

ORGANIZATION OF A MOBILE EMERGENCY MANAGEMENT CENTER

Serghei Peancovschii¹

Abstract: This article covers the problem issues of the organization of a mobile emergency management center of the Main Inspectorate of Emergency Situations of the Republic of Moldova. The key objectives assigned to the Situational Center have been determined, as well as the peculiarities of the developing organizational structure of the information interoperability of the Center's employees, providing the composition of subsystems and the directions aimed at enhancing efficiency.

Key words: situational centers, Mobile Emergency Management Center, the unique liaison protocol, the main scenarios of emergencies, effective solutions.

JEL: JEL H56 D81 C23 C41 M15.

Introduction

In today's technologically developing world and constantly changing natural processes, there is an increase in accidents and disasters that take human lives, lead to irreversible changes in the ecological balance, changes in the economy and politics in the affected territories. The state is engaged in emergency monitoring; invests huge financial and material resources for the construction and maintenance of a complex of specialized state institutions that, in accordance with the law, perform tasks in the field of protecting the population, territory, environment and property in case of danger or emergency.

¹ General Inspectorate of Emergency Situations of the Republic of Moldova
Free International University of Moldova, an_stern@hotmail.com.

History reference

The first reference to the issues of the population protection against various natural disasters as well as civilian and state property dates from the year 1834, where the head of the city ordered the construction of a fire station in Chisinau. As early as 1907 there were five brigades and one voluntary society already functioning in Bessarabia, in which 435 employees worked.

Further, various structural changes occurred depending on the understanding and perception of technological progress, which is ongoing. The latest changes in the structure of specialized state institutions in the field of civil protection were made in February 2019. The new structure is established by the maximum number of the general inspector for emergency situations in the amount of 2,467 units, including 2,395 state employees with special status, 7 civil servants and 65 employees of the staff working on the basis of provision.

This is the last organizational and operational structure, which has incorporated and grouped the units together in the three fundamental directions:

Prevention - the union combining of all departments that carry out prevention and analysis of all regulatory documents;

Intervention - combining all Response Forces including:

Divisions = 10: (Emergency Situation Division) ESD Chişinău municipality, ESD Bălţi municipality, ESD Cahul, ESD Căuşeni, ESD Edineţ, ESD Hînceşti, ESD Orhei, ESD Soroca, ESD Ungheni, ESD Autonomous Territorial Unit of Gagauzia;

Services = 25: SSE Anenii Noi, SSE Basarabeasca, SSE Briceni, SSE Cantemir, SSE Călăraşi, SSE Cimişlia, SSE Criuleni, SSE Donduşeni, SSE Drochia, SSE Dubăsari, SSE Făleşti, SSE Floreşti, SSE Glodeni, SSE Ialoveni, SSE Leova, SSE Nisporeni, SSE Ocnita, SSE Rezina, SSE Rîşcani, SSE Sîngerei, SSE Străşeni, SSE Şoldăneşti, SSE Ştefan Vodă, SSE Taraclia, SSE Teleneşti;

Territorial Search and Rescue Units =2: TSRU 1, TSRU 2

Training Republican Centre = 1: TRC;

ORGANIZATION OF A MOBILE EMERGENCY MANAGEMENT CENTER

Support and logistical support - combining all support units. Strategic plans and material reserves, logistics, finance, lawyers, public relations, international cooperation, internal audit, workflow, etc.

Figure 1 below shows the organigram of the General Inspectorate for Emergency Situations. The author has taken an active part in the development of this organigram.

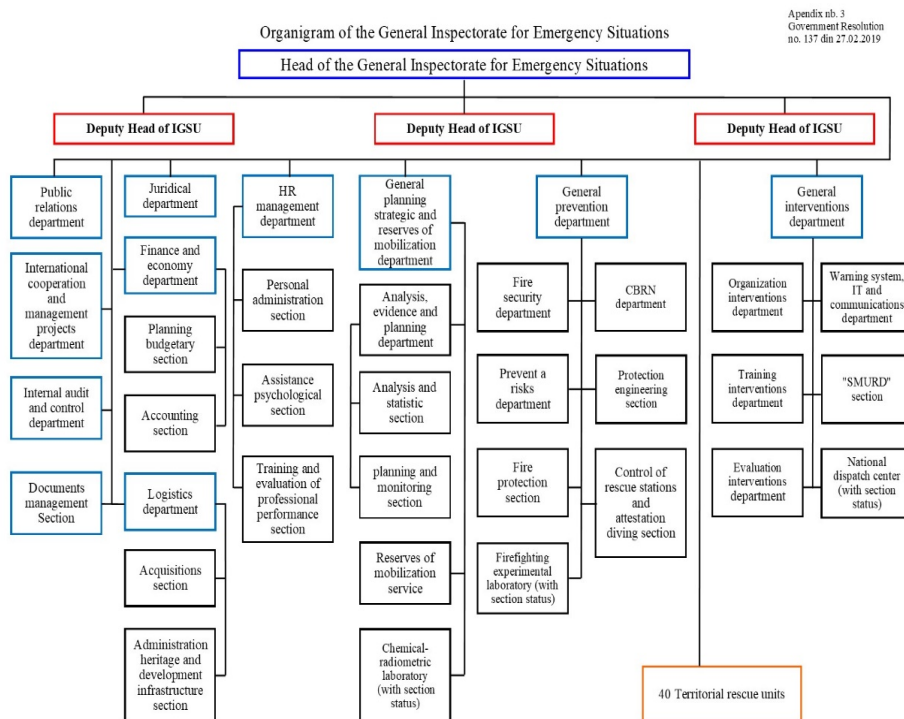


Figure 1. The organization of the General Inspectorate for Emergency Situations of the Republic of Moldova

General Data

Acceleration in the rate of information and communications technologies development ensures a considerable reduction in the time of decision-making, which is especially crucial when making decisions in crises and emergency situations. One of the main tools of quality improvement and efficiency in the management of the General Inspectorate for Emergency Situations of the Republic of Moldova is the National Emergency Operation Centre (NEOC), established in 2014, whose main task is gathering and processing the incoming information about emergency situations thus allowing to estimate the current situation, model and forecast the scenarios, elaborate a set of measures to prevent the effects without waiting for crisis situations. Structurally, the Center is divided into 3 main parts:

1. Emergency dispatcher center, aiming to receive and handle the incoming calls, dispatching forces and facilities.
2. National emergency coordination center, while working together in a crisis cell can monitor, forecast and model all kinds of possible scenarios.
3. National Commission for emergency situations meeting room, where the Ministers, under the chairmanship of the Prime minister, make the final decision about the liquidation of emergency situations. The Commission for emergency situations of the Republic of Moldova, establishes the 27-people commission as composed of:
 - government officials: 2,
 - members from 9 ministries: 13,
 - independent institutions: 12.

Picture 2 represents the Framework of the Emergency Situations Management System in the Republic of Moldova.

In the process of liquidation of Emergency Situations (ES) and their effects there take part different ministries, having their own dispatching centers, the main task of which is monitoring. An important objective in an emergency situation is to ensure the exchange of gathered and processed data. As a rule, the exchange is carried out by means of phone calls, fax, SMS and e-mail. Lately, such messengers as Viber, WhatsApp and Telegram are used. The picture shows the diagram of interrelation among the main dispatching services, subordinated to different state structures, which are to exchange the information with, in the case of emergency situations emerged.

ORGANIZATION OF A MOBILE EMERGENCY MANAGEMENT CENTER

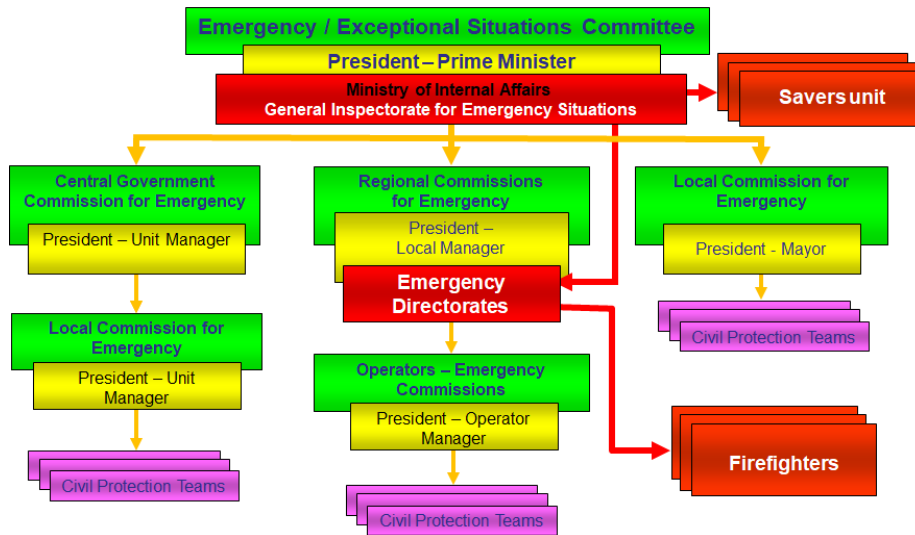


Figure 2. Framework of the Emergency Situations Management System in the Republic of Moldova

At present, the following emergency operational services function independently, throughout the Republic of Moldova: fire brigades, police, emergency medical assistance, gas leak emergency units and other analogical organizations, each having a different telephone numbers. In addition, all these services are based on different organization principles; they lack high-tech information processing platforms. Moreover, they have limited caller ID and reverse connection. All these factors lead to confusing situations and time loss in emergency situations, making it difficult to obtain a fast and safe response to a crisis.

Starting on July 1st 2018, the dispatching offices of such subunits as fire brigades, police and emergency medical assistance began to work on the basis of the single platform 112.

According to the current legislation, the classification of emergency situations is made taking into consideration the following

1. Technogenic emergency situations
 - 1.1. Transportation accidents (disasters):

- 1.2. Fires, explosions, explosion hazards:
- 1.3. Failures with danger of emission of hazardous chemical substances:
- 1.4. Exceeding the maximum allowable concentration of hazardous substances in the environment:
- 1.5. Failures with (emission) danger of emission of radioactive substances:
- 1.6. Sudden collapsing of buildings and constructions:
- 1.7. Electrical and power systems accidents/failures:
- 1.8. Accidents involving common life support systems:
- 1.9. System failure of the contact and electronic communications:
- 1.10. Accidents in the treatment plants:
- 1.11. Hydrodynamic accidents:
- 1.12. Cosmic emergency situations:
- 2. Natural Emergency Situations
 - 2.1. Dangerous geophysical phenomena: earthquakes.
 - 2.2. Dangerous geological phenomena:
 - 2.3. Dangerous meteorological and agro-meteorological phenomena:
 - 2.4. Dangerous hydrological phenomena:
 - 2.5. Dangerous hydrological phenomena:
 - 2.6. Nature fires:
 - 2.7. Emergency situations following the change in ground morphology (soil, landscape, underground):
 - 2.8. Emergency situations due to change in atmosphere composition and features:
 - 2.9. Emergency situations due to the change in hydrosphere:
 - 2.10. Emergency situations due to the change in biosphere:
- 3. Emergency situations with a biological and social feature
 - 3.1. Human contagious diseases:
 - 3.2. Human poisoning:
 - 3.3. Contagious diseases of farm animals:
 - 3.4. Mass poisoning of farm animals:
 - 3.5. Mass extinction of wild animals:
 - 3.6. Field crops with pest infestation and diseases:

ORGANIZATION OF A MOBILE EMERGENCY MANAGEMENT CENTER

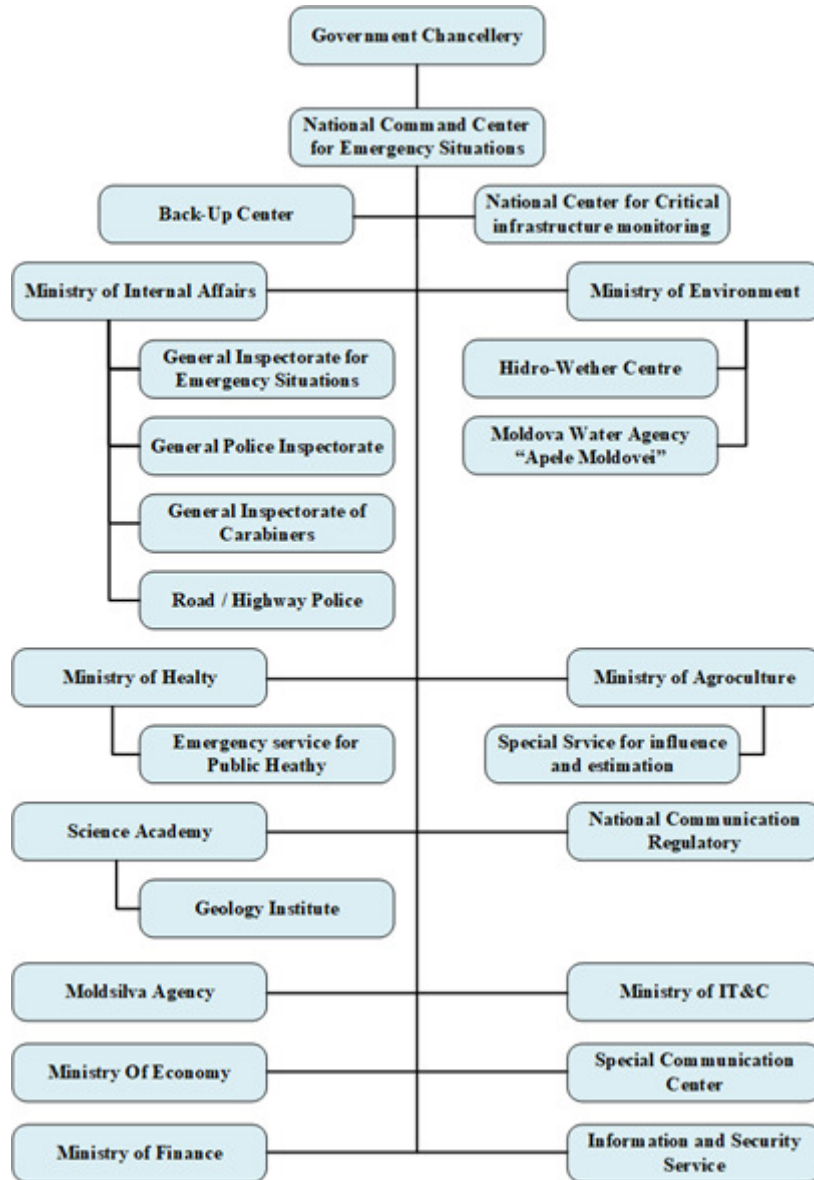


Figure 3. Informational flow concept in emergency case

Civil Protection conceived in this way, beside its traditional focus on disaster preparedness and response, can stimulate the engagement of governments to address appropriate disaster risk reduction policies. This can include the participation of Civil Protection sectors in National Platforms for disaster risk reduction (The Structure, Role and Mandate of Civil Protection in Disaster Risk Reduction for South Eastern Europe, 2008). The Civil Protection structures of each European country demonstrate differences in the organization of civil protection, including the level of preparedness and ability to effectively monitor hazards and evaluate potential vulnerabilities. The nature of the risks each country faces, from both natural and technological hazards, and Civil Protection procedures at a legislative and administrative level (national, regional and municipal), including an assessment of early-warning systems and disaster management capacities. When forming the Mobile Emergency Management Centre special attention should be paid to procedures and technologies employed in trans-border Hazard.

The goal of the present work is the research of possibilities to enhance the efficiency of prevention and liquidation of emergency situations in the Republic of Moldova by means of elaborating a system of information and analysis of ES with the allocation of multifunctional Mobile Emergency Management Center.

The main purpose of this system and Mobile Emergency Management Center consists in preparation of management decisions through acceleration of prevention, liquidation and analysis of emergency situations, as well as minimizing loss of life and economic losses due to emergency situations. The standard list of actions included in the management process embraces:

- determination of management objective;
- assessment of the situation and the initial state in which the control object is located;
- forecasting the development of the situation;
- identification and evaluation of the sequence of actions that collectively are supposed to lead to the achievement of the management goal;

ORGANIZATION OF A MOBILE EMERGENCY MANAGEMENT CENTER

- adoption of the most rational sequence of actions as a management decision.

As a result of the work of this mobile center, the central authority receives data characterizing the operational situation in a particular emergency. The mobile center is a source of operational information, a local point of management and logistics, which is located directly near the emergency development zones.

The Situational Center represents a combination of hardware, software and organizational solutions, which embraces:

- hardware, including a set of workstations, servers, interactive media, data protection;
- telecommunication support (global and local networks, communication channels);
- information support (standards, regulations, methods, normative documents, information sources, data flow, which are processed in the Situational Center;
- software support of management decision-making ((information gathering and storage systems, structuring and processing, analysis and forecast, preparation for visualization, information security software).

The main purpose of the Situational Center is to enhance the efficiency and quality of management decisions, prevention and elimination of crisis and emergency situations. The Situational Center is to ensure information and analytical support of procedures and processes allowing to promptly analyze, model and forecast the possible scenarios and promptly develop efficient solutions.

The Situational Center "General inspectorate for emergency situations of the Republic of Moldova" was created to solve the following tasks:

- strategic planning and control, monitoring, analysis and forecasting of the situation in the socio-political, socio-economic and information spheres, in the field of integrated security, including issues of counter-terrorism, state and public security, upon incurrence of emergency (crisis) situations;
- planning and control of socio-economic and spatial development, integrated security, development of industries, agriculture, trade, science

and education, budget planning, as well as evaluation of public opinion (population, groups of citizens, expert community) on topical issues of the state and society development.

I. Literature Overview

Many publications are devoted to the study of emergency management problems. There is a type of tasks connected with the improvement of decision-making processes, information support, communications, special software, etc. Let us consider the main ones:

The project (Steiner and Andriciu, 2009) considers the main threats as a source of emergency situations typical for our region. It is worth noting the proposed classifier of threats, as well as a detailed consideration of the problems of risk and vulnerability management, the identification of the main threats and risks, possible measures to reduce risks and dangers.

Mobile Center of Excellence (Mobile Center of Excellence: An Enterprise Playbook, 2014) – the basis of the concept of Mobile Center of Excellence is suggested as an efficient way of creation and implementation of the centralized mobility of objects strategy. The present approach seeks to solve a number of problems, including such as the effective creation of scenarios within the model; the avoidance of duplication of costs; effective lifecycle management etc. The road map of mobility includes identifying drivers, obtaining budget funding and developing a mobile strategy, setting the system management, Mobile Innovation Management, Mobile Solutions Management, Mobile Governance Management and Mobile Partner Management (Romano, Onorati, Aedo and Diaz, 2016).

The approach based on social software is of great practical importance for crisis situations management (Reuter, Marx and Pipek, 2012) (Wikis= General Wikis+Specialized Wikis; Blogs=Blogs/Weblogs+Microblog; Social Networks=General Social Networks; Social Sharing/collaborative key wording systems-Social Bookmarking+Content Provider).

A good and effective example of the interoperation of services of the confrontation of emergency situations and risk management at the regional and international levels is the interaction of the specialized services of the

ORGANIZATION OF A MOBILE EMERGENCY MANAGEMENT CENTER

two nearby regions of Romania (the Timus region) and Serbia (the Banat region) (Studiu de specialitate din domeniul managementului situațiilor de risc în regiunea transfrontalieră româno - sârbă (județul Timiș, România și districtul Banatul Central, Serbia)).

An important feature of modern information systems is the use of mobile technologies (Scheepers and Scheepers, 2004). Their composition is constantly complemented by new devices that have new properties, which requires constant review of information security requirements.

One of the actual problems of the information systems functioning in general, and mobile situation centers in particular, is the problem of information security that is provided. First of all, this problem requires the development of a classifier of security threats and its specification, information security policy and a complex of organizational measures on confrontation attempts upon organizing unauthorized access to information and software.

The starting point in the implementation of this process can be the work on the identification of risk, the introduction of information security standards, etc. (Dreyer et al., 2018; Kazarin, Sharyapov and Yashchenko, 2018). The following serve as main factors of classification of threats to information security: the level of danger of the effects of the threat; the purposes and motivation of the sources of threats; the threat carrier; signs of manifestation of the threat; mechanisms and tools for the implementation of threats.

I. Research methodology

The methodology of this study combines many scientific approaches. This is based on a set of economic and mathematical models that are used to optimize its activities. In addition, a single management cyclic data analysis is used, which allows you to get various analytical data and use various forms of information (graphical, textual and sound).

Nowadays the actual problem for the General Inspectorate for Emergency Situations of the Republic of Moldova is the introduction and improvement of information and communication technologies, which ensure:

- quick access to professional and reference information;
- processing large amounts of information;
- timely response to the situation changes;
- forecasting the development of the situation;
- analysis of the experience accumulated, etc.

All these are supposed to be directly related to the geographical, seismic, technological and social features of the objects.

The situation center of the General Inspectorate for Emergency Situations of the Republic of Moldova has the following objectives:

- gathering information from many different sources (video observation, telemetering, Internet and media analysis, dispatching information systems etc.);

- operational analysis of information (identification of significant events (incidents), their grouping in cascades corresponding to emergency situations);

- notification of operators and responsible persons about incidents;

- support of decision making – modeling of emergency situations scenarios, evaluation of their possible effects, providing options to decision makers;

- planning and control of implementation of measures upon emergency situations liquidation;

- retrospective analysis of incidents and actions to eliminate them;

planning, on this basis, of measures aimed at improving emergency situation preparedness.

The task of ensuring security itself can be divided into two: notification of a disaster; organization of an emergency rescue operation. In practice, the management process has been worked out, which is a sequence of targeted actions included in the management, the implementation of which leads to the achievement of the ultimate goal of management as a whole.

In evaluating the chosen decision, the main role is played by determining the forces and facilities necessary for the implementation of the solution, the financial costs, the allocation of resources, etc.

The basis of the work, carried out on the designing of the Mobile Emergency Management Centre, is the technology of decision-making in

ORGANIZATION OF A MOBILE EMERGENCY MANAGEMENT CENTER

crisis situations, which can be marked as organizational and information technologies having a number of common characteristics: they are aimed at increasing the amount of information on the problem; they allow to get specific information that is missing at the moment, from the point of view of the person making the decision; they generate alternative variants of solutions that can be compared; they allow you to work in crisis situations, becoming a kind of anti-crisis tools; they combine the efforts of entire teams, creating an appropriate synergetic effect.

The Mobile Emergency Management Centre development project is based on the following components:

1. Key clients: State specialized services 112, 901, 902 and 903.
2. Information providers: Agency of Financial Relations of the Republic of Moldova (Agentia Relatii Funciare si Cadastru a Republicii Moldova); dispatching services.
3. Input data: GSM operators (information about the phone number and its geolocation); information about the caller – the address and description of the initial situation).
4. Output data: the geolocation map of the caller; information about the location of the nearest cars; interview content and questions for the operator; dispatcher response plan; response reports.
5. Users: service operators 112; emergency dispatchers.

II. Obtained results

The main result of this paper is to consider the formulation of the main tasks of the decision-making technology of the Mobile Emergency Management Center.

The scientific task associated with the development of effective methods, algorithms and programs for conducting a predictive study of the process of functioning of emergency situations management system is of a considerable interest.

Among the many subtasks that, according to the authors, should be addressed within the Mobile Emergency Management Center, we highlight the following:

- Mobilization plan resources production optimization;
- Optimal distribution of mobilization resources production plan;
- Choice of an optimal technology of mobile resources production.

The solution of these subtasks will allow to formulate a list of main activities, a sequence of emergency situations management rules and to determine the list of necessary resources (Ohrimenco and Borta, 2019).

Thus, while developing an optimal plan of mobilization resources production a multicriterial extreme problem appears, timely and precise solution of which is possible, based on economic-mathematical methods and building appropriate models.

In order to optimize mobilization resources, we will build a mathematical model, considering the following limitations:

- A need for products(services);
- A limit of deficit material resources in every category;
- Production plan projects;
- Planned production capacities considering planned introduction of any new ones.

The following will be used as optimum criteria:

- Minimal expenses in production;
- Maximal product output;
- Maximum benefit from production.

In the outcome of problem solution, an optimal plan is produced, satisfying the requirements for production and nomenclature, based on required deficit material resources, available production capacities, corresponding to the goal function extreme value.

In order to build a mathematical model, the following symbols will be used:

- n - the number of good types to be produced;
- i - good type index $1 \leq i \leq n$;
- m - the amount material resource types to be allocated;
- j - resource type index $1 \leq j \leq n$;

ORGANIZATION OF A MOBILE EMERGENCY MANAGEMENT CENTER

l - the number of used production resources (equipment, space, etc.);

k - used production resource index, $1 \leq k \leq l$

π_i - i -type good production lower limit;

Π_i - i -type good production upper limit;

R_j - j -type material resource limit;

r_{ji} - j -type material resource amount required in order to produce a unit of i -type good;

Φ_k - k -type production resource calculated fund;

a_{ki} - k -type production resource progressive norm for an i -type good type;

S_i - i -type good type planned expenses;

C_i - i -type good type effective price;

X_i - i -type good type amount in an optimal plan.

In the abovementioned symbols, the mathematical model may be formulated as follows:

Find the set of unknown $x_i, i = \overline{1, n}$, satisfying the following limit system:

$$\pi_i \leq x_i \leq \Pi_i, i = \overline{1, n} \quad (1)$$

$$\sum_{i=1}^n r_{ji} x_i \leq R_j, j = \overline{1, m} \quad (2)$$

$$\sum_{i=1}^n a_{ki} x_i \leq \Phi_k, k = \overline{1, l} \quad (3)$$

According to which the function

$$F_1 = \sum_{i=1}^n S_i x_i \quad (4)$$

will assume its minimal value, while the functions

$$F_2 = \sum_{i=1}^n (C_i - S_i) x_i \quad (5)$$

will assume its maximum value.

After the linear programming problem is solved, an optimal plan can be singled out or a compromise proposed.

The tasks set can be solved on the basis of the application of decision theory, graph theory, methods of discrete mathematics, system analysis, expert analysis, etc.

The considered mathematical model and algorithms will be the basis for the activities of the mobile center in making operational strategic decisions.

III. Further research

Recognizing the need for further development of work to improve the Mobile Emergency Management Center, we consider it necessary to focus on the elaboration of the following important issues.

First, the construction of an information security system tailored to the specificity of the Mobile Emergency Management Center in accordance with the requirements of the ISO 27000 family standard.

An important role in ensuring information security is played by the development and implementation of information security policy. This document allows us to define priorities at the conceptual level in the field of information security and outline the main ways to ensure it.

To achieve this goal, it is necessary to solve certain tasks: identifying requirements that must be taken into account when creating a policy; analysis of the main stages of its construction; study of the main content of the sections constituting the information security policy.

When developing information security policy, a number of requirements should be taken into account. The requirement of legality implies that the security policy, which is implemented, must comply with the existing regulatory framework.

This applies not only to national legislation, but also to international standards adopted and approved at state level, internal regulatory documents or contracts concluded with third parties and third-party organizations.

The requirement of personal responsibility implies that a responsible person must be appointed — an employee who will be responsible for the security policy throughout its life cycle, i.e., when planning a policy, monitoring its implementation, reviewing, updating, etc.

ORGANIZATION OF A MOBILE EMERGENCY MANAGEMENT CENTER

The requirement of relevance means that the security policy must conform to the ever-changing realities of the General Inspectorate for Emergency Situations, and be updated and revised in accordance with them.

The process of ensuring information security is associated with continuous activity, and not with the development of a specific set of measures and activities. When planning the information security policy, it is necessary to take into account the possibility of the emergence of new threats to the protected information and, in this connection, envisage amending the provisions of the document in question.

The requirement to control information security policy means that the policy should be subjected to an independent external audit to confirm its effectiveness, correctness and compliance with the standards and requirements of regulatory documents.

In the capacity of promising developments, we can also underline the following: digital transformation of management processes; digital ecosystem design; designing the form and content of a digital passport of objects; development of digital objects using the 3D “twin” technology; creation of industrial Internet networks, etc.

We consider one of the promising areas of the activity to be working not with specific physical objects, but with their digital copy. The talk is about the processes of creating, analyzing and managing the so-called digital counterparts. It is these processes that will ultimately reduce the risks and costs while working with real physical assets.

We consider it possible to note the need for an “independent” interaction of the digital twin with the physical “original” and vice versa (Analytic Engine for the Digital Power Plant. GE Digital Twin, 2016; Parrott and Warshaw, 2017). The physical “original” must transfer data about itself to the digital counterpart, which carries out data analysis. In the data stream, deviations are identified according to certain indicators, models, and transferred to the situational center for decision-making.

The technologies being the basis of the Mobile Emergency Management Center should be focused on the processing of several types of unstructured data, including standard format documents, social network data, and audio and video files. Accordingly, the developed special software is designed to provide current benefits in the form of:

- the possibility of building a flexible solution for a set of specific tasks;
- improve the reliability and safety of the system functioning;
- minimizing the risks associated with the use of proprietary software;
- open source codes and independence from system developers;
- lack of license fees in free versions.

The further work should be aimed at development of supporting the Mobile Emergency Management Center subsystems, in particular: expansion of the infrastructure of management objects; development of integrated communication and data transmission network (fixed-line network, radio-mobile network); improving the efficiency of the automated system of interdepartmental information interaction (information and navigation system and warning system); monitoring systems of potentially hazardous objects and territories and information security system.

Conclusion

The considered issues of the design and operation of the Mobile Control Centers are far from exhausting the diversity of the problems of transforming the management processes of the General Inspectorate for Emergency Situations. Solving these problems requires, above all, awareness of the relevance of digitalization issues, the development of selection plans and the introduction of new technologies for collecting, processing and storing unstructured information for preparing emergency situations management solutions.

Thus, the paper proposes an approach used for the design and operation of the Mobile Emergency Management Center for the General Inspectorate for Emergency Situations of the Ministry of Internal Affairs of the Republic of Moldova in order to improve the safety of the population's life and infrastructure.

The main tasks solved by the Mobile Emergency Management Center and the areas of application of information and communication

ORGANIZATION OF A MOBILE EMERGENCY MANAGEMENT CENTER

technologies are identified. They will allow to quickly obtain the necessary information and reduce irretrievable population losses in emergency situations, road traffic accidents, fires and accidents, and reduce the costs of emergency situations response.

The General Inspectorate for Emergency Situations of the Republic of Moldova expects from the activities of the mobile center relevant and detailed information on the state of development of the emergency in the affected area, the condition of the analyzed object, the necessary volume of rescue operations and requested resources.

The creation and operation of a mobile center will provide a reduction in time for making managerial decisions, as well as increase the efficiency of government bodies.

A separate urgent problem is determining the effectiveness of the mobile center, and this problem requires a separate study.

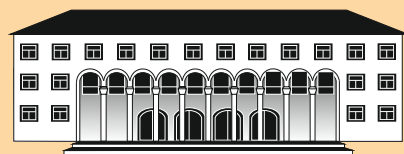
References

- Analytic Engine for the Digital Power Plant. GE Digital Twin. (2016). (https://www.ge.com/digital/sites/default/files/download_assets/Digital-Twin-for-the-digital-power-plant-.pdf)
- Dreyer et al. (2018). Estimating the Global Cost of Cyber Risk Methodology and Examples. (www.rand.org/t/RR2299)
- The Structure, Role and Mandate of Civil Protection in Disaster Risk Reduction for South Eastern Europe. Report. (2008). (https://www.unisdr.org/files/9346_Europe.pdf)
- Kazarin, Sharyapov and Yashchenko. (2018). Multifactorial classification of threats to information security of cyber-physical systems. RSUH/RGGU Bulletin. *“Information Science. Information Security. Mathematics”*.
- Mobile Center of Excellence: An Enterprise Playbook. Cognizant Reports. (2014). (<https://www.cognizant.com/InsightsWhitepapers/Mobile-Center-of-Excellence-An-Enterprise-Playbook.pdf>)

- Ohrimenco and Borta. (2019). *Optimizing Mobilization Resources in Case of a Disaster*.
- Parrott and Warshaw. (2017). *Industry 4.0 and the Digital Twin*.
Manufacturing meets its match.
(<https://www2.deloitte.com/insights/us/en/focus/industry-4-0/digital-twin-technology-smart-factory.html>)
- Romano, Onorati, Aedo and Diaz .(2016). *Designing Mobile Applications for Emergency Response: Citizens Acting as Human Sensors*.
- Reuter, Marx and Pipek. (2012). Crisis Management 2.0: Towards a Systematization of Social Software Use in Crisis Situations.
International Journal of Information Systems for Crisis Response and Management.
- Steiner and Andriciu. (2009). MANAGEMENTUL SITUAȚIILOR DE URGENȚĂ CREATE DE DEZASTRE.
(<https://www.academia.edu/34034085/30>).
- Studiu de specialitate din domeniul managementului situațiilor de risc în regiunea transfrontalieră româno - sârbă (județul Timiș, România și districtul Banatul Central, Serbia).
(<https://tm.prefectura.mai.gov.ro/wp-content/uploads/sites/22/2017/12/situatii-de-urgenta-situatii-de-risc.pdf>)
- Scheepers and Scheepers. (2004). Implementation of Mobile Technology in Organizations: Expanding Individual Use Contexts".
(<http://aisel.aisnet.org/icis2004/14>)

ISSN 0861 - 6604

BUSINESS management



3/2020

PUBLISHED BY
D. A. TSENOV ACADEMY
OF ECONOMICS - SVISHTOV

BUSINESS management 3/2020

Editorial board:

Krasimir Shishmanov – editor in chief, Tsenov Academy of Economics, Svishtov Bulgaria

Nikola Yankov – Co-editor in chief, Tsenov Academy of Economics, Svishtov Bulgaria

Ivan Marchevski, Tsenov Academy of Economics, Svishtov Bulgaria

Irena Emilova, Tsenov Academy of Economics, Svishtov Bulgaria

Lubcho Varamezov, Tsenov Academy of Economics, Svishtov Bulgaria

Rumen Erusalimov, Tsenov Academy of Economics, Svishtov Bulgaria

Silviya Kostova, Tsenov Academy of Economics, Svishtov Bulgaria

International editorial board

Alexandru Nedelea – Stefan cel Mare University of Suceava, Romania

Dmitry Vladimirovich Chistov - Financial University under the Government of the Russian Federation, Moscow, Russia

Ioana Panagoret - Valahia University of Targoviste, Alexandria, Romania

Jan Tadeusz Duda – AGH, Krakow, Poland

Mohsen Mahmoud El Batran – Cairo University, Cairo, Egypt

Nataliya Borisovna Golovanova - Technological University Moscow , Moscow Russia

Tadija Djukic – University of Nish, Nish, Serbia

Tatiana Viktorovna Orehova – *Donetsk National University*, Ukraine

Yoto Yotov - Drexel University, Philadelphia, USA

Viktor Chuzhykov - Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine

Proofreader – Anka Taneva

English translation – senior lecturer Zvetana Shenkova, senior lecturer

Daniela Stoilova, senior lecturer Ivanka Borisova

Russian translation - senior lecturer Irina Ivanova

Technical secretary – Assist. Prof. Zhivka Tananeeva

Submitted for publishing on 16.09.2020, published on 25.06.2020,
format 70x100/16, total print 40

© D. A. Tsenov Academy of Economics, Svishtov,

2 Emanuil Chakarov Str, telephone number: +359 631 66298

© Tsenov Academic Publishing House, Svishtov, 24 Gradevo str.

BUSINESS
management

D. A. Tsenov Academy
of Economics, Svishtov

Year XXX * Book 3, 2020

CONTENTS

MANAGEMENT practice

R&D DISCLOSURES AS PART OF THE FINANCIAL STATEMENTS OF BULGARIAN INNOVATIVE COMPANIES Assoc. Prof. Daniela Ventsislavova Georgieva, PhD	5
A VISION ABOUT THE CORRELATION RECONTINENTALISATION- INTEGRAL CONNECTIVITY OF THE EUROPEAN UNION Prof. Nikola Yankov, PhD	18
THE EFFECT OF SOME BANK INDICATORS UPON THE GDP, THE UNEMPLOYMENT RATE AND FOREIGN DIRECT INVESTMENT IN BULGARIA Head Assist. Prof. Aglika Kaneva, PhD	34
CREATION OF A MECHANISM FOR THE IMPLEMENTATION OF GREEN PURCHASES IN THE PUBLIC SECTOR: UKRAINIAN EXPERIENCE Viktoriiia Psota	57
ORGANIZATION OF A MOBILE EMERGENCY MANAGEMENT CENTER Serghei Peancovschii	71