region. The most relevant earthquake parameters, such as the location and magnitude, are communicated within one hour from an earthquake's onset.

5.1.2.3 Copernicus[68]

The Copernicus Emergency Management Service is part of the Copernicus Programme, which is an EU Programme managed by the European Commission (EC) and implemented in partnership with the UCPM Member States, the European Space Agency (ESA), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the European Centre for medium-range Weather Forecasts (ECMWF), EU Agencies and Mercator Océan. The Programme is aimed at developing a set of European information services based on satellite Earth Observation and in situ (non-space) data.

Managed directly by the European Commission via the Joint Research Centre and DG ECHO, it delivers warnings and risk assessments of floods and forest fires and provides geospatial information derived from satellite images on the impact of natural and man-made disasters all over the world (before, during or after a crisis). Through these, it supports crisis managers, civil protection and hydro-meteorological authorities, humanitarian aid actors dealing with natural disasters, man-made emergency situations, and humanitarian crises, as well as those involved in recovery, disaster risk reduction and preparedness activities. As an EU service, the EMS's first priority is responding to EU needs and interests, whether within the EU or abroad. The Emergency Management Service is provided free of charge to authorised users. The service has two main components:

Early Warning - *The European Flood Alert System (EFAS)* is the first operational European system monitoring and forecasting floods across Europe. It provides complementary flood early warning information up to 10 days in advance. EFAS provides a variety of different products including flood monitoring, probabilistic flood forecasts, flash flood indicators, flood impact assessments and seasonal flood risk outlooks. To offer similar services at the global scale, the Global Flood Awareness System (GloFAS) is currently in its pre-operational testing phase (expected to be fully operational in 2017).

The European Forest Fire Information System (EFFIS) provides information on forest fires and their ecological impacts in the European, Middle East and North Africa regions. Fire monitoring in EFFIS encompasses the full fire cycle, comprising near-real time information services regarding the current

[68] Copernicus Factsheet - https://www.copernicus.eu/en/documentation/information-material/general-fact-sheets

and future fire danger forecast, active fires and burned areas, and post-fire damage assessments. The extension of EFFIS towards a Global Wildfire Information Systems (GWIS) is underway in collaboration with the Group on Earth Observations (GEO).

Mapping. The EMS Mapping Service provides geospatial information (maps) derived from satellite images to assess the impact and respond to natural and man-made disasters. The mapping service operates in two modes: Rapid Mapping for emergencies that require an immediate response, and Risk & Recovery Mapping for situations that do not require immediate action such as prevention and disaster risk analysis and recovery activities.

EFAS partners can access the information through a customisable web interface and web services in real-time. Any national, regional, or local authority that is legally obliged to provide flood forecasting services or has a national role in flood risk management within its country and the European Commission Services can become an EFAS partner. In addition, if agreed with the national authorities in charge of forecasting, other parties can become partners as well. Real-time access to GloFAS products will be free, subject to registration (pr

5.1.2.4 Principles of Host Nation Support

When disaster strikes which overwhelms national response capacities, the importance of a well organised Host Nation (HN) support system becomes evident. A number of serious major incidents such as the Deepwater Horizon accident in 2010 and the Fukushima accident in 2011 demonstrate that countries that do not usually receive international assistance often do experience problems with organising effective reception mechanisms when a disaster occurs.

The EU Host Nation Support Guidelines were adopted in January 2012 and build on existing international recommendations and practices. They specifically target the facilitation of assistance operations under the EUCPM improving solidarity amongst the UCPM member States. Third countries that are likely to request and receive assistance in case of need under this framework are also encouraged to take these non-binding guidelines into account and they provide a useful baseline for these countries to develop their own rules and protocols.

The 2012 Host Nation Support Guidelines (EU HNSG) aims at assisting the affected UCPM member States to receive international assistance in the most effective and efficient manner. It states that “The level of HNS may vary according to the severity of the situation and will be subject to a prior agreement between the requesting and offering Participating States”. The guidelines are of a non-binding nature, which aims to provide guidance and support for UCPM member States. HNS take account of all actions undertaken in the preparedness phase and in the disaster response management by a participating State, whether receiving or sending assistance to remove as much as possible any foreseeable obstacles to international assistance. This ensures that disaster response operations proceed smoothly. It also includes the support that UCPM member States can provide to facilitate international assistance transiting through their territory by land, sea or air.

The primary responsibility for dealing with the immediate consequences of a disaster lies with the affected country. However, when the scale of the emergency overwhelms its national response capabilities, assistance can be requested from other countries and international actors.

The following areas should be considered by receiving nations when making requests for international assistance

Safety & Security

The HN should be responsible for, and take appropriate measures, to address the safety and security of personnel of the incoming teams and modules and of the locations, facilities, means of transport, equipment and goods used in connection with the international assistance provided.

The safety measures shall be taken by deployed teams and modules in cooperation with the HN. For operating equipment of the modules/teams, the main responsibility lies with the responding teams themselves.

Emergency Planning

Advanced planning with a focus on incoming assistance arrangements is a vital aspect of effective European emergency response cooperation. To ensure proper HNS in case of a major disaster, UCPM member States should consider setting up/integrating national arrangements to allow for international emergency support within their territory. To do so, it is helpful to have in advance an analysis of national risks and possible capacity gaps of national resources. This analysis will help to define the moment when a country may activate the EU CP Mechanism and to formulate a precise and timely request for assistance.

All emergency management actors should be identified and made aware of their responsibility in the different phases in the process of HNS. All levels of emergency management authorities/actors should be aware of the EU CP Mechanism and of international guidelines and standards.

During the emergency planning phase, the UCPM member states should, inter alia:

i) focus on the preparation of country briefings/factsheets for incoming teams;
ii) the identification and training of liaison officers (LO) (preferably EU CP trained experts) to join the incoming team;
iii) the set-up and training of HNS team/cell.

The HN and incoming teams and modules should take all necessary measures to ensure the interoperability of the assistance.

Emergency management and co-ordination on site

UCPM member states should use the existing EU and other international coordination systems as much as possible.

The HN should decide at all levels of its existing emergency command, control and coordination structure to facilitate the coordination of international assistance. At the same time, incoming teams should be aware of the HN command, control and coordination structure and should report to the on-site commander at least daily.

The HN should use CECIS (Common Emergency Communication and Information System) as the primary tool and Virtual OSOCC (On-Site Operations Coordination Centre) when applicable to provide regular updates at the headquarter level regarding casualties and damage, entry points and procedures, specific requests for assistance and to inform all international participants of any special cultural, religious or traditional habits of the affected country, weather, safety and security issues.

The HN should establish entry points, Reception and Departure Centre (RDC), a base of operations (BoO), a HNS team and should provide incoming teams with information in the form of a prepared Country briefing (Annex 8). The HN should also consider requesting support from an EU CP Team. The HN when setting up its emergency coordination structures should use the existing EU and other international concepts (such as the OSOCC concept).

Logistics/transport

The respective National Contact Points (NCP) of the UCPM member States should use the existing EU CP procedures for requesting and offering support. To streamline this process, they should use the templates provided for by these guidelines to request the international assistance (Annex 2 and 4) and the corresponding answer forms for offering assistance (Annex 3 and 5). The UCPM member states should ensure that use of these templates is incorporated into national contingency planning, courses, training, and exercises.

All UCPM member States should pre-identify points of entry for incoming teams. Entry points can be any type of border crossing (at roads, rivers, railroads, airports, and seaports). The UCPM member states should develop a "catalogue" of these pre-identified entry points, including their capacities.

The HN should make all necessary arrangements to receive the incoming teams and modules at the point of entry (provision of LO, instructions, etc.). As a best practice, it is recommended for the LO to join the incoming team as early as possible.

Transit countries should facilitate quick transit of the teams, modules and in-kind assistance through its territory by removing all potential "obstacles" (e.g., by provision of escorts, route planning, waiving restrictions/regulations) and by providing a single point of contact. The sending nation (SN) is responsible for negotiating these arrangements with the transit nation (TN).

Also, the HN should be responsible for the route planning and the provision of necessary transport arrangements (transport means, escorts, maps, material handling equipment, fuel, food, etc.) for the incoming teams starting from the point of entry and lasting for the entire operation.

The HN should provide logistic support for the incoming teams and the general maintenance of their equipment. The SN are responsible for the specialised maintenance of their equipment, including bringing specialised spare parts for their equipment to ensure self-sufficiency for the whole mission.

The SN should ensure the adequacy and sufficient quality of the offered assistance, in particular food, medicine, and its proper packing, respecting international standards. The HN should communicate all specific requirements connected to the delivery of incoming in-kind assistance (labelling, packaging etc.).

The HN should be responsible for the take-over, storage and distribution of in-kind assistance received.

The HN should be responsible for the identification of a base of operation, located as close as possible to the existing infrastructure. The HN should consider the base of operation requirements such as access to water, electrical power, and sewage, access for cars and trucks, closeness to the disaster site.

The HN should facilitate the use of telecommunication and the possibility to establish the necessary arrangements/facilities to maintain communications with and within the locations of the international assistance operation. The HN should also provide radio frequencies at the latest upon entry.

Whereas the point of entry has been pre-identified by the HN, the decisions concerning the points of exit should be made bilaterally between HN and SN to ensure the most cost- effective and smooth exit transportation route.

Legal Aspects

Numerous UCPM member States have either ad hoc and/or bilateral solutions with neighbouring countries in place. Nevertheless, it is crucial for a smooth delivery of international assistance that the

UCPM member States have solid and systematic solutions ready to identify relevant legal issues that may constitute obstacles to the overall objective of facilitating the provision of international assistance and, if appropriate, modify their legislation.

UCPM member States should consider the granting of legal exemptions, the HN and the TN should:

i) exempt goods and equipment requested from all custom duties, taxes, tariffs, or any governmental fees, and exempt them from all export transit and import restrictions;
ii) simplify and minimise documentation requirements for export, transit, and import;
iii) permit the re-exportation of goods and equipment used, if the SN wishes to retain what it originally owned;
iv) waive or reduce inspection requirements (where this is difficult use pre-clearance processes where possible to clear relief goods and equipment more rapidly); and
v) arrange for inspection and release outside of business hours and/or at a place outside the customs office to avoid unnecessary delay.

The HN should be prepared to ensure that assisting countries and relevant international organisations are provided with temporary authorisation to legally operate on their territory to enjoy the rights, inter alia to open bank accounts, enter into contracts and leases, acquire and dispose of property and instigate legal proceedings, for the sake of providing assistance.

Personnel sent to assist Participating State after the disaster may possess specific skills and qualifications that are regulated in the affected state. Regulated professions usually include doctors, nurses, paramedics, engineers, and others. The HN should, whenever possible, recognise the relevant professional qualifications of relief personnel for the time necessary to carry out the disaster relief assistance.

The HN should, when necessary and possible, exempt relief personnel from visa regulations and immigration inspection. Where visa regulations and immigration inspection cannot be waived, the HN should expedite the necessary formalities at the appropriate point of entry.

Liability

In questions of liability during relief operations, one would first and foremost seek to find amicable settlements between the HN and SN.

Rules for compensation of damage caused by assisting modules/teams to property or service staff of requesting state need to be considered.

For damage suffered by third parties, the requesting State and State providing assistance should cooperate to facilitate compensation for such damage.

To streamline and expedite this process of cooperation and to avoid any potential for later misunderstanding, the HN and SN should agree on the principles for compensating the potential damage suffered by third parties as early as possible, ideally already during the process of requesting, offering and accepting the international assistance. Both, the HN and SN should declare its willingness or non-willingness to cover damage suffered by third parties.

5.1.3 International Forum to Advance First Responder Innovation (IFAFRI)

What is IFAFRI?

IFAFRI is an initiative from the Department of Homeland Security (USA) that was started in 2014. The Forum consists of participants from authorities that represent first responders from 14 countries and the European Commission and meet 1-2 times per year.

The purpose of the Forum is to identify common capability gaps with the objective to facilitate developing the right methods and technology to make the work of first responders both safer and more efficient on future accident sites. To work on this, three committees have been established:

i) capability Gap committee, led by Sweden, responsible for identifying common needs;
ii) research and Development committee, led by the Netherlands, focusing on developing Research and Development cooperation's; and
iii) stakeholder engagement committee, led by the United States, focusing on stakeholder and business intelligence.

So far, 10 common capability gaps have been identified and the work to develop these as well as identifying ongoing frontier research is ongoing.

i) The ability to know the location of responders and their proximity to threats and hazards in real time;
ii) The ability to detect, monitor, and analyse active and passive threats and hazards at scenes in real time;
iii) The ability to rapidly identify hazardous agents and contaminants;
iv) The ability to incorporate information from multiple and non-traditional sources (e.g., social media) into incident command operations;
v) The ability to maintain communications with responders in any surroundings and situations;
vi) The ability to obtain critical information remotely about the extent and content of an incident;
vii) The ability to monitor the physiological signs of emergency responders;
viii) The ability to conduct on-scene operations remotely without endangering responders;
ix) The ability to create actionable intelligence based on data and information from multiple sources; and
x) The ability to provide appropriate and advanced personal protective equipment (e.g., protective clothing, respiratory protective equipment) for all types of incidents and conditions.

As of 1 June 2019, representation to the IFAFRI comprises of members from Australia, Canada, the European Commission, Finland, Germany, Israel, Japan, Mexico, the Netherlands, New Zealand, Singapore, Spain, Sweden, the United Kingdom and the United States.

5.2 Scenario Specific Doctrine & Frameworks

5.2.1 Earthquake

5.2.1.1 The International Search and Rescue Advisory Group (INSARAG)

What is INSARAG?

INSARAG is a network of disaster prone and disaster-responding countries and organisations dedicated to Urban Search and Rescue (USAR) from collapsed structures and operational field coordination.

INSARAG was established in 1991, following initiatives of international search and rescue teams who responded to the 1988 Armenia earthquake. The United Nations was chosen as the INSARAG

Secretariat to facilitate international participation and coordination. The Field Coordination Support Section (FCSS), located within the Emergency Services Branch (ESB) of the Office for the Coordination of Humanitarian Affairs (OCHA) in Geneva, functions as the INSARAG Secretariat.

Mandate

INSARAG activities are guided by UN General Assembly Resolution 57/150 of 16 December 2002 on "Strengthening the Effectiveness and Coordination of International Urban Search and Rescue Assistance". It is mandated to:

i) Render emergency preparedness and response activities more effective and thereby save more lives, reduce suffering and minimize adverse consequences;
ii) Improve efficiency in cooperation among international urban search and rescue (USAR) teams working in collapsed structures at the site of a disaster;
iii) Promote activities designed to improve search and rescue preparedness in disaster-prone countries, thereby prioritising developing countries;
iv) Develop internationally accepted procedures and systems for sustained cooperation between national USAR teams operating on the international scene; and
v) Develop USAR procedures, guidelines and "best practices" and strengthen cooperation between interested organisations during the emergency relief phase.

INSARAG Guidelines[69]

The INSARAG Guidelines provides a methodology to guide countries affected by a sudden-onset disaster causing large-scale structural collapse, as well as international USAR Teams responding in the affected country. The Guidelines also outlines the role of the UN in assisting affected countries in on-site coordination. Reviewed and updated between 2018 & 2020, the INSARAG Guidelines 2020 have recently been published.

Volume I – Policy - describes the INSARAG methodology for international urban search and rescue (USAR) operations and the policy that underpins it. It describes:

i) INSARAG and how it operates;
ii) the roles of affected countries and those assisting in international USAR responses; and
iii) building national USAR capacity;

the INSARAG External Classification (IEC) and INSARAG External Reclassification (IER) systems.

Volume II – Preparedness & Response provides practical guidance and procedures for USAR Teams. It explains the methodology, minimum standards and correct procedures for developing and maintaining a USAR Team. The manuals also provide guidance for ongoing skills maintenance, operational readiness, and classification INSARAG External Classification (IEC) and reclassification INSARAG External Reclassification (IER) requirements. It is targeted at the Operational Focal Point of the INSARAG Member State, as well as the USAR Team Focal Point.

Volume II is structured into three manuals:

i) manual A: Capacity Building;
ii) manual B: Operations; and
iii) manual C: INSARAG External Classification and Reclassification.

[69] https://www.insarag.org/methodology/insarag-guidelines/

Volume III – Operational Field Guide provides field and tactical information at a glance and should be readily available to all responding USAR Team members in trainings and missions.

It is designed as a checklist for the response and can serve the INSARAG members as an example to the individual teams and organisations, to draft their own specific handbooks.

5.2.1.2 World Health Organisation Emergency Medical Team (EMT)

EMTs are groups of health professionals (doctors, nurses, paramedics etc.) that treat patients affected by an emergency or disaster. This team establishes a 'field hospital' made up of tents and 'pop up' medical facilities, with power, water, toilets, accommodation and all the supplies required to establish a clinic in field, community hall, remote area or anywhere else they may be needed. EMTs provide lifesaving medical care in the critical first days and weeks after a disaster.

EMT staff come from governments, charities (NGOs) and international organisations. They work to meet minimum standards set by WHO and its partners and come trained and self-sufficient to avoid burdening the countries, communities and health services they are assisting.

EMTs historically have had a trauma and surgical focus, but outbreaks in Africa (Ebola) and Asia (diphtheria) shown us their value in outbreak response and other forms of emergency that exceed the capacity of the local health system.

EMTs are designed to respond quickly, deploying to an impacted area with days or hours to treat immediate needs following a disaster or emergency.

The World Health Organisation's (WHO) believe that international medical teams need be deployed only in the case of an emergency of overwhelming proportions, and only at the request of the receiving country. This is the reason why WHO and partners to the EMT initiative are supporting the establishment, training and resourcing of national EMTs.

The WHO global Emergency Medical Teams (EMT) Initiative[70] assists organisations and WHO Member States by coordinating the deployment of verified medical teams in emergencies, whenever disaster strikes or an outbreak occurs the more rapid the response the better the outcome. That is why the EMT Initiative places a strong focus on helping every country develop its own teams, which can arrive where they are needed in the shortest time.

WHO's EMT Initiative includes a full range of support to countries, including training and development, mentoring and supporting teams, establishing and sharing global standards, and supporting coordination/deployment of teams in emergencies.

Host governments and affected populations can depend on EMTs from the list to arrive trained, equipped and capable of providing the interventions promised. Patients and their families can expect the clinical teams treating them to provide safe and effective health care.

Both the EUCPM and the International Red Cross/Red Crescent support the development of international standards for Emergency Medical Teams and have agreements in place to ensure that the teams they provide meet the minimum standards required of the WHO initiative

WHO CLASSIFICATION AND MINIMUM STANDARDS FOR FOREIGN MEDICAL TEAMS IN SUDDEN ONSET DISASTERS

[70] http://www.who.int/hac/global_health_cluster/EMT_guidelines_september2013.pdf?ua=1

FMTs are grouped together by types in terms of level of care, size, capacity, and capabilities to deliver predefined services.

FMT Type 1: Outpatient Emergency Care

Provides outpatient initial emergency care of injuries and other significant health care needs.

A type 1 FMT must be capable of treating at least 100 outpatients per day and function during daytime (rather than 24 hours).

Key Services:

i) Triage, Assessment and First Aid;
ii) Stabilisation and referral of severe trauma and non-trauma emergencies; and
iii) Definitive care for minor trauma and non-trauma emergencies.

Type 1 FMTs can work from suitable existing structures, or supply their own fixed or mobile outpatient facilities, such as tents or special equipped vehicles. They should be available to arrive in the fastest possible time, ideally within 24–48 hours, and be considered light and portable. Their staff should be experienced in those elements of initial trauma care that relates to triage on a mass scale, wound and basic fracture management, basic emergency care of paediatric, obstetric, mental health and medical presentations.

Type 1 FMTs should be able to stay for at least 2–3 weeks, or even longer if they are specialised in ambulant follow up for long term wound care and rehabilitation.

FMT Type 2: Inpatient Surgical Emergency Care

Provide inpatient acute care, general and obstetric surgery for trauma and other major conditions.

A Type 2 FMT must be able to perform at least 7 major or 15 minor operations daily with at least 20 inpatient beds per one operating table and be able to function 24 hours per day, seven days per week (24/7) if required.

Key Services:

i) intake/screening of new and referred patients, counter-referral;
ii) surgical triage and assessment;
iii) advanced life support;
iv) definitive wound and basic fracture management;
v) damage control surgery;
vi) emergency general and obstetric surgery Note: Obstetrics can either be provided or arranged with a local partner or other FMT;
vii) inpatient care for non-trauma emergencies;
viii) basic anaesthesia, X-ray, sterilisation, laboratory and blood transfusion; and
ix) rehabilitation services and patient follow up.

Type 2 services are considered most useful from day one, but it is anticipated that time to operation in the field may be several days. Type 2 FMTs should be available for at least 3 weeks but ideally longer. Those FMTs deployed in the first seven days can expect to see a large mixed burden of disease, with orthopaedic and wound injuries predominating, but also the normal expected need for acute surgery, including Emergency Obstetric Care. The acute trauma surgery is expected to decline quickly and be replaced by those with complications of their incompletely managed wounds and fractures, as well as

the normal local burden of surgical and medical disease. Type 2 FMTs must have staff capable of managing this expected epidemiology and should have a specific plan to manage the co-morbidity of normal disease patterns, and of other medical conditions with complications or severity that requires admission, incl. infectious disease, no communicable disease, obstetric and paediatric presentations expected.

FMT Type 3: Inpatient Referral Care

Provide complex inpatient referral surgical care including intensive care capacity.

Type 3 FMTs must have at least two operating tables in two separate rooms within the theatre area, at least 40 inpatient beds (20 per table) and have the capability to treat 15 major or 30 minor surgical cases a day.

Key Services:

i) intake/Screening of referred and new patients, surgical triage and assessment, plus counter-referral;
ii) capacity to provide type 2 services when needed;
iii) complex reconstructive wound and orthopaedic care, when required;
iv) enhanced, X-ray, sterilisation, laboratory and blood transfusion;
v) rehabilitation services and patient follow up;
vi) high level paediatric and adult anaesthesia; and
vii) intensive care beds with 24/7 monitoring and ability to ventilate.

Type 3 FMTs should be considered an option to provide a high-level referral service to those type 1 and 2 teams (both local and foreign) that cannot provide services of that standard. These must include 4–6 intensive care beds with the ability to ventilate patients and reconstructive wound and orthopaedic capability but can also include other specific specialist groups and services (e.g., maxillo-facial, specialist paediatric, etc.). The original provider of the type 3 FMT may bring these or may declare themselves capable of receiving and integrating specialised care teams (see below) to work within their facility (e.g., an ortho-plastic reconstructive group of surgeons and operative nurses).

Type 3 FMTs should be offered immediately, and upon agreement, deploy without delay, but are unlikely to be operational in the field for at least 5–7 days. In view of their referral function and the complexity of the cases they are likely to manage, they should be considered a service that is only appropriate to deploy for at least 2 months. Teams may deploy into existing health facilities or offer their services within their own structures (field hospital).

Additional Specialised Care Teams

These teams may be as small as two or three senior specialists and provide additional specialised care embedded within type 2 or 3 FMTs or a national Hospital. They must bring appropriate equipment, maintenance and supplies adequate to their specialty area. Like others FMTs, Additional Specialised Care Teams must adhere to the FMT Guiding Principles and core standards and follow current guidelines for the speciality represented, and ensure care provided is appropriate to context and identified needs.

5.2.1.3 Relevant EU Policies

On the European level, there is no specific policy related to earthquakes. However, the European Committee for Standardisation (CEN, French: Comité Européen de Normalisation) has set harmonised technical rules for the design of structures for earthquake resistance, namely Eurocode 8. The purpose

of these rules is to ensure that, in the event of earthquakes, human lives are protected, damage is limited and structures important for civil protection remain operational. 71 A report published by the Joint Research Centre (JRC) found that all EU Member States and Norway published as National Standards 100% of the Eurocodes Parts, except Germany and Luxembourg, which did not publish one part, and Spain, which published or ratified 83% of the Eurocodes Parts.[72] EU policy also refers to the UN's Sendai Framework for Disaster Risk Reduction. Two main preventive measures can help to limit the impacts of earthquakes with regard to new construction: micro-zoning, taking into account fault lines and soil composition, when making decisions on the location of building areas; and application of relevant building codes and zonation in land use planning in order to reduce the severity of human, structural and economic impacts of earthquakes.

As general policy, the Sendai framework is adopted which implies a focus on disaster risk reduction. As earthquakes cannot be prevented, the focus in earthquake-prone countries is on the reduction of the impact of earthquakes as seismic hazard cannot be reduced, seismic risk can only be reduced by reducing vulnerability and exposure to earthquakes).

For new buildings, two main preventive measures can be taken:

i) They can be located based on zonation in land-use planning, considering fault lines and soil composition. This approach aims to reduce the exposure of new buildings to damaging ground-shaking; and
ii) Application of building codes in the construction of new buildings (EN Eurocode 08)[73] can considerably reduce the severity of human, structural and economic impacts of earthquakes due to building damage. This approach aims to reduce the vulnerability of new buildings to earthquakes.

As existing buildings, especially older buildings, are in most cases not constructed according to the current codes, reinforcing/retrofitting of the existing building stock is needed for disaster risk reduction. In general, this is a policy which is difficult to achieve in most countries, given the costs and other political and social constraints.

Global Disaster Alerts and Coordination System (GDACS) a cooperation framework between the UN and the EC. It provides real-time access to web-based disaster information systems and related coordination tools worldwide, with the aim to address information and coordination gaps in the first phase of major disasters.

European Mediterranean Seismological Centre (EMSC) a system for rapid determination of the European and Mediterranean earthquake epicentres. EMSC receives seismological data from more than 65 national seismological agencies, mostly in the Euro-Mediterranean region. The most relevant earthquake parameters, such as the location and magnitude, are communicated within one hour from an earthquake's onset.

Scenario Specific EUCPM Modules/Capacities

Within the UCPM, a **medium urban search and rescue** (MUSAR) module is defined as search with search dogs and/or technical search equipment; rescue, including lifting; cutting concrete; technical rope; basic shoring; hazmat detection and isolation and advanced life support. A **heavy urban search and rescue** (HUSAR) module is defined as search with search dogs and technical search equipment;

71 https://eurocodes.jrc.ec.europa.eu/
72 Athanasopoulou, Adamantia & Dimova, Silvia & Fuchs, Manfred & Sousa, M. & Pinto, Artur & Nikolova, Borislava & Iannaccone, Sonia. (2018). State of Eurocode 8 Implementation in the European Union.
73 EN 1998- Eurocode 8: Design of Structures for Earthquake Resistance (2004)

rescue, including heavy lifting; cutting reinforced concrete and structural steel; technical rope; advanced shoring; hazmat detection and isolation and advanced life support.

Currently:

i) 8 HUSAR modules are part of the civil protection pool;
ii) HUSAR modules are registered in CECIS;
iii) 9 MUSAR modules are part of the civil protection pool;
iv) 2 MUSAR modules in cold conditions are part of the civil protection pool;
v) 22 MUSAR modules are registered in CECIS;
vi) 1 Search and Rescue in CBRN conditions are part of the civil protection pool;
vii) 2 Cave SAR other response capacities are part of the civil protection pool;
viii) 1 Mountain SAR other response capacity is part of the civil protection pool; and
ix) 1 Water Search and Rescue other response capacity is part of the civil protection pool.

Medical assistance is the capability to provide initial and/or follow-up trauma and medical care.

Within the UCPM, the definitions of emergency medical response teams (EMT1, 2 and 3) are aligned with WHO certification standards.

Currently:

i) 3 EMT1 Fixed module are part of the civil protection pool;
ii) 4 EMT 2 modules are part of the civil protection pool;
iii) Advanced Medical Post modules are registered in CECIS;
iv) 3 Advanced Medical Post with Surgery modules are registered in CECIS; and
v) 2 Field Hospital modules are registered in CECIS.

The EMT1, 2 and 3 modules are fit for most disaster relief situations.

Medical evacuation is the capability to transport disaster victims to health facilities for medical treatment.

Within the UCPM, a 'medical aerial evacuation of disaster victims' (MEVAC) module is defined as the capacity to transport 50 patients per 24 hours and to fly during day-time and night-time.

Currently, 2 MEVAC modules are part of the civil protection pool and 2 more are registered in CECIS and there is also a special MEVAC "other response" capacity available for patients with infectious diseases.

Emergency shelter provision is the capability to provide emergency temporary shelter, including staff to assemble the camp, mainly in the initial stages of a disaster in coordination with existing structures, local authorities and international organisations until handover to local authorities or humanitarian organisations, where the capacity remains necessary for longer periods.

In most instances, it is expected that such shelter could be provided using existing infrastructure (e.g., schools, town halls) or by the construction of longer-term shelter facilities, rather than an emergency temporary camp. In some situations, nonetheless there will still be a need for shelter provision, which cannot be directly solved by the affected country.

Within the UCPM, an emergency temporary camp (ETC) module is defined as the provision of a tent camp equipped for 250 persons (50 tents).

Currently, 1 ETC module is part of the civil protection pool, although one Additional Shelter Capacity is registered in CECIS.

Water purification is the capability to meet mass needs for drinking water.

Within the UCPM, a water purification (WP) module is defined as providing drinkable water from surface water sources by purifying 225,000 litres per day, performing water quality controls and having storage capacity equivalent to the production of half a day.

Currently, 5 modules are part of the civil protection pool and five more are registered in CECIS.

Technical and expert assistance is the capability to provide or arrange for ICT support, logistics and subsistence support, transport support (on site) and the set-up and running of an office. It may also cover the provision of expertise in the relevant are or field.

Within the UCPM, a technical and support team (TAST) module is defined as being capable of assisting an assessment, coordination and/or preparedness team, an on-site operations coordination centre, or of being combined into a civil protection module as referred to in Article 12(2)(c).

Currently, 4 modules are part of the civil protection pool and 8 more are registered in CECIS.

5.2.2 International Medical Emergency

5.2.2.1 WHO Strategies & Guidelines

The World Health Organisation, founded in 1948, is a specialised agency of the United Nations. As outlined in its constitution, WHO has a broad mandate to "act as the directing and coordinating authority on international health work" within the United Nations system. It is made up of 194 member states.

Its overarching mission is "attainment by all peoples of the highest possible level of health." It supports its mission through activities such as:

i) providing technical assistance to countries;
ii) setting international health standards and providing guidance on important health issues;
iii) coordinating and supporting international responses to health emergencies such as disease outbreaks; and
iv) promoting and advocating for better global health.

The agency has played a key role in a number of global health achievements, such as the Alma-Ata Declaration on primary health care (1978), the eradication of smallpox (formally recognised in 1980), the Framework Convention on Tobacco Control (adopted in 2003), and the 2005 revision of the International Health Regulations (IHR), an international agreement that outlines roles and responsibilities in preparing for and responding to international health emergencies.

WHO has a headquarters office located in Geneva, Switzerland, six semi-autonomous regional offices that oversee activities in each region, and a network of country offices and representatives around the world.

WHO relies on contributions from member states and private organisations for funding to implement its budget and work plan. The biennial WHO budgets for 2020-2021 has been set at $4.84 billion. However, actual revenue and expenditures over that period may deviate from the budgeted amount, such as when additional expenditures occur in response to health emergencies.

In an extraordinary crisis, the WHO can declare a "Public Health Emergency of International Concern (PHEIC, pronounced "fake"), which it has done six times: during the 2009 swine flu (H1N1) epidemic; in reaction to a reversal of progress in eradicating polio in 2014; amid the 2014 Ebola outbreak in West Africa; during the 2016 Zika virus outbreak in the Americas; once the ongoing Ebola epidemic reached the city of Goma in the Democratic Republic of Congo in 2019; and amid the global outbreak of the new coronavirus in 2020.

During a PHEIC, WHO issues nonbinding guidance to its members on how they should respond to the emergency, including on potential travel and trade restrictions. It seeks to prevent countries in the region and beyond from overreacting and inflicting undue economic harm on the country in crisis. WHO has hoped this would encourage affected countries to report outbreaks in a timely manner' however, it is reported, despite the WHO's guidance, many countries continue to impose damaging travel and trade restrictions, a problem that was highlighted during the 2014 Ebola and 2020 COVID-19 PHEICs.

In an emergency, WHO also spells out treatment guidelines, it also acts as a global coordinator, shepherding scientific data and experts to where they are most needed.

Additionally, WHO provides guidance and coordination for emergencies that do not rise to the level of a PHEIC. However, declaring a PHEIC can help speed up international action and often encourages research on the disease in question, even if there is little risk of a pandemic.

5.2.2.2 Relevant EU Policies

Much of the policy landscape for medical emergencies come from the Health and Security activities of the Commission.

Specific articles and decisions creating the current policy landscape include:

i) The 2013 EU Decision on Serious Cross Border Health Threats to improve the prevention and control of the spread of severe diseases across the borders of the EU Member States, and to combat other serious cross-border threats to health including those of biological and chemical origin;
ii) The 2017 EU CBRN Action Plan 2017 to improve EU medical preparedness and recognised the important role to be played by industry, stockpiles of essential medical countermeasures, laboratory, treatment and other capacities; and
iii) The 2018 European Parliament TERR Committee report to cooperate with the private sector in order to establish mechanisms that ensure a reliable, consistent and adequate supply of medical countermeasures including the possible usage of the Joint Procurement Mechanism that was established by Decision 2013/1082 in 2013 on serious cross-border health threats.

The European Commission has funded many research and innovation projects for better preparedness and response to (re-)emerging infectious diseases. A fast research and innovation response were mobilised as a response to the Ebola outbreak in West Africa where the European Commission became the second biggest funder of Ebola research (contribution of €139 million Horizon 2020 funding for urgent Ebola research).

In its Work Programme 2019 DG SANTE has called upon EU Member States to further strengthen the preparedness and response to biological terror attacks. DG HOME has released earlier this year a call to demonstrate the novel concepts for the management of pandemic crises.

The need to further reinforce the UCPM became clear as the impact of the COVID-19 pandemic spread across the UCPM's Member States. In June 2020, the EC concluded:

> *"[The] system of mutual European solidarity tends to falter if all, or most, Member States are impacted by the same emergency simultaneously and are therefore unable to offer each other assistance. In such cases of large-scale high impact emergencies, the Union is currently unable to step in sufficiently to fill these critical gaps. Ensuring an effective overall Union response to large-scale emergencies, the Union Mechanism re-quires more flexibility and autonomy to act at Union level, in situations when overwhelmed Member States cannot do so."*

A proposal to amend Decision No 1313/2013/EU, which governs the UCPM, was put forward by the EC. This proposal was endorsed by the European Parliament in April 2021. It introduces targeted changes to Decision No. 1313/2013/EU, in parallel to the proposal also amending the UCPM, which was adopted by the EC in 2019.

The changes aim to achieve the following objectives:

i) Reinforce a cross-sectoral and societal preparedness approach to trans-boundary disaster risk management, including establishing a baseline and planning elements at a European level;
ii) Ensure that the EC is able to directly procure an adequate safety net of rescEU capacities.
iii) Provide the EC with the logistical capacity to provide multi-purpose air services in case of emergencies and to ensure timely transport and delivery of assistance;
iv) Design a more flexible system for response to large-scale emergencies;
v) Enhance the ERCC's operational coordination and monitoring role in support of the EU's swift and effective response to a broad range of crises inside and outside the EU;
vi) Enable stronger investment in preparedness at the EU level and further simplification of budget implementation; and
vii) Enable the implementation of recovery and resilience measures under the UCPM through financing from the European Union Recovery Instrument, constituting external assigned revenues according to Article 21(5) of the Financial Regulation.

Medical assistance is the capability to provide initial and/or follow-up trauma and medical care.

Within the UCPM, the definitions of emergency medical response teams (EMT1, 2 and 3) are aligned with WHO certification standards.

Currently:

i) 3 EMT1 Fixed module are part of the civil protection pool;
ii) 4 EMT 2 modules are part of the civil protection pool;
iii) 5 Advanced Medical Post modules are registered in CECIS;
iv) 3 Advanced Medical Post with Surgery modules are registered in CECIS; and
v) 2 Field Hospital modules are registered in CECIS.

The EMT1, 2 and 3 modules are fit for most disaster relief situations.

Medical evacuation is the capability to transport disaster victims to health facilities for medical treatment.

Within the UCPM, a 'medical aerial evacuation of disaster victims' module is defined as the capacity to transport 50 patients per 24 hours and to fly during day-time and night-time.

Currently, 2 MEVAC modules are part of the civil protection pool and 2 more are registered in CECIS there is also a special MEVAC "other response" capacity available for patients with infectious diseases.

Technical and expert assistance is the capability to provide or arrange for ICT support, logistics and subsistence support, transport support (on site) and the set-up and running of an office. It may also cover the provision of expertise in the relevant are or field.

Within the UCPM, a technical and support team (TAST) module is defined as being capable of assisting an assessment, coordination and/or preparedness team, an on-site operations coordination centre, or of being combined into a civil protection module as referred to in Article 12(2)(c).

Currently, 4 modules are part of the civil protection pool and 8 more are registered in CECIS.

5.2.3 Forest/Wildfire

5.2.3.1 Relevant EU Policies

The EU Forest Strategy provides a new framework in response to the increasing demands put on forests and the significant societal and political changes that have affected forests over the last 15 years. Protection of forests from different threats, including fire, is one of the priorities of this strategy, which also identifies prevention of fires as a key area for EU Member States to advance.

For the period 2014-2020, the European Agricultural Fund for Rural Development (EAFRD), which has been active since 2007, has provided support for forest fire prevention and restoration actions. It provides support for activities to prevent and restore damage to forests from fires and other natural disasters and catastrophic events including pests, diseases as well as climate change-related events. The enhancement of territorial ecosystems and limiting the impacts of extreme events and climate change also represent explicit objectives of support under the rural development pillar of the Common Agricultural Policy. During the programming period 2007-2013 five Mediterranean countries allocated more than EUR 1.2 billion for measures targeting prevention and restoration of natural disasters and fires.[74]

EU Member States and regions have allocated EUR 8 billion for climate change adaptation and risk prevention and management for 2014-2020 from the European Regional Development Fund (ERDF) and Cohesion Fund, including for cross-border and transnational cooperation. These investments address various types of risks, including forest fire prevention.

With respect to forest fire intervention or suppression, substantial attention is focused upon the improvement of chemical products used in firefighting with respect to both their performance and their cost/benefit ratio (and eco-impact) and various types of new safety components that are also being tested. New decision support systems, information and communication technology and firefighting resources are employed to increase the effectiveness of risk management and coordination, including the use of specific technical assets (drones, infrared cameras, satellite images).

The European Forest Fire Information System (EFFIS) provides information on forest fires and their ecological impacts in the European, Middle East and North Africa regions. Fire monitoring in EFFIS encompasses the full fire cycle, comprising near-real time information services regarding the current and future fire danger forecast, active fires and burned areas, and post-fire damage assessments. The extension of EFFIS towards a Global Wildfire Information Systems (GWIS) is underway in collaboration with the Group on Earth Observations (GEO).

Ground forest firefighting is the capability to contribute to the extinction of large forest and vegetal fires using on the ground means.

[74] DC ECHO; Overview of natural and man-made disaster risks the European Union may face (2017)

Within the UCPM, a Ground Forest Firefighting module (GFFF/GFFF-V) module is defined as the ability to operate in areas with restricted access continuously for 7 days, with the ability to set long lines of hoses with pumps, minimum 2 km, and/or make defence lines continuously.

Currently,

i) Ground Forest Fire Fighting modules are part of the civil protection pool;
ii) 4 GFFF modules are registered in CECIS;
iii) 5 Ground Forest Fire Fighting modules using Vehicles are part of the civil protection pool;
iv) 19 GFFF-V modules are registered in CECIS; and
v) 2 Fire-fighting advisory other response capacities are part of the civil protection pool.

An **Aerial Forest Firefighting Module** is the capability to contribute to the extinction of large forest and vegetal fires by performing aerial firefighting.

Within the UCPM, two types of aerial firefighting modules exist.

Forest Firefighting Module using Helicopters (FFFH)

i) 3 helicopters (to grantee 2 helicopters at any one time) with a capacity of 1,000 litres; and
ii) Ability to perform continuous operations.

Forest Firefighting Module using Airplanes (FFFP)

i) 2 airplanes with a capacity of 33,000 litres each;
ii) Ability to perform continuous operations; and
iii) Minimum 4 crew members.

Currently there are 2 AFFH and 6 AFFP modules available through RescEU.

Within the UCPM, a **high-capacity pumping** (HCP) module is defined as having the objective to pump water for flooding and forest fires with a capacity to pump at least 1,000m^3 water per hour over a distance of at least 1,000 meters. Currently, 16 modules are part of the civil protection pool and 14 more are registered in CECIS.

The HCP module is as a capacity fit for both flood response and forest fire response.

Besides this, other response capacities registered are able to pump far higher amounts of water, e.g., up to 5,000m^3 per hour.

Technical and expert assistance is the capability to provide or arrange for ICT support, logistics and subsistence support, transport support (on site) and the set-up and running of an office. It may also cover the provision of expertise in the relevant are or field.

Within the UCPM, a technical and support team (TAST) module is defined as being capable of assisting an assessment, coordination and/or preparedness team, an on-site operations coordination centre, or of being combined into a civil protection module as referred to in Article 12(2)(c).

Currently, 4 modules are part of the civil protection pool and 8 more are registered in CECIS.

5.2.4 Floods

5.2.4.1 Relevant EU Policies

Directive No 2007/60/EC on the assessment and management of flood risks (OJ L 288/27), the "flood directive", is the European policy on flood prevention and preparedness. It requires EU Member States to identify river basins and associated coastal areas where significant flood risk exists; prepare flood hazard and flood risk maps; and develop flood risk management plans for these areas.

The long-term procedure to reduce the risk of floods is broken down in three steps:

i) a preliminary flood risk assessment by the end of 2011;
ii) preparation of flood hazard maps and flood risk maps by 2013 (if significant flood risk exists); and
iii) flood risk management plans for those areas by the end of 2015.

EU Member States in the same transboundary river basin must work together to have one overarching flood risk management plan for the whole river basin.

Scenario Specific EUCPM Modules/Capacities *European Flood Alert System (EFAS)* – monitors and forecasts floods across Europe, and in particular the large transnational river basins. It provides complementary, added-value information (e.g., probabilistic, medium range flood forecasts, flash flood indicators, or impact forecasts) to relevant national and regional authorities, as well as the ERCC.

Within the UCPM, a **high-capacity pumping** (HCP) module is defined as having the objective to pump water for flooding and forest fires with a capacity to pump at least 1,000m^3 water per hour over a distance of at least 1,000 meters. Currently, 16 modules are part of the civil protection pool and 14 more are registered in CECIS.

The HCP module is as a capacity fit for both flood response and forest fire response.

Besides this, other response capacities registered are able to pump far higher amounts of water, e.g., up to 5,000m^3 per hour.

Flood containment is the capability to reinforce existing structures and build new barriers to prevent further flooding of rivers, basins and waterways with rising water levels.

Within the UCPM, a flood containment module is defined as the ability to dam up water to a minimum height of 0.8 metres and to build a 1,000m barrier. Furthermore, the module is required to have the ability to reinforce existing levees and to operate at a minimum of 3 locations at the same time within an area accessible by trucks.

Currently, 4 Flood Containment (FC) modules are part of the civil protection pool and 3 more are registered in CECIS.

Flood rescue is the capability to carry out water-based search and rescue and assist people trapped in a flooding situation by using boats; and to provide lifesaving aid and deliver first necessities as required.

Within the UCPM, a Flood Rescue Using Boats (FRB) module is defined as the ability to search for and rescue people out of a flooded area including medical care on first responder level; to work together with aerial search (helicopters and planes); to deliver first necessities of life in a flooded area, including transportation of doctors, medicines, etc. and food and water.

The module must have at least 5 boats and the ability to transport 50 people in total excluding the staff of the module. Boats should be designed for use in cold climate conditions and be able to drive upstream against a flow of at least 10 knots.

Currently, 4 FRB modules form part of the civil protection pool and 5 more are registered in CECIS. 1 Water SAR other response capacity is also registered in CECIS

Emergency shelter provision is the capability to provide emergency temporary shelter, including staff to assemble the camp, mainly in the initial stages of a disaster in coordination with existing structures, local authorities and international organisations until handover to local authorities or humanitarian organisations, where the capacity remains necessary for longer periods.

In most instances, it is expected that such shelter could be provided using existing infrastructure (e.g. schools, town halls) or by the construction of longer-term shelter facilities, rather than an emergency temporary camp. In some situations, nonetheless there will still be a need for shelter provision, which cannot be directly solved by the affected country.

Within the UCPM, an emergency temporary camp (ETC) module is defined as the provision of a tent camp equipped for 250 persons (50 tents).

Currently, 1 ETC module is part of the civil protection pool, although one Additional Shelter Capacity is registered in CECIS.

Technical and expert assistance is the capability to provide or arrange for ICT support, logistics and subsistence support, transport support (on site) and the set-up and running of an office. It may also cover the provision of expertise in the relevant are or field.

Within the UCPM, a technical and support team (TAST) module is defined as being capable of assisting an assessment, coordination and/or preparedness team, an on-site operations coordination centre, or of being combined into a civil protection module as referred to in Article 12(2)(c).

Currently, 4 modules are part of the civil protection pool and 8 more are registered in CECIS.

5.2.5 Radiological Accident

5.2.5.1 Relevant EU Policies

The peaceful use of nuclear energy within the EU is governed by the 1957 Euratom Treaty, which established the European Atomic Energy Community (Euratom).[75] While Euratom is a separate legal entity from the EU, it is governed by the EU's institutions.

The European Commission deals with nuclear activities from three angles:

i) nuclear safety is about the safe operation of nuclear installations. It is complemented by radiation protection and radioactive waste management;
ii) nuclear safeguards are measures to ensure that nuclear materials are used only for the purposes declared by the users; and
iii) nuclear security relates to the physical protection of nuclear material and installations against intentional malicious acts.

[75] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:12012A/TX

The EU promotes the highest safety standards for all types of civilian nuclear activity, including power generation, research, and medical use.[76] Following the Fukushima nuclear accident, the Commission carried out a comprehensive risk and safety assessment of all EU nuclear power plants to assess the safety and robustness of nuclear installations in the event of extreme natural events. The Commission gave an overall positive assessment of current European safety standards but highlighted the need for further upgrades to ensure better consistency among EU Member States and to catch up with international best practices.

In 2014, EU-wide safety rules for nuclear installations were therefore updated (Directive 2014/87/Euratom), i.e., with the requirement for EU Member States to install an emergency management system for nuclear incidents under which the different responsible services (nuclear supervision, civil protection, environmental agencies, health services) cooperate. In February 2015, the Commission proposed that the information requirements under Article 41 and 44 of the Euratom Treaty be reviewed to align them with the new policy developments.

In addition, the notification requirements need to be clearer for investors, and the notification process itself should be made more efficient.

Scenario Specific EUCPM Modules/Capacities

CBRN is a general term referring to the cause of an incident rather than its resulting effects. Normally applied to terrorism events, the modules resulting will also be considered for accidental emergencies (more commonly referred to as Hazardous Materials) for example involving chemical release, nuclear or biological environments.

CBRN detection and sampling is the capability to identify chemical and detect radiological hazards through a combination of handheld, mobile and laboratory-based equipment.

Within the UCPM, a chemical, biological, radiological and nuclear detection and sampling (CBRNDET) module is defined as the ability to detect alpha, beta and gamma radiation and to identify common isotopes; to identify, and if possible, perform semi-quantitative analyses on common toxic industrial chemicals and recognised warfare agents; to gather, handle and prepare biological, chemical and radiological samples for further analyses elsewhere; to apply an appropriate scientific model to hazard prediction and to confirm the model by continuous monitoring; to provide support for immediate risk reduction, including hazard containment and hazard neutralisation; and to provide technical support to other teams or modules.

Currently, 5 modules are part of the civil protection pool and 12 more are registered in CECIS.

Emergency shelter provision is the capability to provide emergency temporary shelter, including staff to assemble the camp, mainly in the initial stages of a disaster in coordination with existing structures, local authorities and international organisations until handover to local authorities or humanitarian organisations, where the capacity remains necessary for longer periods.

In most instances, it is expected that such shelter could be provided using existing infrastructure (e.g., schools, town halls) or by the construction of longer-term shelter facilities, rather than an emergency temporary camp. In some situations, nonetheless there will still be a need for shelter provision, which cannot be directly solved by the affected country.

[76] https://ec.europa.eu/energy/en/topics/nuclear-energy/nuclear-safety

Within the UCPM, an emergency temporary camp (ETC) module is defined as the provision of a tent camp equipped for 250 persons (50 tents).

Currently, 1 ETC module is part of the civil protection pool, although one Additional Shelter Capacity is registered in CECIS.

Water purification is the capability to meet mass needs for drinking water.

Within the UCPM, a water purification (WP) module is defined as providing drinkable water from surface water sources by purifying 225,000 litres per day, performing water quality controls and having storage capacity equivalent to the production of half a day.

Currently, 5 modules are part of the civil protection pool and five more are registered in CECIS.

Technical and expert assistance is the capability to provide or arrange for ICT support, logistics and subsistence support, transport support (on site) and the set-up and running of an office. It may also cover the provision of expertise in the relevant are or field.

Within the UCPM, a technical and support team (TAST) module is defined as being capable of assisting an assessment, coordination and/or preparedness team, an on-site operations coordination centre, or of being combined into a civil protection module as referred to in Article 12(2)(c).

Currently, 4 modules are part of the civil protection pool and 8 more are registered in CECIS.

5.2.6 Extreme Weather

5.2.6.1 Relevant EU Policies

At EU-level, the main policy related to extreme weather are related to climate change adaptation. Frequent extreme weather events are one of the impacts of climate changes. The EU has an EU Adaptation Strategy, which recently underwent an evaluation.[77] The conclusions were that more action is needed to build resilience of Europe and especially vulnerable regions.

In 2000, The Water Framework Directive was also established addressing the impacts of droughts and water shortages.[78]

Scenario Specific EUCPM Modules/Capacities

Water purification is the capability to meet mass needs for drinking water.

Within the UCPM, a water purification (WP) module is defined as providing drinkable water from surface water sources by purifying 225,000 litres per day, performing water quality controls and having storage capacity equivalent to the production of half a day.

Currently, 5 modules are part of the civil protection pool and five more are registered in CECIS.

Technical and expert assistance is the capability to provide or arrange for ICT support, logistics and subsistence support, transport support (on site) and the set-up and running of an office. It may also cover the provision of expertise in the relevant are or field.

[77] https://ec.europa.eu/clima/policies/adaptation/what_en
[78] https://ec.europa.eu/environment/water/water-framework/index_en.html

Within the UCPM, a technical and support team (TAST) module is defined as being capable of assisting an assessment, coordination and/or preparedness team, an on-site operations coordination centre, or of being combined into a civil protection module as referred to in Article 12(2)(c).

Currently, 4 modules are part of the civil protection pool and 8 more are registered in CECIS.

5.2.7 Critical Infrastructure Disruption

5.2.7.1 Relevant EU Policies

In 2008, the EU adopted a directive to enhance the protection of European Critical Infrastructure (2008/114).[79] Based on this directive, EU Member States must adopt a program for critical infrastructure protection in their national legislation (since 2011).

This directive requires EU countries to go through a process of identifying potential European critical infrastructures. The directive applies currently only to the energy and transport sectors (see Annex I of the Directive).

The directive is the legislative basis for the EPCIP, the European programme for critical infrastructure protection.

Scenario Specific EUCPM Modules/Capacities

Emergency shelter provision is the capability to provide emergency temporary shelter, including staff to assemble the camp, mainly in the initial stages of a disaster in coordination with existing structures, local authorities and international organisations until handover to local authorities or humanitarian organisations, where the capacity remains necessary for longer periods.

In most instances, it is expected that such shelter could be provided using existing infrastructure (e.g.,., schools, town halls) or by the construction of longer-term shelter facilities, rather than an emergency temporary camp. In some situations, nonetheless there will still be a need for shelter provision, which cannot be directly solved by the affected country.

Within the UCPM, an emergency temporary camp (ETC) module is defined as the provision of a tent camp equipped for 250 persons (50 tents).

Currently, 1 ETC module is part of the civil protection pool, although one Additional Shelter Capacity is registered in CECIS.

Water purification is the capability to meet mass needs for drinking water.

Within the UCPM, a water purification (WP) module is defined as providing drinkable water from surface water sources by purifying 225,000 litres per day, performing water quality controls and having storage capacity equivalent to the production of half a day.

Currently, 5 modules are part of the civil protection pool and five more are registered in CECIS

Technical and expert assistance is the capability to provide or arrange for ICT support, logistics and subsistence support, transport support (on site) and the set-up and running of an office. It may also cover the provision of expertise in the relevant are or field.

[79] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:345:0075:0082:EN:PDF

Within the UCPM, a technical and support team (TAST) module is defined as being capable of assisting an assessment, coordination and/or preparedness team, an on-site operations coordination centre, or of being combined into a civil protection module as referred to in Article 12(2)(c).

Currently, 4 modules are part of the civil protection pool and 8 more are registered in CECIS.

5.2.8 Chemical Accident

5.2.8.1 Relevant EU Policies

The 'Seveso III' Directive on the control of major accident hazards involving dangerous substances sets a European framework for the prevention of, preparedness for and response to industrial accidents involving dangerous substances. The Seveso III Directive obliges EU Member States to ensure that operators have a policy in place to prevent major accidents.

Operators handling dangerous substances above certain thresholds must notify the relevant national competent authorities of their activities, submit safety reports, establish a safety management system and set up an internal emergency plan. EU Member States shall ensure that the population that is likely to be affected by an industrial accident is regularly informed and that relevant information is kept permanently available to the public, also electronically.

National competent authorities must ensure that external emergency plans are in place for the surrounding areas and that mitigation actions are planned. Regular inspections must take place. The objectives of prevention and control of major-accident hazards in land-use planning must be taken into account. There is a tiered approach to the level of controls: the larger the quantities of dangerous substances present within an establishment, the stricter the rules ('upper-tier' establishments have bigger quantities than 'lower-tier' establishments and are therefore subject to tighter control).

In 2016, there were 11,777 Seveso establishments in Europe. Of the total EU/EEA establishments, approximately 42% had upper tier status and 58% lower tier status in 2012. Together, Germany, France, Italy, and the United Kingdom account for more than half (56%) of total Seveso establishments in Europe.[80]

Scenario Specific EUCPM Modules/Capacities

CBRN detection and sampling is the capability to identify chemical and detect radiological hazards through a combination of handheld, mobile and laboratory-based equipment.

Within the UCPM, a chemical, biological, radiological and nuclear detection and sampling (CBRNDET) module is defined as the ability to detect alpha, beta and gamma radiation and to identify common isotopes; to identify, and if possible, perform semi-quantitative analyses on common toxic industrial chemicals and warfare agents; to gather, handle and prepare biological, chemical and radiological samples for further analyses elsewhere; to apply an appropriate scientific model to hazard prediction and to confirm the model by continuous monitoring; to provide support for immediate risk reduction, including hazard containment and hazard neutralisation; and to provide technical support to other teams or modules.

Currently, 5 modules are part of the civil protection pool and 12 more are registered in CECIS.

Emergency shelter provision is the capability to provide emergency temporary shelter, including staff to assemble the camp, mainly in the initial stages of a disaster in coordination with existing structures,

[80] Seveso Establishments

local authorities and international organisations until handover to local authorities or humanitarian organisations, where the capacity remains necessary for longer periods.

In most instances, it is expected that such shelter could be provided using existing infrastructure (e.g. schools, town halls) or by the construction of longer-term shelter facilities, rather than an emergency temporary camp. In some situations, nonetheless there will still be a need for shelter provision, which cannot be directly solved by the affected country.

Within the UCPM, an emergency temporary camp (ETC) module is defined as the provision of a tent camp equipped for 250 persons (50 tents).

Currently, 1 ETC module is part of the civil protection pool, although one Additional Shelter Capacity is registered in CECIS.

Water purification is the capability to meet mass needs for drinking water.

Within the UCPM, a water purification (WP) module is defined as providing drinkable water from surface water sources by purifying 225,000 litres per day, performing water quality controls and having storage capacity equivalent to the production of half a day.

Currently, 5 modules are part of the civil protection pool and five more are registered in CECIS

Technical and expert assistance is the capability to provide or arrange for ICT support, logistics and subsistence support, transport support (on site) and the set-up and running of an office. It may also cover the provision of expertise in the relevant are or field.

Within the UCPM, a technical and support team (TAST) module is defined as being capable of assisting an assessment, coordination and/or preparedness team, an on-site operations coordination centre, or of being combined into a civil protection module as referred to in Article 12(2)(c).

Currently, 4 modules are part of the civil protection pool and 8 more are registered in CECIS.

5.3 National Frameworks & Doctrine

5.3.1 Turkey

Floods

Brief Description of National Guidelines & Policies

Response to disaster and emergency situations, planning and coordination authority in Turkey is under the responsibility of the Disaster and Emergency Management Presidency (AFAD) under the Ministry of Interior. Provincial Disaster and Emergency Directorate provides this coordination, depending on the Governors in the provinces. There is a Turkey Disaster Response Plan (TAMP)[81] related to this and all institutions have responsibilities in this plan. Risk reduction and prevention activities related to floods are under the responsibility of the General Directorate of Combating Desertification and Erosion under the Ministry of Agriculture and Forestry.

Available Resources

[81] Turkey Disaster Response Plan (TAMP), https://www.afad.gov.tr/kurumlar/afad.gov.tr/2419/files/Afet_Mud_Pl_ResmiG_20122013.pdf

When floods occur, a Provincial Crisis Centre[82] is established under the Presidency of the Governor and AFAD under the Ministry of Interior provides intervention and coordination. Providing security and transportation is the responsibility of the police and municipalities in settlements, and the gendarmerie in rural areas.

Support is received from AFAD's Provincial Search and Rescue Units[83], Municipal Fire Brigades, Land and Air elements of Military Units, and voluntary organisations (NGOs). Ambulance (EMS) Services, National Medical Rescue Teams (UMKE)[84] and Hospitals, under the responsibility of Provincial Health Directorates affiliated to the Ministry of Health, provide intervention to injuries and diseases that occur in floods.

Ministry of Transport and infrastructure, municipalities and related institutions intervene in infrastructure problems.

Necessary warnings about the weather conditions and precipitation amounts before and after the flood are made by the General Directorate of Meteorology under the Ministry of Agriculture and Forestry.

Recovery Plans

Search and rescue activities in flood-damaged areas are carried out by AFAD, Fire Department, UMKE and Military teams. 112 Emergency Call Centres[85] affiliated to the Ministry of Interior evaluate incoming calls and assign police, fire and ambulance teams to the scene. If necessary, mobile health units are established in the region.

Air patient transport is carried out by helicopter ambulances and air rescue military helicopters. Specially equipped land-type ambulances can be used to transport patients to hospitals. Aid from surrounding provinces is accepted under the coordination of the Crisis Centre under the Presidency of the Governor.

Animals are taken under protection by the Ministry of Agriculture and Forestry and Municipalities. Municipal Fire Brigades are responsible for cleaning and evacuation of houses damaged by floods. Damage and assistance in agricultural areas is provided by the teams of the Ministry of Agriculture and Forestry. Instead of demolished bridges and roads, new ones are built first by the Military Units (temporary bridges), then by the Ministry of Transport and Infrastructure and the Municipality. The Health Directorate prepares brochures and informational videos to warn the public against injuries and infections during cleaning works at homes and workplaces after the flood. Autopsies are carried out by Forensic Medicine for those who lost their lives and lost their lives by being caught in flood waters. The construction of new houses, which were destroyed as a result of floods and landslides, is under the responsibility of the Ministry of Environment and Urbanisation, Mass Housing and Public Partnership Administration (TOKİ). Until permanent buildings are built, temporary shelters (tents or containers) can be established by AFAD, TOKİ and Municipalities.

[82] Disaster and Emergency Management Centers Regulation, https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=20111377&MevzuatTur=3&MevzuatTertip=5

[83] Regulation on the Establishment, Duties, Working Procedures and Principles of Disaster and Emergency Search and Rescue Units Directorates and Provincial Disaster and Emergency Search and Rescue Teams, https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=38794&MevzuatTur=7&MevzuatTertip=5

[84] Directive on Duties and Working Principles of National Medical Rescue Teams, https://www.saglik.gov.tr/TR,11268/ulusal-medikal-kurtarma-ekiplerinin-gorevleri-ve-calisma-esaslarina-dair-yonerge.html

[85] 112 Emergency Call Centers Establishment, Duties and Working Regulations, https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=19670&MevzuatTur=7&MevzuatTertip=5

The Turkish Red Crescent provides shelter and food support. Communication and internet problems are under the responsibility of Turk Telekom, which is affiliated to the Ministry of Transport and Infrastructure. The Association of Radio Amateurs (TRAC)[86] provides support as the NGO.

The coordination of all these works is carried out by AFAD Provincial Directorates, depending on the Provincial Crisis Centre.

Forest/Wildfires

Brief Description of National Guidelines & Policies

Response to Disaster and Emergency Situations, planning and coordination authority in Turkey is under the responsibility of the Disaster and Emergency Management Presidency (AFAD)[87] under the Ministry of Interior. The Provincial Disaster and Emergency Directorate provides this coordination under the Governors in the provinces. There is a Turkey Disaster Response Plan (TAMP) for disasters and the responsibilities of all institutions are specified in this plan. Risk reduction, prevention and response activities against forest fires are under the responsibility of the General Directorate of Forestry under the Ministry of Agriculture and Forestry.

Fires are intervened in accordance with the "APPLICATION PRINCIPLES IN PREVENTION AND EXTINGUISHING FOREST FIRES" published by the General Directorate of Forestry[88]. In addition, according to the Municipal Fire Brigade Regulation[89], Fire Brigades participate in responding to forest fires.

Available Resources

When large scale forest or wildfires occur, a Provincial Crisis Centre is established under the Presidency of the Governor and AFAD provides intervention and coordination. Providing security and transportation is the responsibility of the police and municipalities in settlements and the gendarmerie in rural areas. Fires in the areas of responsibility of the Regional Directorates of Forestry affiliated to the General Directorate of Forestry are intervened by firefighting teams, firefighting aircraft and helicopters, Provincial Search and Rescue Units affiliated to AFAD, Municipal Fire Brigades, Land and Air elements of the Military Units. Support is received from voluntary organisations (NGOs). Fires in residential areas are the responsibility of the Municipal Fire Brigades.

Aid from surrounding provinces is provided by the Crisis Centre headed by the Governor. Response to burns, injuries and diseases that occur during fires is carried out by Ambulance (EMS) Services[90], National Medical Rescue Teams (UMKE) and Hospitals under the responsibility of Provincial Health Directorates affiliated to the Ministry of Health. The General Directorate of Meteorology, affiliated to the Ministry of Agriculture and Forestry, makes necessary warnings about the weather conditions, temperature, humidity and wind intensity and direction before and after forest fires.

Recovery Plans

[86] Law on Transformation of Areas at Disaster Risk, https://www.resmigazete.gov.tr/eskiler/2012/05/20120531-1.htm

[87] Law on the Organization and Duties of the Disaster and Emergency Management Presidency, https://www.resmigazete.gov.tr/eskiler/2009/06/20090617-1.htm

[88] Regulation on the Jobs of the Officials in the Prevention and Extinguishing of Forest Fires, https://www.mevzuat.gov.tr/MevzuatMetin/3.5.712520.pdf

[89] Municipal Fire Brigade Regulations, https://www.mevzuat.gov.tr/anasayfa/MevzuatFihristDetayIframe?MevzuatTur=7&MevzuatNo=10713&MevzuatTertip=5

[90] Emergency Medical Services Regulation, https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=4798&MevzuatTur=7&MevzuatTertip=5

Search and rescue activities in forest fire areas are carried out by AFAD, Fire Department, UMKE and Military teams. 112 Emergency Call Centres affiliated to the Ministry of Interior evaluate incoming calls and assign police, fire and ambulance teams to the scene. If necessary, mobile health units are established in safe areas in the region. Air patient transport is done by helicopter ambulances and air rescue military helicopters. Specially equipped land-type ambulances can be used to transport patients to hospitals. Aid from surrounding provinces is provided by the Crisis Centre under the Presidency of the Governor. Animals are taken under protection by the Ministry of Agriculture and Forestry and Municipalities. The fire extinguishing and rescue activities in the settlements are the responsibility of the Municipal Fire Brigades. Damage assistance in agricultural areas is provided by the teams of the Ministry of Agriculture and Forestry.

The construction of new houses to replace the burned ones is under the responsibility of the Ministry of Environment and Urbanisation, Mass Housing and Public Partnership Administration (TOKİ). Until permanent buildings are built, temporary shelters (tents or containers) can be established by TOKİ and Municipalities.

Turkish Red Crescent[91] provides shelter and food support as a NGO. Communication and internet problems are under the responsibility of Türk Telekom, which is affiliated to the Ministry of Transport and Infrastructure. The Association of Radio Amateurs (TRAC) provides support as the NGO. The coordination of all these works is carried out by AFAD Provincial Directorates, depending on the Provincial Crisis Centre.

International aid from abroad (firefighting aircraft and helicopter) is coordinated by the Ministry of Foreign Affairs.

Earthquake

Brief Description of National Guidelines & Policies

Response to Disaster and Emergency Situations, planning and coordination authority in Turkey is under the responsibility of the Disaster and Emergency Management Presidency (AFAD) under the Ministry of Interior. The Provincial Disaster and Emergency Directorate provides this coordination under the Governors in the provinces.

There is a Turkey Disaster Response Plan (TAMP) for disasters and all institutions have responsibilities in this plan.

Risk reduction, prevention and response activities against earthquakes are under the responsibility of the Disaster and Emergency Management Presidency (AFAD) under the Ministry of Interior. There are Turkish Search and Rescue Regulations and Regulations on Duties, Working Procedures and Principles of Search and Rescue Units published by AFAD on how Search and Rescue Activities will be carried out[92].

Available Resources

In the provinces where the earthquake occurred, a Provincial Crisis Centre is established under the Presidency of the Governor and AFAD provides intervention and coordination. Providing security and

[91] Red Crescent Charter, https://www.kizilay.org.tr/Upload/Editor/files/1235049841_Tuzuk_19_02_2009.pdf
[92] Turkey Building Earthquake Regulation, https://www.resmigazete.gov.tr/eskiler/2018/03/20180318M1-2.htm

transportation is the responsibility of the police and municipalities in settlements, and the gendarmerie in rural areas.

Provincial Search and Rescue Units affiliated to AFAD, Municipal Fire Brigades, National Medical Rescue Teams (UMKE), Search and Rescue Volunteer Organisations, Land and Air elements of Military Units are intervened.

Aid from surrounding provinces is provided by the Crisis Centre under the Presidency of the Governor. Response to injuries and diseases that occur during an earthquake is covered by Ambulance (EMS) Services, UMKE and Hospitals under the responsibility of Provincial Health Directorates affiliated to the Ministry of Health.

Recovery Plans

Search and rescue activities in the debris of buildings destroyed in the earthquake are carried out by Fire Brigade, UMKE, Volunteer Search and Rescue Organisations (NGO) and Military teams under the coordination of AFAD. 112 Emergency Call Centres affiliated to the Ministry of Interior evaluate incoming calls and assign police, fire, and ambulance teams to the scene. If necessary, mobile health units are established in safe areas in the region. Air patient transport is done by helicopter ambulances and air rescue military helicopters. All public and private ambulances can be used in the transport of patients to hospitals under the coordination of the 112 Emergency Call Centre. Aid from surrounding provinces is provided by the Crisis Centre under the Presidency of the Governor. Animals are taken under protection by the Ministry of Agriculture and Forestry and Municipalities. The veterinary association also supports the care of affected animals as NGOs. The fire extinguishing and rescue activities in the settlements are the responsibility of the Municipal Fire Brigades. The construction of new houses to replace the demolished houses is under the responsibility of the Ministry of Environment and Urbanisation, Mass Housing and Public Partnership Administration (TOKİ). Until permanent buildings are built, temporary shelters (tents or containers) can be established by AFAD, TOKİ and Municipalities.

Turkish Red Crescent provides shelter and food support as NGO. Communication and internet problems are under the responsibility of Turk Telekom, which is affiliated to the Ministry of Transport and Infrastructure. The Association of Radio Amateurs (TRAC) provides support as the NGO. The coordination of all these works is carried out by AFAD Provincial Directorates, depending on the Provincial Crisis Centre.

International aid from abroad (search and rescue and medical team) is coordinated by the Ministry of Foreign Affairs.

International Medical Emergency

Brief Description of National Guidelines & Policies

Response to Disaster and Emergency Situations, planning and coordination authority in Turkey is under the responsibility of the Disaster and Emergency Management Presidency (AFAD) under the Ministry of Interior. The Provincial Disaster and Emergency Directorate provides this coordination under the Governors in the provinces. There is a Turkey Disaster Response Plan (TAMP) for disasters and the responsibilities of all institutions are specified in this plan. Ministry of Health has the authority to take necessary measures in case of medical emergencies (Pandemic, Epidemic, etc.), to coordinate public and private health institutions and organizations, and to treat and refer patients. Ministry of Health uses this authority in accordance with the Regulation on Health Services in Disasters and Emergencies,

the Hospital Disaster and Emergency Plans Implementation Regulation, and the National Pandemic Plan[93].

Available Resources

Provincial Crisis Centre are established under the chairmanship of the Governor in the provinces where the epidemic is observed. If a worldwide pandemic has been declared by WHO, the Health Disaster Coordination Centre (SAKOM) affiliated to the Ministry of Health is established in the centre under the coordination of the General Directorate of Emergency Health Services. The National Pandemic Plan prepared by the General Directorate of Public Health is taken into effect.

In the Ministry of Health, under the chairmanship of the Minister of Health, a Pandemic Science Board is formed with the participation of experts from the relevant departments of universities. In the provinces, the decisions taken by the Ministry of Health under the Presidency of the Governor are implemented under the coordination of the Provincial Health Directorate. All public and private health institutions, hospitals, ambulances, National Medical Rescue Teams are used for this purpose.

The 112 Emergency Call Centre, police and gendarmerie units affiliated to the Ministry of Interior ensure the implementation of curfews and security when necessary. Municipalities are responsible for the safety of public transportation and the cleaning and inspection of workplaces.

Medical Chambers, relevant departments of universities, Turkish Red Crescent and Voluntary Organisations (NGO) can participate in studies with the permission of the Minister of Health and the Governor.

It is the responsibility of the Presidency of Communications to deliver accurate information to the public from national and local sources.

Vaccines and medicines are supplied from abroad under the coordination of the Ministry of Health.

Recovery Plans

After the pandemic is declared, the plans and practices are updated by the Pandemic Science Board according to the events and information, and this board advises the Ministry of Health on vaccination and treatment issues. Provincial crisis centres implement these plans and involve other institutions.

The Provincial Health Directorate ensures patient transport by ambulances, the implementation of the National Pandemic Plan and the decisions taken by the Pandemic Science Board in all public and private hospitals and health institutions, the supply, storage and distribution of vaccines, the supply and distribution of medicines and medical supplies and personal protective equipment.

National Medical Rescue Teams (UMKE) provide the establishment and operation of mobile health units when necessary. Which hospitals will accept pandemic patients, increasing the service and intensive care bed capacities, opening vaccination stations are made according to the Hospital Disaster and Pandemic plans under the coordination of the Provincial Health Directorate[94].

When necessary, support is received from the Turkish Red Crescent (i.e. Kizilay) and voluntary organisations. Brochures and videos on the importance of vaccination, masks, distance, and personal

[93] National Pandemic Plan, https://www.grip.gov.tr/depo/saglik-calisanlari/ulusal_pandemi_plani.pdf

[94] Regulation on Health Services in Disasters and Emergency Situations, https://www.resmigazete.gov.tr/eskiler/2021/05/20210525-3.htm

hygiene prepared by the Ministry of Health are announced to the public through written and visual media.

The police and gendarmerie teams affiliated to the Ministry of Interior ensure that the curfews are enforced and that the necessary criminal actions are taken against those who do not comply.

It is the responsibility of the provincial and district municipalities to provide clean and safe public transportation vehicles at the specified hours.

In addition, they control the functioning of shopping malls, restaurants, cafes and indoor places, and the cleanliness of places where food is sold.

Police and municipalities assist with cold chain distribution of vaccines and safety issues.

Governorates determine the necessary accommodation places for the quarantine of those coming from abroad. Security and cleanliness of the accommodation is ensured.

Inter-provincial transportation control and restrictions are under the responsibility of the teams affiliated to the Ministry of Interior.

Aid from surrounding provinces is provided by the Crisis Centre under the Presidency of the Governor.

Chemical Accident

Brief Description of National Guidelines & Policies

Response to Disaster and Emergency Situations, planning and coordination authority in Turkey is under the responsibility of the Disaster and Emergency Management Presidency (AFAD) under the Ministry of Interior. The Provincial Disaster and Emergency Directorate provides this coordination under the Governors in the provinces. There is a Turkey Disaster Response Plan (TAMP) for disasters and the responsibilities of all institutions are specified in this plan.

In the event of a chemical hazard due to an industrial accident, the management of the incident is centrally under the responsibility of the Disaster and Emergency Management Presidency (AFAD) under the Ministry of Interior.

There is a "Management Regulation on Chemical, Biological, Radiological, Nuclear Threats and Hazards" published by the Ministry of Interior in 2020[95].

In addition, there is a Mission Directive of the Ministry of Health and its Affiliates on Chemical, Biological, Radiological and Nuclear Hazards. All organizations act according to these regulations.

Available Resources

The Crisis Centre and the Provincial Disaster and Emergency Directorate affiliated to the Governors in the provinces provide this coordination. All public and private institutions act according to the instructions of the Crisis Centre. In the region where industrial accidents and chemical hazards exist, AFAD Search and Rescue Teams, AFAD CBRN teams and equipment, Municipal Fire Brigade CBRN teams and equipment and Ministry of Health UMKE CBRN teams are used in such incidents. Crime scene security is provided by the police, gendarmerie and, when necessary, military personnel.

[95] Mandate Regulation on Chemical, Biological, Radiological, Nuclear Threats and Hazards, https://www.mevzuat.gov.tr/MevzuatMetin/21.5.3033.pdf

AFAD, Fire Brigade and Military units have mobile CBRN decontamination units.

Large hospitals have CBRN Decontamination departments in their emergency departments.

The General Directorate of Meteorology gives information about the weather and the direction of the winds.

If necessary, the public transportation vehicles of the Municipality are used for the evacuation of the people living in the region.

Recovery Plans

In case of chemical hazard, all relevant institutions are assigned in the Centre in accordance with the regulations under the coordination of the Ministry of Interior AFAD and TENMAK.

A Crisis Centre is established under the chairmanship of the Governor in the province where there is danger. Crime scene security is taken by the Police Department (Police or Gendarmerie). Evacuation efforts are initiated for those living in the affected area.

Teams with special training on CBRN and protective clothing and equipment are assigned at the scene (hot and warm area). When necessary, support is obtained from military teams. Measurements are made against air and water pollution.

112 Emergency Call Centres affiliated to the Ministry of Interior evaluate incoming calls, and police, fire and ambulance teams in special suits are assigned to the scene.

The public is informed through the written and visual media under the coordination of the Presidency of Communications.

Before the evacuation, information is given about taking precautions and alarm sirens in the houses.

Decontamination process is applied to everyone coming from the region while passing to the clean area. For this, mobile decontamination vehicles or tents are used. Affected people are transported to hospitals with CBRN Decontamination departments by private ambulances or vehicles, and first the decontamination process is applied.

In the hospital, such patients are treated in a separate department from other patients. Entry and exit are controlled. If necessary, a hospital is designated for such patients and other patients are evacuated. All personnel working here use special protective clothing and equipment.

Radiological Accident

Brief Description of National Guidelines & Policies

There is no nuclear power central operating in Turkey yet. The first reactor of the Akkuyu Nuclear Power Plant, which is under construction in Mersin as a Turkish-Russian joint construction, is planned to be operational in 2023 and the entirety in 2026. A Russian company will operate the power plant for the first 15 years. The planned operating period is 60 years.

It will be controlled by the General Directorate of Nuclear Energy, International Projects affiliated to the Ministry of Energy and Natural Resources, and the Turkish Energy, Nuclear and Mining Research Institute (TENMAK) when it starts to service.

Response to Disaster and Emergency Situations, planning and coordination authority in Turkey is under the responsibility of the Disaster and Emergency Management Presidency (AFAD) under the Ministry of Interior.

There is a Turkey Disaster Response Plan (TAMP) for disasters and the responsibilities of all institutions are specified in this plan.

There are the following regulations and algorithms on this subject:

i) "Regulation on the Safety of Nuclear Facilities and Nuclear Materials[96]", "Regulation on Physical Protection of Nuclear Facilities and Nuclear Materials[97]" and "Radiation Safety Regulation[98]";
ii) "Management Regulation on Chemical, Biological, Radiological, Nuclear Threats and Hazards" published by the Ministry of Interior in 2020; and
iii) "Duty Directive of the Ministry of Health and its Affiliates on Chemical, Biological, Radiological and Nuclear Hazards[99]".

Available Resources

The Crisis Centre and the Provincial Disaster and Emergency Directorate affiliated to the Governors in the provinces will provide coordination. AFAD and TENMAK coordinate the work in case of radiological leakage, accident at the nuclear facility or radioactive fallout from another country.

CBRN teams and equipment of AFAD Search and Rescue Teams affiliated to the Ministry of Interior, CBRN teams and equipment of the Municipal Fire Brigade, and UMKE CBRN teams of the Ministry of Health are used in such events. AFAD, Fire Brigade and Military units have mobile CBRN decontamination units.

Crime scene security is provided by the police, gendarmerie and, when necessary, military personnel.

Large hospitals have CBRN Decontamination departments in their emergency departments.

The General Directorate of Meteorology gives information about the weather and the direction of the winds.

Public buildings and large buildings have bunkers. The Ministry of Foreign Affairs does international briefing and assistance may be sought from other countries.

Recovery Plans

In case of radioactive fallout or leakage, all relevant institutions are assigned in the Centre in accordance with the regulations of the Ministry of Interior, AFAD and TENMAK.

A Crisis Centre is established under the chairmanship of the Governor in the province where there is danger.

[96] Regulation on the Safety of Nuclear Facilities and Nuclear Materials, https://www.resmigazete.gov.tr/eskiler/2020/08/20200808-8.htm
[97] Regulation on the Physical Protection of Nuclear Facilities and Nuclear Materials, https://www.resmigazete.gov.tr/eskiler/2012/05/20120522-7.htm
[98] Radiation Safety Regulation, https://www.mevzuat.gov.tr/File/GeneratePdf?mevzuatNo=5272&mevzuatTur=KurumVeKurulusYonetmeligi&mevzuatTertip=5
[99] Authorization Regulation on Radiation Facilities and Radiation Applications, https://www.resmigazete.gov.tr/eskiler/2020/12/20201217-6.htm

Crime scene security is taken by the Police Department (Police or Gendarmerie).

Evacuation efforts are initiated for those living in the affected area.

Teams with special training on CBRN and protective clothing and equipment from nuclear hazards are assigned at the scene (hot and warm area).

When necessary, support is obtained from military teams.

Measurements are made against air and water pollution.

112 Emergency Call Centres affiliated to the Ministry of Interior evaluate incoming calls, and police, fire and ambulance teams in special suits are assigned to the scene.

Informing the public is done through the written and visual media under the coordination of the

Presidency of Communications. Before the evacuation, information is given about taking precautions and alarm sirens in the houses.

The locations of the shelters and who will be evacuated are planned. Decontamination process is applied to everyone coming from the hot and warm areas while passing to the clean area. For this, mobile decontamination vehicles or tents are used. Affected people are transported to hospitals with CBRN Decontamination departments by private ambulances or vehicles, and first the decontamination process is applied. In the hospital, such patients are treated in a separate department from other patients. Entry and exit are controlled. If necessary, a hospital is designated for such patients and other patients are evacuated.

All personnel working here use special protective clothing and equipment.

Critical infrastructure disruption

Brief Description of National Guidelines & Policies

Response to Disaster and Emergency Situations, planning and coordination authority in Turkey is under the responsibility of the Disaster and Emergency Management Presidency (AFAD) under the Ministry of Interior.

The Provincial Disaster and Emergency Directorate provides this coordination under the Governors in the provinces.

There is a Turkey Disaster Response Plan (TAMP) for disasters and the responsibilities of all institutions are specified in this plan.

If there is an interruption in the power plants, Turkey Electric Distribution Joint Stock Company (TEDAŞ) affiliated to the Ministry of Energy and Natural Resources; Turkey Electric Production-Transfer Joint Stock Company (TEİAŞ)which is responsible for generation, transmission and trade and Electricity Generation Joint Stock Company (EÜAŞ) comes into play.

There is a regulation named "Regulation on supply continuity, commercial and technical quality of electric energy offered in the distribution system in the electricity market[100]" related to this disaster.

[100] Regulation on Continuity of Supply, Commercial and Technical Quality of Electrical Energy Presented in the Distribution System in the Electricity Market, https://www.resmigazete.gov.tr/eskiler/2006/09/20060912-4.htm

Available Resources Crisis Centres and the Provincial Disaster and Emergency Directorate affiliated to the Governors in the provinces provide this coordination. AFAD Search and Rescue Teams, TEDAŞ and TEİAŞ teams, Municipal Fire Brigade teams, Ministry of Health 112 ambulance, hospital and UMKE teams are working in the outage and subsequent fire in one of the power plants.

Crime scene security is provided by the police, gendarmerie and, when necessary, military personnel.

The General Directorate of Meteorology gives information about the weather and the direction of the winds.

Municipalities and voluntary organizations, Turkish Red Crescent (i.e. Kizilay) provide support in settlements where there is a power cut.

Recovery Plans

A Crisis Centre is established under the chairmanship of the Governor in the province where there is a power outage and transformer fire.

Crime scene security is taken by the Police Department (Police or Gendarmerie).

112 Emergency Call Centres affiliated to the Ministry of Interior evaluate incoming calls, and police, fire and ambulance teams in special suits are assigned to the scene. The public is informed through the written and visual media under the coordination of the Presidency of Communications.

Those affected by the fire are transferred to hospitals by 112 ambulances.

People living in areas where there is a power outage are informed in advance of how long the blackout will last. Municipalities provide support to the public in order not to spoil the food in summer and to provide alternative lighting.

TEDAŞ and Municipalities provide generator and fuel support in order to provide electricity to critical buildings (hospital, nursing home, bank, airport, metro, official institutions and food production places, etc.). If necessary, the area is evacuated by public transportation vehicles affiliated to the Municipalities. In winter, measures are taken to warm up.

Hotels and public institutions with generators can be used for accommodation.

Extreme Weather

Brief Description of National Guidelines & Policies

Response to Disaster and Emergency Situations, planning and coordination authority in Turkey is under the responsibility of the Disaster and Emergency Management Presidency (AFAD) under the Ministry of Interior. Provincial Disaster and Emergency Directorate provides this coordination under the Governors in the provinces.

There is a Turkey Disaster Response Plan (TAMP) for disasters and the responsibilities of all institutions are specified in this plan.

It provides coordination between the Ministry of Health and AFAD under the Ministry of Interior, especially for the health problems of the elderly due to extreme temperatures.

Available Resources

The Crisis Centre and the Provincial Disaster and Emergency Directorate affiliated to the Governors in the provinces provide this coordination.

Emergency health problems that may occur after the extreme temperature due to the Crisis Centre are covered by 112 Ambulance (EMS) Services, UMKE and Hospitals under the responsibility of Provincial Health Directorates.

Police or Gendarme provide security. Municipalities take measures for the homeless and stray animals and provide their accommodation.

General Directorate of Meteorology gives information about weather conditions, temperature and humidity. Municipalities and voluntary organizations, Turkish Red Crescent provide support in places where extreme temperatures are observed.

Recovery Plans

Search and rescue activities in forest fire areas are carried out by AFAD, Fire Department, UMKE and Military teams.

112 Emergency Call Centres affiliated to the Ministry of Interior evaluate incoming calls and assign police, fire and ambulance teams to the scene.

Aid from surrounding provinces is provided by the Crisis Centre under the Presidency of the Governor. Animals are taken under protection by the Ministry of Agriculture and Forestry and Municipalities. The veterinary association also supports the care of affected animals as NGOs.

The fire extinguishing and rescue activities in the settlements are the responsibility of the Municipal Fire Brigades. Turkish Red Crescent (i.e. Kizilay) provides shelter and food support as NGO.

Police, Gendarmerie and Fire Brigade teams respond to calls to the 112 Emergency Call Centre.

Measures are taken with the help of the Health Directorate and Municipalities for the elderly people who are most affected by the extreme heat, those with chronic diseases, pregnant and small children, and those living on the streets.

Ambulances transport patients affected by extreme heat to hospitals.

The Provincial Crisis Centre informs the public through the written and visual media and social media to avoid going out on the streets, to consume plenty of liquids, to use hats and umbrellas during the hours when the heat is most affected.

Regulations are made in the working hours of public and private institutions.

If necessary, remote working and training can be started.

Outdoor sports activities and construction works are temporarily suspended. Measures are taken against energy cuts due to excessive use of air conditioners.

5.3.2 Greece

Brief Description of National Guidelines & Policies

General Civil Protection Plan

The purpose of the General Plan with the slogan "Xenocrates" is to formulate a system of effective response to catastrophic phenomena for the protection of life, health and property of citizens, as well as the protection of the natural environment. "Xenokratis" was written by General Secretariat for Civil Protection (GSCP) with Y.A. 1299/2003 (Government Gazette 423 ΒΔ / 10-4-2003) and was revised with an additional Y.A. 3384/2006 (Government Gazette 776 / 28-6-06) with which the Special Plan "Management of Human Losses" was approved.

In the "Xenocrates" plan:

i) The types of disasters and the corresponding terms of civil protection are defined; and
ii) Roles are defined and design directions are given to Ministries, Regions, SE, Municipalities, Communities.

It is clarified that all projects are approved by the GSP.

Identified:

i) Services & agencies involved; and

ii) Bodies that direct and coordinate operational forces at all levels.

Essential data is provided for:

i) risk assessment;
ii) marking of vulnerable areas; and
iii) preparation of special plans for each risk.

Guidelines for:

i) drafting strategies and tactics;
ii) proper organisation and equipment of services and formulation of business philosophy;
iii) timely mobilisation, activation, management and coordination of human resources;
iv) the creation of logistics capabilities to address the problems of both the operational forces and the affected citizens; and
v) the creation of a system of communication and information flow between all services involved and actors in crisis management.

This plan is a basic planning framework, under which the preparation of risk-specific plans is entrusted to the relevant ministries. The process of setting up working groups in the ministries is already underway, at the initiative of the General Secretariat for Civil Protection, in order to upgrade the special plans per risk.

The civil protection mobilisation situation is divided into:

i) Status of civil protection preparedness, due to documented risk, which includes the escalation of the preparedness of the potential and the means of civil protection, during the specialisation that is done in the preparedness planning;
ii) A civil protection emergency situation including a disaster-related situation that requires;
iii) Specific coordination by the General Secretariat for Civil Protection of the potential and means of the services and bodies, which take action at central, regional and local level; and
iv) Mobilisation of potential and resources in addition to those available under normal conditions.

The potential forces of Civil Protection include:

i) Specialised civil protection executives at central, regional and local level, who are responsible

for overseeing the development and implementation of civil protection plans, programs and measures, as well as coordinating the necessary actions;

ii) All government agencies, local government agencies and utilities, which are operationally responsible for the individual civil protection actions and mainly for disaster preparedness and response (such as the Fire Brigade, the Coast Guard, Hellenic Police, Hellenic National Centre for Emergency Care, Armed Forces, Earthquake Planning & Protection Organisation, services of the Region, the Prefecture and the municipalities, Electricity agencies, Phone agencies, Water agency, Gas agencies, National Forecast Service).); and

iii) The civil protection voluntary organisations, as well as the specialised civil protection volunteers, at central, regional and local level, who are part of the planning of the General Secretariat for Civil Protection and undertake the support of prevention and rehabilitation plans and actions, as well as disaster preparedness and response actions.[101]

Flooding

GSCP has issued general instructions to the public for the prevention, treatment, and relief from flooding[102].

These guidelines describe how to deal with the dangers the prevention of floods and during the onset of this natural phenomenon, a series of actions for the best possible impact on human life and on the property of citizens.

GSCP has also prepared the General Plan for Emergency Response and Immediate / Short-term Management of Consequences of a Flood Phenomenon with the code name "DARDANOS" (1st edition)[103.]

This plan describes a series of actions at the level of municipality / community, region and decentralised administration but also at the level of central government such as the Ministry of Infrastructure and Transport, Ministry of Environment and Energy, Ministry of National Defence, Ministry of Civil Protection, Ministry of Shipping and Island Policy, Ministry of Health, Fire Service, Hellenic Police, National Centre for Health Operations, EKAB (EMS), Hellenic Coast Guard etc.

The scope is the prevention of floods, dealing with them and the relief in the affected areas.

According to the "Dardanos" plan, the forces that are activated are from the Decentralised Administration, the regions, the Municipalities, construction companies, voluntary organisations with road construction machinery, pumps and whatever else is needed to deal with the phenomenon.

The Central Administration activates hospitals and health centres and any kind of health formation that is deemed necessary, the EKAB, the armed forces.

Fire Service has established a Special Unit for Disaster Management (EMAK). Its main responsibility is rescue in extreme situations such as rescue of missing persons from floods, catastrophic fires, earthquakes, road accidents decontamination from chemicals of victims, and in any kind of disaster.

---

[101] General Plan of Civil Protection, Ministry for Climate Change and Civil Protection, Accessed October 17,2021, Civil Protection

[102] Severe Weather Phenomena Protection Guidelines, Ministry for Climate Change and Civil Protection, Accessed October 17,2021, https://www.civilprotection.gr/en/severe-weather-phenomena

[103] General Plan for Emergency Response and Immediate / Short-term Management of Consequences of a Flood Phenomenon with the code name "DARDANOS", GSCP, August12, 2019, Accessed October 17,2021, https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_dardanos_oe.pdf https://www.civilprotection.gr/el/geniko-shedio-antimetopisis-ektakton-anagkon-kai-amesisvraheias-diaheirisis-synepeion-apo-ekdilosi

Following the occurrence of flood phenomena EKAB based on of the current institutional framework (Law 1579/1985, Presidential Decree 376/1988 & Presidential Decree 348/1996, Law 4633/2019 - Government Gazette161 / ΑΔ / 2019) is mainly responsible for[104]

i) Addresses and coordinates the treatment of health incidents, giving instructions for first aid to callers, as well as to the ambulance crew aiming for the best patient outcome;
ii) The dispatch of ambulances and mobile units to the site of the disaster;
iii) The provision of first aid to any injured and their transport to hospitals; and
iv) The activation of the Crisis Management Team (CRM) by order of the president of EKAB and by its crisis, which coordinates staff and operations of local activities forces of EKAB (branches of EKAB, Special Department of Disaster Medicine (ETIK) of EKAB, etc).

Coordinating public and private health agencies to deal with emergencies and crises in public health.

Monitoring the implementation of actions of the Health Sector based on the respective planning, such as readiness and operation of the nursing units for the reception injured / patients, coverage of increased needs for pharmaceutical material, public controls Health, etc.

In case of a mass incident activates the implementation of special response plans massive health losses of EKAB through the mobilisation of all involved structures.

EKAB is developed nationwide in 12 Branches (Athens, Thessaloniki, Patras, Heraklion, Larissa, Kavala, Ioannina, Lamia, Alexandroupoli, Tripoli, Kozani and Mytilene) and each Branch is developed in Sectors in different regions of the country.

The development of EKAB creates a modern system of Emergency Pre-Hospital Medicine (EPM) services and contributes: crucial to the quality upgrade of the overall health services provided, in the immediate provision of organised EPM services with the consequence of its reduction mortality, length of hospital stay and frequency of temporary or permanent disability and disability reducing the cost of health services provided in reducing the rate of migration to large urban centres with the creation feeling of security to the inhabitants of the region in the reduction of preventable deaths (internationally only for accidents by 30%)[105].

The GSCP has declared through CECIS the 9 Civil Protection Units that Greece has as a contribution to the means of the Mechanism, which can potentially be mobilised to offer assistance in case of emergencies inside and outside the Union.

Civil protection modules have different mission profile according to the different needs they address to.[106]

Through the National Centre of Emergency Care (EKAB) has developed an Emergency Medical Team type 1 (EMT1) dedicated to dealing with disaster victims in catastrophic situations in Greece but also abroad (EKAB/EMT1).

After the affected countries request medical assistance from the European Civil Protection Mechanism through the Emergency Response Coordination Centre (ERCC); Greece can offer it.

[104] Civil Protection Action Plan to address the risks of the event flood phenomena, GSCP, October 10,2019, https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_drasewn_plimiron_2019.pdf_2.pdf
[105] Hellenic National Centre for Emergency Care (EKAB), https://www.ekab.gr/organismos/
[106] Special Unit for Disaster medicine (ETIK), 2019, EKAB's Standard Operating Procedures

EKAB's vehicles nationwide in order to quickly send specialised personnel to the scene and in a safe and fast way to serve the patient to the nearest Health Centre are[107]:

i) 735 BLS Ambulances;
ii) 102 Special Mobile Units of Emergency Pre-Hospital Medicine (ALS);
iii) 25 Motorcycles;
iv) 4 Small express vehicles (smart, Saxo);
v) 3 Helicopters;
vi) 2 Self-propelled Coordination Centres;
vii) 2 Disaster Management Vehicles; and
viii) 350 Ambulances provided by EKAB and used by Hospitals and Health Centres.

Special Department of Disaster Medicine (ETIK)

EKAB has established the Special Department of Disaster Medicine (ETIK) which is responsible for drafting plans as well as for their implementation in cases of emergencies and massive health losses due to natural or non-massive disasters. The plans prepared by ETIK are part of the general planning of the state for dealing with emergencies and specifically in the General Plan of Civil Protection with the slogan Xenocrates. This department includes doctors and crews of EKAB, who have been trained in dealing with massive health losses due to massive accidents and disasters. As part of the "Xenokratis" plan, our service is called upon to deal with the effects on the health of the citizens from various adverse situations caused by natural or technological disasters, together with the other involved bodies. The mission of ETIK is to ensure and protect public health through a rapid response of EKAB to all situations that require the provision of emergency pre-hospital care to a large number of victims as well as the coordination between pre-hospital and hospital response. Protecting the health as well as protecting the lives and property of citizens from the effects of a natural or technological disaster is very important.[108]

ETIK Vehicles

i) 2 rescue vehicles /storage trucks;
ii) 1 Mobile Communication Centre; and
iii) 3 Sets of two trucks with trailer for each truck.

Recovery

i) According to "Dardanos" plan;
ii) Financial aid for injuries;
iii) Psycho-social support for disasters;
iv) Treatment of emergency concerning the public health;
v) Restorations of affected buildings;
vi) Restoration of damages and removal of risks due the flood;
vii) Financial aid for industrial units, commercial stores, agricultural exploitations, other business and non-profit organisations affected by flood;
viii) Immediate mapping of affected area; and
ix) Financial aid of municipalities and regions according to the existing framework.

Prevention program and treatment of damage and disasters caused by disasters

[107] Hellenic National Centre for Emergency Care (EKAB), https://www.ekab.gr/mesa-diakomidis/
[108] Hellenic National Centre for Emergency Care (EKAB), https://www.ekab.gr/drastiriotites-ipiresies-mesa/idiko-tmima-iatrikis-katastrofon/

i) Compensations for animal and plant capital and production; and
ii) Control and restoration of cultural heritage and monuments.

Forest/Wildfires

There is a General Civil Protection Plan for forest fires with code name “Xenokratis”.

GSCP has issued general instructions to the public for the prevention, treatment and relief from forest fires.[109]

GSCP has also prepared the General Plan for Emergency Response due to forest fires with the code name "IOLAOS" (4th edition).[110]

This plan describes a series of actions at the level of municipality/ community, region and decentralised administration but also at the level of central government such as the Ministry of Infrastructure and Transport, Ministry of Environment and Energy, Ministry of National Defence, Ministry of Civil Protection, Ministry of Shipping and Island Policy, Ministry of Health, Fire Service, Hellenic Police, National Centre for Health Operations, EKAB (EMS), Hellenic Coast Guard etc.

The scope is the prevention of forest fires, dealing with them and the relief in the affected areas.

According to the "Iolaos" plan, the forces that are activated from the Decentralised Administration, the regions, the Municipalities, construction companies, voluntary organisations with road construction machinery, big trucks, bulldozers, private fire trucks, water tanks and whatever else is needed to deal with the forest fires.

The Central Administration activates hospitals, health centres, and any kind of health formation that is deemed necessary, the EKAB, the armed forces.

Fire Service has established a Special Unit for Disaster Management (EMAK). Its main responsibility is rescue in extreme situations such as rescue of missing persons from floods, catastrophic fires, earthquakes, road accidents decontamination from chemicals of victims, and in any kind of disaster.

The Ministry of National Defence activates the "Defkalion" forces[111]. The availability, dispersion and readiness of the air and ground means of the armed forces (AF) depending on the availability, which is agreed to be executed by the AFs for the needs of forest firefighting.

The availability of helicopters to coordinate the firefighting project in severe forest fires and the organisation of air surveillance.

The participation with means and staff of Armed Forces (AF), in the organisation and operation of the mixed on-board patrols.

The provision of a suitable ship for the transport of firefighting vehicles and personnel to islands, to

[109] Forest Fires Protection Guidelines, Ministry for Climate Change and Civil Protection, , https://www.civilprotection.gr/sites/default/gscp_uploads/forest_fires_25_7_19.pdf
[110] General Plan for Emergency Response due to forest fires with the code name "IOLAOS, GSCP, December 6,2012, https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_iolaos_oe.pdf
[111] General Plan for Emergency Response due to forest fires with the code name "IOLAOS, GSCP, December 6,2012, https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_iolaos_oe.pdf

reinforce the fire brigade in the event of a major fire.

The disposal of helicopters or aircrafts or ships of the Navy, when required for the transport of rescue teams or other operatives involved at the site of the disaster, depending on operational needs and as will be decided each time by General Staff of National Defence.

The provision of personnel, means, materials and supplies and their promotion to the affected emergency areas.

The availability of the required maps, aerial photographs etc. operatively involved bodies.

The participation in the implementation of the decision for organised removal of citizens due forest fires when taken by the competent Decentralised Policy Bodies.

Following the occurrence of forest fires EKAB based on of the current institutional framework (Law 1579/1985, Presidential Decree 376/1988 & Presidential Decree 348/1996, Law 4633/2019 - Government Gazette161 / ΑΔ / 2019) is mainly responsible for:

i) Addresses and coordinates the treatment of health incidents, giving instructions for first aid to callers, as well as to the ambulance crew aiming for the best patient outcome;
ii) The dispatch of ambulances and mobile units to the site of the disaster;
iii) The provision of first aid to any injured and their transport to hospitals;
iv) The activation of the Crisis Management Team (CRM) by order of the president of EKAB and by its crisis, which coordinates staff and operations of local activities forces of EKAB (branches of EKAB, Special Department of Disaster Medicine (ETIK) of EKAB, etc).);
v) Coordinating public and private health agencies to deal with emergencies and crises in public health;
vi) Monitoring the implementation of actions of the Health Sector based on the respective planning, such as readiness and operation of the nursing units for the reception injured / patients, coverage of increased needs for pharmaceutical material, public controls Health, et; and
vii) In case of a mass incident activates the implementation of special response plans massive health losses of EKAB through the mobilisation of all involved structures.

EKAB (EMS) also with the Special Unit for Disaster Medicine (ETIK) operates in these areas to treat the injured by setting up tents for triage and treatment of patients and reports the cases to the appropriate hospitals.

Recovery

According to “Iolaos” plan:

i) Financial aid for injuries;
ii) Psycho-social support for disasters;
iii) Treatment of emergency concerning the public health;
iv) Restorations of affected buildings;
v) Restoration of damages and removal of risks due the forest fires;
vi) Financial aid for industrial units, commercial stores, agricultural exploitations, other business and non-profit organisations affected by forest fires;
vii) Immediate mapping of affected area; and
viii) Financial aid of municipalities and regions according to the existing framework.

Prevention program and treatment of damage and disasters caused by disasters

i) Compensations for animal and plant capital and production; and
ii) Control and restoration of cultural heritage and monuments.

Earthquake

General Civil Protection Plan for disaster's management with code name "Xenokratis".

The General Secretariat for Civil Protection (GSCP) has issued general instructions to the public for the prevention, treatment and relief from earthquake. [112]

GSCP has also prepared the General Plan for Emergency Response and Immediate / Short-term Management of the Consequences of the Earthquake with the code name "EGKELADOS." [113]

According to the "Egkelados" plan, forces that are activated are from the Decentralised Administration, the regions, the Municipalities, construction companies, voluntary organisations with road construction machinery, big trucks, bulldozers, big cranes, and whatever else is needed to deal with the phenomena.

The Central Administration activates hospitals and health centres and any kind of health formation that is deemed necessary, the EKAB, the armed forces etc.

Fire Service has established a Special Unit for Disaster Management (EMAK). Its main responsibility is rescue in extreme situations such as rescue of missing persons from floods, catastrophic fires, earthquakes, road accidents decontamination from chemicals of victims, and in any kind of disaster.

Following the occurrence of earthquake EKAB based on of the current institutional framework (Law 1579/1985, Presidential Decree 376/1988 & Presidential Decree 348/1996, Law 4633/2019 - Government Gazette161 / ΑΔ / 2019) is mainly responsible for:

i) Addresses and coordinates the treatment of health incidents, giving instructions for first aid to callers, as well as to the ambulance crew aiming for the best patient outcome;
ii) The dispatch of ambulances and mobile units to the site of the disaster;
iii) The provision of first aid to any injured and their transport to hospitals;
iv) The activation of the Crisis Management Team (CRM) by order of the president of EKAB and by its crisis, which coordinates staff and operations of local activities forces of EKAB (branches of EKAB, Special Department of Disaster Medicine (ETIK) of EKAB, etc.);
v) Coordinating public and private health agencies to deal with emergencies and crises in public health;
vi) Monitoring the implementation of actions of the Health Sector based on the respective planning, such as readiness and operation of the nursing units for the reception injured / patients, coverage of increased needs for pharmaceutical material, public controls Health, etc; and
vii) In case of a mass incident activates the implementation of special response plans massive health losses of EKAB through the mobilisation of all involved structures.

[112] Earthquakes, Protection Guidelines, Ministry for Climate Change and Civil Protection, https://www.civilprotection.gr/en/eaGuidelrthquakes

[113] Emergency Response and Immediate / Short-term Management of the Consequences of the Earthquake with the code name "EGKELADOS.", GSCP, January 20,2020, https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_egkelados.pdf https://www.civilprotection.gr/en/earthquakes

EKAB (EMS) also with the Special Unit for Disaster Medicine (ETIK) operates in these areas to treat the injured by setting up tents for triage and treatment of patients and reports the cases to the appropriate hospitals.

Recovery

According to "Egkelados" plan[114]:

i) Financial aid for injuries;
ii) Psycho-social support for disasters;
iii) Treatment of emergency concerning the public health;
iv) Post-earthquake control of buildings and infrastructures;
v) Restoration of buildings affected by the earthquake;
vi) Granting of housing assistance;
vii) Repair of damages and removal of risks due to earthquake;
viii) Financial aid for industrial units, commercial stores, agricultural exploitations, other business and non-profit organisations affected by forest fires;
ix) Immediate mapping of affected area; and
x) Financial aid of municipalities and regions according to the existing framework

Prevention program and treatment of damage and disasters caused by disasters

i) Compensations for animal and plant capital and production; and
ii) Control and restoration of cultural heritage and monuments.

International Medical Emergency

The Ministry of Health, in the context of its responsibilities and due to the seasonal increase of cases of viral etiology (seasonal flu, COVID-19, etc.) considers it expedient and necessary to remind basic hygiene rules that must be observed in all public transport land, sea and air and in their passenger stations, with the main objective of protecting and ensuring the Individual Health of passengers and employees and consequently of Public Health.

In addition, you consider it expedient and necessary to intensify the health controls in the companies of Health interest, while informing the managers of the companies for increased Hygiene and self-control measures.[115]

GSCP has also issued similar instructions to the public.[116]

EKAB (EMS) has issued a training program, which is an operational plan of control of readiness, training & exercises of EKAB in the Health Formations of the Island country.[117]

The program of readiness control, training & exercises with the code name "EKAB be S.A.F.E. »(Stay Alert Fully Educated), is addressed (mainly) to the health executives of the islands and key tourist destinations (islands that have Hospitals and mainly Health Centres or Multipurpose Regional Clinics but also major tourist destinations such as Halkidiki and Crete island to the executives of the locally

[114] Emergency Response and Immediate / Short-term Management of the Consequences of the Earthquake with the code name "EGKELADOS.", GSCP, January 20,2020, https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_egkelados.pdf
[115] Public Health Regulations, Ministry of Health, https://www.moh.gov.gr/articles/health/dieythynsh-_dhmosias-ygieinhs/tmhma-ygeionomikwn-kanonismwn-dhmosias-ygeias/c337-egkyklioi
[116] Corona Virus19-Public Guidelines, GSCP, https://www.civilprotection.gr/el/koronoios-covid-19-hrisimes-odigies
[117] Covid19 Press Release, Hellenic National Centre for Emergency Care (EKAB), https://www.ekab.gr/anakoinoseis/besafe/

involved services for the realisation of air transportation and water transportation (Coast Guard - Hellenic Coast Guard).

The main objective of this program is to ensure both the readiness and the adequacy of the knowledge of all Health executives, the officers of the Coast Guard as well as the involved executives of the Regional and Local Government, etc., regarding the observance of the individual means of protection but and the provision of emergency prehospital care (on a case-by-case basis) to support patients' vital functions during the safe delivery of a suspected or confirmed SARS-CoV-2 incident to a designated Covid-19 Referral Hospital.

The National Public Health Organisation (NPHO) is a legal entity of Private Law under the supervision of the Minister of Health. It is established under the Law 4633/2019 and it is the universal successor of the pre-existing Centre for Diseases Control and Prevention (KEELPNO/HCDCP), which was abolished by the Law 4600/2019.[118]

NPHO's mission is to provide services that contribute to the protection and improvement of health and increase the life expectancy of the population by enhancing the capacity of the National Healthcare System, with particular focus on public health services, to effectively respond to threats to human health by communicable diseases through the early detection, monitoring and evaluation of risks, reporting and submission of evidence-based proposals and intervention measures.

The National Council for Public Health has prepared a National Strategic Plan for public health (2019-2022).[119]

The aim is to change the mentality, a new level of perception that will include the logic of Public Health at all levels of policy, as well as a framework that will include common strategies, coordination of joint actions, exchange of know-how and good practices. New, sophisticated management and surveillance tools and mechanisms are needed.

Greece is divided into seven health districts with variety of hospitals (public, university, military, private), health centres, peripheral health units etc.[120]

The Armed forces also have Health Services in all three branches (Army, Navy, Air Force), which also contribute, as was the case with the national vaccination program for the Covid 19 pandemic.

EKAB (EMS) and the Centre for Health Operations coordinate the health forces in dealing with pandemics, such as ambulances, Mobile Intensive Care Units, hospital beds, Intensive Care Unit's bed, etc.

Recovery

i) Financial support to affected citizens due pandemic;
ii) Strengthening the National Health System with medical staff, new beds on Intensive Care Units, extra financial support;
iii) National Centre for Social Solidarity (EKKA) in the midst of the coronavirus pandemic (COVID-19) operational actions adapted to the situation of the new virus aim at:

[118] Introduction, National Public Health Organization, https://eody.gov.gr/en/npho/
[119] National Plan for Public Health 2019-2022, National Council of Public Health, Ministry of Health ,May 2019, 2021, https://www.moh.gov.gr/articles/health/domes-kai-draseis-gia-thn-ygeia/ethnika-sxedia-drashs/6237-ethniko-sxedio-drashs-gia-thn-dhmosia-
[120] Health Districts, Ministry of Health, https://www.moh.gov.gr/articles/citizen/xrhsima-thlefwna-amp-dieythynseis/2719-ygeionomikes-perifereies

a. the protection of public health through Instructions / instructions for the psychological management of the new virus emergency from the telephone lines "197" and "1107";
b. the protection of the health of the guests in the hostels of EKKA through the establishment of a "Special Group for the Prevention & Promotion of Health" as well as an action plan in case;
c. the psychosocial support of vulnerable populations (victims of domestic violence, unaccompanied minors in housing structures, people who are forced to stay at home due to a traffic ban) through of the application ("HELPida") for victims of domestic violence.; and

iv) Anti-stigma guide: EKKA has translated into Greek the guide of the World Health Organisation (WHO), UNICEF and the International Federation of Red Cross and Turkish Red Crescent Societies (IFRC) for the prevention of stigma related to stigma related to with Covid 19).[121]

Chemical Accidents

GSCP has issued general instructions to the public for the prevention, treatment and relief from industrial accidents including chemical incident industry-related according SEVESSO 2 direction[122].

GSCP has also prepared 1st Edition of the General Plan for Emergency Response due to Accidents during Road and Rail Transport of Dangerous Goods according to them ADR / RID regulations[123] including chemical incidents and the 3rd Edition of the General Plan for Dealing with Large-Scale Technological Accidents (General SATAME) with the code name "HERACLEITOS".[124]

National Public Health Organisation (EODY) has written instructions first responders (police officers, fire fighters, paramedics) how to deal with chemicals and the decontamination.[125]

According to the laws (3013/2002 and 4249/2014 art108)[126,127] the organised evacuation of citizens from an area for reasons of protection of their life or health from an evolving or impending disaster is part of the Civil Protection actions. The decision on the organised evacuation of citizens is the responsibility of the local Mayors and Presidents of the Communities, who have the coordination of the civil protection project to deal with the disaster at the local level. When the ongoing or impending disaster may affect more than one Municipality or Community, the competent Prefect takes the decision.

In case of generalised mass destruction in more than three regions, the decision is taken by the General Secretary of Civil Protection or the General Secretary of the relevant Region and is executed by competent Prefects, Mayors and Presidents of Communities. The decision shall be based on the recommendations of the bodies responsible for reducing the effects of the disaster.

The obligatory removal of citizens from the area, which is nearby of the scene of the incident and is in

[121] Introduction, National Public Health Organization, , https://eody.gov.gr/en/npho/
[122] Introduction, National Public Health Organization, https://eody.gov.gr/en/npho/ https://www.civilprotection.gr/sites/default/gscp_uploads/shedio_irakleitos.pdf
[123] General Plan for Emergency Response due to Accidents during Road and Rail Transport of Dangerous Goods according to them ADR / RID regulations, GSCP, June 30, 2020, https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_atyximaton_adr_rid_2020.pdf
[124] General Plan for Dealing with Large-Scale Technological Accidents (General SATAME) with the code name "HERACLEITOS", GSCP, February 6,2020, https://www.civilprotection.gr/sites/default/gscp_uploads/shedio_irakleitos.pdf
[125] Dealing with patients on scene, NPO(EODY),2019, https://eody.gov.gr/wp-content/uploads/2019/01/antimetopisi_asthenon_ston_topo_toy_symbantos.pdf
[126] National Gazette (FEK 102), December 7,2006, https://www.civilprotection.gr/sites/default/gscp_uploads/media/ipapofasi72702006sistasiyodxbrp_el_GR.pdf
[127] Responsibilities of the General Secretariat for Civil Protection, Law 249/2014, https://www.lawspot.gr/nomikes-plirofories/nomothesia/n-4249-2014/arthro-108-nomos-4249-2014-armodiotites-genikis

immediate danger when the incident caused near houses, school units, bus stations, suburban railway, etc. and the lives and safety of citizens are immediately threatened.

Fire Service has established a Special Unit for Disaster Management (EMAK). Its main responsibility is rescue in extreme situations such as rescue of missing persons from floods, catastrophic fires, earthquakes, road accidents decontamination from chemicals of victims, and in any kind of disaster.

Fire Service transport the wounded and sick up to the limit of the warm with the cold zone (after disinfection, when required and possible, e.g., in case of chlorine contamination), where they are received by the EKAB unit, for the purpose of their care and transportation.

EKAB(EMS) with the Special Unit for Disaster Medicine (ETIK) operates in these areas to treat the injured by setting up tents for triage and treatment of patients and reports the cases to the appropriate hospitals.

Armed forces have established special CBRN Defence units, including the Special Interdisciplinary Battalion CBRN Defence, participate in the dealing with an accident while transporting dangerous goods by road only in support of the other parties involved institutions (provision of materials and means, if there is a reason and disposition of a doctor personnel for any rescue of operational team personnel reaction), at the request of the EKAB/KEPY. Full activation and involvement of the above departments in dealing with an accident, constitutes last resort and is done only if the other stakeholders unable to act.[2]

Greek government (with YA 7270/2006) has set up a support group for Chemical, Biological, Radiological, Nuclear Threat and Incident Management Team, taking into account the experience gained during the 2004 Olympic Games, reports to the Secretary-General for Civil Protection and is a staff advisory body that supports on a regular, operational and political level the Civil Protection forces and bodies for managing events or threats that are either due to an accident or are the result of a terrorist act and can cause an emergency.

The team is staffed by employees with appropriate scientific knowledge and specialisation, of the General Secretariat for Civil Protection, of the Ministries of Environment, Spatial Planning and Public Works, Health and Rural Development and Food, the General State Chemistry, the Hellenic Atomic Energy Commission, the National Meteorological Service, the General Staff of National Defence, the Greek Police, the Fire Brigade and the Coast Guard.

Recovery

When complete suppression of the event occurs, the operator, if required, immediately implements all required measures / tasks for short-term resolution.

In addition, restoration of the accident site and protection of the natural and anthropogenic environment under the supervision and approval of the decentralised administration. After the completion of the remediation and restoration actions of the space, the incident ends, following the order of the Chief Officer of the Fire Service.

Convening of Coordinating Bodies of Municipalities after the incident, for emergency response and immediate / short-term management consequences.

Temporary / long-term housing of the victims by setting up camps in public places includes:

i) Hygiene care;
ii) Safety and Security care;

iii) Financial aid;
iv) Long-term financial support with low-interest loans;
v) Psychological support; and
vi) Children's education and training.

Radiological Accident

Brief Description of National Guidelines & Policies

General Civil Protection Plan for disaster's management with code name "Xenokratis".

GSCP has issued general instructions to the public for the prevention, treatment and relief from CBRN accidents.[128]

GSCP has also prepared 3rd Edition of the General Plan for Dealing with Large-Scale Technological Accidents (General SATAME) with the code name "HERACLEITOS"[129].

The Fire Service has established a Special Unit for Disaster Management (EMAK). Its main responsibility is rescue in extreme situations such as rescue of missing persons from floods, catastrophic fires, earthquakes, road accidents decontamination from chemicals of victims, and in any kind of disaster.

The Fire Service transport the wounded and sick up to the limit of the warm with the cold zone (after disinfection, when required and possible, e.g. in case of chlorine contamination), where they are received by the EKAB unit, for the purpose of their care and transportation.

EKAB (EMS) with the Special Unit for Disaster Medicine (ETIK) operates in these areas to treat the injured by setting up tents for triage and treatment of patients and reports the cases to the appropriate hospitals.

Greek government (with YA 7270/2006) has set up a support group for Chemical, Biological, Radiological, Nuclear Threat and Incident Management Team, taking into account the experience gained during the 2004 Olympic Games, reports to the Secretary-General for Civil Protection and is a staff advisory body that supports on a regular, operational and political level the Civil Protection forces and bodies for managing events or threats that are either due to an accident or are the result of a terrorist act and can cause an emergency.

The team is staffed by employees with appropriate scientific knowledge and specialisation, of the General Secretariat for Civil Protection, of the Ministries of Environment, Spatial Planning and Public Works, Health and Rural Development and Food, the General State Chemistry, the Hellenic Atomic Energy Commission, the National Meteorological Service, the General Staff of National Defense, the Greek Police, the Fire Brigade and the Coast Guard.

Armed forces have established special CBRN Defence units, including.

of the Special Interdisciplinary Battalion CBRN Defence, participate in the dealing with an accident while transporting dangerous goods by road only in support of the other parties involved institutions (provision of materials and means, if there is a reason and disposition of a doctor personnel for any rescue of operational team personnel reaction), at the request of the EKAB/KEPY. Full activation and

[128] CBRN Accidents, Protection Guidelines, Ministry for Climate Change and Civil Protection, https://www.civilprotection.gr/en/cbrn-accidents

[129] General Plan for Dealing with Large-Scale Technological Accidents (General SATAME) with the code name "HERACLEITOS", GSCP, February 6, 2020 , Accessed October 17,2021, https://www.civilprotection.gr/sites/default/gscp_uploads/shedio_irakleitos.pdf

involvement of the above departments in dealing with an accident, constitutes last resort and is done only if the other stakeholders unable to act.[2]

Recovery

Greece does not have a nuclear plant and the only possible accident that may occur is during the transport of isotopes for medical or industrial use.

The recovery procedures will be the same as in the event of a chemical accident.

Critical Infrastructure Failure

Brief Description of National Guidelines & Policies

GSCP has prepared 2nd Edition of the General Plan for Dealing with Large-Scale Technological Accidents.[130]

The Safety Study Centre (KEMEA) has also prepared a Training Handbook for the protection of Crucial Infrastructures[131].

KEMEA is the National Contact Point with the European Commission and its member states European Union for the protection of European Critical Infrastructures, in accordance with Council Directive 2008/114/EC incorporated into Greek law (PD 39/2011) and in the context of its role, evaluates the security measures taken by the companies – organisations.[132]

Every company in possession of critical infrastructure as defined by the European Union must draw up plans to deal with such incidents and carry out similar exercises and training. Also, must design and prepare security plans.

i) The technical staff of the companies themselves;
ii) The technical staff of the electricity suppliers;
iii) The technical staff of the Hellenic Electricity Distribution Network Operator;
iv) Any kind of technical staff from the regions, municipalities that can help in the temporary restoration of energy supply;
v) Mobile generators from the central administration, regions, municipalities; and
vi) Armed forces with technical personnel and mobile generators.

According to the Greek Regulations, the hospitals in general, the sanitary formations, as well as other critical infrastructures that have to do with the state and the security of the state, have generators for their operation with a program of control and maintenance.

If in the end the needs cannot be met, assistance will be sought from the European Civil Protection Mechanism as is always the case in any disaster that cannot be dealt with by national means and forces.

Recovery

[130] General Plan for Dealing with Large-Scale Technological Accidents ,GSCP , July 9,2018 , https://www.civilprotection.gr/sites/default/gscp_uploads/2h_ekdosi_genikou_satame_1_0.pdf
[131] Vital infrastructure protection manual, Centre for Security Studies, March 2018, http://www.ciprotection.gr/images/CIPManual/CIPmanual.pdf
[132] Training Program, Center for Security Studies, December 2015, http://www.kemea.gr/images/Docs/Kemea_CI/Libretto.pdf

Supporting the victims with appropriate measures to address the current situation.

Financial support, suspension of payment of tax liabilities and other financial measures that will be deemed necessary and will relieve in the short/ long term.

Purchase of energy from neighbouring countries, which happens when there is high demand special in heat wave period.

Extreme Weather

Brief Description of National Guidelines & Policies

General instructions to the public from GSCP[133], from National Public Health Organisation[134]and Hellenic National Centre for Emergency Care (EKAB).[135]

It should be noted that a first aid book is posted on the EKAB website and is free for any citizen to download and be informed about any first aid issue.[136]

The meteorological service issues bulletin announcements of the coming heat.

The prefectures and the municipalities are starting the preparation they open large rooms with air conditioning open 24 hours a day to accommodate citizens who do not have air conditioning in their homes, homeless and other vulnerable groups.

The GSCP broadcast announcements from television and radio station with instructions for dealing with the impending heatwave.

EKAB enters increased readiness during the phenomenon.

The whole state mechanism that is involved in dealing with the heat is on high alert, such as hospitals, the Fire Service because at the same time there is an increased risk of fires, the National Centre of Social Solidarity and the Social Welfare Services of municipalities and regions to support the vulnerable groups to their needs, voluntary organisations, etc.

Available Resources – Nationally/Locally.

i) Hellenic National Health System (ESY) with Health Centres and the state hospitals across Greece for providing medical care;
ii) Hellenic National Centre for Emergency Care (EKAB) for providing emergency prehospital care and patient emergency transportation to ESY hospitals and Health Centres;
iii) National Centre of Social Solidarity and Municipality's and Region's Social Welfare Services to cover the social needs of the affected citizens; and
iv) Voluntary organisations and Family care.

It is worth noting here that in Greece family ties are a powerful factor in the care of older, children,

[133] Heat wave, Protection Guidelines, Ministry for Climate Change and Civil Protection, https://www.civilprotection.gr/sites/default/gscp_uploads/kausonas_gia_istoselida.pdf
[134] Heat wave ,Protection Guidelines, Hellenic National Centre for Emergency Care (EKAB), https://www.ekab.gr/arch/arch_general/odigies-gia-tin-antimetopisi-tou-kafsona/
[135] Heat wave ,Protection Guidelines, Hellenic National Centre for Emergency Care (EKAB), https://www.ekab.gr/arch/arch_general/odigies-gia-tin-antimetopisi-tou-kafsona/
[136] First aid Handbook, Hellenic National Centre for Emergency Care (EKAB),May 2017, https://www.ekab.gr/files/entypa/EKAB-protes-voithies.pdf https://www.ekab.gr/files/entypa/EKAB-protes-voithies.pdf

and general family members in need.

Recovery Plans

Informing the public through the media.

Purchase of energy from neighbouring countries for the possibility of high demand.

Readiness of the entire National Health System.

Readiness of the Fire Service.

Rooms with air conditioning for the vulnerable groups from the municipalities and the regions.

5.3.3 Portugal

Flooding

Brief Description of National Guidelines & Policies

When several districts in the national territory are affected, it implies the management of the occurrence at the national level, being the responsibility of the National Command of ANEPC the management and coordination. At the level of each district, the ANEPC District Commands liaise with the Municipal Civil Protection Coordinators of the respective municipal councils and with the local Civil Protection Agents, with a view to resolving situations/occurrences.[137]

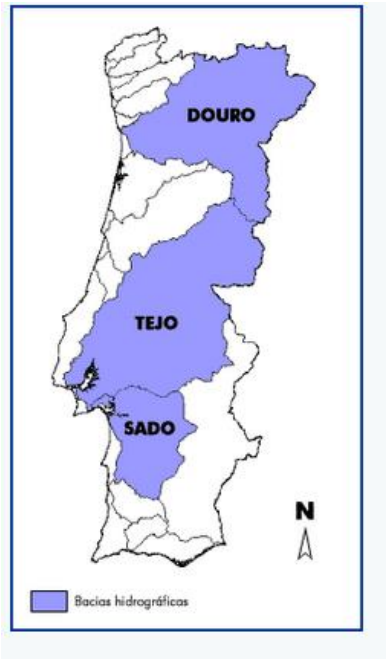


Figure 9 The river Basins of the Tejo, Douro and Safo rivers

Available Resources – Nationally/Locally

[137] http://www.prociv.pt/pt-pt/RISCOSPREV/RISCOSNAT/CHEIAS/Paginas/default.aspx

This National Operational Directive (DON) is an information tool, organisation, coordination and operational command of the Integrated Operations Device Protection and Relief (DIOPS) and update to DON No. 1/2009 of ANEPC - DIOPS, based on legislation published and in the contributions of the agents that comprise it, constituting as reference document for plans, directives or orders of operations of other entities public or private areas of protection and relief. It is also intending that this directive constitute a document of generalised disclosure and permanent consultation with all entities that work and compete for protection measures and help.[138] [139]

Forest/Wildfire

Brief Description of National Guidelines & Policies and Available Resources – Nationally/Locally.

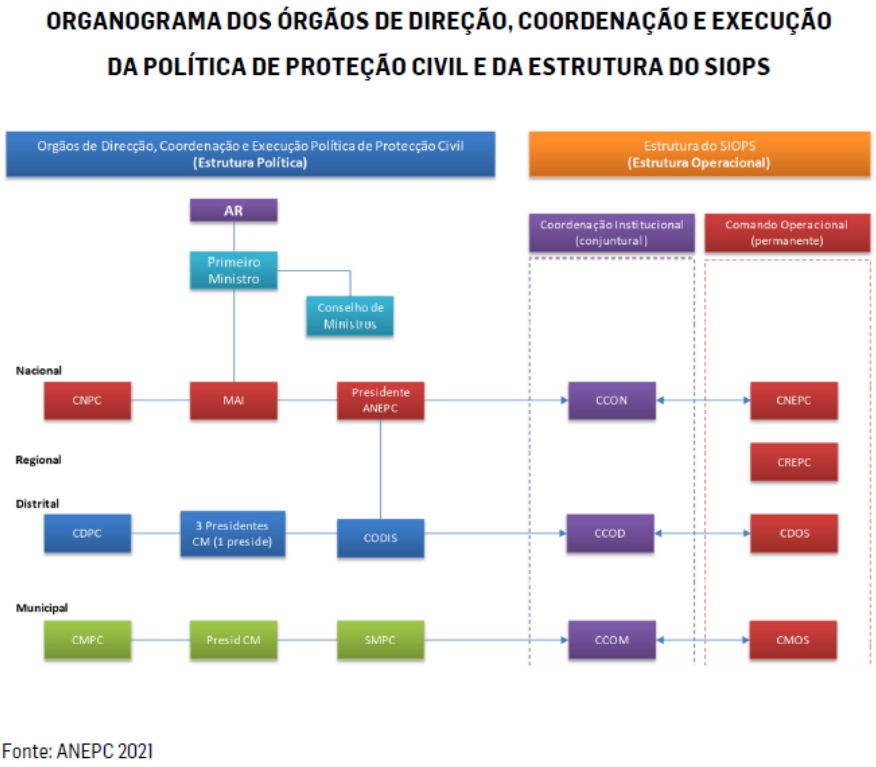
This National Operational Directive (DON) is an information tool, organisation, coordination and operational command of the Integrated Operations Device Protection and Relief (DIOPS) and update to DON No. 1/2009 of ANEPC - DIOPS, based on legislation published and in the contributions of the agents that comprise it, constituting as reference document for plans, directives or orders of operations of other entities public or private areas of protection and relief. It is also intended that this directive constitutes a document of generalised disclosure and permanent consultation with all entities that work and compete for protection measures and help.[140]

This Operational Directive (DON) is a subsidiary of the Single Prevention and Combat Directive (DUPC), approved by RCM Nº. 20/2018, of March 1, which aims to define the attributions and the way of articulation of multiple agents with shared responsibilities in rural and peri-urban environments, acting to ensure the management of rural spaces and the application of efficient combat or suppression techniques and tactics, in conjunction with any related risks or derivatives. It also operationalises the responsibilities of the different entities within the framework of the SGIFR, in accordance with the chain of processes established under the PNGIFR and related to the fighting rural fires, in the pre-suppression, suppression and rescue phases.

It is also a subsidiary of DON Nº. 1 - Integrated Device for Protection and Relief Operations (DIOPS) of ANEPC and replaces DON Nº. 2/2020 of ANEPC - DECIR, based on current legislation and contributions of the Agents and Entities that comprise it, constituting an instrument of planning, organisation, coordination and operational command. With this DON, the architecture of the structure of direction, command and control is defined, the way it is ensured institutional coordination, regulation, articulation and optimisation of performance operational forces of the SIOPS (Integrated System for Relief Operations) member forces, the bodies and institutions involved or to be involved in the operations of defence of the forest against fire, understood in the aspect of protection and aid, in view of the fulfilment of the strategic objectives defined by the Government in this matter.[141]

Safe Village and Safe People: Get ready and protect yourself from rural fires.[142]

138 Available Resources
139 Available Resource 2
140 http://www.prociv.pt/en-us/Pages/default.aspx
141 http://www.prociv.pt/pt-pt/RISCOSPREV/RISCOSNAT/INCENDIOSRURAIS/Paginas/default.aspx#!#collapse-2
142 Leaflet (EN) | Poster (bilingual)



Fonte: ANEPC 2021

Figure 10 Organogram of the structure of disaster management in Portugal

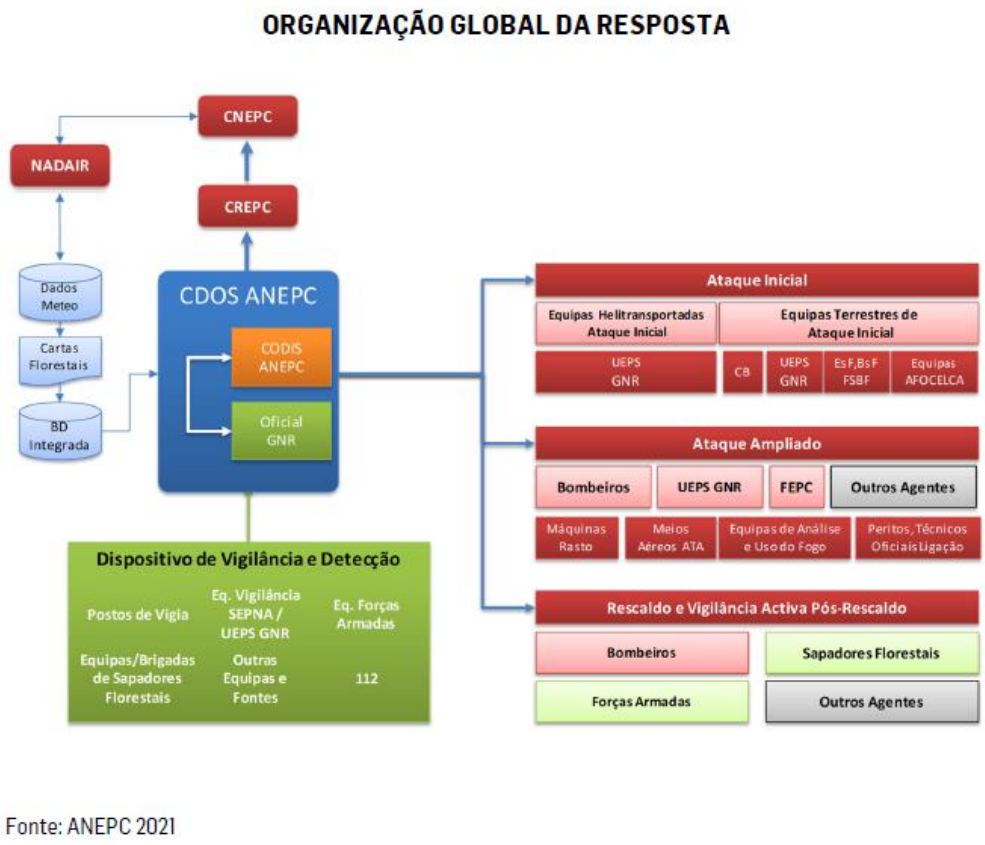


Figure 11 Organisation of the civil protection response in Austria

Earthquake

Brief Description of National Guidelines & Policies and Available Resources – Nationally/Locally.

This National Operational Directive (DON) is an information tool, organisation, coordination and operational command of the Integrated Operations Device Protection and Relief (DIOPS) and update to DON No. 1/2009 of ANEPC - DIOPS, based on legislation published and in the contributions of the agents that comprise it, constituting as reference document for plans, directives or orders of operations of other entities public or private areas of protection and relief. It is also intended that this directive constitute a document of generalised disclosure and permanent consultation with all entities that work and compete for protection measures and help.[143]

International Medical Emergency

Brief Description of National Guidelines & Policies

INEM is the Ministry of Health's body responsible for coordinating the operation, in the territory of mainland Portugal, of an Integrated Medical Emergency System (SIEM), in order to guarantee victims or victims of sudden illnesses the prompt and correct provision of care of health.

[143] National Guidelines

The provision of help at the scene of the occurrence, assisted transport of victims to the appropriate hospital and the articulation between the various actors in the SIEM (PSP, GNR[144]), INEM, Firefighters, Portuguese Red Cross and Hospitals and Health Centres) are the main INEM tasks.

Thus, SIEM is activated when someone calls 112, the European Emergency Number. Calls are handled by the PSP and the GNR, at the emergency centres. Whenever the reason for the call has to do with the health area, it is forwarded to INEM's Urgent Patient Guidance Centres. INEM, through 112, has several means to respond effectively, at any time, to medical emergencies.

These means belong to INEM, but also to the Fire Brigade and Delegations of the Portuguese Red Cross. In addition, to decide which means will help a situation, factors such as the availability of means at that time and its proximity to the place of occurrence are considered. It is important to emphasise that emergency means should only be used in **life-threatening situations.**

Available Resources – Nationally/Locally.

This National Operational Directive (DON) is an information tool, organisation, coordination and operational command of the Integrated Operations Device Protection and Relief (DIOPS) and update to DON No. 1/2009 of ANEPC - DIOPS, based on legislation published and in the contributions of the agents that comprise it, constituting as reference document for plans, directives or orders of operations of other entities public or private areas of protection and relief. It is also intended that this directive constitute a document of generalised disclosure and permanent consultation with all entities that work and compete for protection measures and help.[145]

The Urgent Patient Guidance Centres are Medical Emergency Centres responsible for the medicalisation of the European Emergency Number – 112.

Requests for help made through 112, which concern emergencies or medical emergencies, are transferred to the CODU.

INEM has four CODUs in operation: Lisbon, Porto, Coimbra and Faro.

It is the responsibility of the CODU to respond to and assess in the shortest possible time the requests for help received, with the aim of determining the necessary and adequate resources for each case.

Its operation is ensured, 24 hours a day, by teams of qualified professionals (Doctors and Technicians) with specific training to provide assistance, screening, advice, selection and dispatch of means of assistance.

For this purpose, the CODU have a set of equipment in the area of telecommunications and information technology that allow the coordination and profitability of existing human and technical resources.

The CODU coordinate and manage a set of means of assistance (motorcycles, rescue ambulances, medical vehicles and helicopters).

The means are carefully selected according to:

- the clinical situation of the victims;
- the proximity of the place of occurrence; and

[144] National Gendarmerie of Portugal
[145] National Guidelines

- accessibility to the place of occurrence.

This service ensures the follow-up of rescue teams in the field through clinical information received.

It is also possible to select and prepare the hospital reception of patients, based on clinical, geographic and resource criteria of the health unit of destination.

Chemical Accident

Brief Description of National Guidelines & Policies

This National Operational Directive (DON) is an information tool, organisation, coordination and operational command of the Integrated Operations Device Protection and Relief (DIOPS) and update to DON No. 1/2009 of ANEPC - DIOPS, based on legislation published and in the contributions of the agents that comprise it, constituting as reference document for plans, directives or orders of operations of other entities public or private areas of protection and relief. It is also intended that this directive constitutes a document of generalised disclosure and permanent consultation with all entities that work and compete for protection measures and help.[146]

Available Resources – Nationally/Locally.

The Manual to Support the Development of External Emergency Plans is a document intended to assist in the preparation of External Emergency Plans (PEExt) for higher-level establishments covered by Decree-Law no. 150/2015, of 5 August, systematising the procedures inherent in the entire emergency planning process of civil protection.[147]

This Technical Booklet is, therefore, an adaptation of the Manual to Support the Elaboration and Operationalisation of Civil Protection Emergency Plans (Technical Book PROCIV 3, edited by the National Civil Protection Authority), being articulated with the provisions of the Information Guide for the Elaboration of the External Emergency Plan – Directive "Seveso III" (Technical Notebook PROCIV 2).

The indications presented in this document are based on the provisions of the Directive on technical criteria and standards for the preparation and operationalisation of civil protection emergency plans (Resolution No. 30/2015, of 7 May) and the Prevention Regime of Serious Accidents involving Hazardous Substances (Decree-Law No. 150/2015).

The provisions of the Civil Protection Basic Law (Law No. 27/2006, of 3 July, with the amendments introduced by Organic Law No. 1/2011, of 30 November, and by the Law No. 80/2015, of 3 August, which republished it), in the Law that Defines the Institutional and Operational Framework for Civil Protection in the Municipal Scope (Law No. 65/2007, of 12 November) and in the System Integrated Protection and Relief Operations (Decree-Law No. 134/2006, of 25 July, with the changes introduced by Decree-Law No. 114/2011, of 30 November, and No. 72/2013 , of May 31, which republished it).

The content of this Technical Booklet is applicable both to PEExt of a single establishment and to plans relating to neighbouring establishments or to groups of establishments with the "domino effect" defined by the Portuguese Environment Agency (APA), pursuant to Decree-Law no. /2015, in which case PEExt will take into account the nature and extent of the global major accident hazard.

[146] National Guidelines
[147] Available Resources

Radiological Incidents

Brief Description of National Guidelines & Policies

This National Operational Directive (DON) is an information tool, organisation, coordination and operational command of the Integrated Operations Device Protection and Relief (DIOPS) and update to DON No. 1/2009 of ANEPC - DIOPS, based on legislation published and in the contributions of the agents that comprise it, constituting as reference document for plans, directives or orders of operations of other entities public or private areas of protection and relief. It is also intended that this directive constitute a document of generalised disclosure and permanent consultation with all entities that work and compete for protection measures and help.

Available Resources – Nationally/Locally.

The Manual for Intervention in Radiological Emergencies is intended to provide practical guidance to everyone involved in responding to radiological emergencies during the early hours, including local emergency services and national structures. This Technical Notebook was based on the publication of the International Atomic Energy Agency "Manual for First Responders to a Radiological Emergency", having been the subject of the necessary adaptations to the Portuguese reality, consulted by the National Commission on Radiological Emergencies (Decree-Law no. 165/2002, of July 17). The publication of the Manual fills the gaps found during exercises and emergency management.

This Technical Booklet is specifically of interest to civil protection agents, civil protection authorities and services, technical authorities for intervention in radiological emergencies (Decree-Law No. 174/2002, of 25 July) and other collaborating entities. It is of interest to all entities involved in the response to radiological emergencies.

The manual is structured in chapters and sections.

i) The first chapter defines the type of incidents referred to in the Manual, its purpose and structure; and
ii) Chapter 2 characterises the risk and covers the basic concepts and provisions that must be understood for an effective use of this publication, including the protection of the operatives and the population, the lessons learned from past emergencies and the organisation of the intervention.

Chapter 3 describes how the guidelines should be applied. The remaining parts of the publication, sections A, B and C, contain guidelines for use by first responders. Section A contains action guides for the incident relief operations commander and general initial response action guides, while Section B contains action guides for each operational team. Finally, Section C contains instructions on how to carry out various tasks required in the Action Guides.

Extreme Weather – Heatwave

Brief Description of National Guidelines & Policies

This National Operational Directive (DON) is an information tool, organisation, coordination and operational command of the Integrated Operations Device Protection and Relief (DIOPS) and update to DON No. 1/2009 of ANEPC - DIOPS, based on legislation published and in the contributions of the agents that comprise it, constituting as reference document for plans, directives or orders of operations of other entities public or private areas of protection and relief. It is also intended that this

directive constitute a document of generalised disclosure and permanent consultation with all entities that work and compete for protection measures and help.

Available Resources – Nationally/Locally.

A heat wave, according to the World Meteorological Organisation (WMO), "occurs when in an interval of at least six consecutive days the maximum daily temperature is 5ºC higher than the daily average value in the reference period" (IM).

Heat waves have a great impact on human health andcontribute to creating favourable conditions for the spread of forest fires. The consequence of this extreme thermal phenomenon is directly related to humans, causing changes in their physiological state, in particular in elderly population groups, children and people with heart and respiratory tract diseases, to which awareness and prevention actions should be directed.

The maximum temperatures for which a heat wave is thought to exist vary widely across the globe. Extreme heat situations affect populations in temperate regions in a different way, such as mainland Portugal, and those living in normally warmer regions, which have physiological acclimatisation and an adapted lifestyle. In general, heat waves that occur in June, in mainland Portugal, are associated with higher mortality than heat waves with the same characteristics that occur in August, suggesting that the human body has a capacity for acclimatisation to heat.

5.3.4 Romania

Flood

Hydro-meteorological hazards

Romania is also one of the most flood-prone countries in Europe, with significant damage from floods occurring several times per decade. More than one million hectares (ha) of land are exposed to flooding; nearly one million Romanians live in high flood risk areas; and more than 900 communities in the country are situated in high flood risk areas.

These have significant impact, as highlighted by these recent events:

i) 1970: 200 fatalities and USD 3 billion in damage;
ii) 1991: estimated damage of USD 0.5 billion affecting an area of ~1,400 km^2, including more than 12,000 buildings, 990 km of roads, 14 km of railroads, and 150 bridges;
iii) 1997: estimated damage at USD 310 million;
iv) 1998 floods: estimated damage at US$150 million;
v) 2005: USD 2 billion in damage (representing 2.1% of Romania's GNP), affecting 656,392 ha agricultural land, 10,420 km roads, 23.8 km of railway, 9,113 bridges and foot bridges, and 90,394 contaminated wells;
vi) 2006: An estimated 100-year flood event resulted in economic damage of more than 1% from Romanian GNP. The number of affected localities was 160; the estimated number of affected homes was 10,000. About 600 km of roads and 300 bridges were damaged, and the total farmland affected was 21,000 ha;
vii) 2010: a high number of damaging events throughout the Danube River basin led to 35 casualties and damages of €2B across the Danube River basin, including €1B in Romania; and
viii) 2013: flash floods affected numerous municipalities across Romania, resulting in nine deaths, requiring the evacuation of 6,900 people, and resulting in 3,000 ha of flooded agriculture land.

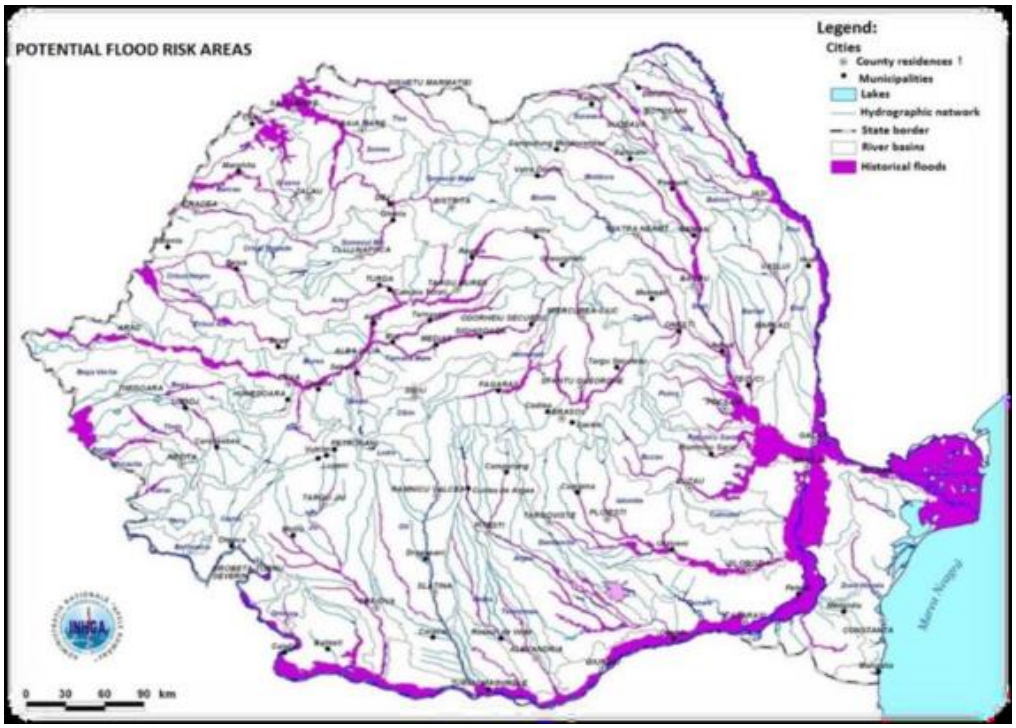


Figure 12 Historical flood affected areas in Romania

From 1987 to 2002, Romania had the greatest spatial extent with repeated flood events of all EU countries**.**

A 100-year flood along the Danube River would affect more than 800,000 inhabitants, 3,550 communities, 5% of national highways, 700 km of major roads, more than 2,000 km of county and local roads, 100 nationally protected areas, and more than 300 cultural heritage buildings. For a 1,000-year flood, more than 1.8 million inhabitants would be affected. Across Romania, flood risk to GDP is highest in Ialomita and Satu Mare, followed by Arad, Teleorman, Giurgiu and Calarasi. Urban flood is also considered high possibility, with urban floods resulting from inability of urban water management systems to cope with high intensity rainfall events. As the climate changes, flood events are projected to occur more frequently in many river basins, particularly in winter and spring. Flood risk modelling predicts that 50-year return period flood could affect 2 billion USD of GDP in 2015, but by 2080—considering change in socio-economic and climate conditions—this may double or even quadruple, depending on the mitigation pathway selected

Brief Description of National Guidelines & Policies

The National Flood Risk Management Strategy approved by GD 846/2010. This strategy establishes the measures necessary to be implemented to reduce the risks associated with dangerous hydro-meteorological phenomena, among the elaboration of flood hazard and risk maps, the elaboration of the basin plans for the management of the flood risks, as well as the updating of the local and county flood protection plans in the medium and long term.

Flood Risk Management Plans approved by DECISION **no. 972 of 21 December 2016.** Their main objective is to reduce the negative consequences of flood for citizens' safety, human health, economic activity, environment, cultural heritage and consider structural and non-structural measures on 5 areas of action (prevention, protection, preparedness, public awareness, restoration/reconstruction) and 3

categories, depending on the level of application (measures at national level, measures at basin level and measures at area level with high potential flood risk).

As measures to increase resilience, we mention measures to increase the awareness of the community, measures regarding flood forecasting, measures regarding the management of emergency situations and finally, measures to regulate the constructions currently in floodplains: measures to strengthen / can't the home, measures to waterproof its structure.

The Risk Analysis and Coverage Plan, which is updated annually, defines and describes the risks and sources of potential risk generating emergency situations identified on the territory of the measures, actions and resources necessary for the management of the respective risks.

This plan aims to achieve the following objectives:

i) ensuring the prevention of risks generating emergency situations, by avoiding their manifestation, reducing the frequency of production or limiting their consequences, based on the conclusions resulting from the identification and evaluation of the types of risk, according to the territorial risk scheme;
ii) placement and dimensioning of the operational units and other forces designed to ensure the support functions regarding the prevention and management of emergency situations;
iii) establishing the concept of intervention in emergency situations and elaborating the operative plans; and
iv) allocating and optimising the forces and means necessary for the prevention and management of emergency situations.

Identification, localisation and inventory of risk sources based on the study of seismic area; characteristics of watercourses and hydro technical constructions; meteorological situations; relief, geological and hydrogeological conditions; location of risk source objectives (biological, chemical, etc.).

Monitoring the avoidance of destructive effects by analysis of existing sites and conditions; restrictions on activities in risk areas; prohibitions for new sites; monitoring the compliance with the legal framework of design, execution, behaviour and exploitation; monitoring the existence, completion and adoption of notification-information, surveillance and control systems.

Available Resources – Nationally/Locally.

In accordance with the status of national authority responsible for ensuring the protection of Romanian dignitaries and their families, of foreign ones during their stay in Romania, as well as in ensuring the security of work premises and their residences, in terms of the types of risk, associated risks and areas of action, SPP is an organisation with a specific field of competence, which contributes to the response in case of emergency situations / crises, disasters.

Due to the nature of the activities carried out and based on the concept of integrated security assurance, SPP also carries out activities for the prevention and response in case of disasters or the occurrence of emergency / crisis situations, which directly target the protected officials, residences and work premises. The follow-up actions in case of such events are subsequently taken over by other authorities in cooperation with the SPP, but during the specific missions, the first intervention actions are provided with their own forces and means.

The main authority in Romania with attributions in streamlining the actions of prevention and management of emergencies, assistance of people in critical situations, intervention to technological,

radiological, nuclear, biological accidents or other types of natural or anthropogenic calamities is the General Inspectorate for Emergency Situation.

General Inspectorate for Emergency Situation operate in the 41 counties and in Bucharest having in total at national level over 280 operating units.

In case of a flooding who affect a significant area from a county or more county, forces and means of intervention are dislocated from another operating units and in case of a major emergencyRomania asks for help through the European Union's Civil Protection Mechanism

Recovery

Law on compulsory insurance of dwellings against earthquakes, landslides and floods**.** According to its provisions, individuals and legal entities are obliged to insure against natural disasters, all constructions with the destination of housing, from urban or rural areas, owned and registered in the records of tax authorities.

Monitoring the implementation of some measures and actions of correction of the characteristics and operating / exploitation conditions to reduce and eliminate the vulnerability by:

i) consolidation and restoration;
ii) reuse and refurbishment;
iii) new investments instead of vulnerable ones, which can no longer be corrected; and
iv) restorations, arrangements of environmental conditions.

Forest/Wildfire

Brief Description of National Guidelines & Policies

DECISION no. 557 / 2016 on the management of risk types regarding the National Emergency Management System. The management of the types of risk involves the identification of the types of risk and the associated risks, the establishment of the responsible authorities, by types of risk, the establishment of the areas of action of the responsible authorities, for the prevention, preparation and response to the event and the restoration / rehabilitation of the situation, as well as the distribution of the support functions.

Forest fires occurred with different frequencies, intensities (burning energy) and severities (organic matter losses resulting from burning), with important consequences materialised in direct economic losses, changes in social behaviour and quality of life, as well as ecological degradations.

In addition, weather conditions are a major enable factor for forest fires. In the case of high temperatures against the background of a significant long-term water deficit, meteorological factors can become a trigger for forest fires, especially in the case of extreme weather events (e.g. lightning). However, most forest fires are the source of the human factor, amid a favourable climate context.

Romania has aligned itself with the European rules in the field of forest fire risk assessment, transposing into national legislation the provisions of EU Council Regulation no. 2158/1992 on the protection of the Community against forest fires.

Compared to other EU countries (e.g. Greece, Spain, Portugal), Romania poses a low risk of forest fires, according to the classification carried out by the European Commission.

Most of the fires in the forest have as their triggering source the human factor, but without a climate favourable to combustion (high temperatures, against the background of a significant long-term water

deficit and intensification of the wind), the number of fires would be much lower. Because of this, weather conditions are the most important factor of forest fires, and climate change contributes to the amplification of these conditions.

The value series for the period 1986-2019 are represented in the accompanying graph (number of forest fires) (area affected by forest fires).

The data have been officially reported and canbe found in the EFFIS record.[148]

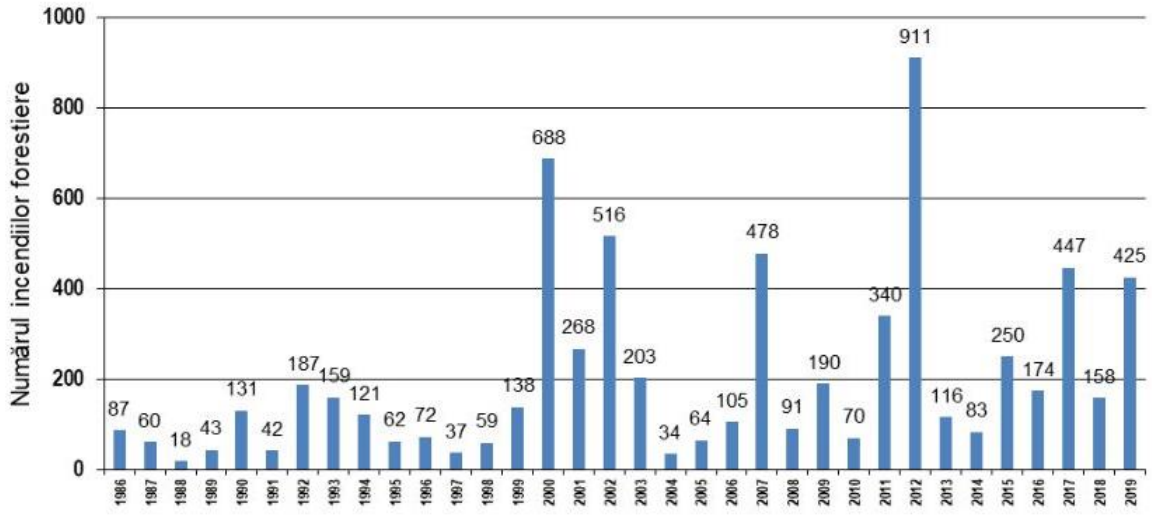


Figure 13 Number of forest fires in Romania

Most of the fires in the forest fund have as their triggering source the human factor, but without a climate fund favourable to combustion (high temperatures, against the background of a significant long-term water deficit and intensification of the wind), the number of fires would be much lower. Because of this, weather conditions are the most important favouring factor of forest fires, and climate change contributes to the amplification of these conditions.

Available Resources – Nationally/Locally.

The National Concept of Response in case of Forest Fires aims at achieving the general planning framework for the preparation and conduct of response actions, according to the activities associated with the support functions that the components of the National Emergency Management System must perform in such emergency situations, on the national territory or in the vicinity of Romania, with an effect on the national territory.

National Emergency Management System through its components and, when exceeding the national response capacity, in cooperation with the European bodies, it shall carry out a complex response to the occurrence of forest fires, in one of the assumptions presented, mainly for:

i) Rescuing victims and providing emergency medical assistance / qualified first aid;
ii) Limiting the effects, locating and extinguishing forest fires;
iii) Ensuring measures for the protection of the population and property; and

[148] https://effis.jrc.ec.europa.eu/reports-and-publications/annual-fire-reports/

iv) Ensuring the continuity of economic and social activities and successively returning to the provisional state of normality.

Operational priorities given in the affected areas:

i) achieving a timely, integrated and efficient response;
ii) short-term concentration of the necessary forces and means;
iii) ensuring the evacuation of the population from the affected or potentially affected areas;
iv) protection of heritage objectives;
v) providing qualified first aid, emergency medical assistance in the affected areas;
vi) carrying out the necessary logistical and financial support;
vii) the provision of basic services in safe conditions, including access to drinking water;
viii) the provision of immediate food aid to the victims/evacuated population;
ix) support to ensure individual and collective hygiene for displaced or temporarily evicted persons;
x) prohibiting access to risk areas for the population, with the exception of intervention teams;
xi) ensuring the minimum conditions necessary for accommodation of evacuated / stricken persons;
xii) protective activities to prevent actions aimed at the deterioration of the climate of public order and safety;
xiii) providing the financial support necessary for the continuation of intervention actions; and
xiv) ensure the continuity of support for living conditions and the initiation of actions to immediately restore the affected infrastructure.

Preparation and conduct of response actions

It is integrated by all the components of the SNMSU to fulfil the tasks established at local, county, regional / national level, according to the provisions of the action plans, in three stages:

Stage I: Immediate reaction (from T0 to T+24 hours) The centre of gravity of this stage is the actions of notification-alarm, evacuation, search-rescue and provision of emergency medical assistance / first aid, respectively limiting the propagation / development of fire.

Phase II: Location (from T+24 hours to T+5 days) The centre of gravity of this stage is the actions to limit the spread / development of the fire, simultaneously with the protection of vulnerable people.

Stage III: Liquidation (over T+5 days – long-term action) The of gravity of this stage is to ensure the continuity of the actions in the second stage and to return successively to the state of normality.

Table 13 Romania checklist of actions in case of forest fire

No. crt.	Measures and actions	Immediate reaction up to 24 hours	Location up to 5 days	Liquidation over 5 days	Observations
1.	Receiving through SNUAU 112 the call for notification of the outbreak of a forest fire.	X			
2.	Confirmation of the veracity of the information to the	X			Immediately after receipt of the notice

	police / administrator of the forest fund.				
3.	Transmission of information / warning messages to the population, forest managers, road managers and owners of objectives within / near forests regarding the risk of spreading the fire and affecting the localities, infrastructure and economic objectives in order to order the urgent measures that are required.	**X**			Immediately after receiving the message
4.	Alerting the intervention forces and obtaining additional information from the forest fire;	**X**			
5.	Gradual increase in the operational capacity of the response structures at local or zonal / regional, national level, as appropriate.	**X**			Depending on the operational situation
6.	Transmission of certain details concerning: 1. ensuring permanence at the mayoralties and operationalisation of the operative centres with temporary activity; 2. the toleration of the SVSU and the mobilisation of citizens who have machinery/means and are able to work, in order to support the intervention; 3. warning/alarming the population, as the case may be; 4. preventive evacuation of the population and animals from the risk zone;	**X**	**X**		Immediately after receiving the information/warning

	a. preparation of water supply sources, etc.				
7.	Continuous execution of re-recognitions (land and, where appropriate, air)	**X**			In the first 2-3 hours
8.	Taking the decision and giving the order to intervene. Resumption of the process depending on the evolution of the situation and the results of the intervention.	**X**	**X**		
9.	Taking the decision and giving the order to intervene. Resumption of the process depending on the evolution of the situation and the results of the intervention.	**X**	**X**	**X**	
10.	Making public order devices, protecting people and goods that may be affected or evacuated, guiding the movement, etc.	**X**	**X**	**X**	
11.	Carrying out the first intervention and continuing the intervention actions, depending on the evolution of the forest fire.	**X**	**X**		Immediately after the announcement of the forest fire and then permanent
12.	Appointment of the commander of the action / intervention, as appropriate	**X**	**X**	**X**	
13.	Acting of the intervention/action commander, as appropriate	**X**	**X**		
14.	Convening CLSU, CJSU and identifying any elements necessary to amend / complete the action plan.	**X**	**X**		First 2-3 hours or after the execution of recognitions
15.	Organisation and arrangement of advanced operational points	**X**			First 2-3 hours or after the execution of recognitions
16.	Performing the maneuver of forces and means from the unaffected counties	**X**	**X**	**X**	

17.	Operationalisation of command-and-control systems/operational centers, respectively coordination and management	**X**			First 2-4 hours
18.	Operationalisation of advanced operational points, as appropriate.	**X**	**X**		
19.	Establishment of specialised modules / intervention groups that will act in support of the forces in the affected areas.	**X**			The first 4 hours
20.	Concentration of intervention resources in critical areas	**X**			The first 4 hours
21.	Providing logistical support for its own capabilities, depending on the duration of operations, as follows: water, food, equipment, accommodation, fuels and lubricants, etc.	**X**	**X**	**X**	From the beginning of the operation and continuously until the liquidation of the forest fire
22.	Implementation of evacuation plans according to the concrete situation and guidance of self-evacuation, with a focus on: - organising and ensuring the functioning of the assembly, boarding and reception districts in their area of responsibility; - organising and ensuring the transport of the population, material goods and patrimony objects; - providing medical assistance in evacuation districts and during transport; - taking into account the population that is being evacuated.	**X**	**X**		

23.	Convening the CNSSU and identifying the elements necessary to support the action plan	**X**	**X**		Depending on the evolution of the situation
24.	Identification of the transport infrastructure elements (roads, ports) that have been affected, respectively those that can be used in full or, as the case may be, with certain restrictions	**X**	**X**		First 4-6 hours
25.	Recognition of the accommodation spaces established in the action plans drawn up at local/ county level and establishment of those that can be used according to the consequences of the event produced	**X**			First 6 hours
26.	Organisation and arrangement of operations bases.	**X**			First 24 hours (if applicable)
27.	Establishing the *"state of emergency* "in the affected counties or, as the case may be, declaring the "state of *alert* "based on the evaluations received and the proposals / decisions of the committees for emergency situations.	**X**			First 24 hours (if applicable)
28.	Transmission of information provided by economic operators in the field on the adoption of the decision to interrupt the supply of electricity, gas and ensure communications in the affected areas, in order to prevent electrocutions, intoxications or other technological accidents	**X**	**X**		
29.	Search-rescue of people caught / missing in the	**X**	**X**		

	affected areas and provision of medical first aid				
30.	Notification of international organisations (E.U., N.A.T.O., O.N.U.) regarding the occurrence of the event.	**X**			The first 24 hours
31.	Contacting the specialised structures in the neighboring countries, in order to cooperate for the extinguishing of cross-border forest fires.	**X**	**X**	**X**	When the risk of cross-border spread arises
32.	Formulating proposals and requesting international assistance (E.U., N.A.T.O., O.N.U.), when the situation requires it and taking the necessary steps to receive support.	**X**	**X**		Starting with the first 24 hours
33.	Requesting satellite images of the affected areas and analysing them in order to adapt the operational situation and missions to the reality on the ground.	**X**	**X**		
34.	Guarding and protecting the objectives of particular importance, the affected areas and the camps of victims/evacuated.	**X**	**X**	**X**	As a rule from day 1 onwards
35.	Distribution to the public of essential aid and aid offered by other states as humanitarian aid, if any.	**X**	**X**	**X**	Usually starting from the 2nd day
36.	Emergency medical assistance and qualified first aid.	**X**	**X**	**X**	
37.	Supplementation, as appropriate, of the hospitalisation capacity and, if necessary, *the organisation of first aid points and/or advanced medical triage.*	**X**	**X**		

38.	Psychological assistance and social work.		**X**	**X**	
39.	Providing the telecommunications and information technology services necessary for carrying out the intervention actions.	**X**	**X**	**X**	
40.	Informing foreign citizens on the national territory about the measures ordered for their protection.	**X**	**X**		
41.	Implementation of conventions and service contracts.	**X**	**X**	**X**	
42.	Application of the measures established following the declaration / establishment of states of alert / emergency, including those aimed at restricting some fundamental rights and freedoms.	**X**	**X**	**X**	
43.	Establishing the cause and estimating the damages caused by the production and manifestation of forest fires.			**X**	

The specialised module for intervention in forest fires includes, depending on the operational support needs, the following resources:

i) 2-3 special working vehicles with water and foam, where the area allows, served by 8-15 people;
ii) 1 special vehicle (minibus) passenger transport, served by 1 person;
iii) 1 towable motor pump; - 2-3 transportable motor pumps;
iv) 2 intervention trucks, served by 4 people;
v) 1 truck with hydraulic loading/unloading system and logistic support container of the intervention, served by 2 people;
vi) 2 4x4 special vehicles for operative work, served by 2 persons;
vii) 1 UTV, served by 1 person;
viii) 1 mobile command point special vehicle served by 3 persons (on order or according to the specific procedure);
ix) means of water transport and extinguishing individual (10-20 backpacks for extinguishing fires, 100 plastic bags, etc.);
x) folding water tanks/basins with a capacity of min. 5 m^3 that can be supplied at a height, in the absence of other sources, with Bambi Bucket type installations;

xi) 2-3 tanks/water basins with a capacity of 1-3 m³ that can be transported at a height by helicopters, loaded;
xii) 1-3 inflatable/folding tanks/basins with volumes between 300 – 3,000 l that can be transported in the high areas with off-road access vehicles (trucks, 4x4 cars, etc.), loaded;
xiii) 2-3 barrels of 200 litres for making relays;
xiv) 2-3 chainsaws; - 25-30 beaters for extinguishing fires, shovels, cauldrons, digs or brooms of trinkets (picks);
xv) accessories for the passage of water, of which at least 1,000m discharge hose;
xvi) materials necessary for the organisation of the base of operations (tents, generating sets, sleeping bags, beds, etc.);
xvii) other specific intervention means and materials, generic tools (forest-type diggers, shovels, cauldrons, pickaxe, axe- for the entire module) etc.;
xviii) personal protective equipment - on the herd and reserve;
xix) portable communication means – minimum 10 pcs; and
xx) 1 camp of victims (depending on the needs).

If the human and material resources needed to manage forest fires are insufficient, international assistance is requested, according to specific procedures. GIES functions as a national point of contact in relations with international governmental and nongovernmental bodies and organisations with responsibilities in the field of emergencies. In this regard, the request for international humanitarian assistance is being forwarded. In situations when there is a risk of spreading the fire across the border, the neighbouring state will be contacted through diplomatic channels, as well as direct channels between similar specialised structures.

For situations that require satellite monitoring and evaluation of the national territory, requests may be made, through the ERCC, within *the Union Civil Protection Mechanism, the* Copernicus *Program of the European Commission,* which provides the early warning component through The European Forest Fire Information System *(EFFIS),* as well as to the European Space *Agency* for the provision of high-resolution images of the affected areas

In accordance with the status of national authority responsible for ensuring the protection of Romanian dignitaries and their families, of foreign ones during their stay in Romania, as well as in ensuring the security of work premises and their residences, in terms of the types of risk, associated risks and areas of action, SPP is an organisation with a specific field of competence, which contributes to the response in case of emergency situations / crises, disasters.

Due to the nature of the activities carried out and based on the concept of integrated security assurance, SPP also carries out activities for the prevention and response in case of disasters or the occurrence of emergency / crisis situations, which directly target the protected officials, residences and work premises. The follow-up actions in case of such events are subsequently taken over by other authorities in cooperation with the SPP, but during the specific missions, the first intervention actions are provided with their own forces and means

Earthquake

Brief Description of National Guidelines & Policies

Romania is one of the countries most at risk from earthquakes in the EU, with hundreds of lives lost and tens of thousands of buildings damaged in earthquakes in the last 200 years. In the last five centuries, there have been, on average, two magnitude 7+ earthquakes each century, with five earthquakes since 1802 with magnitudes higher than 7.5 At a global level, among the 10 countries ranked with the highest amount of built-up surface potentially exposed to seismic hazard, two

European countries emerge: Italy and Romania, with 84% and 92% respectively, of built-up surfaces in hazard zones. The vulnerability of the Romanian economy to earthquakes alone is further exacerbated by:

i) >75% of the population (65% of urban population) and 45% of all national lifelines are in areas with high earthquake hazard; and
ii) 60–75% of fixed assets, and 70–80% of GDP, are produced in earthquake prone areas.

Bucharest is the most earthquake-prone capital city in the EU because of its proximity to the Vrancea earthquake zone, which is capable of producing earthquakes as high as magnitude 8.1. For example, the 1802 Vrancea earthquake, with a magnitude of 7.9 is one of the largest earthquakes on record to occur in Europe, with shaking felt as far as St Petersburg, Russia.

One of Romania's most powerful recent earthquakes took place in 1977. Measuring 7.2 on the Richter scale, it caused more than 1,500 fatalities, left 11,321 injured, and collapsed or severely damaged 156,000 residential apartments. More than about 2,000 schools were damaged, and 274 completely collapsed. Of hospitals and polyclinics, 448 were damaged, and 11 hospitals collapsed. In 1978, a World Bank report estimated a total damage of US$2 billion, with Bucharest accounting for 70% of the total damage (about US$1.4 billion). The 1977 earthquake contributed extensively to the serious economic crisis that began in Romania in 1979 and lasted even after 1989.

Scientists and engineers calculated that a similar event today would have direct damage costs of €7-11Bn (out of which €5 billion would be uninsured losses), with economic losses exceeding €25 Bn. Estimates of lives lost range from 700 to 4,500, with 250,000 people estimated to be homeless for months and years.

According to UNSAR, the Romanian insurer's professional body, more than 80% of affected families will not have the necessary resources to repair or to rebuild after an earthquake similar to the 1977 event. Modelling by the Technical Construction University of Bucharest estimates that a magnitude 7.5 Vrancea earthquake would immediately reduce the functionality and access to housing in Bucharest to 30%, with functionality only rising to 65% after a year, and 90% after two years.

Although the potential for an earthquake event is not affected by climate change, urbanisation and the increased concentration of economic assets, and population growth in earthquake prone areas such as Bucharest, mean that the risk will continue to grow through time—doubling by 2080—unless urgent action is taken to reduce earthquake risks. Today, one-quarter of the Romanian population has not experienced an earthquake with a magnitude ≥6, and more than 40% were born after the devastating 1977 event, so there is limited memory and thus limited focus on the potential risks.

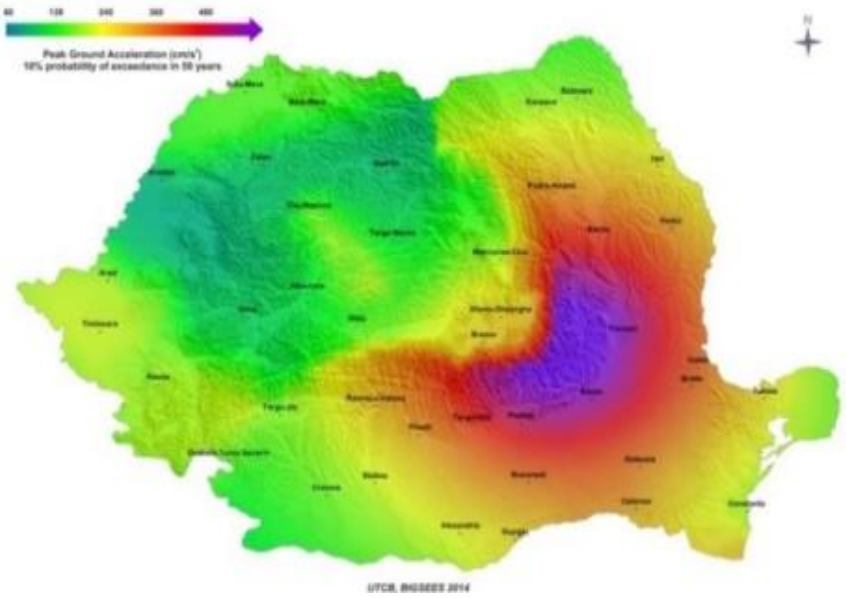


Figure 14 Probabilistic seismic hazard map of Romania

Available Resources – Nationally/Locally

Regarding the intervention, the National Post-Earthquake Response Concept was elaborated, which ensures the concretisation of the following requirements:

i) strengthening, developing and integrating the operational capacities, collective knowledge, capabilities and resources of the authorities, institutions and organisations that make up the National System for the Management of Emergency Situations (SNMSU) at national, county and local level;
ii) establishing the general mode of action of the CNSSU components in order to achieve the management, coordination and control of the human and material resources that the Romanian State and the communities have in order to protect life, property and the environment, to limit and remove the effects of a disaster caused by an earthquake with major impact and to return to the state of normality; and
iii) achieving an opportune and efficient response to ensure the continuity of the economic and social life and the government's action in case of a major earthquake, by establishing the national organisational framework for the response of the SNMSU components and by continuously adapting to the operational reality.

Recovery

Law on compulsory insurance of dwellings against earthquakes, landslides and floods. According to its provisions, individuals and legal entities are obliged to insure against natural disasters, all constructions with the destination of housing, from urban or rural areas, owned and registered in the records of tax authorities.

The national strategy for seismic risk reduction, elaborated in support of the World Bank, includes an action plan with specific objectives in the short, medium and long term (2030, 2040 and 2050) and corrective actions to solve the existing problems identified at the current stage in the field of seismic risk for buildings. Among them can be listed below.

i) Transformation by 2050 of the built-up funds of Romania into a built fund resistant to earthquakes;
ii) Reducing seismic risk at national level by saving lives, reducing injuries and protecting the built fund through prioritised and efficient investments;
iii) Promoting well-being by creating co-benefits by improving conditions for energy and sanitation efficiency, among other functional aspects;
iv) Increasing resilience by integrating seismic/multi-risk risk considerations into territorial and sectoral planning and ensuring resilient post-earthquake recovery and reconstruction processes; and
v) Mobilising inclusive participation and action by increasing the level of public awareness about seismic risk management and increasing the level of ownership in the implementation of risk reduction measures.

International Medical Emergency

Brief Description of National Guidelines & Policies

In October 2001, the European Commission established the EU Civil Protection Mechanism. The Mechanism aims to strengthen cooperation between the EU Member States and 6 Participating States on civil protection to improve prevention, preparedness and response to disasters. When an emergency overwhelms the response capabilities of a country in Europe and beyond, it can request assistance through the Mechanism. The European Commission plays a key role in coordinating the disaster response worldwide, contributing to at least 75% of the transport and/or operational costs of deployments.[149]

Recovery

Coronavirus: 13 European countries provide urgent assistance to Tunisia.

Several member states reacted to Tunisia's request, including Austria, Belgium, Germany, Spain, France, Luxembourg, Malta, Norway, Portugal, Latvia, Czechia, Croatia and Romania.[150]

Romania will grant an aid package to the Republic of Moldova, in the context of the efforts to combat the COVID-19 pandemic, as an expression of its commitment to consistent action for the direct benefit of the citizens of the Republic of Moldova.[151]

Chemical Accident

Brief Description of National Guidelines & Policies

The chemical industry in Romania is a traditional branch – more than 4,500 companies operate in the sector. More than 75% of them are micro business, while only 7% could be classified as middle (248), large (48) and very large (10 with more than 1,000 employees). Their main activities could be grouped in four clusters: Manufacture of coke and of refined petroleum products, manufacture of chemicals and chemical products, manufacture of basic pharmaceutical products and pharmaceutical preparations, and manufacture of rubber and plastic. As Figure 15 illustrates, most of them are

[149] https://ec.europa.eu/echo/what/civil-protection/mechanism_en
[150] https://ec.europa.eu/commission/presscorner/detail/en/IP_21_4243
[151] https://gov.ro/en/news/romania-supports-the-citizens-of-the-republic-of-moldova-in-the-context-of-the-covid-19-pandemic

distributed south of the Carpathian Mountains where are located the main oil sources and big refineries.

HG no. 557/2016 on the management of risk types regarding the National Emergency Management System. Risk management involves identifying types of risk and associated risks, establishing the responsible authorities, by types of risk, establishing the areas of action of the responsible authorities, for preventing, preparing, responding, restoring/rehabilitating the situation and assigning the support authorities.

LAW no. 59/2016 regarding the measures for preventing major accidents involving dangerous substances, as well as to limit their consequences on human health and the environment, to ensure a high level of protection throughout the country, in a consistent and effective manner.

LAW no. 481/2004 regarding the civil protection as a component of the national security system. This law presents an integrated set of specific activities, measures and organisational, technical, operational, humanitarian and public information tasks, planned, organised and carried out according to this law, in order to prevent and reduce the risks of disasters, to protect the population, properties and the environment against the negative effects of emergencies and armed conflicts.

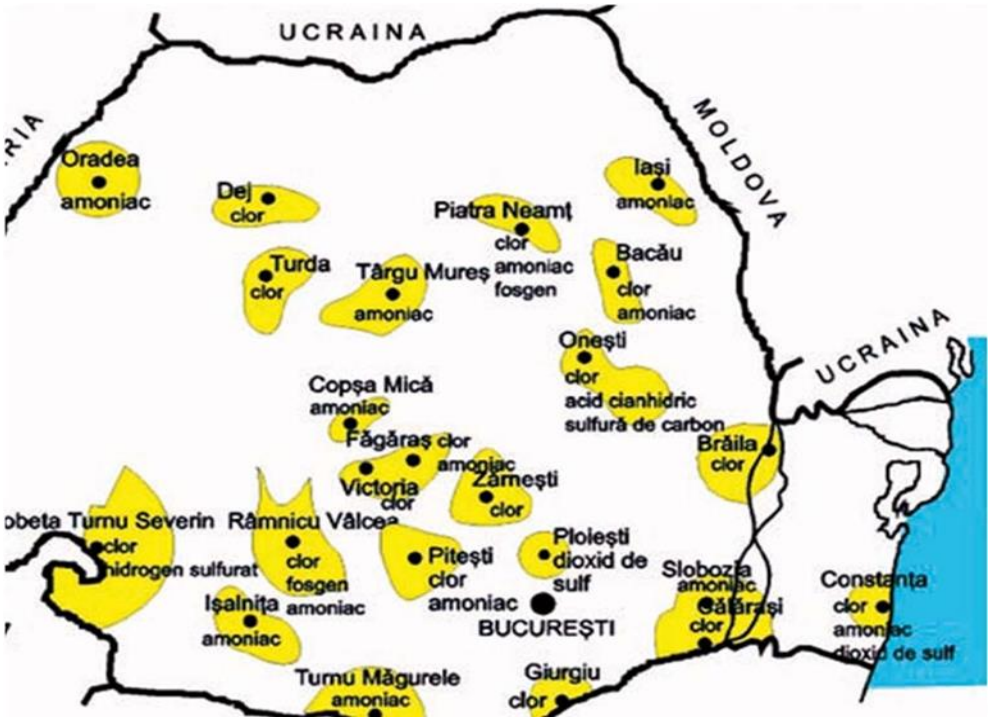


Figure 15 Areas with risk of industrial incidents in Romania

Source: *UNISDIR, 2008. Courtesy of the Romanian General Inspectorate for Emergency Situations.*

The main authority in Romania with responsibilities in streamlining the prevention and management of emergencies, assistance to people in critical situations, intervention in technological accident is the Ministry of Internal Affairs through the General Inspectorate for Emergency Situation.

General Inspectorate for Emergency Situation (IGSU) operates in the 41 counties and in Bucharest having in total, at national level, over 280 operating units. During the intervention actions, IGSU

collaborates with the Environmental Guard, National Institute of Public Health (INSP), Public Health (DSP).

Protection and Guard Services (SPP) carries out activities for prevention and response in case of disasters or emergencies, which directly target protected dignitaries, residences and objectives. Actions in the event of such situations are subsequently taken over by other authorities in cooperation with SPP, but during specific missions, the first responders are represented by own forces. In case of a chemical accident, SPP receives information about the whereabouts of the incident, the area of dispersion of chemicals for the management of the contamination risk of objectives, as well as of its own personnel. If the incident affects one of the interests of the service (dignitary / permanent objectives / own staff), the specific measures are applied or in collaboration with other institutions.

In case of a chemical incident, the CBRN decontamination and depollution measures are applied. These measures are represented by the totality of the activities carried out by the intervention structures for carrying out the depollution and decontamination of the environment, the population, the buildings and the intervention technique.

The operational measures applied by SPP in case of a technological accident or a chemical incident are included in the recovery plans. These include the following:

i) monitoring the degree of chemical contamination in the perimeter in our objectives;
ii) the applied measured for limiting the dispersion of pollutants or contaminants in order to ensure the protection of the personnel and main objectives;
iii) neutralising the effects of hazardous materials and decontamination of the personnel, objects and buildings.

Radiological Accident

Brief Description of National Guidelines & Policies

Risks from nuclear pollution are associated with the Romanian nuclear power plant (NPP) at Cernavoda and the Bulgarian at Kozlodui.

The Cernavoda nuclear power plant is part of the 1980s strategy of the communist regime to make the country fully energy independent. Accordingly, big dam projects on the Danube River – Iron Gate II, Turnu Magurele and Silistra, large hydro projects in the Carpathian Mountains, and ambitious wind energy plans in the Danube Delta had to be realised and implemented. In fact, only several hydro projects in the Carpathian Mountains and the Iron Gate II became a reality.

After the revolution of 1990, the construction of the Cernavoda NPP was halted, but shortly afterwards work on unit 1 continued, with the facility put in operation on 11 July 1996. Consequently, the construction of unit 2 at Cernavoda was restarted, with the unit entering in operation on 7 August 2007. In the early 2000s, plans to finish construction of units 3 and 4 resurfaced. The reactors in Cernavoda are based on the Canadian CANDU6 design, which, according to the Western European Nuclear Regulators Association, has not changed since 1979. According to some experts, “there are big question marks over the reactor’s safety, which shares the same design flaw as the reactor that caused the Chernobyl disaster in 1986.”

The Kozlodui NPP in Bulgaria has two operational reactors (Russian design VEER 1000) of six with plans to build a new one, based on a different technology.

Other sources of concern are nuclear reactors used for research and engineering purposes. Below illustrates the dislocation of nuclear facilities and estimates of the risks from the major nuclear facilities in Romania and bordering Bulgaria.

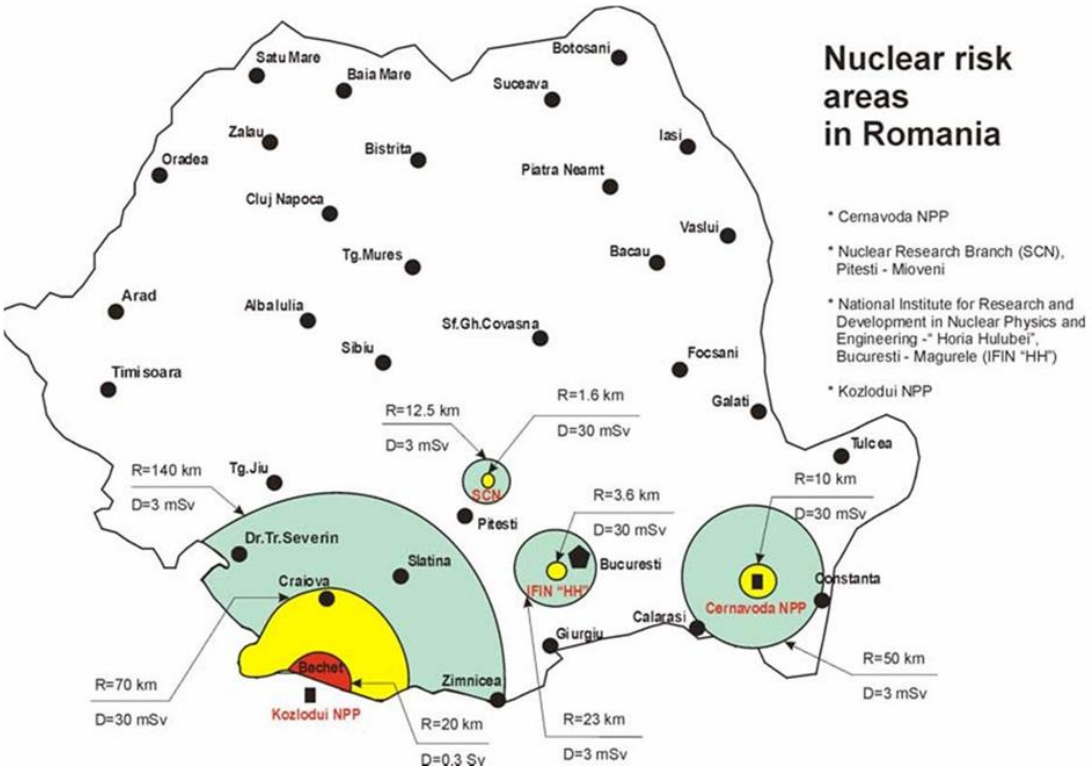


Figure 16 Nuclear Risk areas in Romania

Source: *UNISDIR, 2008. Courtesy of the Romanian General Inspectorate for Emergencies*

National Strategy on Nuclear Safety and Security, approved by HG 600/2014, has as main objective the continuous improvement of the nuclear safety and security, respectively the protection against the harmful effects of the ionizing radiations of the professional personnel, of the population and of the environment.

The base of the National Strategy Nuclear Safety and Security is the national legislation in the nuclear field, managed by the National Commission for Nuclear Activities Control (CNCAN).

The nuclear security standard regarding the response preparation to transients, accidents and emergencies at nuclear power plants emitted by National Commission for Nuclear Activities Control (CNCAN) establish the general nuclear safety requirements for response preparation to transients, accidents and emergencies at nuclear power plants. The general objectives and principles are:

i) Development and implementation response measures to transients, accidents and emergency situations at nuclear power plants;
ii) Development and implementation of reasonable and practicable measures to prevent events that could lead to overexposure of professional personnel and population; and
iii) Reasonable and practicable measures to limit the consequences of possible severe nuclear accidents.

National Emergency Management System prevent and manage emergencies, ensure and coordinate the human, material, financial and other resources necessary to restore normality.

National Emergency Management System has 3 types of structures:

i) Decision-making structures are part of the emergency committees (established at local, county and national level);
ii) Intervention structures, the General Inspectorate for Emergency Situations and the county institutions for emergency situations, as professional community public services for emergency situations; and
iii) Operational structures, operational centres for emergencies established at local, county and national level.

As the main authority in case of a nuclear accident or radiological emergency, National Commission for Nuclear Activities Control (CNCAN) is established and maintains its own emergency preparedness response system through Emergency Response Centre.

In addition, CNCAN has representatives in the structures of the National Emergency Management System: National Committee for Emergency Situations, National Centre for Coordination and Management of Intervention, Centre for Nuclear Accident and Radiological Emergencies.

The second authority with responsibility in case of a nuclear accident or radiological emergency is General Inspectorate for Emergency Situation.

For risk prevention and emergency response are responsible the following authorities: National Commission for Nuclear Activities Control, General Inspectorate for Emergency Situation and Nuclear and Radioactive Waste Agency (ANDR).

The operational measures applied by SPP in case of a radiological incident are included in the recovery plans. These include the following:

i) monitoring the degree of irradiation and radiological contamination in the perimeter of our objectives;
ii) procedures for limiting the irradiation and the radiological contamination and in order to ensure the protection of the personnel and main objectives; and
iii) isolation of the radioactive area and decontamination of the personnel, objects and buildings.

Critical Infrastructure Failure

Brief Description of National Guidelines & Policies

One of the major objectives of the EU is reducing the vulnerabilities of critical infrastructure and increasing their resilience. An adequate level of protection must be ensured and the harmful effects of disruptions on the society and citizens must be limited as far as possible.

Critical infrastructures extend across many sectors of the economy, including communications, banking and finance, transport and distribution, energy, utilities, health, food supply, as well as key government services.

Critical infrastructure consists of physical and information technology facilities, networks, services and assets that, if disrupted or destroyed, would have a serious impact on the health, safety, security or

economic well-being of citizens or the effective functioning of the government as a result of the failure to maintain those functions.

The complexity and diversity of risks and threats, increasingly interconnected and characterised by multiple causes, require an integrative, systemic and comprehensive approach on security goals, especially on the protection of the vital components for the safety and the normal development of social and economic life.

Threats to a single critical infrastructure can have a very significant impact on a broad range of actors in different infrastructures and more widely.

Moreover, the effects of those interdependencies are not limited to single countries. Many critical infrastructures have a cross border dimension. In addition to interdependencies between sectors, there are also many interdependencies within the same sector but across several European countries.

In Romania, the protection of critical infrastructure is seen as a dynamic process, with a variable geometry, which requires constant reporting to the various types of threats of the external environment: terrorism, organised crime, illegal migration, border insecurity, etc. For this reason, any process of designing/redesigning the concept of national critical infrastructure protection should relate to the complexity and the fluidity of the present international security

environment and the fundamental reason of any initiative regarding this process is enhancing the status of "vector of stability" at the Eastern border of the European Union and NATO, considering that many of the transnational threats facing Europe originate from this area.

Defining the protection of critical infrastructures. The reflection of the concept in the Romanian legislation

Critical infrastructure protection issue is permanently in the attention of specialists, representing a constant concern to them. The field of critical infrastructure protection is generally addressed as a subsystem of the national security system. From a strictly theoretical point of view, the critical infrastructure protection is "any activity that aims at ensuring the functionality, continuity and integrity of national/ European critical infrastructures in order to deter, mitigate and neutralise a threat, risk or a weak point. In a non-exhaustive enumeration, critical infrastructure protection includes activities in succession concerning the risks assessment, the classified information protection, design of security plans of the critical infrastructure operators, designation of liaison officers and the way of achieving communications, as well as exercises, reports, revaluations and updates of the documents drawn up.

Critical infrastructure protection is closely linked to the legal provisions, which allow for achieving and maintaining a balance based on:

i) social consensus required for the best performance of the social ensemble under the legal regulations in force;
ii) defence of and respect for fundamental rights and freedoms of citizens;
iii) defence of public and private property; and
iv) Defence of the supreme values to promote social progress and affirmation in a democratic society.

The relevant legislation should cover all the normative acts in force, which regulate the activity of the protection of critical infrastructures, including those relating to the organisation and functioning of authorities with powers in this direction, as follows:

i) the Emergency Ordinance of the Romanian Government No. 98, of 3 November 2010, on the identification, designation and protection of critical infrastructure;
ii) law No. 18 of March 11, 2011, for the approval of Government Emergency Ordinance No. 98/2010 related to the identification, designation and protection of critical infrastructures;
iii) the Romanian Government Decision No. 1198, of December 4, 2012, in designating the national critical infrastructures;
iv) the Romanian Government Decision No. 1,110, of 3 November 2010, on the composition, tasks and organisation of the inter-institutional working group for the protection of critical infrastructures;
v) the Romanian Government Decision No. 1.154, 16 November 2011, for the approval of critical cross-cutting criteria thresholds related underlying potential national critical infrastructure identification and approving the methodology for applying critical cross-cutting criteria thresholds related and determining the level of criticality;
vi) the Romanian Government Decision No. 718, of 13 July, approving the national strategy on protection of critical infrastructures;
vii) decisions of the Prime Minister of the Romanian Government; and
viii) Order of the leaders of the public authorities responsible for the sectoral criteria and critical thresholds associated with them.

Risk Factors

They refer to domestic and foreign developments, elements, conditions and circumstances, sometimes accompanied by actions, determining or favouring the materialisation of infrastructure threats, generating insecurity.

Critical infrastructure risks can be classified according to:

i) the structure and extent of breakdown, failure, intervention, degree of probability, as well as human action potential;
ii) the driving factor and vulnerabilities of a system or systems; and
iii) the nature, as well as the degree of ambiguity and incertitude.

The importance of identifying and preventing the emergence of risk factors implies a comprehensive risk assessment, starting with the dysfunctions and vulnerabilities.

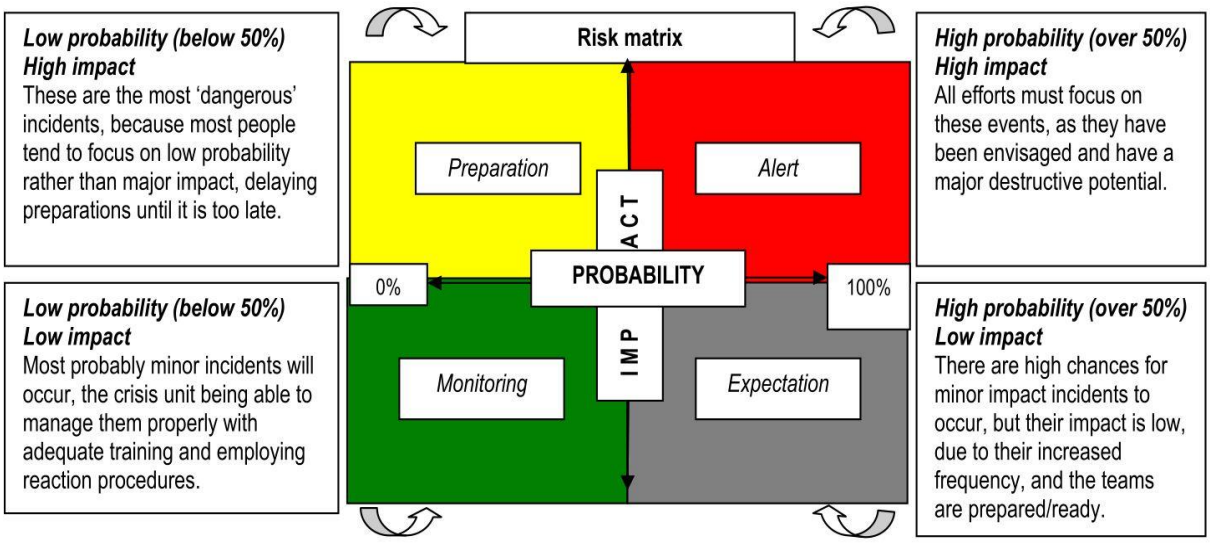


Figure 17 Risk assessment model for critical infrastructure in Romania

The national infrastructure system, due to its characteristic development, technical performance, and security level, creates real premises for the emergence of vulnerabilities and risk factors generating significant imbalances with major social and economic impact, at the national and macro-regional level.

Thus, the negative effects of the precarious technical condition of the specialised transport infrastructure are highlighted by the increased operation time, poor performance of activities, with direct impact on competitive services complying with high quality and safety standards.

Similarly, the energy, oil and gas systems (the study focusing on those targeted by the European Directive) face major dysfunctions generated by insufficient rehabilitation measures, leading to poor technical exploitation performance.

The insufficient physical protection of these infrastructures allows the increase in

i) the theft of transported goods; and
ii) the risk of deliberate and aggressive interventions, leading to major disruptions at the level of the distribution system of public elements/services, with a severe economic and social impact.

In November 2010, the Romanian legal framework in critical infrastructures protection was strengthened with two acts in the area of critical infrastructures protection, regarding the identification, designation and protection of critical infrastructures, in accordance with the Directive 114/ 2008/ EC. Government's Emergency Ordnance nr. 98 was approved and modified by the Law nr.18 from 11 March 2011.

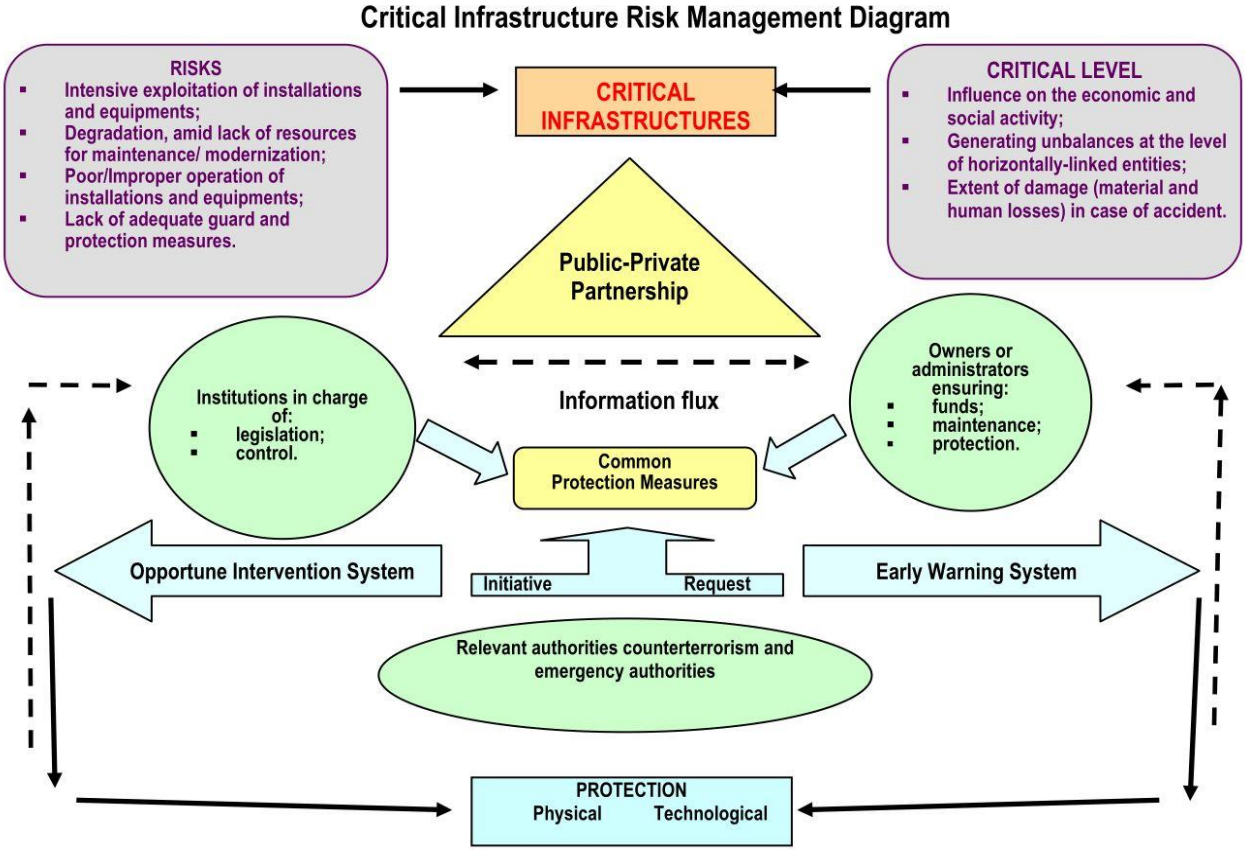


Figure 18 Critical Infrastructure risk management model in Romania

Extreme Weather Heatwave

Brief Description of National Guidelines & Policies

Droughts have affected 48% of agricultural land in Romania, and estimates suggest a 20% chance of severe drought in the next 10 years, affecting the south-western and north-eastern provinces the most, with a likely increase in the number of drought events into the future. Between 1961 and 2006, the rate of precipitation in Romania also decreased by roughly 30 mm per decade, and during the 1980–2012 period drought occurrences increased, with precipitation amounts below normal most years. Thus, the frequency of droughts increased from 1 in 10 years to 1 in 5 years. A total of eight drought months were recorded during agricultural year 2011–2012, November 2011 being the driest month in last 52 years in Romania with a monthly mean of only 1.2 mm as against multi-annual mean of 43.9 mm. Studies reveal a 40–60% decline in crop yields during this time. Lower agricultural production may reduce the availability of food products in local markets and cause food inflation. This trend is expected to continue because of climate change, resulting in higher levels of water stress, especially in the summer, and potential implications for hydropower generation.

Analysis from 1961 to 2010 also shows a reduction in snow depth and duration in winter months, and an 82% reduction in snow days. However, evidence indicates that while snowfalls are shorter, they are becoming more intense. For example, intense events, such as the 2014 blizzard—which left families without power, blocked roads, collapsed roofs, and resulted in several fatalities may become more common.

Extreme heat events are becoming more frequent as the climate warms, with the follow-on events of more intense and frequent wildfires. Bucharest currently ranks among the 5th fastest-warming cities around the world, with an increase of +7.9°C temperature if recent emissions trends continue, and +4.2°C with moderate emission cuts. The frequency of wildfire events has doubled, from about 175 per year between 1956 and 2005 to about 341 events per year in the last decade. Moreover, the average area affected has increased by 25% in the same period. Fortunately, wildfire events typically occur in the less-populated Carpathian mountainous area, but the impact on forestry, protected areas, and the environment is still significant.

Romania also faces frequent landslides in some areas, with most events occurring in March and April, during snowmelt and spring rain overlap, and again in June and July, when heavier rainfall occurs. Increased landslide activity has also occurred following significant earthquakes. Most of the damage is related to homes and road infrastructure

Overall, the impact of climate-related hazards on critical infrastructure in Romania indicates that expected annual damage to infrastructure alone would double by 2020, and by 2080 could be six-times higher**.** Considering this history and these forecasts, it is important for any disaster risk management (DRM) and sectoral interventions in Romania to consider a range of hydro-meteorological and geophysical hazards, and how these can change in the future.

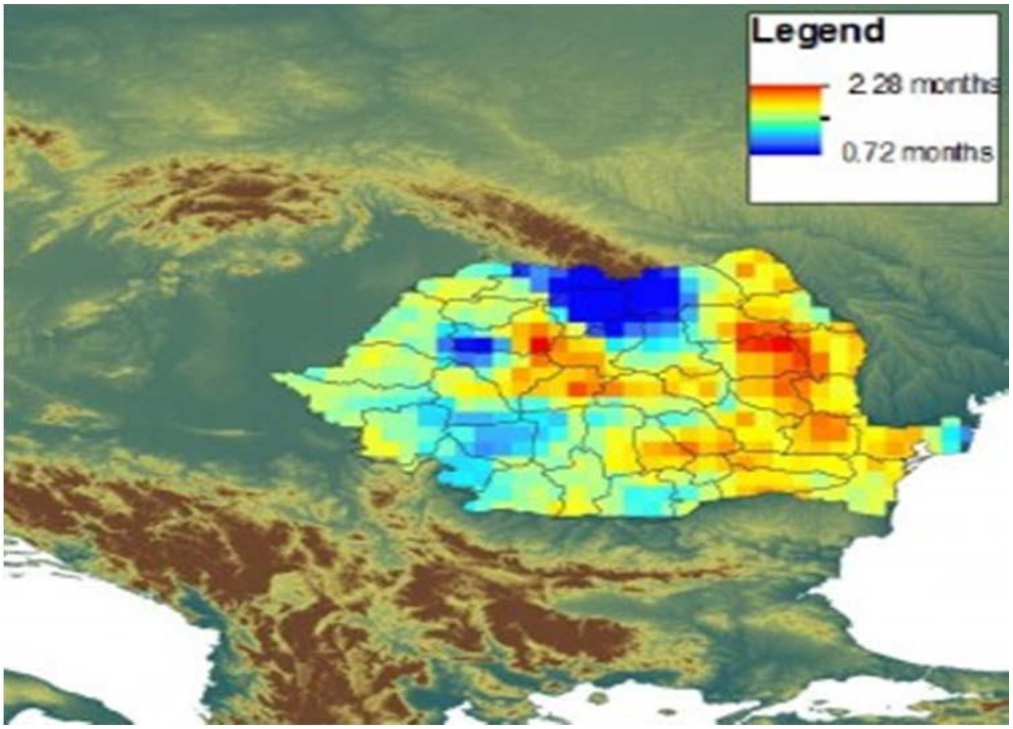


Figure 19 Average months/year with drought in Romania (1951-2000)

Recovery

The National Strategy for Combating the Effects of Drought aimed at reducing the effects of drought in the short, medium and long term.

The strategy aims to:

i) allocating the necessary resources to prevent and reduce the effects of drought and to ensure the conditions of continuation of the activity in conditions of high risk of the impact of the lack of humidity and the action of extreme temperatures;
ii) creating the conditions of adequate drinking water supply, ensuring thermal comfort and humidity threshold for the population, as well as; and
iii) the establishment of a framework document for a systematic and efficient short- and medium-term approach to drought management, with the aim of reducing its effects on the population and adopting measures to combat long-term aridification and desertification.

The National Strategy on Climate Change, together with the National Action Plan for the implementation of the National Strategy on Climate Change and Low-Carbon Growth, addresses the two key components of the climate effort: preventing and combating the effects of climate change (through actions aimed at reducing greenhouse gas emissions) and adequate adaptation and with minimal damage in the context created by climate change already underway.

The adaptation component incorporates Romania's efforts to reduce the risks of forest fires, drought, hail, and floods, also addressed in other official documents and normative acts, as well as the activities carried out in order to assess the risks of disasters at national level and to elaborate the related risk maps.

5.3.5 Austria

Generic.

Measures to prevent, eliminate or mitigate the effects of catastrophic or imminent disasters (disaster relief) are predominantly a matter for the states (Bundeslander) within the federal organized country. These states have to issue appropriate laws, which lay down the appropriate emergency management at municipal, district and the state level. This implies that the Organisation structure can differ within Austria. Complementary tasks are assigned to the federal authorities.[152]

The legal basis is the disaster relief laws of the states, which in particular lay down the diagnosis of the disaster management in the municipalities, districts and 'states'[153]

In crises and disasters, there is an increased need for coordination, which is guaranteed in Austria by the State Crisis and Disaster Management (SKKM) The SKKM is part of the Ministry of Interior of Austria (BMI). SKKM enables effective disaster management in Austria and internationally through the cooperation of all relevant entities in the federal state with the disaster management authorities of the 'Bundeslander' as well as the federal organized aid and rescue organizations (e.g. Austrian Red Cross)

Major catastrophic events at home and abroad, such as the Chernobyl reactor disaster in 1986 or the flood disaster in Central Europe in 2002, have shown that in the case of major disaster, there is overall coordination across administrative and regional boundaries of local and regional territorial corporations. In 1986, therefore, the Federal Government set up a State Crisis Management at the Federal Chancellery. Since May 2003, the Coordination of State Crisis and Disaster Protection Management and International Disaster Relief have been the responsibility of the Federal Ministry of the Interior.

The Federal Ministries, States, Federal organized aid and rescue organisations and public information are represented in this coordination committee. In the case of large-scale threat situations, the committee is obliged to coordinate the measures required at Bundeslander and national level. The committee will not only act in a coordinating manner, but also in a coordinating manner in the principal planning. For the planning of principles, eight specialist groups were used in agreement with the federal states, e.g. for legal, technical and operational interests.

[152] https://www.bmi.gv.at/204/skkm/Katastrophenhilfe.aspx
[153] https://www.bmi.gv.at/204/skkm/start.aspx

Figure 20 Federal organisation of crisis management in Austria

In case of emergency, the Federal Warning Centre (BWZ) serves as an information hub and permanently occupied national contact point. It is responsible for the federal states, the neighbouring states, the European Union (EUCPM) and all international organizations.

In the case of complex crisis and disaster situations, the task of the SKKM is to ensure the rapid coordination of the federal authorities with each other as well as the coordination and cooperation with the states.

The emergency and rescue organizations form the backbone of Austrian disaster response. The authorities on all levels of government are supported by numerous voluntary organizations that are involved in emergency response mainly at the municipal level. In the event of a disaster, they act as emergency relief services under the command and control of the respective authorities. The principle of voluntariness is one of the basic pillars of Austrian civil protection. It is one of the strengths of the system and influences its organizational structure. Due to the high percentage of volunteers, it is possible to maintain one of the world's densest networks of emergency and rescue organizations. Accordingly, Austria has more than 4,800 fire brigades and more than 900 rescue stations. In total, there are approximately 250,000 persons active in the fire brigades and over 40,000 paramedics.

Most emergency and rescue organisations have an overarching national association assuring unity in command and coordination structures of the individual organisations or branches. The main relevant associations are:

i) Austrian Federal Fire Brigade Association;
ii) Austrian Red Cross;
iii) Austrian Mountain Rescue Service;
iv) Worker's Samaritan Federation Austria;
v) Die Johanniter (the Order of St. John);
vi) The Order of Malta Ambulance Corps of Austria; and
vii) The Austrian Water Rescue Service.

To warn the population, the BMI installed a national warning system. More than 8,000 sirens will warn the population in an emergency. An alarm can be triggered nationwide or regionally. In addition, the warning system "KATWARN" was introduced in Austria, which uses a mobile app and short messages

to warn the population about various types of danger. The Austrian National Weather Service operates a warning system for extreme weather conditions, which is used to warn the authorities and response organisations but it is also available to the media and the public on the internet. Weather warnings are also disseminated via "KATWARN". In addition, a number of surveillance systems monitor the environment and trigger an alert to the relevant authorities when defined thresholds are exceeded. On the main rivers, there are fully automatic flood warning and control systems managed by the hydrological services of the provincial governments.

The organisation of flood risk management in Austria is divided amongst three authorities. This is due to the legal requirements, the diversity in landscapes and topography, and regionally different responsibilities[154]..

i) The waterways of Danube and March, but also stretches of the rivers Thaya, Enns and Traun are in the responsibility of the Federal Ministry of Transport, Innovation and Technology (BMVIT);
ii) Torrents where boundaries are defined by ordinance are in the responsibility of the Torrent and Avalanche Control (WLV) in the Federal Ministry of Sustainability and Tourism, Section III; and
iii) Water bodies which are neither torrents nor waterways are in the responsibility of the Federal Water Engineering Administration (BWV). This task is fulfilled by the Federal Ministry for Sustainability and Tourism (Section I - Environment and Water Management) together with the federal provinces.

The *Hydraulic Engineering Assistance Act* states the prerequisites for granting public funds and provides the basis for planning and implementing measures in the frame of flood risk management. These are funded primarily by the federal state (around 56%) and the provinces (around 28%), but beneficiaries and stakeholders such as municipalities, water associations or cooperatives are also required to provide funds (around 16 %). Since the 2002 flood event, the federal state has been investing around 200 million Euro per year into protection against natural hazards. The majority is used for structural measures and maintenance, another share for (hazard zone) planning and the compensation of flood damages. In total, around 400 million Euro are invested per year in flood risk management measures. The *Disaster Relief Fund* has been a proven funding tool for flood risk management for 50 years. It was created to provide additional funding of measures to prevent future damages and to compensate those, which occur. The Disaster Relief Fund also partially funds emergency apparatus for fire brigades and the warning and alarm system, as well as subsidising hail insurance premiums. Affected private individuals can file a request for benefits out of the Disaster Relief Fund directly at their municipal office. The size of the benefits is determined by province guidelines.

Early warning systems

Early warning systems are in place. The alerts are issued well ahead of the flood events, e.g., to set up demountable barriers in time and to issue alarms to raise people's awareness. This is particularly important where mobile flood protection is the only option because of space limitations or the value of the landscape. Currently, forecasting models are in operation at almost every larger water body. The models constantly calculate the current discharge situation and predictions for up to two full days in advance.[155]

[154] Flood risk management in Austria: Federal Ministry for Sustainability and Tourism, 2018
[155] https://www.bmnt.gv.at/wasser/schutz_vor_naturgefahren/ hochwasserprognose/hw_prognose_at.html

Forest/Wildfire

The risk of forest fires is increasing in Austria but still rather limited. Due to climate changes also in Austria the amount of forest fires is growing.

For this year (2021) only 64 forest fires have been registered in the Austrian forest fire database between June and August. Most forest fires occur after the first heat wave in late June and early July. The area's largest forest fire this year was also registered during this period: On July 3, eight hectares of black pine forest near Saubersdorf, district Neunkirchen (Lower Austria) caught fire. The trigger here was presumably self-igniting ammunition from World War II.156

A monitoring/early warning system is in place operated through the Austrian Meteorological Service,[157]as well as regular warning messages by the University of Natural Resources and Life Sciences (Universität für Bodenkultur (BOKU)) that has a department to conduct research on forest fires.

The main response to forest fires is carried out by the local fire brigades. Due to the density of fire brigades in Austria this is considered the most adequate approach.

Due to the expected increase in risk and based on experience from deploying assets abroad (for example in 2021 to Northern Macedonia) developments are ongoing to have more specific teams and assets available within the fire brigades.[158]

Earthquake

National Guidelines and Policies

The Austrian Association for Earthquake Engineering and Structural Dynamics (OGE)[159], considers all aspects of seismic safety. Of special importance is the Standard OENORM B 4015 (Design loads in building-accidental actions-seismic actions-general principles and methods of calculation; fully compliant with the EuroCode). That includes the Austrian map of Seismic risk zonation (higher resolutions, i.e. micro-zonation is available for zones of high risk from ZAMG, Vienna[160]).).

The risk of earthquakes is limited in Austria, but severe earthquakes are possible. A specific relevant risk for Austria is that of landslides, Rockfall and avalanches. To respond to these risks relevant fire brigades are specifically trained and Austria has a wide network of mountain rescue organisations (Bundesverband Bergrettung) with more than 12,000 volunteers and over 200 rescue dogs.

Austria has three registered Urban Search and Rescue teams for international deployment.

i) Austrian Forces Disaster Relief Unit (AFDRU) -: INSARAG Heavy classified USAR Team (2012).
ii) Samaritan Austria Rapid Response Team - no INSARAG classification.
iii) Search and Rescue Unit Vorarlberg - INSARAG Medium USAR Team (2011).

International Medical Emergency

Brief Description of National Guidelines & Policies

156 https://fireblog.boku.ac.at/2021/09/06/sommerrueckblick-2021/
157 https://www.zamg.ac.at/cms/de/wetter/wetter-oesterreich/waldbrand/oesterreich/heute
158 https://kurier.at/chronik/niederoesterreich/feuerwehr-ruestet-sich-fuer-waldbraende/401473342
159 http://www.oge.ro.at/
160 http://www.zamg.ac.at

Austria had adopted a national pandemic response plan in 2008[161] for influenza pandemic. This plan however has only limited use for the current COVID 19 pandemic response in Austria.

The current Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz (BMSGPK) published in May 2021 a strategy for the current COVID-19 pandemic[162].

Based on the spread dynamics the course of a pandemic in the plan is divided into different phases, taking into account the necessary preparatory and reaction measures for each phase. The Plan gives a description of the phases of the pandemic.

i) First stage: the first cases of illness appear in the population. (in Austria until 15-3-2020).
ii) Second stage: there is an outbreak with local transmission (from 16-3-2020 to 11-4-2020).
iii) Third stage: the outbreak develops into an epidemic or pandemic, whereby the pathogen is transmitted from person to person and a sustained outbreak occurs with further geographical spread (from 12-4-2020 until 31-8-2020).
iv) Fourth stage: the transmission from person to person is decreasing because a sufficiently large part of the population is immune to the pathogen or the interventions taken to contain the epidemic or pandemic have shown effects (from 1-9-2020 until now.)-

The aims of the plan are:

i) the reduction of mortality in the general population;
ii) ensuring the care of the sick;
iii) maintaining essential public services; and
iv) reliable timely information for political decision-makers, specialist staff, the population and the media.

Depending on the epidemiological phase, the goals are achieved through different strategies.

A distinction can be made between three strategies of infection control (often also referred to as phases).

i) Containment = containment strategy;
ii) Protection = protection strategy for groups at risk of severe disease; and
iii) Mitigation = strategy to mitigate the consequences.

The three strategies “containment, protection, mitigation” cannot be clearly separated from one another in reality. The transitions are fluid and include a step-by-step adaptation of the measures used to cope with the pandemic. The development of the epidemic can vary from region to region, which is why the individual strategies can also overlap.

Measures for rapid case identification and isolation as well as contact person management are important in every phase of a pandemic and help to reduce the rate of spread and the number of diseases in the population. This is very important because it can reduce the additional burden on the health system.

For the risk identification and evaluation there is a specific advisory committee The Corona Commission is set up in accordance with the public health law consisting of experts and representatives of the BMSGPK and other ministries as well as the federal states to advise the Minister of Health.

[161] Influenza Pandemieplan Strategie für Österreich, Buindesministerium fur gesundheit und frauen
[162] Die COVID-19-Pandemie in Österreich Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz (BMSGPK)

The Corona Commission is assessing the risk regularly, including:

i) assessing the spread of the risk: danger to public health from the spread of COVID-19); and
ii) assessing the systemic risk (= risk of overloading the health care system COVID-19 patients).

The possible measures to be taken are partly based on a specific Corona law.

i) Rules and requirements for entering and driving on public roads and in public transport;
ii) Rules Permanent establishments for the purpose of purchasing goods and services;
iii) Rules for Workplaces; and
iv) Restrictions on leaving private living quarters if essential to contain COVID-19.

And partly based on the public health law.

i) Obligation to notify SARS-CoV-2 suspected cases, illnesses and deaths;
ii) Secretions from sick people, people who are suspected of being sick or contagious;
iii) Requirements for information gathering, data collection, statistics;
iv) Screening programs;
v) Measures against the confluence of large crowd;
vi) Traffic restrictions, e.g. For residents of certain localities or abroad;
vii) Appointment of epidemic doctors;
viii) Involvement of organs of the public security service; and
ix) Compensation (e.g.in the case of segregation).

Chemical Accident

Brief Description of National Guidelines & Policies

The Austrian Federal Ministry of Science, Research and Economy (BMWFW) is responsible for the major chemical hazards policy in Austria which is based on the European Seveso III regulations which are implemented in the "Störfallverordnung".

The implementation is a responsibility of the States, based on guidelines and support from the federal government.

Response to chemical incidents is done by the Fire brigades. Support can be delivered through the disaster response units of the Austrian Army.

Radiological Accident

Brief Description of National Guidelines & Policies[163]

The Austrian arrangements to respond to Radiological accidents are given in the Austrian National Radiation Emergency Plan. This plan is based on a systematic hazard assessment.

i) Nuclear or radiological facilities of hazard category III, such as a research reactor of low power, a central waste treatment and interim facility for low and intermediate level waste, are in operation in Austria;
ii) Approximately 1,000 partly mobile dangerous sources (hazard category IV); and
iii) potential trans-boundary impacts of nuclear reactor accidents in neighbouring countries (hazard category V).

[163] The Austrian National Report for the on Emergency Preparedness and Response Arrangements for the 7thMeeting of Representatives of Competent Authorities IAEA.2017

The plan is based on legal requirements of the Radiation Protection Act and subsequent Ordinances. The plan is the basis for the plans on radiological incidents for the states. The plan also give the obligations and rules for the plans of the license holders of radiological installations.

An intensive bilateral cooperation with neighbouring, countries including bilateral emergency exercises, is implemented to assure both early notification and a good follow up of the response to incidents in neighbouring countries.

An automatic nationwide measurement network for gamma radiation has been in operation for rapid detection and assessment of large-scale radioactive contaminations in Austria for more than 30 years. It was Europe's first automatic radiation measurement system and, with over 300 measurement stations, represents one of the world's denser monitoring networks. The measurement results are automatically transmitted to the head offices of federal and state governments every 10 minutes. The data from 111 monitoring stations is also available on the Radiation Protection website of the BMK.

In addition, 10 air monitors are installed that automatically and continuously measure the alpha, beta and gamma rays of aerosols in the air. All readings from the Austrian Radiation Early Warning System are available online in both federal emergency control centres for radiation, which run in parallel in order to achieve a high degree of fail-safety.

For reliable detection of new emissions, the radiation early warning system is complemented by the laboratory-based monitoring network of the Austrian Agency for Health and Food (AGES). At the facilities in Vienna, Linz, Graz and Innsbruck various monitoring tasks are carried out in specially equipped radiation protection laboratories. The main task is to determine even small increases of radioactivity in food (food control) and various environmental media such as air, precipitation, soil and surface water as well as in wastewater treatment plant discharges nationwide at any time.

Early recognition of extensive radioactive contamination of Austria is made possible by a nation-wide automatic radiation early warning with 345 measuring posts run by the Federal Ministry of Agriculture, Forestry, Environment and Water Management. No village or settlement is more than 15 km away from the next measuring post.

Conurbations have more than one post. For the early warning of the population, a joint warning and alerting system has been installed by the provinces and the Ministry of the Interior. More than 77,000 sirens will warn the population in an emergency. Once a year a nationwide test of the system is carried out. In some of the provinces, there are fully automatic flood warning and air control systems managed by the provincial government. The first have been activated lately in August 2002 (flood disaster) and contributed to the reduction of losses.

Critical Infrastructure Failure

For the protection of critical infrastructure on the country level a masterplan is available APCIP[164] (Austrian Program for Critical Infrastructure Protection). This plan is implemented in all states within Austria, the operational responsibilities are on the state level while the federal level assures legislation and coordination nationally and internationally.

The principles of the plan are the following.

[164] https://www.bvt.gv.at/401/files/APCIP_Masterplan_2014.pdf

i) Operator based approach: not including full critical sectors to refrain from overburden or measures and too much focus on the complexity of interdependencies, Austria has been identifying strategic critical companies;
ii) Subsidiarity and corporate commitment: the owners and operators of strategic businesses are primarily responsible for their services and the protection of their systems and facilities. Since there is a national interest in the supply function of these companies, these should be expressed in a (voluntary) commitment to increased resilience and thus commit to protection standards that are jointly defined;
iii) Complementarity: existing measures and plans should continue to be used and adapted to new threats;
iv) Confidentiality: information should be exchanged based on confidentiality and is only available in the depth when the information is required for the respective tasks;
v) Cooperation: the cooperation of all stakeholders, i.e., companies and interest groups, public administration and regulators, but also standardization institutes and the media have an appropriate contribution assure further development and implementation of APCIP;
vi) Proportionality: the measures and costs to increase the level of protection must be in a balanced relationship to the respective risk and to the possibilities to reduce the risk; and
vii) All-hazards approach: critical infrastructures face a wide range of possible risks. The measures should therefore reduce the risk of criminal acts and terrorist attacks as well as natural hazards and Man-made disasters or technical failure.

APCIP focuses on supporting strategic companies to implement a comprehensive security architecture. For this it is necessary that the companies:

i) know their own vulnerability and carry out risk analysis;
ii) derive measures based on the risk analysis to mitigate or reduce risks;
iii) have the ability to deal with disruptions and emergencies through crisis management; and
iv) set up a security management system.

The country has installed an early warning cell at the BMI.

Extreme Weather - Heatwave

National policies

The Austrian Meteorological and Weather service ZAMG provides warnings nationwide for extreme weather events: wind, rain, snow, thunderstorms, thunderstorms with hail, black ice, heat stress and cold stress.

The intensity of a predicted event, also the extent of the expected effects, are characterized by warning colours. The warning colours yellow, orange and red are used for heat exposure, each of which stands for caution and danger.

When determining the warning level, factors are also taken into account that can increase or weaken the effects and thus also the damage potential of the expected weather situation. For example, the effects of the first heat wave of the year will be stronger than that of other midsummer weather conditions.

Specifically for heatwaves a national heat plan is developed by the Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz (BMGF)[165] in 2017.

ZAMG issues heat warnings based on forecast values for the perceived temperature (PT). This is based on the forecasts of the high-resolution weather forecast models from ZAMG. Heat warnings are issued if, according to these forecasts, predefined warning thresholds are reached or exceeded over a period of several days.

In the event of a heat warning, the states will inform the facilities they have specified in advance. In particular, such facilities are:

i) care and nursing facilities;
ii) hospitals and sanatoriums;
iii) childcare facilities (kindergartens, schools, etc.);
iv) mobile care services;
v) medical association; and
vi) emergency organizations.

It is a responsibility of the facilities themselves to take the appropriate action. Advisory on this is issued by the Austrian Agency for Health and Food Safety (AGES).

The BMGF, in cooperation with the Austrian Agency for Health and Food Safety (AGES), will set up a hotline to advise the population if necessary, such as in the event of prolonged or particularly severe heat exposure.

5.3.6 Ireland

Flood

Brief Description of National Guidelines & Policies

The first response to major emergencies in Ireland is led by the 3 principal emergency services, An Garda Síochána (police force), the ambulance service, the fire service and the Irish coast guard. These principal agencies are responsible for the response to an emergency up to and including a major emergency in Ireland.

The Framework for Major Emergency Management (MEM)[166] was developed in 2005 and was adopted by government decision in 2006. Its purpose is to set out common arrangements and structures for front-line public-sector emergency management in Ireland. The Framework is based on the internationally recognised systems approach that, in essence, proposes an iterative cycle of continuous activity through five stages of emergency management:

i) hazard identification;
ii) mitigation;
iii) preparedness;
iv) response; and
v) recovery.

The Framework is designed to fit with the 'all hazards' approach to emergency management, and has been developed reflecting best international practice, customised to suit Irish conditions. In Ireland, one of the main purposes of the Framework for Major Emergency Management is to set out the

[165] Gesamtstaatlicher Hitzeschutzplan 2017, Bundesministerium fur Gesundheit und Frauen
[166] http://www.mem.ie/wp-content/uploads/2015/05/A-Guide-to-Flood-Emergencies-Ver2-11-July-2013.pdf

working relationship between the various elements, which make up the front-line emergency response.

National Structures

The national structures and arrangements are set out in the Strategic Emergency Management, National Structures & Framework Document (SEM)[167]. These structures are in place to enable the delivery of national-level emergency management, in the event of a major emergency.

The MEM Framework sets out the arrangements to enable the Principal Response Agencies (PRAs - Local Authorities, the Health Service Executive, and An Garda Síochána) to prepare for and provide a coordinated response to major emergencies.

An extensive range of appendices and other guidance documents and protocols dealing with specific aspects of emergency management complement the MEM Framework. Both the SEM and the MEM Frameworks adopt an all-hazards approach to emergency management, which advocates a systems approach based around a five-stage emergency management paradigm, as illustrated in Figure 21.

Figure 21 Five stage emergency management paradigm Ireland

In conjunction with the relevant guidance documents, the MEM Framework details how a structured hazard analysis and risk assessment must be completed initially by the PRAs and then by regional, multi-agency teams in each of the eight designated MEM regions within the country.

As well as setting out how the PRAs work together, the MEM Framework also identifies how these plans link with other National Plans and with site or event specific local emergency plans (See Figure 22 below - Linking National Plans, MEM Plans and other Plans).

[167] https://www.gov.ie/en/publication/7ff6f-strategic-emergency-management-sem-national-structures-and-framework/

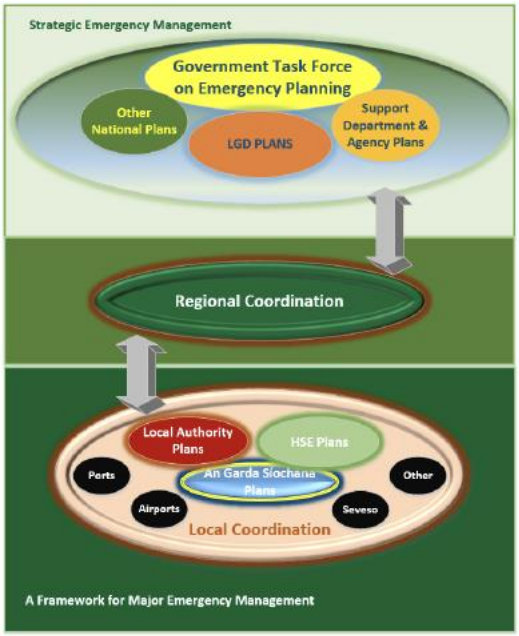


Figure 22 Structure for emergency management in Ireland

Floods

Ireland has experienced several significant flooding events in recent years. These floods have an impact on people, the environment, the economy and the social fabric and infrastructure of society.

Since 2012, when flooding was rated one of the most significant national level risks, additional flood mitigation schemes are implemented on an ongoing, prioritised basis. Funding of 430 million euro has been allocated to Flood Risk Management in the Capital Investment Plan 2016-2021.

A country-wide protocol[168] has been prepared by the National Working Group (NWG) and approved by the National Steering Group (NSG) for Major Emergency Management. It builds on the original protocol, which was developed by the NSG with the assistance and co-operation of the Office of Public Works (OPW).

The protocol is intended to enable the Principal Response Agencies (PRAs), An Garda Síochána (AGS), the Health Service Executive (HSE), the local authorities (LA), their Principal Emergency Services (PES) and Civil Defence (CD) to work together, to respond effectively and safely to flood events.

The protocol supports the PRA's working with and co-ordinating the activities of other groups and organisations deployed to assist with managing flood events, which cause significant disruption to communities or constitute a significant risk, regardless of whether a major emergency is declared. Organisations such as the Defence Forces, the Irish Coast Guard, numerous voluntary emergency services and community groups work with the PRAs during flooding crises.

The Protocol will ensure that all agencies involved are aware of the functions and responsibilities assigned to them in a flooding scenario, so that the necessary emergency procedures are undertaken immediately.

The Protocol should not be interpreted as restricting initiative or common sense, having regard to the nature of the particular flooding emergency that may arise and the possibility of continually changing

[168] A guide to floodmanagement 2008 , Department of housing. Local government and heritage

circumstances that may accompany any flooding emergency. The Protocol has been developed as a guide to good practice and not a prescriptive formula.

For the purposes of clarity, it is important to define the context within which the term "flooding" is used for the purposes of this protocol. The protocol has been written with a view to mitigating loss/damage caused by significant flooding and reducing the risk of exposure to such loss/damage. It is in this context that the term 'flood' is used, i.e., loss/damage or disruption, the temporary covering by water of land not normally covered by water [EU-Directive 2007/60/EC]. For practical, common sense reasons flooding in the present context includes:

i) threat to the safety or health of persons;
ii) damage or disruption to critical infrastructure;
iii) serious damage to property;
iv) major social or economic impact on communities.

Forest/Wildfire

Every year in Ireland, several hundred hectares of forests and woodland are destroyed by fire.

The highest risk period occurs between February and June, when ground vegetation is dead and dry following winter. For this reason, the danger can be extremely high even when it has rained recently.

Forest Fire Danger Notices (FFDN) are issued by the Department of Agriculture, Food and Marine (DAFM) from February through to September. These notices provide advance warning of high-risk weather conditions and permit appropriate readiness measures to be taken in advance of fire outbreaks.

FFDN are generally based on the daily Met Eireann Fire Weather Index (FWI) and the European Forest Fire Information System (EFFIS) outputs with additional processing and daily analysis by DAFM.

DAFM issues advice and public information on the Forest Fire Danger Notices[169] and has issued a protocol for prescribed burning.[170]

International Medical Emergency

Brief Description of National Guidelines & Policies

Many organisations, including the World Health Organisation, the European Centre for Disease Prevention and Control, and the Health Protection Surveillance Centre in Ireland are monitoring the progress of the H5N1 virus, so that they can act as soon as there is any sign of the virus mutating and passing from human to human.

The Department of Health and Children (DHC) and the Health Service Executive (HSE) have developed a plan[171] based on recommendations by the World Health Organisation for national pandemic plans. The plan reflects the advice of the Irish Pandemic Influenza Expert Group and have been developed from the work of expert groups on vaccines and antiviral medicines, surveillance, communications, case management, laboratory operation, personnel, and supplies.

169 https://www.teagasc.ie/crops/forestry/advice/management/dealing-with-wildfires/
170 https://www.teagasc.ie/media/website/crops/forestry/advice/CofPPrescribedBurningFinal90212.pdf
171 https://www.hse.ie/eng/services/publications/emergency-management/national-plan-for-pandemic-influenza-january-2007-.pdf

It concentrates on the health response but also provides some advice on the planning which must take place across all sectors of society.

The National Pandemic Influenza Plan is based on eight core elements:

i) communications strategy;
ii) telephone hotline;
iii) outlining the responsibilities of the public;
iv) surveillance;
v) antiviral drugs;
vi) pandemic vaccine;
vii) reorganisation of health services and redeployment of health service staff; and
viii) essential supplies.

The plan assumes that 96% of those who fall ill can be cared for in their own homes. Much of the planning effort revolves around making this possible. It includes:

i) a communications plan to keep healthcare professionals and the public informed and always advised;
ii) provision of antiviral medicines to those who fall ill to reduce the duration and severity of their symptoms; and
iii) a dedicated telephone hotline to provide advice and support.

The overall aims of pandemic planning in Ireland are to reduce mortality (deaths) and morbidity (sickness) and to minimise the resulting disruption to society.

DHC has also issued an Ethical Framework for Decision Making During a Pandemic[172].

Chemical Accident

Brief Description of National Guidelines & Policies

Ireland has a total of 91 COMAH – Control of Major Accident Hazard - sites (2016 figure). Such sites are subject to significant regulatory control and oversight. Less data is available in relation to sub-COMAH sites, which can house significant quantities (up to 50 tonnes of toxic material and up to 5,000 tonnes of flammable liquid).

The reasonable worst-case scenario assessed was an incident triggered by hazardous materials at a sub-COMAH site in Dublin Port. The port location is especially significant as several COMAH sites are co-located. Such proximity has the potential to trigger a domino effect. Historical data, based on 25 years, indicates that no such incidents have occurred.[173]

Legislation governing the carriage of dangerous goods by road nationally and internationally is based on the ADR, which has been adopted by 50 countries worldwide. This agreement was originally signed in Geneva in 1957 and is currently amended every two years.

In Ireland, the ADR is given effect by national regulations which are frequently amended to keep it in line with each new edition of the ADR. This guide has been prepared with reference to current national legislation and the current edition of the ADR. Although care has been taken to make such references

[172] https://www.gov.ie/en/publication/dbf3fb-ethical-framework-for-decision-making-in-a-pandemic/

[173] https://www.gov.ie/en/publication/709bf3-a-national-risk-assessment-for-ireland-2017/

as non-specific as possible, it is advised that you take account of the biennial updating of the ADR, and consequential updates to national legislation.

National legislation provides for general participant duties, the practical safe transport of dangerous goods, competent authorities, powers of enforcement, offences and penalties.

Major industrial accidents involving dangerous substances pose a significant threat to humans and the environment; such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. In Europe, a catastrophic accident in the Italian town of Seveso in 1976 prompted the adoption of legislation on the prevention and control of such accidents.[174]

The so-called Seveso-Directive (Directive 82/501/EEC) was subsequently amended in view of the lessons learned from later accidents such as Bhopal, Toulouse or Enschede resulting in the Seveso-II (Directive 96/82/EC).

In 2012 the Seveso-III (Directive 2012/18/EU) was adopted taking into account, amongst other factors, the changes in EU legislation on the classification of chemicals and increased rights for citizens to access information and justice.

The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), implement the Seveso III Directive (2012/18/EU). The purpose of the COMAH Regulations is to lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

The intention is to achieve this through tiered controls on the operators of the establishments subject to the regulations - the larger the quantities of dangerous substances present at an establishment, the more onerous the duties on the operator.

The European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2006 and the European Union (Control of Major Accident Hazards Involving Dangerous Substances) (Amendment) Regulations 2013, which implemented the Seveso II Directive (96/82/EC), have been revoked by the European Union (Control of Major Accident Hazards Involving Dangerous Substances)(Revocation) Regulations 2015 (S.I. No. 208 of 2015) and replaced by the COMAH Regulations.

Radiological Accident

Brief Description of National Guidelines & Policies

The Environmental Protection Agency (EPA) plays a central role in assessing exposure to ionising radiation and monitoring developments relating to nuclear installations and radiological safety. An accident or terrorist attack at a nuclear installation abroad has the potential to cause widespread low-level radioactive contamination of the environment in Ireland.

The EPA report indicates the likelihood of a nuclear incident in Sellafield triggering an emergency in Ireland is low, since: "For almost 90% of the time, the prevalent meteorological conditions in Ireland would result in any radioactive plume from Sellafield travelling in an easterly direction (away from Ireland)".

[174] https://www.hsa.ie/eng/Your_Industry/Chemicals/Legislation_Enforcement/COMAH/

The economic impact of an incident close to Ireland in north-western Europe was assessed by the Economic and Social Research Institute (ESRI) in 2016. The minimum potential impact was assessed at €4 billion.

A National Plan for Nuclear and Radiological Emergency Exposures[175] and specific supporting sub-plans for the key Departments and Agencies involved in the response to a nuclear emergency are in place. The reasonable worst-case scenario remains as it was in 2017, a severe nuclear incident in the UK or north-western Europe. Given the nature of this risk, there is significant cross-border cooperation with European States on monitoring and sharing radiological data.[176]

Ireland's established policy is that, while not a nuclear energy producing country, it recognises the right of other States to determine their own energy mix.

The National Plan recognises that based on the hazard analyses conducted, there exists a potential, albeit small, for emergency exposure situations to occur as the result of accidents or incidents. This plan sets out steps for a national response to an emergency exposure situation, and the subsequent transition to a managed existing exposure situation.

The central goal of this plan is to substantially reduce public exposure to any radioactive contamination, which reaches Ireland as a result of a major nuclear or radiological incident abroad. It does this by setting out steps for the rapid implementation of protective measures in the hours and days immediately following the incident. These steps will substantially reduce public exposure to any radioactive contamination, which reaches Ireland. This will in turn minimise the potential long-term health risks to the population.

This plan does not contain detailed guidelines for dealing with a nuclear or radiological exposure of a local nature. In such cases, prime responsibility for response rests with either the relevant local authority or with the licensed undertaking which is responsible for the source causing contamination.

Critical Infrastructure Failure

Brief Description of National Guidelines & Policies

The collapse of a critical structure such as a bridge, hospital, dam, or tunnel has the potential to result in mass casualties and cause extended disruption to relevant services. Significant structural damage to the Dublin Port Tunnel, making the tunnel unavailable for an extended period, was the reasonable worst-case scenario agreed by the Expert Focus Group.[177]

The closure of Dublin Port Tunnel would affect severely on the resilience of transport and distribution networks, resulting in major economic impacts for the duration of the closure. The transportation of aviation fuel from the Port to Dublin Airport would suffer significant impact. As a sizeable number of the trucks using the Port and the Tunnel move freight to and from Northern Ireland, its closure would also have knock-on effects on exports to European markets and on critical imports to the region.

Internationally it is generally accepted that the risk to society, due to inadvertent or deliberate disruption or destruction to Critical Infrastructure, is gradually increasing. There are many reasons for this, including urbanisation, increased use of ICT, increased dependencies, increased demand and awareness of the instability caused by the interruption of services.

[175] https://www.epa.ie/publications/monitoring--assessment/radiation/National-Plan-for-Nuclear-and-Radiological-Emergency-Exposures-(2019).pdf

[176] https://www.gov.ie/en/press-release/5e685-national-risk-assessment-for-ireland-2020/

[177] https://www.gov.ie/en/press-release/5e685-national-risk-assessment-for-ireland-2020/

In 2005, responding to these trends and their related risks to society, the EU adopted a green paper on a European programme for Critical Infrastructure Protection. In 2008, the European Council (EC) issued Directive 2008/114/EC[178] requiring Member States to identify and designate European Critical Infrastructure (ECI) and assess the need for its protection.

Today modern States depend on multiple types of infrastructure, some of which are Critical Infrastructure (CI). CI is defined as an asset, system or part thereof which is essential for the maintenance of vital societal functions, health, safety, security, economic or social wellbeing of the people and the disruption or destruction of which would have a significant impact in the State as a result of failure to maintain those functions.

CI provides services and utilities in order to facilitate efficient functioning of the economy, the safety and wellbeing of its citizens and the continual functioning of government. Citizens of Ireland expect that CI of the State will function efficiently and when disrupted that those services will be restored as quickly as possible.

The importance to a State of resilient CI is well understood. However, more recently there is an increasing complexity, dependency, and interdependency within and between CI. This potentially poses risks to society that need to be identified and evaluated. A Guideline Document[179] issued by the Government offers guidance to Government Departments and Agencies, and public and private operators of essential services, on how to identify what is CI, how to evaluate/quantify the criticality of the disruption or destruction of that CI and provides a framework of measures to improve resilience of CI.

This Guideline adopts a risk-based approach that is societal centric and is focused on the impact of the loss of services to Irish society rather than on the losses incurred to the owner or operator of that service.

PART ONE outlines the background and purpose of this Guideline Document, including important terminology and definitions used throughout. It introduces the understanding of National Infrastructure and Lead Government Department (LGD) principles in relation to their responsibility to Sectors and Sub-Sectors. In addition, it also provides an explanation of the Irish, EU and international context about Critical Infrastructure Resilience (CIR).

PART TWO outlines a methodology for identifying CI and the process for evaluating and quantifying disruption impacts, considering measures already in place to mitigate against risk. This methodology introduces the Criticality Metrics, the use of Impact Factors within the categories of Scope, Severity and Time Related, and finally the Criticality Score. This allows for the evaluation (based on the Criticality Score) of the impact of the disruption or destruction of a service provided by CI on Ireland's society. This Criticality Score facilitates Government Departments/Agencies to determine which national infrastructure is CI. Evaluations on the upper scale allows for the identification of Critical National Infrastructure (CNI).

A risk-based approach is accepted internationally as an essential step to evaluating the criticality of National Infrastructure. This approach is taken to evaluate the impact on society caused by a disruption or destruction to essential services.

[178] Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection.

[179] Strategic Emergency Management Guideline 3 – Version 2 - Critical Infrastructure Resilience, https://www.gov.ie/en/collection/5ef65-publications/

The effects of a disruption to identified National Infrastructure are evaluated to categorise the impact on society, the safety and wellbeing of its citizens, the economy, and the continual functioning of Government. The methodology to evaluate infrastructure criticality is based on the loss of a service to society. Senior Management of relevant stakeholders should evaluate infrastructure criticality by following the six-step process outlined below.

Figure 23 Ireland: 6 steps to evaluate critical infrastructure

PART THREE proposes a framework of measures to improve resilience of CI. This framework compliments the five-stage systems approach to emergency management outlined in the Strategic Emergency Management (SEM): National Structures and Framework1 document. It advises on resilience measures in eight (8) key areas to enable Government Departments, Agencies and owners and/or Operators of Essential Services (OES) to continuously improve the resilience of their specific CI.

Figure 24 Measure to improve resilience of critical infrastructure

Extreme Weather - Heatwave

Brief Description of National Guidelines & Policies

Recent experiences suggest that Ireland's climate maybe changing; these changing climatic conditions bring different types of severe weather, which may increase the impact of weather events for:

i) flooding;
ii) frost/ice;
iii) heavy snow/blizzard;
iv) severe windstorms;
v) thunderstorms; and
vi) prolonged heat wave (drought conditions).

The National Risk Assessment (NRA) assigns a high risk to many of the severe weather events listed above. In the preparation of joint risk assessments, the PRAs acknowledged this risk and have put in place severe weather plans and associated preparedness programmes to address them.

The Framework for Major Emergency Management (2006) sets out the arrangements by which the principal response agencies will work together in the management of large-scale incidents.

The *Guide to Severe Weather Emergencies*[180] is intended to support the Framework text and to provide additional guidance on the response of Principal Response Agencies to Severe Weather Events.

Local authorities are designated Lead Agency in the preparation and the response to severe weather emergencies under the Government approved Framework (2006) and they lead and co-ordinate both the response and the recovery operation in accordance with well-established protocols and guidance, under the overall umbrella of their Major Emergency Plans. Each Local Authority as Lead Agency should have, as a specific sub plan of its Major Emergency Plan, a plan for responding to severe weather emergencies, whether a major emergency is declared or not.

The supporting PRA's (The Health Service Executive & An Garda, Síochána) are also required to have sub-plans in place that detail how their supporting functions will be carried out during the response phase2. The objective of this guide is to support all PRA's in developing severe weather plans, building on the experience from severe weather events.

Since the implementation of the Framework (2006), the Principal Response Agencies (PRAs) have had to deal with a series of flooding, severe ice/snow, heatwaves and severe storm emergencies, in each case requiring local Coordination of the response and in some instances supported by national co-ordination (a Whole-of-Government response) where deemed necessary. During flooding and severe weather emergencies the Principal Response Agencies have responded using the co-ordination structures and procedures set out in the Framework (2006). These responses were typically lengthy and challenging, requiring very significant resources during the response and recovery phases.

Consequences of Severe Weather

There are different consequences for each type of severe weather event but among the most common are:

i) life risk;
ii) public health issues, environmental health, critical health continuity;
iii) rescue from homes, vehicles, etc;
iv) roads closures;
v) isolation and other problems for the elderly and vulnerable;
vi) disruption of water supplies;
vii) disruption of power supplies;
viii) closure of schools;
ix) disruption to public transport, businesses, etc;
x) disruption of supplies of food, medicines, fuel, etc;
xi) problems with feeding and shelter for animals;
xii) damage to infrastructure, such as roads, railways, power lines, etc; and
xiii) damage to the environment, including forest and wild land fires.

What is a Severe Weather Plan?

A severe weather plan outlines the roles and responsibilities of the PRAs in the preparation, for response to, and recovery from severe weather emergencies, which includes the following.

i) Planning & Preparedness, including the Local Authority having a Severe Weather Assessment Team (SWAT) monitoring information from Met Éireann;

[180] Guide to Severe weather emergencies, Department of Housing, Local Government and heritage (2020)

ii) Procedures and processes in place (and individuals who have been trained) to establish and run, as required:
    a. PRA Crisis Management Teams;
    b. on-site Co-ordination Groups;
    c. local Co-ordination Groups;
    d. regional Co-ordination Groups;
    e. the National Emergency Co-ordination Group.
iii) Procedures for the mobilisation of resources during severe weather events; and
iv) Public Information, monitoring social media and other sources and utilising the full resources of the PRAs to disseminate information in a timely fashion to the targeted population.

Local Authority Severe Weather Assessment Team (SWAT)
Each Local Authority should ensure that it has a Severe Weather Assessment Team (SWAT) in place which can be activated if and when required, comprising of relevant technical individuals and senior management from within the LA system.

The composition of the team may change by providing the technical knowledge required to understand the event and its possible implications, in order to make key decisions. The Local Authority Severe Weather Assessment Team (SWAT) and Crisis Management Team (CMT) will often have members which are common and interchangeable or two distinct separate teams, depending on the severity of the weather event.

Effective arrangements need to be in place and formalised to receive and respond promptly to such weather warnings. Key to this is updating personal contact information of the SWAT and relaying this to the National Directorate for Fire and Emergency Management (NDFEM)/ Met Éireann andthe organisations detailed above.

The LA SWAT should appraise the information it receives and depending on the nature of the weather impact assessment, a warning, pre-alert as seen for Storm Ophelia and/or activation instruction should be issued to all appropriate sections of the Local Authority, as well as to the other PRA's. A Major Emergency should be considered and declared where appropriate.

Every warning or alert received should be considered by a Local Authority in the context of other relevant information available to it (such as, hydrological information from the OPW and local knowledge of river systems, roads, infrastructure, vulnerable communities, etc.). Based on this information, a 'Best Guess' weather impact assessment should be prepared in each case. The Local Authority should consider all this information using the generic crisis management system and consider activating Local Coordination arrangements at an early stage in anticipation of the unfolding severe weather emergency. It should always share their assessment of the predicted severe weather episode with the other PRAs.

In the event of a major emergency being declared for a severe weather event, The Local Authority will operate to procedures contained within the Major Emergency Plan (see Major Emergency Plan for further details).

Whenever a Severe Weather Event occurs, or is threatened, the PRA's should respond in a manner, which is appropriate to the severity of the event (or threatened event). For the purpose of this guidance document, these events are divided into three classes as follows: Exceptional Severe Weather Events, Severe Weather Alerts and Routine Weather Events[11].

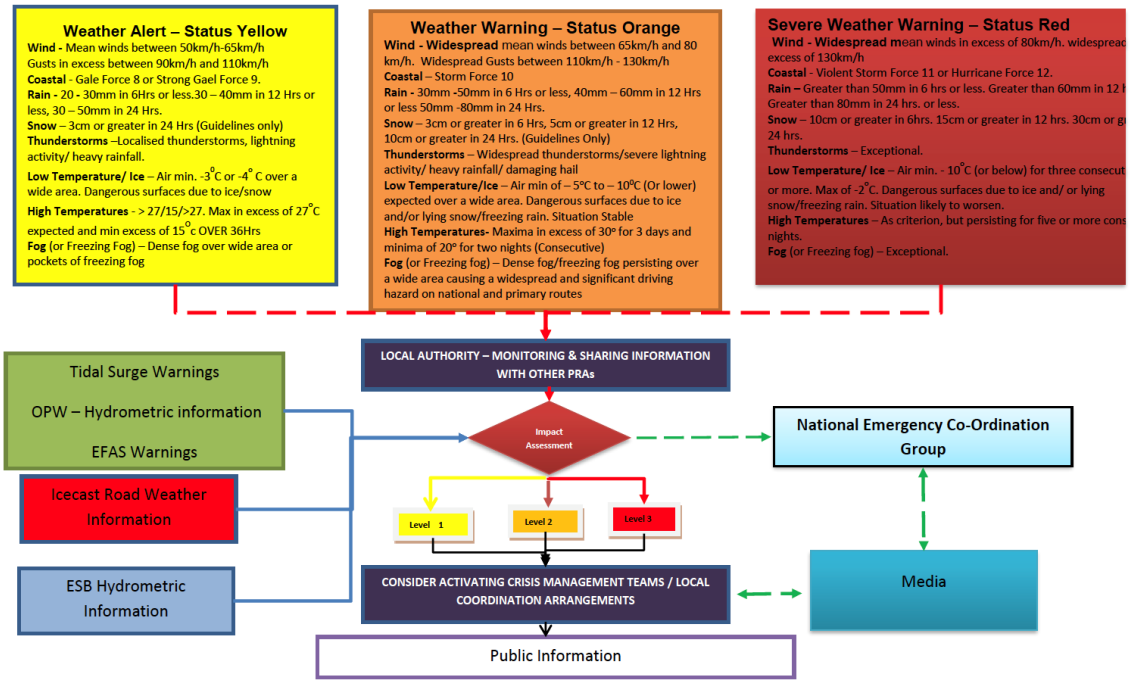


Figure 25 Local authority Severe Weather assessment team Ireland

Local Coordination

The Local Authority acting as the Lead Agency should consider convening Local Coordination at the earliest time possible prior to (On information received as a precautionary measure) or during a severe weather event. There may be situations where the Local Coordination group are notified of an impending severe weather event possibly affecting their functional area and in this situation, it may be imperative for the group to convene in pre-crisis mode, with the Local Coordination Group monitoring the situation as it develops enabling a prompt response to a very dynamic situation.

Regional Level Co-ordination

Where a Severe weather event impacts over a wide area, where a number of Local Authorities, Garda Divisions or HSE Regions are involved, consideration should be given to establishing a Regional Co-ordination Group and structuring the inter-service response on a regional basis12. The initial step in deciding on Regional Coordination is through tele/ or videoconferencing between the PRAs, identifying the need and requirements for regional coordination to be activated.

The configuration and operations of the regional coordination will be agreed among the chairs of the lead agencies involved.

National Emergency Coordination Group

During a Severe Weather Event, where it is considered appropriate, the National Co-ordination Group may be convened at the National Emergency Co-ordination Centre, Kildare Street, Dublin13. This Group may be activated whether a Major Emergency has been declared or not. Once the National Co-ordination Group has been convened, it is important that each Local and Regional Co-ordination Centre, which has been activated establish communications with the NECC via the relevant Lead Agency (i.e., the Local Authority).

Once communication has been established, the format and frequency of reports between the local/regional and the national levels, which will vary depending on the nature, severity and extent of the Severe Weather Event, can be established.

The director of HPLG will chair the group as lead Government Department, and all other Government Departments will be represented as detailed in the Strategic Emergency Management Guide (2017).

The group will conduct a national overview of the situation liaising with Local Authorities and the other PRA's within the affected Regions. A media briefing may be called to disseminate information to the public.

5.3.7 Denmark

Brief Description of National Polices

In general, Denmark is a safe society, with a well-functioning infrastructure and a high degree of security in energy supply. Although relatively few major accidents and disasters occur, extraordinary incidents do take place. Man-made or natural incidents, unpredicted or predicted - one common feature for all such incidents is that they require an extraordinary response.

Some incidents are so severe, extensive, prolonged or complex, that they require crisis management involving several authorities, both at national and local level. In such cases, the response is coordinated within the framework of the national crisis management system.

The Danish Emergency Management Agency (DEMA) is a governmental agency under the Ministry of Defence. We work to prepare society for, prevent and respond to crises, accidents and disasters.

The joint mission of the organisation of the Ministry of Defence:

> *Together we work for the Danish security and interests and the security of citizens.*

The joint vision of the organisation of the Ministry of Defence.

i) We operate and develop tasks so that we get the most out of the resources we have available;
ii) The Ministry of Defence wants to be a professional and widely recognised collaboration partner; and
iii) Joint capacity and drive will be created through loyal and confident cooperation.

DEMA is headed by a Director General and has a presence in all regions of Denmark.

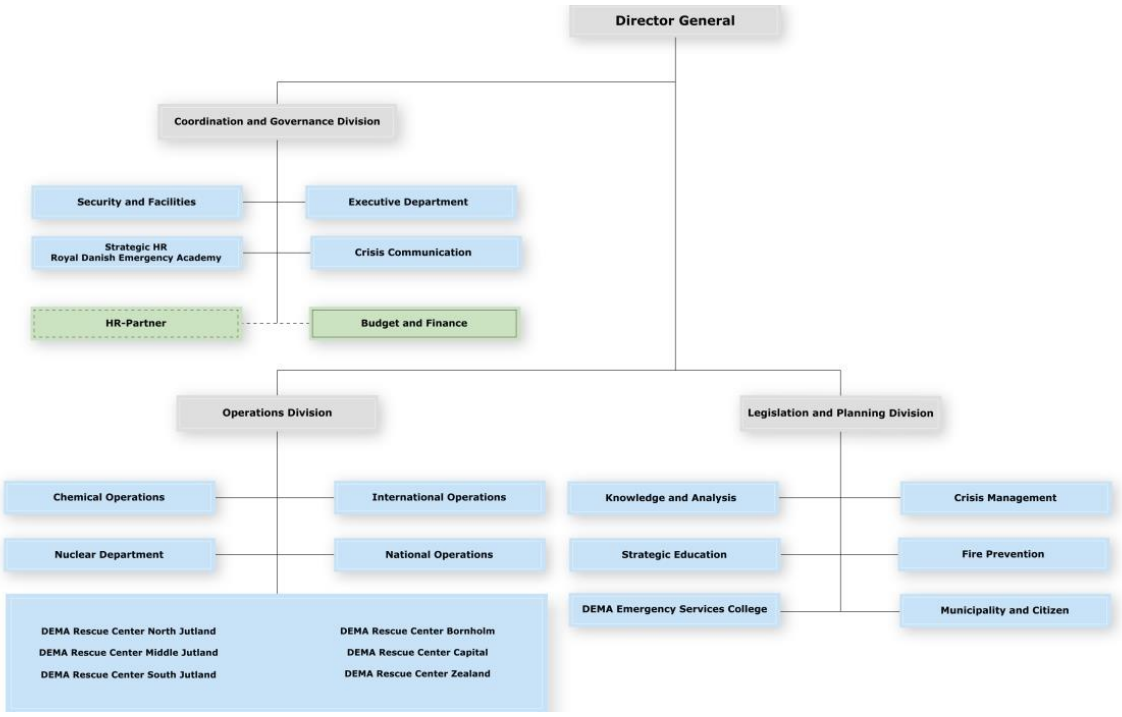


Figure 26 DEMA organisational chart

Multi-level emergency management

It is designed as a multi-level system.

The municipal fire and rescue service (Level 1) is in charge of a day-to-day emergency management. The municipal and national support sites (Level 2) assist by supplying equipment for the most frequent tasks while the national fire and rescue centres (Level 3) assist in larger, long-term or particularly personnel intensive accidents.

Level 1: The municipal fire and rescue service

The municipality may choose to have a municipal fire and rescue service or enter into a contract with a private company (most often Falck) or a voluntary fire brigade. The first turnout of the firefighting service must depart as soon as possible and within five minutes of the alarm. The number of fire-fighting vehicles and fire fighters is established by the local council on the basis of a local risk assessment. The response of the fire and rescue service at the site of damage is managed by the municipal onsite commander while the overall response is coordinated by the police.

Level 2: The municipal and national support sites

If the municipal fire and rescue service does not have enough capacity to handle an accident using its own resources, it may call upon the assistance of nine municipal and national support sites situated in Aalborg, Århus, Esbjerg, Fredericia, Odense, Kalundborg, Fredensborg, Greve and Nykøbing Falster or the five national fire and rescue centres. The support site assistance can reach a site of damage throughout the country within an hour. The municipal support sites are staffed by full-time or part-time employees of the municipality or local volunteers, and the Danish Emergency Management Agency (DEMA) places equipment at their disposal. This may be water tankers, lighting

equipment or high-pressure compressors. The municipal and national support sites thus only offer equipment.

Level 3: The national fire and rescue service

In the case of comprehensive accidents requiring special equipment or large amounts of equipment and personnel, the municipalities may call on the assistance of DEMA's five fire and rescue centres in Thisted, Herning, Haderslev, Næstved and Allinge all on 24-hour turn-out duty. DEMA's centres may dispatch personnel and equipment within five minutes and reach destinations all over the country within approx. two hours. DEMA can rapidly muster up to 1,200 conscripts, non-commissioned officers and volunteers. DEMA also has two voluntary response forces deployed in Hedehusene and Herning at its disposal, which may support the fire and rescue service with approximately 400 volunteers.

The National Crisis Management System

The national crisis management system consists of a number of cross-sectoral crisis staffs, ranging from the Local Incident Command in the response area to the Government Security Committee. In Denmark, the crisis management system is constructed as a general and flexible capacity, and therefore the system is applicable to any kind of accident or disaster, as well as scheduled large-scale events, such as political summits.

The authorities can activate the national crisis management system, or parts of it, if it is assessed that a given incident cannot be managed effectively, or sufficiently fast, by ordinary measures, or when cross-sectoral coordination and mutual orientation is necessary.

The national crisis management system also supports effective and swift application of society's collective resources during a crisis. The overarching objective is to limit the consequences of major accidents and disasters as much as possible, so that society can quickly return to normal.

Primary tasks for the Danish crisis management system

i) To establish and maintain an overview of the current situation ("the common situation picture"), enabling involved authorities at all levels to make decisions quickly and effectively;
ii) To ensure active cooperation and efficient coordination of actions and resources across different authorities and administrative levels; and
iii) Inform the public about the situation and provide instructions for citizens to take appropriate self-protecting measures.

National Emergency Plan, 6th Edition.

The distribution of responsibilities between authorities remains the same when the national crisis management system is activated. Each individual authority involved has and maintains full responsibility for managing the response within its own sector. Likewise, each individual authority is responsible for informing its own political level, as well as for communicating to the public. This feature - that each authority participates with its own competence - applies to procedures in any cross-sectoral staff and is referred to as the 'principle of sector-responsibility'.

The Danish crisis management system is based on five central principles that guide the overall distribution of roles and responsibilities, the organisation, and the specific actions taken as part of the crisisresponse.

General principles for preparedness planning and crisis management

i) Sector-responsibility: the department or agency which has the daily responsibility for a given sector retains responsibility for that sector during crisis;
ii) Similarity: the procedures and division of responsibilities applied on a day-to-day basis should, to the largest extent possible, also be applied in crisis management. The largest similarity possible between the daily setup and the crisis management setup must be maintained in order to minimise the extent of organisational re-arrangements when activating the crisis management organisation;
iii) Subsidiarity: emergency management and crisis management should be handled at the lowest organisational level possible;
iv) Cooperation: authorities are responsible for cooperating and coordinating with each other in terms of both preparedness planning and crisis management; and
v) Precaution: in a situation with unclear or incomplete information, it is always preferable to establish a higher, rather than a lower, level of preparedness. Subsequently, adjustments to the preparedness level can quickly be made, in order to minimize strain on resources.

The National Crisis Management Plan

The national crisis management system is described in the National Crisis Management Plan. The purpose of the plan is to determine the framework and the procedures, etc. that apply to authorities when many different actors collaborate in the management of a major accident or a disaster.

Thus, the National Crisis Management Plan contains an overview of the national crisis management system, including its organisation, the allocation of responsibilities and competences, a description of the general expectations to each authority's contribution to the crisis management process (c.f. the Emergency Management Act §24) and additionally establishes the overall procedures in relation to major accidents and disasters.

The Minister of Defence is responsible for producing and revising the National Crisis Management Plan according to the Emergency Management Act §26.

The plan applies universally and to any type of incident but is primarily intended for use in the event of extraordinary incidents that require a coordinated response from the affected central authorities The plan applies to all authorities and, insofar as relevant and possible, also to the authorities in Greenland and on the Faroe Islands (both part of the Kingdom of Denmark).

The Crisis Management Group

The Crisis Management Group is a forum for planning, which supports the continuous adjustments of the national crisis management system. The group helps determine the overarching framework for the system, supports the Minister of Defence' coordination of preparedness planning, and contributes to the strategic anchoring of the governmental authorities' preparedness planning and crisis management. The Crisis Management Group consists of representatives from the Ministry of Defence (chair), the Prime Minister's Office, the Ministry of Foreign Affairs, Ministry of Justice, Ministry of Health, Defence Command Denmark, the Danish Defence Intelligence Service, the Danish Emergency Management Agency, the National Police, the Danish Security and Intelligence Service, and the Danish Health and Medicines Authority.

The Crisis Management Group is not activated during acute crises, but at least once every second year the group is tasked with planning and conducting a national crisis management exercise, in which the National Crisis Management Plan is tested. The exercise is managed jointly by the Danish

Emergency Management Agency and the National Police. The Crisis Management Group is responsible for the revision of the National Cri- sis Management Plan, following its activation during exercises or crises alike.

The Authorities' Contribution to the Collective Crisis Management

Any governmental authority can be required to play a role in the crisis management system, but it is the specific circumstances of a given incident, that determine which authorities must participate in which crisis staffs. The crisis management system in Den- mark is based on the precondition that all central government, regional, and local authorities are responsible for familiarising themselves with, and preparing themselves for, respective roles and responsibilities. According to chapter 5 in the Danish Emergency Management Act, all authorities are required, within their sectors, to plan for the continuity and maintenance of vital societal functions in case of major accidents and disasters.

This includes the development of preparedness plans.

All authorities must thus prepare to:

i) Conduct crisis management within their own sector;
ii) Assist other authorities during major accidents and disasters that involve several sectors; and
iii) Participate in cross-sectoral crisis management fora.

The authorities' responsibility

In relation to participation in cross-sectoral crisis management fora, e.g., the government 's crisis management organisation, the National Operational Staff, or the Local Operational Staffs, the authorities must, at short notice, be prepared to the following.

i) Represent and maintain close contact with their own sectors/authorities, including press officers;
ii) Create an overview and inform about the situation in their own sectors/ authorities. This includes acknowledgement of known and unexpected problems (including lack of resources), and assessment of the situation's potential development in the short and long term;
iii) Inform about planned, commenced, and completed concrete sec- tor-specific preparedness measures, including the implementation of any general preparedness measures. Inform about planned, commenced, and completed sector-specific communication to the public and to the media about visible sector specific preparedness measures, derived effect, and the response within own sector;
iv) Assess and re-assess the implemented measures and their effect across sectors; and
v) Assess and re-assess the need for information to the public based on the current situation.

The Crisis Management's OrganisationalFramework

Within the national crisis management system, the cross-sectoral coordination can take place on four levels:

i) the government's crisis management organisation;
ii) theNationalOperational Staff;
iii) the 12 local operational staffs; and
iv) the local incident command in the response area.

The government's crisis management organisation

The government's crisis management organisation consists of two committees: The Government Security Committee and the Senior Officials' Security Committee.

The Government Security Committee will, in the event of a major disaster or accident, be kept informed and, if necessary, discuss relevant matters of political and strategic nature.

i) The Government Security Committee consists of the Prime Minister (chair), the Minister of Economic and Business Affairs, the Minister of Foreign Affairs, the Minister of Defence, and the Minister of Justice; and
ii) The Senior Officials' Security Committee will, in the event of a major disaster or accident, be kept informed by the National Operational Staff (NOST) and by the involved ministries. Furthermore, the committee advises the Government Security Committee in matters of political and strategic nature.

The Senior Officials' Security Committee consists of the permanent secretaries of the above-mentioned ministries, as well as the Head of the Defence Intelligence Service, and the Head of the Security Intelligence Service.

In both committees, the Prime Minister's Office may invite ad hoc members from other ministries, if relevant to the crisis management. Further to that, any ministry may actively request to join the committees if they assess that a given situation warrants it.

The National Operational Staff

The National Operational Staff (NOST) has a coordinating role and must, among other tasks, ensure that the government's crisis management organisation and the relevant sectors continuously possess relevant, coordinated, and precise information concerning the specific response.

NOST stays updated on the operational response, including in the local operational staffs and relevant sectors, and creates a comprehensive overview of the specific response.

Furthermore, NOST regularly supplies the participating authorities and the government's crisis management organisation, as well as other central sectors, with information (e.g. situation reports) necessary for quick and effective decision-making.

The permanent members of NOST are the National Police, the Danish Emergency Management Agency, Defence Command Denmark, the Defence Intelligence Service, the Security Intelligence Service, the Danish Health and Medicines Authority, and the Ministry of Foreign Affairs. Additionally, NOST may call in ad hoc members from relevant authorities and other organisations.

The Central Operational Communication Staff

The Central Operational Communication Staff (DCOK) is a staff under the National Operational Staff. DCOK is responsible for ensuring the quick distribution of relevant, accurate, correct, and coordinated information to the public and to the media concerning the situation and possible precautionary measures. The participants in the DCOK must mirror the composition of NOST, both as regards permanent and ad hoc members.

DCOK coordinates and assists the distribution of messages and information to the public and the media, for instance through cooperation with press officers at local and regional levels. DCOK also conducts media monitoring, in order to identify potential issues that may affect the development of the crisis.

Finally, DCOK prepares recommendations to the government's crisis management organisation on communication to the public and the media. A distinction is made between the political-strategic crisis communication, coordinated within the framework of the government's crisis management organisation, and the operational crisis communication, conducted by the sector-responsible authorities and coordinated within the context of NOST and DCOK.

The International Operational Staff

The International Operational Staff (IOS) carries out the overall coordinating function during major incidents abroad in order to secure a quick and effective Danish response to assist Danish citizens.

The permanent members of IOS are the Ministry of Foreign Affairs (chair), the Prime Minister's Office, the Ministry of Justice, the National Police, Defence Command Denmark, The Danish Emergency Management Agency, The Ministry of Health, and the Danish Health and Medicines Authority. If relevant, ad hoc members from other authorities or private actors can be included. Likewise, IOS can gather under certain circumstances with a smaller selection of permanentmembers.

The Local Operational Staff

In each of Denmark's 12 police districts, a Local Operational Staff can be established to manage the cross-sectoral coordination and cooperation within that geographical juris- diction when an extraordinary incidentoccurs.

When extraordinary incidents involve several police districts, the Head of the National Police, in consultation with Defence Command Denmark and the Danish Emergency Management Agency, may appoint one police district responsible for the response and coordination of the joint effort.

The permanent members of the Local Operational Staff are the police (chair), the local defence region, the Danish Emergency Management Agency's regional fire and rescue centre, the municipality, and the region's health preparedness organisation. The police can invite additional ad hoc members from other relevant authorities and private actors, when appropriate.

The Local Incident Command in the response area

The comprehensive response to large incidents is coordinated by the Chief of Police. This coordinating leadership entails ensuring that all parts of the response inside and outside the response area are coordinated as effective as possible.

The on-site coordination of tasks in a response area takes place in the incident command in collaboration between the police's incident commander, the fire and rescue services' incident commander, and the leader of the health response (the coordinating physician). Other relevant leaders can be included ad hoc. In practice, the police's incident commander has the general coordinating leadership throughout the response area, the fire and rescue services' incident commander is responsible for the technical response at one or more scenes of accident with the response area, and the leader of the health response manages the pre-hospitalresponse.

Nuclear Incident[181]

Brief Description of National Guidelines & Policies

The Danish Emergency Management Agency, Nukleart Beredskab, is, as an expert emergency service, responsible for carrying out a number of tasks within the operational nuclear emergency preparedness in Denmark and in Greenland.

The work of the authorities in the event of an accident

There are no nuclear power plants in Denmark or in Greenland, but Denmark and Greenland are surrounded by countries with large nuclear facilities, and an incident at one of these can directly and extensively affect Denmark and Greenland. Such an incident at a nuclear facility can lead to the spread of radioactive material over very large distances and areas. Decay of radioactive material can pose health risks to the population and animals and can affect the environment and food production. Although an incident does not directly lead to precipitation over Danish or Greenlandic territory, there may be uncertainty in the public and there is a great need for information and advice to citizens in Denmark and Greenland as well as abroad.

If a spill occurs with radioactive substances, for example from a nuclear power plant abroad, a large number of authorities work together to protect the population and limit the consequences of the spill at home. The same applies if a release of radioactive substances abroad can have consequences for Danes in the accident-prone country.

The Danish Emergency Management Agency is the international contact point for the Danish nuclear emergency preparedness and leads the operational emergency preparedness. The Danish Emergency Management Agency is staffed around the clock.

If the Danish Emergency Management Agency receives a report of an accident at a nuclear facility abroad, the nuclear emergency service is alerted, which decides whether and to what extent the nuclear emergency response must be activated.

Pursuant to the sectoral responsibility principle, a number of authorities have tasks in connection with a nuclear incident or accident: The tasks that an authority is responsible for solving on a daily basis must also be solved during a crisis. In the event of a release of radioactive substances, the authorities will therefore carry out the tasks that are a natural extension of their area of authority on a daily basis.

The list below illustrates the tasks and division of labour between some authorities in the event of a release of radioactive substances. In the specific case, fewer or more authorities may be involved in tasks other than those listed below. This is not an exhaustive overview. For example, specific emergency preparedness tasks may also arise regarding agriculture, water supply and the environment.

[181] https://brs.dk/da/arbejdsopgaver/indsats-ved-ulykker-og-katastrofer/nukleare-handelser/

Table 14 Task during a radiological incident in Denmark

Authority	Sector	Examples of work assignments
The Danish Emergency Management Agency	Nuclear facilities	Communication about the situation at a wrecked nuclear power plant to the population and the press Measurement of radiation levels in Denmark and Greenland Forecasts for the spread of radioactive substances
National Board of Health, Radiation Protection	Radiation and radiation hazard	Communication about radiation hazards to the population and the press Advising authorities, businesses and the public on radiation protection measures
The Danish Veterinary and Food Administration	Food safety	Communication on food security to the population and the press Introduction of import restrictions on food contaminated with radioactive particles
The police	Security, safety, peace and order	Coordinating management for nuclear preparedness
Ministry of Foreign Affairs	Security and safety for Danes abroad	Communication about and implementation of evacuations of Danes abroad

In the event of an accident, information from the authorities about the situation and behavioural information will be sent out via emergency reports to the press.

The Danish authorities also advise the authorities in Greenland and the Faroe Islands.

The Nordic authorities publish a Nordic emergency manual on co-operation between the authorities in the event of nuclear accidents and other radiological incidents. The manual is called The Nordic

Manual[182] or simply NORMAN and describes practical agreements on communication and information exchange in the event of nuclear accidents or other radiological events.

Spread forecasts

If there is a release of radioactive substances into the air, the amount and properties of the radioactive substances as well as wind conditions and precipitation are decisive for where the substances move to and for the effect of the release on humans and the environment. Nuclear Contingency has a number of specialised IT-based systems available for detailed forecast calculations and decision support.

The Danish Emergency Management Agency uses the computer program ARGOS to calculate the spread of radioactive substances in the atmosphere. ARGOS can calculate forecasts for the spread of a radioactive contamination on both a local and global scale, analyse and visualise measurement data and calculate radiation doses after a given contamination. It allows the authorities to advice citizens and businesses on countermeasures following a possible spill.

[182] https://brs.dk/da/nyheder-og-publikationer/publikationer2/alle-publikationer/2020/norman/

6 Conclusions

This document gives an overview of the environment in which first responder work within Europe in General and more specific within the partner countries.

First responders have to face a variety of challenges.

Regarding possible large scale disasters 9 scenarios are dominant in Europe:

i) flooding,
ii) extreme weather,
iii) forest fires,
iv) earthquakes,
v) medical emergencies (pandemic),
vi) chemical incidents,
vii) radiological incidents,
viii) failure of critical infrastructure

Not in all of the study countries the chance on one of these scenarios is the same. Neither will be the scale and impact be the same.

However these scenarios are also the scenarios in which the possible need for international assistance within Europe is present, which implies that first responders also can be asked to work together in combatting one of these type of large scale incidents in another Union Civil Protection Mechanism participating state.

First responders work in each country in a different way based on the chosen structure in a country, but through the INSARAG, WHO and the EU alignment of procedures when working together is taking place.

7 References

7.1 Background information, websources

- Copernicus Factsheet: https://www.copernicus.eu/en/documentation/information-material/general-fact-sheets
- EFFIS: https://effis.jrc.ec.europa.eu/reports-and-publications/annual-fire-reports/
- European Centre for Disease Control (ECDC): https://www.ecdc.europa.eu/en/about-ecdc
- European Civil protection Mechanism : https://ec.europa.eu/echo/
- European Civil protection vademecum: https://ec.europa.eu/echo/what/civil-protection/vademecum-for-civil-protection_en ,
- EU climate change adaptation strategy: https://ec.europa.eu/clima/policies/adaptation/what_en
- EU water framework directive: https://ec.europa.eu/environment/water/water-framework/index_en.html
- European Food Safety Authority. Avian influenza: https://www.efsa.europa.eu/en/topics/topic/avian-influenza
- Eurocodes (European building codes) : https://eurocodes.jrc.ec.europa.eu/
- Euronuclear: Nuclear power in Europe http://www.euronuclear.org/info/encyclopedia/n/nuclear-power-plant-europe.htm
- Eurosurveillance (health) : https://www.eurosurveillance.org
- IFFAFRI: https://www.internationalresponderforum.org/
- INFORM, Hazard and vulnerability overview: https://drmkc.jrc.ec.europa.eu/inform-index
- Nuclear safety in the European Union: https://ec.europa.eu/energy/en/topics/nuclear-energy/nuclear-safety
- UNISDR: https://www.unisdr.org/
- UN-OCHA – UNDAC - the role of UNDAC: https://www.unocha.org/our-work/coordination/un-disaster-assessment-and-coordination-undac
- UN-OCHA - UNDAC: UNDAC Handbook: https://www.unocha.org/sites/unocha/files/dms/Documents/UNDAC%20Handbook_interactive.pdf

- WHO: https://www.who.int

- WHO: EMT Guidelines: http://www.who.int/hac/global_health_cluster/EMT_guidelines_september2013.pdf?ua=1

7.2 References

General references

- Athanasopoulou, Adamantia & Dimova, Silvia & Fuchs, Manfred & Sousa, M. & Pinto, Artur & Nikolova, Borislava & Iannaccone, Sonia. (2018). State of Eurocode 8 Implementation in the European Union.

- Centre for Strategy and Evaluation services, Evaluation Study of Definitions, Gaps and Costs of Response Capacities for the Union Civil Protection Mechanism, 2019

- R.Davies. Case study: Floods in the Attica Region, Greece, November 2017. 22 November 2017 –

- Euratom Treaty, OJC 327/2012 establishing the European Atomic Energy Community available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:12012A/TXT

- Euratom Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations

- European Commision COM/2018/738, report From The Commission to the European Parliament and the Council on the implementation of the EU Strategy on adaptation to climate change.

- European Commission, SWD 176/2017,Overview of natural and man-made disaster risks the European Union may face

- European Commission (2017), Evaluation of the European Union Solidarity Fund 2002-2017

- European Commission SWD 330/2020 Overview of natural and man-made disaster risks the European Union may face

- European Commission, DG ENER (2018), Study on the quality of electricity market data of transmission system operators, electricity supply disruptions, and their impact on the European electricity markets,

- European Commission, Joint Research Centre (2018), Technical Report Task 7 – River Floods

- European Drought Observatory (EDO) (2018) Drought in Central-Northern Europe

- European Environment Agency, EEA Report No. 1/2017, Climate change impacts and vulnerability in Europe. An indicator-based report.

- European Environment Agency, EEA Report No 22/2018, Unequal exposure and unequal impacts: social vulnerability to air pollution, noise and extreme temperatures in Europe. Available at https://www.eea.europa.eu/publications/unequal-exposure-and-unequal-impacts

- European Environment Agency (2019), Economic losses from climate-related extremes in Europe

- European Commission Communication COM 216 /2013, from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: An EU Strategy on adaptation to climate change;) final.

- European Union Directive, 2000/60/EC, establishing a framework for Community action in the field of water policy.

- European Union Directive, 2008/114/EC, On the identification and designation of European critical infrastructures and the assessment of the need to improve their protection

- European Union Directive 2000/60/EC, establishing a framework for the Community action in the field of water policy

- European Union Directive No 2007/60/EC, on the assessment and management of flood risks

- European Union Directive, 2012/18/EU, on the control of major-accident hazards involving dangerous substances,

- European Union Directive, 2013/1313/EU on a Union Civil Protection Mechanism

- European Union, Decision 2021/836/EU, on a Union Civil Protection Mechanism

- INSARAG Guidelines 2020, available at: https://www.insarag.org/methodology/insarag-guidelines/

- International federation of the Red Cross and Red Cressent societies: Disaster Response Laws, available at : https://disasterlaw.ifrc.org/sites/default/files/media/disaster_law/2020-08/113600-idrl-deskstudy-en.pdf

- Keatinge W. R. (2003). Death in heat waves. BMJ (Clinical research ed.), 327(7414), 512–513.

- Shearer, P., and Stark, P., (2012), Global risk of big earthquakes has not recently increased, Proceedings of the National Academy of Sciences. January 17, 2012, 109 (3) 647-648.

- Spinoni J., Naumann G., Vogt J.V. (2017): Pan-European seasonal trends and recent changes of drought frequency and severity. Global and Planetary Change: 148, 113-130.

- Toreti et al. The exceptional 2018 European water seesaw calls for action on adaptation. Earth's Future, 7 (6): 652–663.

- United Nations university & Alliance Developments Work, 'World risk report 2014' https://i.unu.edu/media/ehs.unu.edu/news/4070/11895.pdf

- World Bank (2017), Pandemic Emergency Financing Facility (PEF): Proposed Financing From IDA.

References for Austria

- Bundesamt für Verfassungsschutz und Terrorismusbekämpfung, Master plan for Critical infrastructure protection in Austria (2014) https://www.bvt.gv.at/401/files/APCIP_Masterplan_2014.pdf

- Bundesministerium fur Gesundheit und Frauen, Gesamtstaatlicher Hitzeschutzplan (2017)

- Buindesministerium fur gesundheit und frauen Influenza Pandemieplan Strategie für Österreich (2008)

- Bundesministerium des Inneres: Disaster management in Austria: https://www.bmi.gv.at/204/start.aspx

- Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz (BMSGPK)Die COVID-19-Pandemie in Österreich (2020)

- Bundesministerin für Landwirtschaft, Regionen und Tourismus: Early warning for flooding: https://www.bmnt.gv.at/wasser/schutz_vor_naturgefahren/hochwasserprognose/hw_prognose_at.html

- International Atomic Energy Agency, The Austrian National Report for the on Emergency Preparedness and Response Arrangements for the 7thMeeting of Representatives of Competent Authorities (2017)

- Meteorological service of Austria http://www.zamg.ac.at

- Österreichische Gesellschaft fur Erdbebeningenieurwesen und baudynaiek Eartquake building codes for Austria: http://www.oge.or.at/

- Stefan Jadlica, Firebrigades prepare for forest fires (2021) https://kurier.at/chronik/niederoesterreich/feuerwehr-ruestet-sich-fuer-waldbraende/401473342

- Universität für Bodenkultur Wien, Institut für Waldbau, Early warning information for forest fires: https://fireblog.boku.ac.at/2021/09/06/sommerrueckblick-2021/

- Zentralanstalt für Meteorologie und Geodynamik, Early alarm for forest fires https://www.zamg.ac.at/cms/de/wetter/wetter-oesterreich/waldbrand/oesterreich/heute

References for Denmark

- Danish Emergency Management Agency: https://brs.dk/en/
- Falck: https://www.falck.com/en/
- DEMA, Approach to Risk and Vulnerability Analysis for Civil Contingency Planning' https://brs.dk/globalassets/brs---beredskabsstyrelsen/dokumenter/krisestyring-og-beredskabsplanlagning/2020/-background-paper-on-demas-approach-to-risk-and-vulnerability-analysis-.pdf
- DEMA crisis management in Denmark (2021)' https://brs.dk/globalassets/brs---beredskabsstyrelsen/dokumenter/krisestyring-og-beredskabsplanlagning/2021/-crisis-management-in-denmark-.pdf
- DEMA, Nuclear Incidents, https://brs.dk/da/arbejdsopgaver/indsats-ved-ulykker-og-katastrofer/nukleare-handelser/

References for Greece

- Center for Security Studies, Training Programm, December 2015 Accessed October 17,2021, http://www.kemea.gr/images/Docs/Kemea_CI/Libretto.pdf
- Centre for Security Studies Vital infrastructure protection manual, , March 2018, Accessed October 17,2021 http://www.ciprotection.gr/images/CIPManual/CIPmanual.pdf
- GSCP, Civil Protection Action Plan to address the risks of the event flood phenomena, , October 10,2019, Accessed October 17,2021 https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_drasewn_plimiron_2019.pdf_2.pdf
- GSCP, Corona Virus19-Public Guidelines, Accessed October17,2021, https://www.civilprotection.gr/el/koronoios-covid-19-hrisimes-odigies
- GSCP, Industrial Accidents Public Instructions, Accessed October 17,2021, https://www.civilprotection.gr/en/industrial-accidents
- GSCP, Emergency Response and Immediate / Short-term Management of the Consequences of the Earthquake with the code name "EGKELADOS.", , January 20,2020, Accessed October 17,2021 https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_egkelados.pdf
- GSCP, Emergency Response and Immediate / Short-term Management of the Consequences of the Earthquake with the code name "EGKELADOS.", ,January 20,2020, Accessed October 17,2021 https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_egkelados.pdf
- GSCP, General Plan for Emergency Response and Immediate / Short-term Management of Consequences of a Flood Phenomenon with the code name "DARDANOS", , August12, 2019, Accessed October 17,2021, https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_dardanos_oe.pdf

https://www.civilprotection.gr/el/geniko-shedio-antimetopisis-ektakton-anagkon-kai-amesisvraheias-diaheirisis-synepeion-apo-ekdilosi

- GSCP, General Plan for Emergency Response due to forest fires with the code name "IOLAOS, December 6,2012, Accessed October 17,2021 https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_iolaos_oe.pdf

- GSCP, General Plan for Emergency Response due to Accidents during Road and Rail Transport of Dangerous Goods according to them ADR / RID regulations, June 30, 2020, Accessed October 17,2021, https://www.civilprotection.gr/sites/default/gscp_uploads/sxedio_atyximaton_adr_rid_2020.pdf

- GSCP, General Plan for Dealing with Large-Scale Technological Accidents (General SATAME) with the code name “HERACLEITOS”, , February 6,2020,Accessed October 17,2021, https://www.civilprotection.gr/sites/default/gscp_uploads/shedio_irakleitos.pdf

- GSCP, General Plan for Dealing with Large-Scale Technological Accidents, July 9,2018 Accessed October 17,2021, https://www.civilprotection.gr/sites/default/gscp_uploads/2h_ekdosi_genikou_satame_1_0.pdf

- Greek government: Kallikratis Plan”, last modified on 20 December 2015, https://en.wikipedia.org/wiki/Kallikratis_Plan

- Greek Government, Responsibilities of the General Secretariat for Civil Protection, Law 249/2014, Accessed October 17,2021, https://www.lawspot.gr/nomikes-plirofories/nomothesia/n-4249-2014/arthro-108-nomos-4249-2014-armodiotites-genikis

- Hellenic National Centre for Emergency Care (EKAB), Covid19 Press Release, , Accessed October 19,2021, https://www.ekab.gr/anakoinoseis/besafe/

- Hellenic National Centre for Emergency Care (EKAB), First aid Handbook, May 2017, Accessed October 17,2021, https://www.ekab.gr/files/entypa/EKAB-protes-voithies.pdf

- Hellenic National Centre for Emergency Care (EKAB, Heat wave ,Protection Guidelines, , Accessed October 17,2021, https://www.ekab.gr/arch/arch_general/odigies-gia-tin-antimetopisi-tou-kafsona/

- Hellenic National Centre for Emergency Care (EKAB), Accessed October 17,2021, https://www.ekab.gr/organismos/

- Hellenic National Centre for Emergency Care, Special Unit for Disaster medicine (ETIK), 2019, EKAB’s Standard Operating Procedures

- Hellenic National Centre for Emergency Care (EKAB), Accessed October 17,2021, https://www.ekab.gr/mesa-diakomidis/

- Hellenic National Centre for Emergency Care (EKAB), Accessed October 17,2021, https://www.ekab.gr/drastiriotites-ipiresies-mesa/idiko-tmima-iatrikis-katastrofon/

- Ministry for Climate Change and Civil Protection, CBRN Accidents, Protection Guidelines, , Accessed October 17,2021, https://www.civilprotection.gr/en/cbrn-accidents

- Ministry for Climate Change and Civil Protection, Earthquakes, Protection Guidelines, , Accessed October 17,2021, https://www.civilprotection.gr/en/eaGuidelrthquakes

- Ministry for Climate Change and Civil Protection, Forest Fires Protection Guidelines, , Accessed October 17,2021, https://www.civilprotection.gr/sites/default/gscp_uploads/forest_fires_25_7_19.pdf

- Ministry for Climate Change and Civil Protection, General Plan of Civil Protection, Accessed October 17,2021, Civil Protection

- Ministry for Climate Change and Civil Protection, Heat wave ,Protection Guidelines, Accessed October 17,2021, https://www.civilprotection.gr/sites/default/gscp_uploads/kausonas_gia_istoselida.pdf

- Ministry for Climate Change and Civil Protection, Severe Weather Phenomena Protection Guidelines, Accessed October 17,2021, https://www.civilprotection.gr/en/severe-weather-phenomena

- Ministry of Health Public Health Regulations, , Accessed October 17,2021, https://www.moh.gov.gr/articles/health/dieythynsh-dhmosias-ygieinhs/tmhma-ygeionomikwn-kanonismwn-dhmosias-ygeias/c337-egkyklioi

- Ministry of Health, Health Districts, Accessed October 17,2021, https://www.moh.gov.gr/articles/citizen/xrhsima-thlefwna-amp-dieythynseis/2719-ygeionomikes-perifereies

- Ministry of Health, National Council of Public Health, National Plan for Public Health 2019-2022, ,May 2019, Accessed October 17, 2021, https://www.moh.gov.gr/articles/health/domes-kai-draseis-gia-thn-ygeia/ethnika-sxedia-drashs/6237-ethniko-sxedio-drashs-gia-thn-dhmosia-

- National Centre of Social Solidarity Anti-Stigma Guide, , Accessed October 17,2021, https://ekka.org.gr/index.php/el/diaxeirisi-kriseon

- National Gazette (FEK 102), December 7,2006, Accessed October 17,2021, https://www.civilprotection.gr/sites/default/gscp_uploads/media/ipapofasi72702006sistasiyodxbrp_el_GR.pdf

- NPO(EODY), Dealing with patients on scene, 2019, Accessed October 17,2021, , https://eody.gov.gr/wp-content/uploads/2019/01/antimetopisi_asthenon_ston_topo_toy_symbantos.pdf

- NOPH(EODY),Heat wave ,Protection Guidelines, 2019, Accessed October 17,2021, https://eody.gov.gr/wp-content/uploads/2019/12/odigies-kausona-gr.pdf

- NOPH (EODY) Introduction, National Public Health Organization, Accessed October 17,2021, https://eody.gov.gr/en/npho/

- Papazachos & Papazachou. 1999. Earthquakes in Greece

References for Ireland

- Agriculture and food development authority, Wildfire management in Ireland: https://www.teagasc.ie/crops/forestry/advice/management/dealing-with-wildfires/

- Department of Defence, "National risk assessment for Ireland (2017)" https://www.gov.ie/en/publication/709bf3-a-national-risk-assessment-for-ireland-2017/

- Department of Defence. " National risk assessment for Ireland (2020)" https://www.gov.ie/en/press-release/5e685-national-risk-assessment-for-ireland-2020/

- Department of Defence, Office of emergency planning; "Preparing for Major Emergencies", 2008, www.mem.ie

- Department of Defence, office of emergency planning, "disaster management in Ireland": www.emergencyplanning.ie

- Department of Defence, Office of Emergency planning, National emergency management structures https://www.gov.ie/en/publication/7ff6f-strategic-emergency-management-sem-national-structures-and-framework/

- Department of Health, Ethical framework for decision making in a pandemic (2021) https://www.gov.ie/en/publication/dbf3fb-ethical-framework-for-decision-making-in-a-pandemic/

- Department of Health and Children, National Influenza plan Ireland (2007: https://www.hse.ie/eng/services/publications/emergency-management/national-plan-for-pandemic-influenza-january-2007-.pdf

- Department of Housing, Local Government and Heritage , Critical infrastructure protection - Strategic Emergency Management Guideline 3 – Version 2 - Critical Infrastructure Resilience, https://www.gov.ie/en/collection/5ef65-publications/

- Department of Housing, Local Government and Heritage (2008) Guide to Flood Emergencies

- Department of Housing, Local Government and Heritage (2021) A framework for major emergency management

- Department of Housing, Local Government and heritage (2020)Guide to Severe weather emergencies

- Government of Ireland, National plan for Nuclear and Radiological Emergency exposure (2019) https://www.epa.ie/publications/monitoring--assessment/radiation/National-Plan-for-Nuclear-and-Radiological-Emergency-Exposures-(2019).pdf

- Health and Safety Authority, Industrial accidents legislation, https://www.hsa.ie/eng/Your_Industry/Chemicals/Legislation_Enforcement/COMAH/

References for Portugal

- ANEP, Overview of Risk assessment http://www.prociv.pt/pt-pt/RISCOSPREV/RISCOSNAT/CHEIAS/Paginas/default.aspx

- Ecorys, Peer review of Portugal within the Union Civil protection mechanism (2019) https://ec.europa.eu/echo/sites/default/files/peer_review_-_report_portugal_final.pdf

References for Romania

- Government of Romania, National Strategy on Civil Protection (Published in Official Gazette no. 600 as of 12 July 2005).

References for Turkey

- AFAD, Turkey Disaster Response Plan (TAMP), (2012) https://www.afad.gov.tr/kurumlar/afad.gov.tr/2419/files/Afet_Mud_Pl_ResmiG_20122013.pdf

- Government of Turkey, Governmental Gazette 1976/12520 Regulation on the Jobs of the Officials in the Prevention and Extinguishing of Forest Fires, https://www.mevzuat.gov.tr/MevzuatMetin/3.5.712520.pdf

- Government of Turkey, Governmental Gazette, 2000-24046, Emergency Medical Services Regulation https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=4798&MevzuatTur=7&MevzuatTertip=5

- Government of Turkey, Governmental Gazette 2006-26287 regulation on Continuity of Supply, Commercial and Technical Quality of Electrical Energy Presented in the Distribution System in the Electricity Market, https://www.resmigazete.gov.tr/eskiler/2006/09/20060912-4.htm

- Government of Turkey, Governmental Gazette 2011/27851 Disaster and Emergency Management Centers Regulation, https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=20111377&MevzuatTur=3&MevzuatTertip=5

- Government of Turkey, Governmental Gazette 2014-29002, 112 Emergency Call Centers Establishment, Duties and Working Regulations,

https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=19670&MevzuatTur=7&MevzuatTertip=5

- Government of Turkey, Government Gazette 2018-30364, Turkey Building Earthquake Regulation, https://www.resmigazete.gov.tr/eskiler/2018/03/20180318M1-2.htm

- Government of Turkey, Governmental Gazette 2020-31087 Municipal Fire Brigade Regulations https://www.mevzuat.gov.tr/anasayfa/MevzuatFihristDetayIframe?MevzuatTur=7&MevzuatNo=10713&MevzuatTertip=5

- Government of Turkey, Governmental Gazette 2020-31207, Regulation on the Safety of Nuclear Facilities and Nuclear Materials, https://www.resmigazete.gov.tr/eskiler/2020/08/20200808-8.htm

- Government of Turkey, Governmental Gazette 2020-31261, Mandate Regulation on Chemical, Biological, Radiological, Nuclear Threats and Hazards, https://www.mevzuat.gov.tr/MevzuatMetin/21.5.3033.pdf

- Government of Turkey, Governmental Gazette 2021-31491, Regulation on Health Services in Disasters and Emergency Situations, https://www.resmigazete.gov.tr/eskiler/2021/05/20210525-3.htm

- Government of Turkey, Governmental Gazette 2020-31337 Radiation Safety Regulation, https://www.mevzuat.gov.tr/File/GeneratePdf?mevzuatNo=5272&mevzuatTur=KurumVeKurulusYonetmeligi&mevzuatTertip=5

- Government of Turkey, Governmental Gazette: 2021-31540 Regulation on the Establishment, Duties, Working Procedures and Principles of Disaster and Emergency Search and Rescue Units Directorates and Provincial Disaster and Emergency Search and Rescue Teams, (2021) https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=38794&MevzuatTur=7&MevzuatTertip=5

- Government of Turkey, law, 2009-5902, Law on the Organization and Duties of the Disaster and Emergency Management Presidency, https://www.resmigazete.gov.tr/eskiler/2009/06/20090617-1.htm

- Government of Turkey, law 2012-6306, Law on Transformation of Areas at Disaster Risk, https://www.resmigazete.gov.tr/eskiler/2012/05/20120531-1.htm

- Ministry of Heath, Directive on Duties and Working Principles of National Medical Rescue Teams, (2016) https://www.saglik.gov.tr/TR,11268/ulusal-medikal-kurtarma-ekiplerinin-gorevleri-ve-calisma-esaslarina-dair-yonerge.html

- Ministry of Health, Mission Directive on Chemical, Biological, Radiological and Nuclear Hazards, https://adanaism.saglik.gov.tr/Eklenti/59075/0/saglik-bakanligi-ve-bagli-kuruluslarinin-kimyasal-biyolojik-radyolojik-ve-nukleer-tehlikelere-dair-gorev-yonergesipdf.pdf

- Ministry of Health. National Influenza Pandemic Plan (2019) https://www.grip.gov.tr/depo/saglik-calisanlari/ulusal_pandemi_plani.pdf

- Turkish Radio Amateur Association, TRAC Charter, https://trac.org.tr/hakkimizda/tuzugumuz

- Turkish Red Cresent (kizilay), Red Crescent Charter, https://www.kizilay.org.tr/Upload/Editor/files/1235049841_Tuzuk_19_02_2009.pdf

APPENDIX 1: Terminology for first responders and disaster risk management

Introduction

As with any well-founded research project, TeamAware will gain credibility and usefulness from expressing and referencing clear and well described definitions of the phrases and terms used within its outputs.

Well researched and resourced efforts have been deployed across the Disaster Resilience sector and it would be wasted effort for this project to attempt to recreate them. It is also important that the project recognises and values the need for a common nomenclature across the Disaster Resilience sector whenever possible. Such an approach will ensure both the shared comprehension of principles and the interoperability of outcomes and products.

It is not in the interests of TeamAware to redefine or re-invent perfectly usable and accepted professional terms and definitions created by specialists in their fields. For this reason, the Project partners have agreed to incorporate a suite of definitions founded largely (but not exclusively) within the work of the:

i) International Standards Organisation (ISO);
ii) United Nations Office for Disaster Risk Reduction (UNDRR), formerly known as UNISDR and
iii) International Federation of Red Cross & Crescents (IFRC);
iv) (For Trials and Demonstrations) The work of the Driver+ project;
v) Various ISO standards;
vi) RESILOC – A project on Community Resilience under the H2020 DRS01 Cluster GA 833671 and other referenced research activities.

This **glossary of terms and terminology** is the outcome of a project-specific standardisation/alignment activity that was implemented to ensure a common and sound language between researchers working on TeamAware and for the purpose of supporting focused and comprehensive communication efforts within the project consortium and with external stakeholders.

Further terms beyond those outlined above have been developed to include words and phrases that are either:

i) new to the DRS world due the specialist activities of TeamAware; or
ii) are accepted terms from other bodies which need 'flexing' to fit the activities and context of our work.

The glossary of terms and terminology is an ongoing 'work in progress' and will be kept live for the duration of the project as it proposes new entries whilst stressing and testing its own explanations and definitions.

At any given time, the terms and phrases included will range from those accepted by international bodies to new ones receiving a consensus across a specific project but are immature in development. The TeamAware Glossary will become increasingly credible as time progresses and will be completed for publication towards the final stages of the project.

At this stage of the project, the majority of terms presented have been identified through the research efforts employed through Work Package 2 - "System Architecture Specification and Design" and with an early view of Work Package 13 - "Demonstration and Validation".

It is expected that terms may be removed or newly defined during the project. To conclude on the currency of data please observe the Document history.

The TeamAware Project is keen to deliver value beyond its original remit, in particular to other projects operating within the same H2020 Call area for Secure Societies - Protecting freedom and security of Europe and its citizens.

Intended Use

The Project Glossary of terms presented here represents a collection of terms as defined and agreed upon during the first phase of the TeamAware project whilst maintaining the flexibility and capacity to evolve during later stages of the project. It is intended to be used for the coordination of research activities but mainly for coherent and sound communication activities within the project and with external stakeholders.

The hierarchy involved in determining the definition used throughout the project is as follows: The standard definition (from existing glossaries described above) will apply unless a different meaning is clearly attributed to it within a document/deliverable. Where this is the case, the alternative definition will be clearly referenced in this Project Glossary and the author will be encouraged to justify why this has been necessary in their text.

Project partners that publish content from the TeamAware project are required to consult and reference the glossary. Where additional inter-understanding or perspectives are required, new terms and phrases are proposed and described by the respective author incorporating them. In this way, the Glossary will grow and gain professional credibility as the project progresses.

Each Deliverable within the project will reference this document and rely on it to reflect the content and context of each term or phrase used.

Glossary and Terminology

The following table is the glossary of terms as used within the research activities of the TeamAware Project (Status 31 October 2021)

Term	Definition	In-Text Reference	Reference	Web Link
A				
Accident	Unintended damage to people or objects that affect the functioning of the system we choose to analyse	Perrow, 1999: 64	RESILOC Deliverable 2.1 - Analysis of Risk Perception Perrow, C. (1999). Normal accidents. Living with High-Risk Technologies. Princeton University Press: Princeton.	https://press.princeton.edu/books/paperback/9780691004129/normal-accidents
Action	Actions includes measures and activities implemented to manage the event and in response to it, with the aim of limiting the risk and facilitating the overcoming of the emergency.	RESILOC	RESILOC Deliverable 2.7 - Architecture of the RESILOC Inventory	
Affected	People who are affected, either directly or indirectly, by a hazardous event. Directly affected are those who have suffered injury, illness or other health effects; who were evacuated, displaced, relocated or have suffered direct damage to their livelihoods, economic, physical, social, cultural and environmental assets. Indirectly affected are people who have suffered consequences, other than or in addition to direct effects, over time, due to disruption or changes in economy, critical infrastructure, basic services, commerce or work, or social, health and psychological consequences.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Affiliated volunteer	Individual, who is affiliated with an existing incident response organisation or voluntary organisation but who, without extensive preplanning, offers support to the response to, and recovery from, an incident.	Drver+		

Term	Definition	In-Text Reference	Reference	Web Link
Assessment	related to disaster risk: an approach to determine the nature and extent of disaster risk by analysing potential hazards and evaluating existing conditions of exposure and vulnerability that together could harm people, property, services, livelihoods and the environment on which they depend (UN Office for Disaster Risk Reduction, 2017).	UNDRR 2016	Adapted from "Disaster Risk Assessment" below	https://www.undrr.org/terminology
B				
Best Practice	This encompasses the preferred actions in a specific type of situation to efficiently and effectively achieve a certain objective. Best Practice may be formalised in internal policy documents such as handbooks and standard operation procedures and could be based on one or several Lesson Identified/Lessons Learned approved by decision-makers.	Driver+		
C				
Capability	The means to accomplish one or more tasks under specific conditions.	Driver+		
Capacity	The combination of all the strengths, attributes and resources available within an organisation, community or society to manage and reduce disaster risks and strengthen resilience.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Civil Protection	Protection for people, their environment, property and cultural heritage in the event of natural or manmade crises and disasters.	Hellenberg, 2006: 5	Civil protection according to the EU	

Term	Definition	In-Text Reference	Reference	Web Link
Civil Society	Civil society refers to both the networks of actors and groups that are non-state, formally and informally constituted, and to the networks of trust and reciprocity among citizens in a society	Aldrich and Crook, 2008	Aldrich, D.P. and Crook, K. (2008). Strong Civil Society as a Double-Edged Sword. Political Research Quarterly 61(3), 379-389	-
Community	Local community – the people living in, serving or responsible for a particular small area, especially of a country (adapted from Cambridge University Press 2019). Besides geographical aspects, the community may also share common values, interests, and needs (UNDP, 2009).	RESILOC	Adapted from Cambridge University Press 2019 and UNDP 2009??	
Command Post Exercise (CPX)	A functional exercise in which the field response and deployment is simulated, involving the headquarters and/or coordination centres that would normally intervene in an emergency. All plans, procedures, communications and activities that would be performed during a real response would be conducted except the field activities.	Union Civil Protection Mechanism (UCPM) - Technical Guide for UCPM Full-scale exercises - Version 3.0 09 March 2021		-
Command & Control	Activities of target-oriented decision-making, situation assessment, planning, implementing decisions and controlling the effects of implementation on the incident.	Driver+		

Term	Definition	In-Text Reference	Reference	Web Link
Community of Practice	A platform and its members that facilitate and foster cooperation and synergies among Crisis Management professionals. A broad variety of stakeholders including practitioners, researchers, industry representatives and/or policy makers can exchange knowledge and best practices and initiate cooperation on Crisis Management topics.	Driver+		
Competence	Demonstrated ability to apply knowledge and skills to achieve intended results.	Driver+		
Competence Framework	Structure that defines the competence of people within an organisation.	Driver+		
Consent	The data subject agrees to freely give, specific, informed and unambiguous indication of the data subject's wishes by which he or she, by a statement or by a clear affirmative action, signifies agreement to the processing of personal data relating to him or her.	GDPR 2018	GDPR Article 4(11) and Article 7	
Contingency planning	A management process that analyses disaster risks and establishes arrangements in advance to enable timely, effective and appropriate responses	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Critical Infrastructure	An asset, system or part thereof located in Member States which is essential for the maintenance of vital societal functions, health, safety, security, economic or social well-being of people, and the disruption or destruction of which would have a significant impact in a Member State as a result of the failure to maintain those functions.	Council Directive 2008/114/EC	European Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2008.345.01.0075.01.ENG

Term	Definition	In-Text Reference	Reference	Web Link
Crisis	A period of upheaval and collective stress, disturbing everyday patterns and threatening core values and structures of a social system in unexpected, often unconceivable, ways.	Rosenthal et al., 2001:6	Rosenthal, U., Boin, R. and Comfort, L.K. (2001). Managing crises. Threats, Dilemmas, Opportunities. Charles C. Thomas Publisher: Springfield.	
Crisis Communication	Crisis communication includes the collection and processing of information for crisis team decision making along with the creation and dissemination of crisis messages to people outside of the team.	Coombs and Holladay, 2010: 20	Coombs W.T. and Holladay S.J. (2010) (Eds.). The Handbook of Crisis Communication. Wiley-Blackwell.	
Crisis Management	Holistic management process that identifies potential impacts that threaten an organisation and provides a framework for building resilience, with the capability for an effective response that safeguards the interests of the organisation's key interested parties, reputation, brand and value creating activities, as well as effectively restoring operational capabilities.	Driver+		
Crisis Management Cycle	It is a multiple-phase chronological process, during which an organisation deals with a crisis or a disaster. There have been developed several models, but the most widely accepted foresees four phases: prevention/mitigation, preparedness, response and recovery. It is also referred to by other names, such as "the emergency management cycle or crisis life cycle.	Pursiainen, 2018: 4	Pursiainen, C. (2018). The crisis management cycle. Routledge: London	

Term	Definition	In-Text Reference	Reference	Web Link
Crisis Management Function	Crisis management functions aim at achieving effects, e.g. coordination, a direction of effort, shared awareness, etc., in a crisis management system-of-systems. The "function" focuses on what is to be achieved, not how or by whom. Several systems, tools, building blocks, etc. may individually or in concert deliver a given function and, conversely, may support several different functions.	Driver+		
Crisis Management Professional	Person with knowledge, experience or ability needed to effectively and timely respond to crisis in order to minimize damage to society.	Driver+		
Critical Infrastructure	The physical structures, facilities, networks and other assets which provide services that are essential to the social and economic functioning of a community or society.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Culture - organisational	The values, attitudes and behaviours of an organisation that contribute to the unique social and psychological environment in which it operates.	ISO 22316:2017	ISO 22316:2017	https://www.iso.org/standard/50053.html
D				
Disaster	A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology

Term	Definition	In-Text Reference	Reference	Web Link
Disaster management	The organisation, planning and application of measures preparing for, responding to and recovering from disasters	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Disaster resilience	The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure.	UNISDR 2005b, 4	Hyogo Framework of Action	https://gsdrc.org/topic-guides/disaster-resilience/concepts/what-is-disaster-resilience/
Disaster risk	The potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Disaster risk management	Disaster risk management is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Discussion based exercise or tabletop exercise (TTX)	A discussion-based exercise where you simulate an emergency and generate discussions around it. TTX are designed to put crisis response managers and practitioners in a situation to use existing plans and procedures and to take decisions according to a proposed scenario.	Union Civil Protection Mechanism (UCPM) - Technical Guide for UCPM Full-scale exercises - Version 3.0 09 March 2021		-

Term	Definition	In-Text Reference	Reference	Web Link
Dry Run 1	First rehearsal of a Trial, focusing on the technical integration of solutions, reference implementation of the Testbed, and scenario validation; it also serves as a readiness review to approve the maturity of technical solutions.	Driver+		
Dry Run 2	Full scale rehearsal of a Trial without external end-users' participation, aimed at detection of technical issues and last second fine-tuning; Dry Run 2 is organised as a complete mirror of the Trial.	Driver+		
E				
Early warning system	An integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Emergency	Manifested hazardous event or events that may or may not result in the serious disruption of the functioning of a community or society.	RESILOC	Adaptation of UNDRR 2016	
Emergency Management	The organisation and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response and initial recovery steps.	UNISDR, 2009: 13	UNISDR (2009). UNISDR Terminology for Disaster Risk Reduction. United Nations: Geneva	https://www.preventionweb.net/files/7817_UNISDRTerminologyEnglish.pdf
Emergency response unit (ERU)	A team of trained technical specialists, ready to be deployed at short notice, which uses pre-packed sets of standardised equipment. ERUs are present at different scales and often have different capabilities.	IFRCC	International Federation of Red Cross and TurkishTurkish Red Crescent Societies 2019	https://www.ifrc.org/en/what-we-do/disaster-management/responding/disaster-response-system/dr-tools-and-systems/eru/

Term	Definition	In-Text Reference	Reference	Web Link
End User	Individual person who ultimately benefits from the outcomes of the system.	Driver+		
Environment	The surroundings or conditions, as a whole or in a particular geographical area, in which the activity of persons, animals or plants takes place.	RESILOC	RESILOC Deliverable 2.7 - Architecture of the RESILOC Inventory	
Evacuation	Moving people and assets temporarily to safer places before, during or after the occurrence of a hazardous event in order to protect them.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Evaluation	Process of estimating the effectiveness, efficiency, utility and relevance of a service or facility.	Driver+		
Exercise	Process to train for, assess, practise and improve performance in an organisation.	Driver+		
F				
First responder	a person who is among those responsible for going immediately to the scene of an accident or emergency to provide assistance	RESILOC	RESILOC Deliverable 2.7 - Architecture of the RESILOC Inventory Merriam Webster, 2019	https://www.merriam-webster.com/dictionary/first%20responder
G				
Gap	Difference between the existing capabilities of responders and what was actually needed for effective and	Driver+		
H				
Hazard	Hazard is defined as a human process, phenomenon or activity that can result in loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. Hazards may be natural, anthropogenic or socio-natural in origin.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology

Term	Definition	In-Text Reference	Reference	Web Link
Hazard scenario	A type of risk-assessment scenario aimed at creating adverse event illustrations used for planning for the project pilots	RESILOC	RESILOC Deliverable 2.5 - Hazard Scenarios Analysis	
Hazard Source	The location where a hazard first arises	RESILOC	RESILOC Deliverable 2.5 - Hazard Scenarios Analysis adapted from Queensland Government, 2019	
Hazardous event	The manifestation of a hazard in a particular place during a particular period of time.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
I				
Innovation	Implementation of a new or significantly improved product (good or service), or process, new marketing method, or new organisational method in business practices, workplace organisation or external relations.	Driver+		
Interoperability	The ability of diverse systems and organisations to work together, i.e. to interoperate.	Driver+		-
K				
Key Performance Indicator	Key performance indicator (KPI) is a quantifiable measure that an organisation (person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives) uses to gauge or compare performance (measurable result) in terms of meeting its strategic and operational objectives (result to be achieved).	Driver+		
L				

Term	Definition	In-Text Reference	Reference	Web Link
Legacy System	(Crisis management) system currently in operational use.	Driver+		
Lessons identified	A lesson identified is an issue captured by any emergency responder that negatively impacts on interoperability and/or national resilience capabilities	JESIP (2016)		
Lessons learned	A lesson learned is a lesson that has been resolved through the implementation of necessary change which has a positive impact on responder agencies interoperability and/or national resilience capabilities. A lesson learned means practice has been improved	JESIP (2016)		
Lessons Learning Process	Distributing the problem information to the whole project and organisation as well as other related projects	Driver+		
Local authority	A local authority is an organisation that is officially responsible for all the public services and facilities in a particular area	RESILOC	Collins English Dictionary	https://www.collinsdictionary.com/dictionary/english/local-authority
Local community	The people living in, serving or responsible for a particular small area, especially of a country. Besides geographical aspects, the community may also share common values, interests, and needs (UNDP, 2009). There are multiple layers of local communities within a country.	RESILOC	RESILOC Deliverable 2.1 - Analysis of Risk Perception Adapted from Cambridge University Press 2019	
M				
Minimum Business Continuity Objective (MBCO)	The minimum level of services and/or products that it is acceptable to the organisation to achieve its business objectives.	ISO 22301:2012	ISO 22301:2012	

Term	Definition	In-Text Reference	Reference	Web Link
Maximum acceptable outage (MAO)	The time it would take for adverse impacts, which might arise as a result of not providing a product or service or performing an activity, to become unacceptable. See also MTPD.	ISO 22301:2013	ISO 22301:2013	
Maximum tolerable period of disruption (MTPD)	The time it would take for adverse impacts, which might arise as a result of not providing a product/service or performing an activity, to become unacceptable. See also MAO.	ISO 22301:2014	ISO 22301:2014	
Mitigation	The lessening or minimizing of the adverse impacts of a hazardous event	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
N				
Natural Hazard	Natural hazards are naturally occurring physical phenomena caused either by rapid or slow onset events which can be geophysical (earthquakes, landslides, tsunamis and volcanic activity), hydrological (avalanches and floods), climatological (extreme temperatures, drought and wildfires), meteorological (cyclones and storms/wave surges) or biological (disease epidemics and insect/animal plagues).[IFRC]	IFRCC	International Federation of Red Cross and TurkishTurkish Red Crescent Societies 2019	https://www.ifrc.org/en/what-we-do/disaster-management/responding/disaster-response-system/dr-tools-and-systems/eru/
Need	Prerequisite identified as necessary to achieve an intended outcome, implied or stated.	Driver+		

Term	Definition	In-Text Reference	Reference	Web Link
Notable practice	Notable practice is where an emergency responder has identified an issue but found a proven effective and useful way of doing something. Notable practice does not always necessitate essential change throughout a sector, but it is something which responder agencies may wish to adopt as it has had a positive impact on interoperability and/or national resilience capabilities in another area of the country.	JESIP (2016)		
O				
Observation	Method of data collection in which the situation of interest is watched and the relevant facts, actions and behaviours are recorded	Driver+		
Observer	Participant who witnesses the exercise while remaining separate from exercise activities. (Observers may be part of the evaluation process).	Driver+		
Operator	Person engaged in task performance, considered as a monitoring, controlling or directing element in a system or process capable of a dynamic response to system inputs and disturbances.	Driver+		
Organisation	Person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives.	Driver+		
P				
Personnel	People working for and under control of the organisation.		ISO 22301:2012	
Policy	The policy provides the intentions and direction of an organisation as formally expressed by its top management.		ISO 22301:2012	
Practitioner	See "Crisis Management Professional"	Driver+		

Term	Definition	In-Text Reference	Reference	Web Link
Preparedness	The knowledge and capacities developed by governments, response and recovery organizations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Prevention	activities and measures to avoid existing and new disaster risks. Prevention expresses the concept and intention to completely avoid potential adverse impacts of hazardous events. While certain disaster risks cannot be eliminated, prevention aims at reducing vulnerability and exposure in such contexts where, as a result, the risk of disaster is removed. Prevention measures can also be taken during or after a hazardous event or disaster to prevent secondary hazards or their consequences, such as measures to prevent the contamination of water.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Prioritised activities	The activities to which priority must be given following an incident in order to mitigate impacts.		ISO 22301:2012	
Public Awareness	Person with knowledge, experience or ability needed to effectively and timely respond to crisis in order to minimize damage to society.	Driver+		
R				
Recovery	The restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities, of a disaster-affected community or society, aligning with the principles of sustainable development and “build back better”, to avoid or reduce future disaster risk.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology

Term	Definition	In-Text Reference	Reference	Web Link
Recovery point objective	The point to which information used by an activity must be restored to enable the activity to operate on resumption	ISO 22301:2012	ISO 22301:2012	
Recovery time objective	The period of time following an incident within which a product or service must be resumed, or activity must be resumed, or resources must be recovered.	ISO 22301:2012	ISO 22301:2012	
Research Ethics	The ethics of the planning, conduct, and reporting of research; this pertains in particular to rules and	Driver+		
Resilience	The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management.	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Response	Actions taken directly before, during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected	UNDRR 2016	UNDRR - Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction	https://www.undrr.org/terminology
Risk	The effect of uncertainty on objectives. [standard term]	ISO3001 2018	International Standards Organisation - Risk management Guidelines	https://www.iso.org/obp/ui/#iso:std:iso:31000:ed-2:v1:en
Risk analysis	The process to comprehend the nature of risk and to determine the level of risk (ISO 2009) Risk analysis provides the basis for risk evaluation and decisions about risk treatment. Risk analysis includes risk estimation.	ISO 73:2009	International Standards Organisation - Risk management Vocabulary	https://www.iso.org/obp/ui/#iso:std:iso:guide:73:ed-1:v1:en

Term	Definition	In-Text Reference	Reference	Web Link
Risk Assessment	Overall process of risk identification, risk analysis and risk evaluation.	ISO 73:2009	International Standards Organisation - Risk management Vocabulary	https://www.iso.org/obp/ui/#iso:std:iso:guide:73:ed-1:v1:en
S				
Safety	A state in which or a place where you are safe and not in danger or at risk	BUILDERS	Cambridge online dictionary	https://dictionary.cambridge.org/dictionary/english/safety?q=Safety
Scenario	Plausible & often simplified descriptions of how an event may develop based on a coherent and internal consistent set of assumptions about the driving forces & key relationships. Used to drive exercises or assist planning for future events.	Houghton et al 2001	Houghton et al 2001	
Scenario – script	The script describes the content and timing of all the events in a scenario. This includes the imagined chronological course of the scenario and control measures according to time, kind and location.	Houghton et al 2001	Houghton et al 2001	
Scenario Planning	Focus on possible events in the future. It is a method where organisations can form an idea of possible future events and test how they may react or respond to these events.	Houghton et al 2001	Houghton et al 2001	
Situational Awareness	the state of individual and/or collective knowledge relating to past and current events, their implications and potential future developments. The process of building situational awareness involves perception, comprehension, evaluation and future projection; achieving a common position within groups necessitates transparency around, for example, the concepts, assumptions, language and frameworks used to build individual situational awareness".	JESIP (2016)		

Term	Definition	In-Text Reference	Reference	Web Link
Skill	Ability to perform a task or activity with a specific intended outcome acquired through education, training,	Driver+		
Social Media	They are interactive computer-mediated technologies that facilitate the creation or sharing of information, ideas, career interests and other forms of expression via virtual communities and networks	RESILOC	RESILOC Deliverable 2.7 - Architecture of the RESILOC Inventory	
Societal Impact	Dimension of crisis management that refers to its unintended positive or negative impacts on different societal groups or society as a whole, as well as on its core values and societal principles as captured for example in fundamental rights, constitutional laws, but also in public debate.	Driver+		
Societal Security	Protection of society from, and response to, incidents, emergencies and disasters caused by intentional and unintentional human acts, natural hazards, and technical failures.	Driver+		
Solution	A solution is a means that contributes to a crisis management function. A solution is either one or more processes or one or more tools with related procedures.	Driver+		
Strategic Decision Maker	The individual who has the power and is tasked to take a strategic decision. These are elected officials, and high-ranking personnel in response organisations / relevant authorities / agencies tasked with the response to the crisis.	Driver+		
T				
Test	An exercise whose aim is to obtain an expected, measurable pass/fail outcome	ISO 22301:2012	ISO 22301:2012	

Term	Definition	In-Text Reference	Reference	Web Link
Test-Bed	The software tools, middleware and methodology to systematically conduct Trials and evaluate solutions within an appropriate environment. An "appropriate environment" is a testing environment (life and/or virtual) where the trialling of solutions is carried out using a structured, all-encompassing and mutual learning approach. The Testbed can enable existing facilities to connect and exchange data, providing a pan-European arena of virtually connected facilities and crisis labs where users, providers, researchers, policy makers and citizens jointly and iteratively can progress on new approaches or solutions to emerging needs.	Driver+		-
Test Bed Infrastructure	The software tools and middleware to systematically create an appropriate (life and/or virtual) environment in which the trialling of solutions is carried out. The Test-bed infrastructure can enable existing facilities to connect and exchange data.	Driver+		-
Threat	A potential cause of an unwanted incident, which can result in harm to individuals, the environment or the community.	ISO 22301:2012	ISO 22301:2012	-
Tool	A device, equipment or piece of software used to carry out a particular process or procedure.	Driver+		-
Training	Activities designed to facilitate the learning and development of knowledge, skills, and abilities, and to improve the performance of specific tasks or roles.	Driver+		-

Term	Definition	In-Text Reference	Reference	Web Link
Trial (Field Trial)	An event for systematically assessing solutions for current and emerging needs in such a way that practitioners can do this following a pragmatic and systematic approach.	Driver+		-
Trial Action Plan (TAP)	The main Trial planning document, facilitating collaborative planning and supporting execution of the Trial. It covers all areas related to the Trial organisation and is used to record efforts, circulate decisions and assess progress.	Driver+		-
Trial Guidance Methodology (TGM)	A structured approach from designing a Trial to evaluating the outcomes and identifying lessons learned.	Driver+		-
Trial Guidance Tool (TGT)	A software tool that guides Trial design, execution and evaluation in a step-by-step way (according to the Trial Guidance Methodology) including as much of the necessary information as possible in form of data or references to the Portfolio of Solutions.	Driver+		-
V				
Volunteer	Individual, who is not affiliated with an existing incident response organisation or voluntary organisation but who, without extensive preplanning, offers support to the response to, and recovery from, an incident.	Driver+		
Vulnerability	The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.	UNISDR 2004	based on UNISDR 2004, quoted in the Sendai Framework	
W				

Term	Definition	In-Text Reference	Reference	Web Link
Worst-case scenario	A scenario in which all conditions are in the most unfavourable position, causing maximum consequences. For our purposes we will have the worst-case scenario as an imaginary situation describing what one individual may go through (if s/he's 'the unluckiest person alive') when a specific hazard scenario becomes a reality.	RESILOC	RESILOC Deliverable 2.1 - Analysis of Risk Perception Based on Cambridge online Dictionary	https://dictionary.cambridge.org/dictionary/english/worst-case-scenario