

EU PROJECT COMMAND d

Commanding and Operations Mechanism for Multisector Analysis of Nexus Disaster Data

Union Civil Protection Mechanism

Decision making support (risk assessment) methodology for North Macedonia

INTRODUCTION

Natural disasters, the risks and dangers of modern technologies and global climate changes, are increasingly causing major consequences for people and the environment, occupying areas of several countries and even continents. Consequently, in dealing with their consequences, states have become interdependent to undertake a jointly coordinated response. For those reasons, the countries of the world decided on a new approach in protection and rescue, in which the partnership for building a more secure world based on common interest and the sharing of responsibility for saving human lives, through the transfer of technology and the exchange of information and a joint approach in prevention activities and reduction of consequences is a priority of every government.

Protection and rescue in the Republic of North Macedonia is organized as a unique system for monitoring, preventing and mitigating the consequences caused by natural disasters or other emergency situations. The system is regulated by the Protection and Rescue Law. The law states that responsibilities are shared among participants in protection and rescue activities, including the state, local authorities, private companies, public enterprises, facilities and services. Based on the Protection and Rescue Law, rescue organizations are obliged to participate in protection and rescue activities in the event of disasters and major accidents.

The Law on Crisis Management regulates all risk management approaches from local to national level in crisis management. The crisis management system in the Republic of North Macedonia was established due to the need for continuous monitoring and assessment of security risks and dangers.

The Protection and Rescue Department performs work in the field of protection and rescue, crisis management, defense and firefighting in accordance with the law and coordinates its work with other departments within the administration of the City of Skopje.

Protection and rescue of people, the environment, material goods, natural resources, animal and plant life and cultural heritage from natural disasters and other accidents in peace, state of emergency and war in the Republic of Macedonia are regulated by the Law on Protection and Rescue as a unique system for protection and rescue.

The protection and rescue system is a connected process of successive and interrelated activities namely: prevention, reduction of consequences, preparedness, response and recovery, which are properly processed and represented in all segments and phases of planning and response at local, national, regional and international level. Investing in prevention and preparedness will multiply the consequences and resources needed for response and recovery. Skopje is the capital and largest city of North Macedonia. According to the 2002 census, the urban zone, which includes semi-urban settlements that have merged with the city, had 428,933 inhabitants, while the wider urban area, which includes about 50 rural settlements up to 25 km from the city center, had 506,926 inhabitants? The area of the city is 571.5 km².

The protection and rescue system of the City of Skopje includes the following operational forces:

- Territorial Fire Brigade of the City of Skopje
- Red Cross of the City of Skopje
- Department of Internal Affairs of Skopje – DIA - Skopje
- Directorate for protection and Rescue
- City headquarters for protection and rescue (Spatial forces of the City of Skopje).

Legal entities of interest to the civil protection system in the City of Skopje are:

- Municipalities in the City of Skopje (ELS)
- PE „Parkovi i zelenilo“
- PE „Gradski parking“
- PE „Ulici i patista“
- Public transport enterprise – „JSP Skopje“
- PE „Komunalna higijena“
- PE „Vodovod i kanalizacija“
- PE „Deponija Drisla“
- PE for welfare of stray animals „Lajka“
- Public health institution City General Hospital „8 –mi Septemvri“
- Center for Public Health – Skopje
- Emergency medical assistance (IMP) – Skopje
- National Forests – Karadzica Forestry (NF – KF) – Skopje
- PE for protection of the multi-purpose area – „Jasen“
- AD Vodostopanstvo of RNM – Skopsko pole – Skopje
- PE „Makedonija pat“ – Skopje branch
- Trade companies of special importance for work in a crisis situation in agreement with municipalities in the City of Skopje (ELS) – „Rule Tours“ – Skopje, „Zito Luks“ – Skopje, „Zito Skopje“ – Skopje, „Skopski Pazar“ – Skopje, „Fershped“ – Skopje, Veterinary Hospital – Skopje, „Mak stil“ - Skopje, „Mital stil“ – Skopje, „Mak control“ – Skopje, „Butel“ – Skopje.

Also, within the broader segment of disaster risk reduction entities that are important for the area of the City of Skopje and which are listed in the assessment and planning documents in the response resources segment, 269 private health

institutions from general medicine, 169 dental offices, 41 specialist organizations in gynaecology, 73 specialist – consultative offices, 72 pharmacies, 4 private polyclinics, 2 diagnostic laboratories, about 40 PHI University clinics, specialized and general private hospitals, as well as veterinary offices.

In accordance with the provisions of the Law for protection and rescue, the following planning documents are in force in the City of Skopje:

- Assessment of the impact of the City of Skopje on natural disasters and other accidents
- Plan for protection and rescue of the City of Skopje from natural disasters and other accidents
- Annual action plan for protection and rescue

However, the Republic of N.Macedonia has developed a quality institutional system that is responsible for the impact of disasters of any nature (natural or technical-technological), and is composed of the competent authorities in the state, the relevant competent authorities of the state administration, the local self-government authorities, the private business sector and the non-governmental sector. In general, all institutions of state administration, commercial enterprises, institutions and services participate in the disaster management system and have their own role.

Structure of the COMMAND d Data system in the City of Skopje - data collection, in the preparatory phase through 3 segments:

1. Overview of technical facilities – catalog of operating costs
2. Methodology for risk assessment – (atlas of risks),
3. Planning documentation – online archive.

Important: For the effective implementation and functioning of the COMMAND d system, daily and continuous coordination between the above entities is necessary in order to prevent and deal with natural or technical-technological (artificial) disasters.

It is planned that all data will be georeferenced. Publicly available maps are used for the cartographic base. It is important that all 3 segments are connected because of the need to collect information for making decisions in crisis situations. The protection and rescue system is a connected process of phases: prevention, mitigation, preparedness, response and recovery that are integrated into the development plans and ensure the implementation of progressive protection and rescue measures at the local, national, regional and international level.

1. OVERVIEW OF TECHNICAL CAPACITIES – CATALOG OF OPERATIONAL CAPABILITIES

The catalog of operational capabilities is a set of interrelated data that allows an overview of the capacities of the operational forces of the protection and rescue system, which are used in an appropriate manner and under certain conditions, for the implementation of certain measures and tasks for the protection and rescue system in case of catastrophes and accidents as well as for training and development.

Basis for data collection:

- Constitution of Republic of N. Macedonia (article no.125,126,127 128)
- Law for crisis management (Official Gazette of the Republic of Macedonia no. 29/2005, 36/11, 41/14 and 104/15, 39/16 and 83/18)
- Law for protection and rescue (Official Gazette of the Republic of Macedonia no. 136) Law for firefighting (Official Gazette of the Republic of Macedonia, no.168) Defense Law (Official Gazette of the Republic of Macedonia no.185),
- Forest Law (Official Gazette of the Republic of Macedonia no.47/97),
- National Platform for reduction of risks from disasters ,
- Rulebook for the training program for the manager of a fire extinguishing operation and rescue of people and property, as well as the composition of the committee for passing the professional exam for the manager of the fire extinguishing operation and saving people and property (Official Gazette of the Republic of Macedonia no.87/06)
- Rulebook of the method for determining the places for fire protection devices and installations, other firefighting equipment, such as means of extinguishing fire and fire extinguishers, their maintenance in proper condition, special marking and availability to use (Official Gazette of the Republic of Macedonia no.74/06)
- Rulebook on the form and content of the identification form of the leader of the fire fighting operation, the method of its issuance and the method of keeping records of the issued identifications (Official Gazette of the Republic of Macedonia no.75/06)
- Rulebook for the form of the forms, the way of keeping the records of the fires, explosions, fire extinguishing interventions and other events (Official Gazette of the Republic of Macedonia no.60/06)

- Rulebook for the content and method of conducting self-defense training in educational institutions (Official Gazette of the Republic of Macedonia no.48/06)
- Rulebook for formations, ranks, as well as rank insignia in firefighting units (Official Gazette of the Republic of Macedonia no.32/06)
- Rulebook on the rules for performing the service, as well as the minimum criteria for accommodation, technical equipment and means for extinguishing fires that the firefighting units should have (Official Gazette of the Republic of Macedonia no.19/06)
- Rulebook of the type and appearance of the uniform, the type of protective equipment and the method of checking and testing its correctness (Official Gazette of the Republic of Macedonia no.141/20)
- Rulebook for implementation of the training of seasonal firefighters (Official Gazette of the Republic of Macedonia no.19/06)

The legal framework represents a broader basis and is used as a database, which is used by the Protection and Rescue Department, together with other services in the City of Skopje that are part of the crisis management system. The legal regulation for dealing with disasters in the Republic of Macedonia takes place at several levels

Each item in the database is intended to contain cards for available material resources and equipment with information on (for example vehicles, facilities, drones, trailers, aggregates, pumps, reflectors, tents, heaters, sirens, logistics support tools, medical equipment, equipment for wreck rescue, standard equipment as well as emergency rescue equipment.

RISK ASSESSMENT METHODOLOGY - ATLAS OF RISKS

The assessment of risks - atlas of risks, is a set of interrelated data, which allows an overview of threats and differences in risks in the area, including the demographic data of the city of Skopje, and which is used in an appropriate way and under certain conditions for the needs of implementation of measures and activities in the protection and rescue system, preparation and updating of planning documents, that is, for the needs of implementing training and development. The methodology for the content and method of hazard assessment and protection and rescue planning is intended for all participants in the protection and rescue system, the holders of planning and preparation of the protection and rescue plans in the Republic of N. Macedonia, the state administration bodies, the units of the local self-government, trading companies, public enterprises, institutions and services.

Basis for data collection:

- Law on Protection and Rescue ("Official Gazette of the R.M", no. 36/004),
- Law on territorial organization of local self-government in the Republic of

Macedonia ("Official Gazette ",no. 55/2004)

- Low on Defense (Official Gazette of the RM", no. 42/01)
- Methodology for the content and method of hazard assessment and protection and remediation planning (Government of the R.M 19.06.2006)
- Law on fire protection refined text ("Official Gazette", no. 39/16).

The assessment of the dangers from natural disasters, in accordance with the Spatial Plan of the Republic of N. Macedonia, contains and is carried out especially on the basis of the following elements:

1. the general characteristics of the territory or area,
2. the assessment after protection and rescue measures,
3. the needs and opportunities for organization and management of protection and rescue and the organization of forces for protection and rescue .
4. improving the capacity of entities for protection and rescue in local self-government units, commercial companies, public enterprises, institutions and services.
5. empowerment of citizens in the system of protection and rescue in the City of Skopje

Each segment of the database represents a separate segment (one segment – one operative force). (eg the City of Skopje's fire department has a separate database) and would have its own special card in which the requested data is entered:

- basic characteristics of the area,
- prioritizing the risk
- identification of threats and risks
- criteria of social values for determining the impact on people's life and health economy and social stability and politics
- mapping of objects with vulnerable categories of citizens
- locations of facilities with vulnerable groups (for example homes for the elderly and infirm, schools, kindergartens, etc.)
- scenarios for complex risks (which describe events with the worst possible consequences)
- risk assessment
- locations of SEVSEO facilities
- infrastructure (traffic, telecommunications, electricity distribution, water supply and drainage, gas pipelines, etc.)
- cartographic display of risks.

The database contains a form for entering variable data (traffic frequency, meteorological conditions, water levels, ionizing radiation, etc.) that are spatially displayed in a atlas of risks.

The risk atlas is a digitized risk assessment for the city of Skopje, with possible consequences for people, property and the environment.

2. DOCUMENTATION PLAN – ONLINE ARCHIVE

Review of digitized documents for civil protection: risk assessment, action plan, situation analysis, development program, guidelines, external plan, exercises for civil protection and reports from lessons learned.

The on-line archive will enable a quick search of the information, through the use of keywords or terms in an overview format.

The review of digitized civil protection documents through the on-line archive must allow for quick searching using keywords and/or terms in a review format. Since it is not entirely possible to collect and transfer data to COMMAND d through existing systems, only usable data will be used according to the capabilities of each partner, while for the future COMMAND d will create a new database based on real events that will happen in the future.

1. SYMBOLOGY OF THE COMMAND DATA SYSTEM

The symbols displayed on the map are divided into static and dynamic. Static symbols show objects in space that do not change their coordinates during certain events..

Articles symbols represent objects in space

- infrastructural-static,
- situational-static,
- symbols of potential sources of risks, for the occurrence of major accidents and catastrophes,

Dynamic symbols are those that change in scale with changes in situations in a certain space, and their purpose is easier monitoring of the development of the situation and better planning and operational action. We can divide the dynamic symbols into:

- GPS dynamic symbols (for example showing the locations of people, objects, vehicles and drones in space),
- situational-dynamic symbols (for example showing the development of a situation/threat in space) or critical infrastructure damage locations (eg road damage location or embankment burst site).

2. MANAGEMENT OF THE COMMAND DATA SYSTEM

The City of Skopje as potential (administrator) is responsible for the management of the database and coordinates the filling and updating of the database with authorized representatives of the operational forces (administrators for entering and reviewing their data).

The system must enable searching for the entered data and enable the creation of reports (textual and cartographic).

The system has the following capabilities:

- Must be a web designed application and with a local data display interface
- an elaborate way to access and manage data in relation to the organizations and bodies that will use the system
- the system must have an interface for administration and data display
- create objects and their attributes for each class (data type) without the need to change the structure of the database itself
- the search can locate an object as an individual object or as an integral part of another object or as a whole
- the communication between the application and the map (objects from the database must be able to be displayed on the map), overview of entered objects on the map and overview of objects individually and collectively
- preparing reports for existing facilities using spatial data for facilities (statistical data)
- entering values for each attribute of the connected object
- possibility of mass input and output of data (using MS Excel)
- the search must be enabled through text input or through a geographic map
- object search must be enabled using existing attributes for the associated object.

Important: The COMMAND DATA system concept will be upgraded over time with other capabilities, parts and will be networked with other systems and IT platforms that will be able to manage data and make decisions about decisions (eg DRAS, DesInventar Sendai, NICS, CoordCom etc.)

The administrator (City of Skopje) is expected to ensure the security and confidentiality of the database and has the authority to review and modify all data in order to correct errors.

The operational forces in the City of Skopje appoint authorized representatives (external users) to complete and update the database.

The city of Skopje is in charge of establishing, maintaining and upgrading the catalog of operational capabilities, and the information security advisor continuously assesses the security risks of using the database for the purposes of standardizing the implementation of measures in all areas of information security.

The application should be developed on an open source platform ie. using technologies that do not require a commercial license.

The documents that are expected as a result of creating a database are technical documentation and user manuals (administrator's manual and user's manual). The technical documentation and user manual should be ready when the database creation is complete.

3. EXPECTED RESULTS

Through the implementation of the project, it will be possible to use the data of IT tools as a basis for making decisions in the protection and rescue system in the City of Skopje. In accordance with the purpose and idea of the project, i.e. they will represent a basis for standardizing data for crisis communication in the use of threat information and the resulting consequences in the event of an elementary accident.

The project represents a basis for further development and standardization of IT tools in order to unify data from different communication systems, carriers of information sources. In addition, the project created a basis for further development and standardization of IT tools in order to unify data from different communication systems, carriers of information sources, that is, it will help in faster collection of information delivered to the operational center, in order to accurately and promptly monitor how basis for making decisions on handling and forwarding information.

The proposed mechanism for protection and rescue will enable a better connection of all phases required for protection: prevention, reduction of consequences, readiness for an appropriate response, as well as recovery, which are integrated into development plans and ensure the implementation of gradual measures for protection and rescue at local, national, regional and international level.

It enables multi-sectoral data processing, the possibility of real-time data analysis, while the standardization will speed up key data between all key actors of protection and rescue in the City of Skopje and at the level of R. of North Macedonia, with opportunities for coordination with the procedures of the Emergency Response Coordination Center of the European Commission. As part of a partnership approach in the project.

Through the implementation of this project, it is understood the use of information about the disasters and their consequences in real time, which in its entirety implies the existence of a functional and efficient command-operating system for protection and rescue, which realizes its effectiveness by making adequate decisions. Timely

activation of operative forces of the system for protection and rescue is also possible, as well as their coordinated and (coordinated) action within the framework of their competencies.

Contribution to the appropriate response through the mobilization of capacities, resources, equipment and leadership and command through a unified command and operational system for protection and defense in the region.

Through the realization of this project, prerequisites will be created for the command-operational system of the countries of the project partners, for building a system for the use of IT tools, which will enable interoperability both at the local and national, i.e. international level.

Therefore, the main result of this project is the use of information about the consequences in real time as a basis for decision-making and management in crisis situations with the realization of the following functionalities:

Management in crisis situations

The management in crisis situations in the Republic of North Macedonia is based on the Law on Crisis Management, on the basis of which a whole crisis management system has been developed. The implementation of the project results will create conditions for efficient assessment of the consequences of accidents and disasters in the territory of the City of Skopje, as well as making decisions for the implementation of operational activities based on real indicators.

Database in terms of human and material resources

Creation of a database for human and material resources for the area of the city of Skopje using unique bases and determining the obligation for continuous input and updating of data from users of the database.

Ability to connect communication systems

Through the project activities, it will be possible to create prerequisites for connection of the communication systems, of all entities that are the holders of information on protection and destruction. Including the following resources:

Procedures and protocols in using the communication system

Establishing uniform procedures and protocols for the exchange of data and information in real time, as well as defining the conditions for "access" to the communication system of an individual subject for protection and rescue and use of the necessary data.

Shortening the time of decision-making

Implementation of the results of the project will make it possible to shorten the time needed for making decisions of the Headquarters for Civil Protection of the City of Skopje with an indication of making decisions based on the current situation and the resulting consequences.

Flexibility in decision making

The implementation of the results of the project enables the continuous evaluation of the decisions made, i.e. their correction during the implementation of the activities and measures by the operational forces of the protection and rescue system based on real situations.

Training and practice

The connection of the communication systems of the entities for protection and rescue will create a prerequisite for continuous training and training of the users of the communication systems, the carriers of information.

Uniformity of use of symbols

The implementation of the project will define the use of the same symbols that are used for "static" ie "dynamic" display of human and material resources in real time by specifying their GPS location.

Exchange of information

The possibility of continuous exchange, that is, use of information and data from the communication systems of information carriers in the "early warning" phase (eg announcement of flood defense measures).

Coordination in the creation of the database

One of the significant results in the implementation of the project is the creation of a basis for the implementation of the coordination of the actions of the subjects of the communication systems of the information carriers, both in the phase of collection and in the phase of creation, that is, use of the database.

Standardization (uniformity) of databases

The realization of this project implies the creation of a basis for standardization, i.e. uniformity of the databases, which also implies the implementation of the necessary training of experts - system operators.

Interoperability of databases of individual communication systems

The realization of this project represents a well-established starting point for the formation of a database, with the use of appropriate bases for the presentation of human and material resources and with the use of unique symbols and the use of IT tools that enable the interoperability of communication systems of information carriers, such as in the regional, as well as in the national and international environment.

Strengthening of staff

The realization of this project will impose the need for the employment of experts - system operators in all entities for protection and rescue that form the above databases.

System improvement

The realization of this project creates basic prerequisites for continuous monitoring of the efficiency and simplicity of its use, and thus the detection and removal of shortcomings both in relation to the used IT tools and in relation to the procedures of collection and creation (formation) of the database.

Preparations for using the system

The basis for successful use of the system is based on continuous training and training of system operators at all levels of database creation.

Using procedures

The implementation of the results of this project implies the appropriate use of the database in accordance with the established procedures in the city of Skopje regarding the assessment of the consequences and the adoption of Decisions for the implementation of the measures and activities.

Database connection

Implementation of the request from this project for connection or interoperability with the compensation system both nationally and internationally of the Civil Protection Mechanism of the European Union.

In accordance with the mentioned functionalities, the main result of the project is the creation of an IT tool that will enable the use of data in real time from different sources, that is, which will be the basis for effective analysis of data from different sources. In this way, it will be possible to carry out an analysis in real time, while speeding up the procedures for the exchange of key data important for effective management in crisis situations in the city of Skopje.

Also, the implementation of the results of this project primarily refers to the standardization of IT tools, which will create the prerequisites for connecting to the early warning system, which will be supported by appropriate GIS tools in order to predict and simulate the possible risk, i.e. assessment of further endangerment in the city of Skopje, while at the same time complying with ERCC procedures and procedures

It should also be noted that the aforementioned IT tool will include real-time analysis, accelerate the exchange of key data between all project partners in the region through the standardization process and at the same time be linked to early warning systems supported by GIS tools and as such enable predictions and simulations, that is, it will be compliant with UCPM procedures.

It is planned to deliver information in real time for the COOMMAND d data system from the following institutions:

- Operation center 112
- Regional crisis management center 195
- Administration for hydro meteorological affairs

- Automotive Union of Macedonia
- EVN (data on interruption of electricity power)
- PE "Water supply and sewerage" - (data on interruption and field work for water supply).

The connection is expected to be carried out in the coming period in accordance with the positive legal norms of the Republic of North Macedonia.

Table 1. Overview of data on IT platforms

