



**BABEŞ – BOLYAI UNIVERSITY, CLUJ – NAPOCA
FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION**

**SUMMARY OF THE DOCTORAL
THESIS**

**THE MANAGEMENT AND
LOGISTICS OF EMERGENCIES AND
PROFESSIONAL EMERGENCY
SERVICES**

**Scientific Coordinator:
Prof.univ. LIVIU ILIEŞ, PhD**

**PhD Student:
IOAN BAŞ**

**CLUJ – NAPOCA
2010**

TABLE OF CONTENTS - ABSTRACT

TABLE OF CONTENTS-THESIS.....	2
KEY WORDS.....	5
INTRODUCTION.....	6
MANAGEMENT METHODS AND TECHNIQUES - SPECIFIC PARTICULARITIES IN CASE OF PROFESSIONAL EMERGENCY SERVICES.....	8
THE INITIAL AND CONTINUOUS TRAINING OF PERSONNEL.....	11
THE IMPLEMENTATION OF AN INTERNAL SYSTEM FOR DECISIONAL SUPPORT BY INSPECTORATE FOR EMERGENCY SITUATIONS OF BIHOR COUNTY.CASE STUDY.....	13
COUNTY SYSTEM OF RECORDING AND PLANNING OF THE RESOURCES OF THE NATIONAL ECONOMY, FOR EMERGENCY SITUATIONS.....	17
SUGGESTIONS TO IMPROVE THE PLANNING PROCESS OF THE RESOURCES USED FOR EMERGENCIES MANAGEMENT.....	20
SUGESTIONS FOR THE IMPROVEMENT OF SUPPORT FUNCTIONS ASSIGNEMENT.....	23
INCIDENT COMMAND SYSTEM, COMPONENT OF THE EMERGENCIES MANAGEMENT. CASE STUDY.....	25
CASE STUDY - DECISION SUPPORT SYSTEM FOR EVACUATION OPERATIONS IN CASE OF EMERGENCIES.....	27
DESCRIPTION OF THE INFORMATIONAL DECISION SUPPORT SYSTEM IN CASE OF EMERGENCIES.(SSD-SU).....	28
CONCLUSIONS AND PERSONAL CONTRIBUTIONS.....	31
SELECTIVE BIBLIOGRAPHY.....	36

TABLE OF CONTENTS-THESIS

CHAPTER I	
METHODS AND TECHNIQUES OF MANAGEMENT - PARTICULARITIES OF EMERGENCY SERVICES.....	13
1.1. THE ORGANIZATION MANAGEMENT SYSTEM. CONCEPTUALAPPROACHES.....	13
1.2. METHODS, TECHNIQUES AND TOOLS OF MANAGEMENT.....	18
1.2.1. <i>THE MANAGEMENT THROUGH OBJECTIVES.....</i>	<i>18</i>
1.2.2. <i>THE MANAGEMENT THROUGH BUDGETS.....</i>	<i>22</i>
1.2.3. <i>THE MANAGEMENT THROUGH PROJECTS.....</i>	<i>25</i>
1.2.4. <i>DIAGNOZE ANALYSIS.....</i>	<i>37</i>
1.2.5. <i>BOARD PANEL.....</i>	<i>39</i>
1.3. THE MANAGERS OF EMERGENCY SERVICES.....	43
CHAPTER II	
THE ROLE AND IMPORTANCE OF HUMAN RESOURCES WITHIN EMERGENCY SERVICES.....	49
2.1. THE ROLE OF HUMAN RESOURCES WITHIN EMERGENCY SERVICES.....	49
2.2. PLANNING, RECRUITMENT AND SELECTION OF HUMAN RESOURCES.....	55
2.2.1. <i>HUMAN RESOURCES PLANNING.....</i>	<i>55</i>
2.2.2. <i>HUMAN RESOURCES RECRUITMENT.....</i>	<i>58</i>
2.2.3. <i>HUMAN RESOURCES SELECTION.....</i>	<i>60</i>
2.3. THE MOTIVATION OF EMERGENCY SERVICES PERSONELL.....	63
2.3.1. <i>THE CONCEPT OF MOTIVATION. THEORIES ABOUT HUMAN RESOURCES MOTIVATION.....</i>	<i>63</i>
2.3.2. <i>MOTIVATION AND SATISFACTION IN WORK.....</i>	<i>71</i>
2.3.3. <i>INITIATION AND CONTINOUS PREPAREDNESS OFTHE PERSONELL AS MOTIVATING INSTRUMENT.....</i>	<i>74</i>
CHAPTER III	
LOGISTICS MANAGEMENT AND FINANCIAL MANAGEMENT- COMPONENTS OF THE EMERGENCIES SEVICIES MANAGEMENT.....	83
3.1. LOGISTICS MANAGEMENT. CONCEPT.....	83
3.2. CONTENT AND FUNCTIONS OF LOGISTICS MANAGEMENT.....	87
3.3. PROFESSIONALS EMERGENCY SERVICES MANAGEMENT.....	92
3.3.1. <i>TECHNICAL CAPACITIES PROVIDING.....</i>	<i>96</i>
3.3.2. <i>HUMAN RESOURCES PROVIDING.....</i>	<i>99</i>
3.3.3. <i>AQUISITION MANAGEMENT.....</i>	<i>102</i>
3.3.4. <i>PROVIDING THE FINANCIAL RESOURCES.....</i>	<i>113</i>
3.3.5. <i>LABOUR INSPECTION, ENVIRONMENT PROTECTION AND TECHNICAL SURVEILANCE.....</i>	<i>118</i>

CHAPTER IV	
THE MANAGEMENT OF TOTAL QUALITY IN THE FIELD OF PROFESSIONAL EMERGENCY SERVICES.....	121
4.1. TOTAL QUALITY MANAGEMENT. CONCEPT AND PRINCIPLES.....	121
4.2. ORIENTATION TOWARDS PROCESSES.....	127
4.3. THE LEADERSHIP IN THE FRAME OF TOTAL QUALITY MANAGEMENT.....	127
4.4. THE IMPLEMENTATION OF AN INTERNAL SYSTEM FOR DECISIONAL ASSISTANCE BY INSPECTORATE FOR EMERGENCY SITUATIONS OF BIHOR COUNTY. CASE STUDY.....	129
4.5.1. <i>ISUTEL SUBMODULE</i>	132
4.5.2. <i>SIPER/SUBSIPER MODULE</i>	134
4.5.3. <i>IS-IP-004 MODULE</i>	139
4.5.4. <i>ISULOG MODULE</i>	140

CHAPTER V	
DEVELOPMENT AND IMPROVEMENT OF THE NATIONAL SYSTEM FOR EMERGENCIES MANAGEMENT- SNMSU.....	147
5.1. EMERGENCIES: CONCEPT, CHARACTERISTICS.....	147
5.2. EMERGENCIES EFFECTS AND PREVENTION.....	156
5.3. THE CLASIFICATION AND REPARTITION OF RISKS WHICH GENERATES EMERGENCIES.....	167
5.4. NATIONAL SYSTEM FOR EMERGENCIES MANAGEMENT- SNMSU.....	172
5.4.1. <i>THE NECESSITY AND THE SCOPE OF NATIONAL SYSTEM FOR EMERGENCIES MANAGEMENT</i>	172
5.4.2. <i>THE ORGANIZATION OF NATIONAL SYSTEM FOR EMERGENCIES MANAGEMENT</i>	173
5.4.3. <i>THE ORGANIZATION OF COUNTY INSPECTORATES FOR EMERGENCY SITUATIONS</i>	183

CHAPTER VI	
STRUCTURES AND MECHANISMS FOR COORDINATION OF RESOURCES USE IN EMERGENCIES.....	189
6.1. THE INTERVENTION LOGISTICS IN EMERGENCIES.....	189
6.2. LOCAL AND NATIONAL STRUCTURES FOR COORDINATION AND COMMAND OF THE INTERVENTION IN EMERGENCIES.....	192
6.2.1. <i>COORDINATION AND COMAND CENTERS</i>	192
6.2.2. <i>PLANNING OF THE INTERVENTION RESOURCES</i>	194
6.2.3. <i>PLANNING DOCUMENTS OF THE INTERVENTION RESOURCES IN LARGE SCALE EMERGENCIES</i>	199
6.2.4. <i>METHODS AND DIFFERENT WAYS FOR IMPROVEMENT OF RESOURCES PLANNING IN EMERGENCIES</i>	204
6.2.5. <i>CONSIDERATIONS REGARDING THE IMPROVEMENT OF SUPPORT FUNCTIONS DISTRIBUTION</i>	208
6.3. INTERNATIONAL STRUCTURES AND MECHANISMS FOR ACTIVATION AND COORDINATION OF INTERVENTION RESOURCES...203	

6.3.1. COORDINATION OF PROVIDING ACTIVATION AND USE OF RESOURCES THROUGH UN STRUCTURES.....	203
6.3.2. EUROPEAN STRUCTURES FOR COORDINATION OF THE RESPONSE IN CASE OF EMERGENCIES.....	207
6.3.3. NATO'S ORGANISMS FOR COORDINATION OF THE INTERVENTIONS IN CASE OF EMERGENCIES.....	211

CHAPTER VII

MODERN SYSTEMS FOR EMERGENCIES MANAGEMENT. CASE STUDY

INCIDENT MANAGEMENT SYSTEM (NIMS)-SUA.....	223
7.1. THE EVOLUTION OF NATIONAL SYSTEM FOR EMERGENCIES MANAGEMENT – NATIONAL INCIDENT MANAGEMENT SYSTEM (NIMS).....	224
7.2. ELEMENTS OF NATIONAL INCIDENT MANAGEMENT SYSTEM.....	226
7.3. COMMUNICATION IN EMERGENCIES MANAGEMENT.....	230
7.3.1. CONCEPTS AND PRINCIPLES	230
7.3.2. CHARACTERISTICS OF COMMUNICATION IN EMERGENCIES MANAGEMENT.....	232
7.4. THE INCIDENT COMMAND SYSTEM AS A MAJOR COMPONENT OF THE EMERGENCIES MANAGEMENT.....	236
7.4.1. OPERATIONS SECTOR.....	240
7.4.2. PLANNING SECTOR.....	244
7.4.3. LOGISTICS SECTOR.....	247

CHAPTER VIII

THE IMPLEMENTATION OF AN INTEGRATED INFORMATIONAL SYSTEM FOR DECISIONAL SUPPORT IN CASE OF EMERGENCIES BY INSPECTORATE FOR EMERGENCY SITUATIONS "CRISANA" OF BIHOR COUNTY.....

257	257
8.1. DECISION, THE ACT OF DECISION MAKING AND DECISIONAL PROCESS.....	258
8.2. CONCEPTS REGARDING THE DECISIONAL SUPPORT SYSTEMS.....	261
8.3. INITIATION OF THE PROJECT" FLOODS PREVENTION AND THE REDUCTION OF THEIR CONSEQUENCES BY USING IN DECISION MAKING PROCESS OF AN INTEGRATED INFORMATIONAL SYSTEM"	263
8.4. PLANNING THE ACTIVITIES OF THE PROJECT" FLOODS PREVENTION AND THE REDUCTION OF THEIR CONSEQUENCES BY USING IN DECISION MAKING PROCESS OF AN INTEGRATED INFORMATIONAL SYSTEM".....	277
8.5. DEVELOPMENT OF THE PROJECT" FLOODS PREVENTION AND THE REDUCTION OF THEIR CONSEQUENCES BY USING IN DECISION MAKING PROCESS OF AN INTEGRATED INFORMATIONAL SYSTEM".....	287
8.6. FINALIZATION OF THE PROJECT" FLOODS PREVENTION AND THE REDUCTION OF THEIR CONSEQUENCES BY USING IN	

DECISION MAKING PROCESS OF AN INTEGRATED INFORMATIONAL SYSTEM".....	293
8.7. DECISION SUPPORT SYSTEM FOR EVACUATION OPERATIONS IN CASE OF EMERGENCIES. CASE STUDY WITHIN INSPECTORATE FOR EMERGENCY SITUATIONS OF BIHOR COUNTY.....	295
8.8. THE IMPLEMENTATION OF AN INTEGRATED INFORMATIONAL SYSTEM FOR DECISIONAL SUPPORT IN CASE OF EMERGENCIES. CASE STUDY- INSPECTORATE FOR EMERGENCY SITUATIONS "CRISANA"OF BIHOR COUNTY.....	301
CONCLUSIONS AND PERSONAL CONTRIBUTIONS.....	317
BIBLIOGRAPHY.....	323
ANNEXES.....	331

KEYWORDS

- Emergency;
- Support function;
- Informational system for decisional support;
- Logistics management;
- Hazards;
- Module;
- Evacuation.

INTRODUCTION

Taking into account the wide range of risk factors along with the growing intensity of these, considering the climatic changes, which generate meteorological phenomena of increased frequency and intensity, emergencies with disastrous consequences for the population are to be expected. Unfortunately, in recent years, Romania has been severely affected by floods which affected large areas of land, caused casualties and material damage amounting to tens of millions of euros. The efforts of the state were considerable in restoring the affected areas and in supporting the victims. Effective intervention during the emergencies as well as the actions developed during the rehabilitation and restoration of the normal state of good management require the authorities to reduce the negative effects of these phenomena.

The need to improve systems and mechanisms of response in case of emergencies, based on case studies and experience lead to initiating and carrying out this research.

In this context, the thesis approaches in a systematic vision, the management of professional emergency services in Romania, as well as the problematic related to the management of large-scale emergencies. Thus, the research objectives referred to:

- analysing the management of emergency services and emergency situations management;
- identifying the opportunities for changing the legislation related to emergency situations;
- developing informational solutions for improving institutional management for decisional support in case of emergency situations.

In order to identify solutions to optimise these two fields, there have been studied similar systems like those of the United States, Great Britain, Netherlands, Germany and Belgium.

The thesis analyses the current system of training for the personnel working in the professional emergency services and the career management in this field; a series of problems were identified such as the conception and the regulation. Studies made upon the systems applied by similar services in Europe, were used as basis, and certain solutions

were proposed in order to optimise the training of operative personnel and the career in the field of professional emergency services in Romania. After 20 years of experience, in order to improve the organization management, some fields were studied and proposals were made for these to be improved. Thus, during the doctoral internship, an internal support system of decision making process was created and implemented. This system ensures the optimization of managing process and activities within the compartments of the Inspectorate for Emergency Situations "Crişana "of Bihor county.

During the doctoral internship it was developed a new concept regarding the evacuation in case of emergency situations. The necessary steps were made to implement it at national level. Thus, at the end of 2007, during the international exercise Olympic Offspring, a study has been conducted. On this circumstance, over 700 persons were evacuated, from Terneuzen - Netherlands in Zelzate - Belgium. This event marked the initiation of the project when the software application TEVAC was implemented. This application was tested in 2008, during the international exercise EU - HUROMEX 2008. The concept and software were tested in real time, when 160 persons were evacuated from Gyula - Hungary to Chişineu Criş - Romania. The widespread use of the application TEVAC at national level starting with 2009 reflects the usefulness and reliability, details on the application being presented in the content of the thesis.

In its content, the thesis presents a comparison between concepts and structures of the management of emergency situations in Romania, Europe and the United States of America. Based on the study, some proposals are drawn up, on improving the concept of allocation and coordination of resources, the drafting of rules related to the constitution and activation of the financial resources required for the emergency situations management and adopting some technical regulations on material resources used for interventions. Furthermore, concrete solutions are proposed in order to optimise the distribution system of support functions having as basis the framework of response strategy in the United States.

In its content, the thesis presents the draft implementation of an informational support system for decision making process in case of large-scale emergencies. Thus, after the presentation of theoretical aspects by using the method of management through projects in

the field of professional emergency services, there were detailed the steps taken under the project "*Floods prevention and the reduction of their consequences by using in decision making process of an integrated informational system*" carried out under the PHARE programme CBC RO-HU 2006. The project, which was finalised during the studies, was initiated and implemented in the Inspectorate for Emergency Situations "Crişana" of Bihor County in partnership with Waters Direction Oradea and the Directorate for Defence against Disasters of Hajdu – Bihar county, Hungary.

With a budget of over 800,000 euros, the project tried to optimize the utilization of resources to protect a target group of 600,000 inhabitants in a cross-border area in which the yearly average of material damage in the past 30 years is the amount of over 1.3 million euros. The project was successfully completed in February 28, 2010 and it represents a first-time event in this field and may be replied at national level. The project was successfully completed on 28 February 2010, the information systems implemented under the control points of the two beneficiary institutions contributing significantly to increase the management quality of emergency situations by providing the necessary information to make operational decisions. It is the first project in this area and can be replicated at national level. We believe that the ideas presented in the thesis offers solutions to improve the management of emergency situations through its pragmatic character. Moreover, it could be a source of study for professionals in this field.

MANAGEMENT METHODS AND TECHNIQUES - SPECIFIC PARTICULARITIES IN CASE OF PROFESSIONAL EMERGENCY SERVICES

Exercising their functions and management relations at the level of each organization is carried out by the system of management. Being defined as "*the assembly of elements with making decisions, organizational, informational, motivational character etc. within each organization, which can act upon the assembly of all processes and management relationships in order to get the best effectiveness and efficiency*" (Nicolas, Verboncu, 2008: 177), the management system from the modern organization is based on a complex

of principles, rules and requirements; this ensures its adequate modelling according to the principles of management science.

The managerial method is defined as "a coherent and rigorous managerial construction, which incorporates phases, components, rules etc. fully delineated, through which it is carried a small segment of managerial processes or relationships in an organization, with the effects which are regularly confined to a small number of managers and compartments of an organization" (Nicolescu, Verboncu, 2008: 193).

Another pragmatic definition presents the managing methods as "*practical ways for allocating the material, human, financial, and informational resources of the firm in time and space*" (Ilieș, Lazăr, Mortan, Popa, Lungescu, Vereș, 2006: 191).

These methods are used for the most efficient solving of specific issues of the various management functions, having the role to ensure the awareness of the routine operational events and facts, which take place in an organization. With their help, managers can positively sway the processes development up to their progress. The scientific dimension of board panel assume a rapid reading of contained information. To achieve such a function it is important to use various mode of visualisation , the most frequent having been already mentioned: tables of values, charts, and mixed forms (tables of values associated with charts). Models of the board panel must ensure: fulfilment of informational needs of the recipients; fulfilment of the board panel functions; the containing of this managerial technique characteristics .

The board panel method is used with success within the Inspectorate for Emergency Situations "CRIȘANA" of Bihor County, where board panel was conceived, by synthesizing performance indicators of the service, offering the possibility of making some operative analyses, identifying disturbances and making decisions to improve the missions quality .

It should be noted that the qualitative and quantitative indicators, established and followed in the board panel, are the result of the operational criteria regarding the functioning of the

county operational centers for emergency situations, their monitoring providing the necessary information to correct the possible errors in achieving the tasks.

The current form of the picture, shown in Annex 1 is the result of an improvement process initiated in 2004. The management board of the institution, analyzes information from the board panel in weekly working sessions and measures are operatively established in order to remove deficiencies. Monitoring indicators provided in the board panel is a continuous process to be carried out by the operational center, the conclusions being presented in biannual and annual analyses of the operative situation of the inspectorate.

SITUATIA STATISTICĂ A INTERVENȚIILOR în perioada:		TIPUL INTERVENȚIEI														Domeniul de activitate							
UNITATEA SUBORDINATĂ	TOTAL INTERVENȚII	INCENDII							ALTE SITUAȚII DE URGENȚĂ							SĂNĂȚATE	DEZASTRE	SALVARE (NON)	TOALĂ	Decedate	Razuit	Salvati	performanta
		TOTAL INCENDII	STINGERE CĂMINĂRI	STINGERE SALE	STINGERE SALE	STINGERE SALE	STINGERE SALE	STINGERE SALE	STINGERE SALE	STINGERE SALE	STINGERE SALE	STINGERE SALE	STINGERE SALE	STINGERE SALE	STINGERE SALE								
GENERAL		COMITETE LOCALA PENTRU SITUAȚII DE URGENȚĂ							INSTITUȚIE CU FUNCȚII DE AFERINȚĂ							E-MAIL							
NUMĂRUL DE TRANSPORTURI PERICULOASE MONITORIZATE																							
NUMĂRUL DE MĂȘINI DE PARCARE PRINDE PEȘIPE PEȘIPE METRO PERICULOASE																							
NUMĂRUL TOTAL DE MĂȘINI DE PARCARE REBRANSMIS/DOP CAR																							
Dupa destinație																							
Dupa mijloc de transmisie difuz																							
Dupa mijloc de transmisie difuz																							
NUMĂRUL DE APLĂRI DE URGENȚĂ DESTINATE FĂRĂ ÎMPĂCĂRIA GĂZILOR DE INTERVENȚIE																							

Annex 1

THE INITIAL AND CONTINUOUS TRAINING OF PERSONNEL

Chapter two of the thesis presents of the importance of the human resources within the professional emergency services.

An objective analysis of the continuous preparation mode of the personnel in professional emergency services from the point of view of its organization, development and assessment, lead to a series of *critical remarks*, from which we present the followings:

- preparation mostly influenced by commanders, who establishes the training needs of individuals and implicitly the forms of training, determining this way a reduced initiative of the staff in this sector;
- although set annually, training objectives have a high degree of generalization and they do not fully reflect the needs of personnel training;
- limited access to literature and limited opportunities to participate in the scientific events for documentation;
- concrete forms of continuous preparation are not adapted to the current requirement, the necessary endowment for a qualitative preparation being not assured.

A documentary study was conducted during 2009-2010 in Greater Manchester Fire Brigade, Great Britain. The Inspectorate for Emergency Situations “Crișana” of Bihor County initiated this under a program financed from European funds. The conclusions of this study are systematized in SWOT analysis.

Based on conclusions from the analysis, there was identified the opportunity to develop a project, in order to improve the training system of the operative personnel through the following objectives:

- Drawing up a similar document to RISPM (the regulation of the specific training of the military firefighters), in a new concept, based on the analysis of similar documents used in England.
- Detailed presentation and adoption of the British - Incident Command System (ICS);
- Defining competencies at all levels, in a similar way with the British system. For each competency there will be established ways of forming, preparing, training and assessment, on certain levels, similarly to the system defined for paramedics;
- Redefining the career guide having as principle one's evolution in his career by acquiring competencies;
- Documenting the necessary requirements for interventions by identifying in other countries those accessories used for intervention that can increase the effectiveness of intervention operations or security of the personnel;
- Translating foreign movies and written materials, used for the operative personnel training;

- Reanalyzing the concept regarding geographical distribution and organization of fire stations (few large stations versus many small stations);
- Identifying computer solutions for a more efficient training – assessment process (intranet through VPN, similar to the system used in Manchester,UK).
- Optimizing the dispatch activity in case of large-scale emergencies (a large number of calls and the intensification of information flow) by using computer solutions.

These objective's aim is the improvement of the response capacity at operational, tactical and strategic level. On the other hand, the intervention's efficiency depends on three factors: the training level of the operative personnel, the endowment of the professional emergency services and the response time.

The implementation of the training and continuous preparation system of operative personnel is proposed to be achieved through a project developed in pilot system, on four levels: fire station, county inspectorate, regional level and national level.

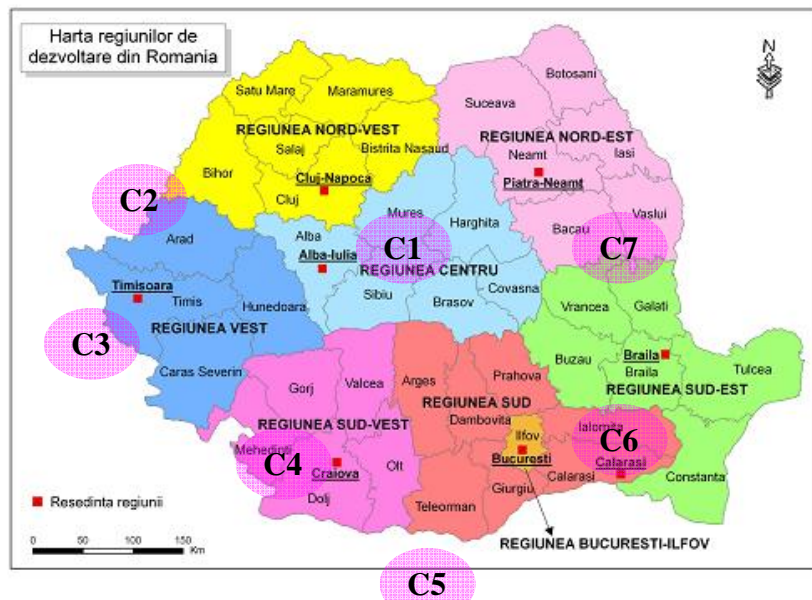


Figure 2.7 The map of regional training centers (proposal)

The national training centers will be created on types of competences, and the locations of these centers could be set depending on the availability of the premises needed for training and accommodation, logistics and human resources.

For each competence(skill), such as “height rescue”, “water rescue”, fire investigation”, “interventions in toxic areas”, will be established regulations regarding the initiation, preparation, training and assessment, on levels of competence, similarly to the system defined for paramedics as follows:

- National training center for trainers (e.g. paramedics: Tg. Mures for paramedics)
- Regional training centers for specialists from fire stations (e.g. paramedics: Iași, Bihor, Timișoara);
- Coordinator of the training programme at county level (e.g. paramedics: medical assistant within the Operational Center);
- Continuous preparation in subunits.

The system development can be achieved through the involvement of all available human resources that will be engaged in the project according to their knowledge (foreign languages, computer skills, etc.) and to their experience (in management activities, accumulated experience from participating to interventions, exercises, courses, or international missions).

Experience in collaborating with similar services from countries like England, Netherlands, Belgium, Germany, has led to the conclusion that” best practice” and the “lessons learnt” from them can be used. To overcome the linguistic barriers it is preferable to collaborate with Anglo-Saxon countries.

CASE STUDY: IMPLEMENTING AN INTERNAL DECISION ASSISTANCE SYSTEM FOR THE EMERGENCY INSPECTORATE FOR EMERGENCY SITUATIONS OF BIHOR COUNTY

During the study, software solutions developed in United Kingdom, Germany, Netherlands and Belgium, aimed to assist the decision making process, have been studied. As a result, the conclusions emerged from the study have been used to create an internal informational system that can provide the necessary information for the decision makers. The system have been developed in a project, using only the own human resources of the Emergency

Situations Inspectorate „CRISANA” of Bihor County, over a relative long period of time, between 2007 and 2010. Thus, at the beginning, the persons whose competences could create added value to the project, have been identified.

The project team have been larged as the system have developed, experts able to provide relevant expertise being involved in diferent stages of the project.



Figure 4. 1.. The Internal Decision Assistance System structure

The modules of the Internal Decision Assistance System – S1AD, are prezented below. The system is structured in four modules as follows:

A. ISUTEL can be roughly described as a telephone agenda built for the needs of the CJCCI(County comand and intervention coordination center) and CJSU (county emergency situations commete) members. Thus, all the contact data that could be relavant durring an emergency situation is stored in a well structured databese. Any edit operation can be traced using the time and user information, recovery function being available. The phone numbers can be fast obtained using advanced interogation oprions and can be dialed directly from an easy to use interface.



Figure 4. 2. The ISUTEL user interface
(Source: ISUTEL user help manual)

B. SubSiper allow the user to register and interrogate the current position of any employee of the institution. Thus, the duty hours, working in missions hours, position in the operational structures can be stored, both at the headquarters and in the firestations. Finally, the module can generate daily and overall reports that contain information needed for organisational decisions and planning process.

ID	Grad	Nume	Prenume	5	8	7	8	9	10	11	12	13	14	15	16	17	18	19	Ore	Ore	Zile	
				Joi	Vin	Sab	Dum	Lun	Mai	Mie	Joi	Vin	Sab	Dum	Lun	Mai	Mie	Joi	lucrate	anteni	noapți	C.O.
1	Cpt	ZON	MIHAI																48	48	7	
2	Cpt	LUNC	TEODOR																88	88		
3	Pit.maj	CHE	GHEORGHE																88	88		
4	Sg.maj	OPR	TEODOR																88	88		
5	Sg.maj	VLAC	TEODOR																88	88		
6	lt	TAN	ANDRIN																88	88		
7	Sg.maj	FAL	ANDRIN																88	88		15
8	Sg.maj	MAL	ANDRIN																88	88		
9	Pit	TOC	ANDRIN																56	40	4	
10	P.adj.sef	SAF	ANDRIN																72	72	24	
11	Pit.adj	MUN	ANDRIN																88	88		15
12	Pit.maj	LUN	ANDRIN																96	96	32	
13	Pit	BOF	ANDRIN																72	72	24	
14	Pit	MAF	ANDRIN																96	96	32	
15	Pit.adj	STEF	ANDRIN																96	96	32	
16	Pit.adj	DAN	ANDRIN																72	72	24	
17	Sg.maj	NIS	ANDRIN																96	96	32	
18	Sg.maj	CM	ANDRIN																96	96	32	

Figure 4. 3. SIPER user interface
(Source: SIPER user help manual)

C. IS-IP-004 is the module that is being used to store and interrogate the prevention process. It has four sections: Fire prevention, Fire risk analysis, Civil protection and Citizens preparedness;

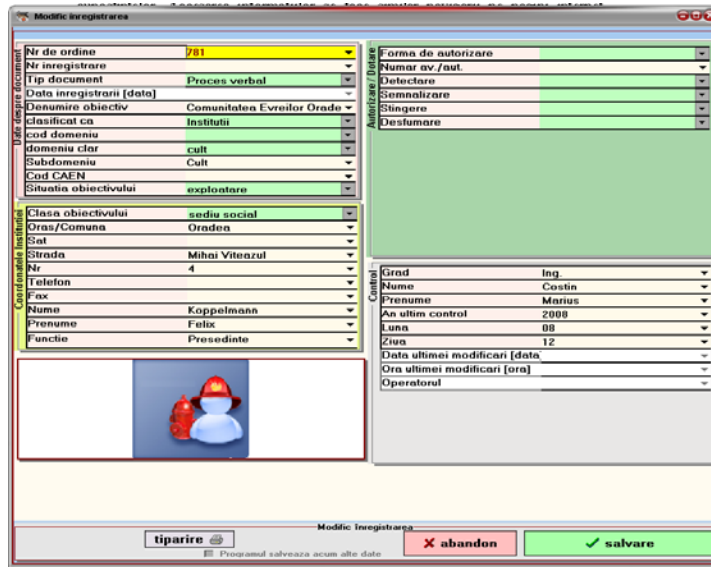


Figure 4. 4. IS-IP-004 user interface
(Source: IS-IP-004 user help manual)

D. IsuLOG, the module that have been created to allow the update and a fast acces to data regarding intervention means, being structured in four sections: Endowment, Usage, Technical assistance and Technical administration evidence.



Figura 4. 5. IsuLOG user interface
(Source: IsuLOG user help manual)

COUNTY SYSTEM OF RECORDING AND PLANNING OF THE RESOURCES OF THE NATIONAL ECONOMY, FOR EMERGENCY SITUATIONS

Within chapter six, the thesis presents aspects related with systems and mechanisms for coordination of resources in case of emergencies, the most important being presented in the following rows. Resources of economic agents may play a key role in limiting the disaster effects, but for activating them it is necessary to know data regarding the type, quantities and availability of these resources and also a rapid notification system of holders on the request. It is clear that both conditions can be ensured only by computer solutions.

Studying facts at the level of Bihor county and legislation regarding the goods(resources) property, one conclusion can be drawn: the current system can be radically improved. Thus, it was found that Register of Commerce holds data about 36,184 companies, but does not hold data with regards to real field of activity, because the CAEN codes do not express information about current activity. This institution does not always hold data about the means of transport held by these companies, this information being held by the Public community service for driving licences and vehicles registration subordinated to the Prefect's Institution.

The institution that filters and verifies this information is the Office of Economy Mobilization and Preparation of Territory for the Defence, abbreviated as OMEPTA, being subordinated to the Central State Office for Special Problems. This office, also subordinated to the Prefect Institution, create a database with operators that hold requisitionable resources, including approximately 150 of such agents. But the database is annually updated, being most of the time non-compliant with reality, taking into account the dynamics of the economy and the mobility of resources.

Moreover, it is not carried out an automatic elimination from the database of motor vehicles which have been put out of registration or circulation, there is no software solution to correlate the data held by OMEPTA with those from the Registration service. Also, the software used presently by this institution is developed in a programming language which does not offer real opportunities for interrogation.

In these conditions, ISU Bihor, has created a software which allows the integration of data held by OMEPTA, in the inspectorate database regarding the resources for intervention; in case of disasters, the holders of resources would be operatively contacted for validating the data regarding the available resources in order to be requisitioned.

This solution is a partial one, the study outlines a more efficient alternative but this involves legislative changes. Therefore, by creating a compulsory updating by the holder of the data about the situation of own resources which are relevant for the emergency situations management, using a web application to be used in intranet system, it would be created premises for creating an updated database, the task of OMEPTA being limited in checking these data. A similar solution is adopted in Holland for companies which carry out high risk activities; they are obliged to update data such as the type and quantities of dangerous substances handled or processed, an extremely useful information for protection of the population in the area, or staff in case of interventions for accidents.

Another problem regarding the access to data about the resources, is the lack of such nomenclatures adapted to these needs. Thus, by the Order of Central State Office for Special Problems No 63/18.08.2004 it is regulated the nomenclature of goods to be requisitioned, but the structure and product names do not correspond to the necessary format for managing an emergency situation, including characteristics of technical means which are not relevant for the emergency situations domain.

Taking into consideration that the resources of SNMSU institutions as well as those from the national economy are unitary managed it is compulsory to form a unique data base; this imply the creation of an universal nomenclature regarding the resources assigned for interventions in emergency situations. This nomenclature should allow the grouping of means or materials for intervention on categories, subcategories and types, permitting access to detailed data and generating some synthesis reports, extremely useful in making decisions at strategic level. In the study there were also analysed the European regulations on the matter, the most relevant document in this context being the Regulation No 2151 of 16 December, 2003, regarding the common vocabulary of public acquisitions (CPV), issued by

the Council of the European Union. This nomenclature is created in accordance with the *“Central provisory classification of products (CPC) of the United Nations Organization, Statistical Nomenclature of economic activities in the European Community (NACE Rev.1) and the Combined Nomenclature (NC)”*.

However, this nomenclature is extremely complex, being conceived as a single system of classification applicable to the public acquisitions, in order to unite the references used by entities and contracting authorities to describe the acquisition object and to overcome language barriers. It requires a filtering of references for easy access to the relevant information, but it is extremely important to integrate this nomenclature in the software solution designed for emergencies logistics.

The conclusion is that the only institution at county level that holds information on available resources, OMEPTA, uses another nomenclature.

Hypothetically considering that a database of available resources which may be used in emergencies of large-scale were created, the rapid activation of these resources can only be made by using complex computer systems. The lack of a logistical planning and of a such system, the check of availability and the resources request would be made by telephone calls; this would lead to the exponential growth of this process duration.

Thus, after a practical experiment carried out in the dispatch of the Inspectorate for Emergency Situations „„Crișana” of Bihor county, it was concluded that in order to communicate a 5 words message it is necessary a one minute phone call. In case of a bidirectional conversation in which is communicated a larger amount of information, the duration may reach up to five minutes.

This way, the total duration can be of 16 hours in case of 200 conversations. Although the hypothesis of updating the databases by using only computer based solutions is unlikely, using this system with 70 percent of the resources holders, is an achievable objective.

For this it is necessary to achieve the followings:

- the creation of a single nomenclature of resources for interventions in case of disasters;
- to design the structure of resources data base;
- achieving a web-type software solution in order to allow adequate access to relevant information on resources;
- creating the data links VPN – virtual private network - between the resources holders and installation of the software in all locations connected to this network;
- establishing the mechanism for data exchange in a standard format between the resources holders and inspectorate;
- testing the system;
- training the staff regarding the software use.

SUGGESTIONS TO IMPROVE THE PLANNING PROCESS OF THE RESOURCES USED FOR EMERGENCIES MANAGEMENT

In order to improve the planning process of the resources used in the field of emergencies management it is considered useful the analysis by comparison with the systems implemented in other countries.

The use for the first time within the law of the term *support function*, request to define this term. As an result of the missing of one clear definition, in the law are foreseen support functions which represents current actions or actions which are implemented prior the emergency situation or even actions without any connection with an emergency.

In order to go further with the reasoning there is proposed the following definition: The support function represents a category of actions in direct relation with an emergency situation, designed to support the response actions in order to reestablish the normality(or rehabilitation of affected area), actions taken prior, during or after an emergency.

Starting from this definition of the term *support function*, definition based upon the analysis of the support functions described in other countries, hereby are presented some arguments that the law might be improved.

Thus, the support functions, which represents current activities, might be eliminated as follows: section C “ *evaluation of the specific hazards*” – the support functions” *monitoring of hazards, specific risks and their negative effects*” and “*planning and preparedness of the resources and services.* ”.

Some support functions, even though they are connected with emergencies management, are performed by any institution or organism which provide support functions. This results also from the fact that these functions are distributed to “*each organism of central public administration according to his specific field activity*”. The simple fact that a support function is performed by all the institutions eliminates it from the general list of the support functions.

It is the case of support function no.18” *logistics of the intervention: providing the material resources in order to fulfill the support function* ”, which is not necessary as long as each institution is taking care of his own logistics and the extra needs are covered by support functions.

All the arguments are grouped in table 9.3 where there are presented the modifications which consist in:

- elimination of five support functions;
- grouping of four support functions into two;
- changing the denomination of four support functions;
- introduction of two new support functions.

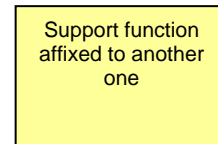
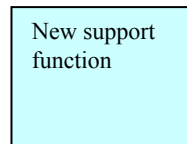
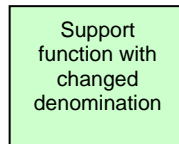
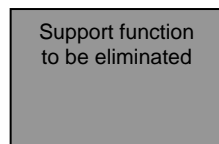
Thus, there will be in total 15 support functions, similar with the American and Dutch model. This similarity may be another argument taking in consideration the expertise of these two countries in the field of risk management. Also there is considered to be useful the grouping of the support functions into four categories according to the table from bellow:

Table 6.3. Arguments in favor of modification of the support functions

No	Support functions according to HGR 2288/2004	No.	Proposed support functions	Argument
1	monitoring of hazards, specific risks and their negative consequences			This is a current action-routine
2	Information, awareness and warning			the actions specific to this domain are ruled by protocols(eg. The protocol for the transmission of prevention messages towards mass-media)
3	Planning and preparedness of the resources			This is not a support function being a task for each structure
4	IT and communications	14	Communications and information technology	
5	Search, rescue and extrication of people	2	Search rescue and extrication	
6	Evacuation of people, population or goods endangered	7	Providing the evacuation, accommodation and shelter	Function no.6 and no.14 are connected and complementary
7	Providing medical assistance in emergencies	6	Public health and medical assistance	Attributes of the same structure and the actions are linked
8	Mass illness prevention			
9	Limitation and extinction of the fires	1	Fire extinguishing	To extinguish a fire implies the limitation of the fire in the first step
10	Neutralization of the hazardous materials effects	3	Neutralization of the hazardous materials effects	
11	Providing the transport of the human and material resources, evacuees and other resources	11	Providing the transport of the human and material resources, evacuees and other resources	
12	Public works and rehabilitation of the damaged buildings, installations and other developments	12	Providing the functioning of the public utility systems and other special works	The term “Public utility systems “ includes also the roads, railroads, water supply system, sewage system. The details will be presented in the procedure
13	Providing the food and water supply for people and animals affected or evacuated	8	Providing the food and water supply for people and animals affected or evacuated	
14	Providing the accommodation and shelter for affected or evacuated persons	7	Providing the evacuation, accommodation and shelter	Function no.6 and no.14 are connected and complementary

No	Support functions according to HGR 2288/2004	No.	Proposed support functions	Argument
15	Providing the energy for lighting, heating and other utilities	13	Providing the power supply and thermal energy	The terms electrical and thermal energy includes the energy for lighting and heating
16	Performing the depollution and decontamination	4	Performing the depollution and decontamination	
17	Maintaining and reinstatement of public order	5	Maintaining and reinstatement of public order	
18	Intervention logistics			each institution which intervene is taking care of his own logistics and the extra needs are covered by support functions (support function no 11)
19	Rehabilitation of damaged area	15	Rehabilitation of damaged area	
20	Providing first necessity goods, indemnities, social and religious assistance			
		9	Providing zootechnical assistance and interventions in agriculture	
		10	Management of the information about the victims and missing persons	

Legenda:



SUGESTIONS FOR THE IMPROVEMENT OF SUPPORT FUNCTIONS ASSIGNEMENT

Starting from the manner the support functions where assigned in United States of America, in table 9.6 there are presented the suggestions for the ranking the public institutions according to their role in fulfillment of an support function. Therefore is

suggested the idea that a specific support function to be assigned to a single institution, this authority having the main role. This authority will be marked with letter “P”- primary. The other institutions which will perform activities within the same support function will be coordinated by the main role authority and will be considered as secondary role authorities, noted with letter “S”. The advantage of this solution is that only 15 authorities are involved in decision making, these authorities being represented in CJCCI. Each main role authority will manage one or more support function coordinating the secondary role authorities.

Within this context it is proposed the definition of the expression “technical support group”, as follows: group of persons which represent the main role authorities within CJCCI/CNCCI. Therefore when an large scale emergency occurs, the representative of one “main role authority” (for a specific support function) will realize the connection between CJCCI and that authority, providing in the same time coordination of the secondary role authorities.

Table 6.6. Main role authorities(P) and secondary role authorities(S) assigned to fulfill the support functions

Support function <ul style="list-style-type: none"> • Ministries • Central Authorities and organizations • NGO's 	Emergency services					Assistance for evacuated persons and animals					Infrastructure			
	Fire extinguishing	Search and rescue, extrication	Neutralization of hazardous materials effects	Providing decontamination and de-pollution	Maintaining and reinstatement of public order	Acordarea asistentei medicale si asigurarea sănătății publice Providing medical assistance and taking care of public health	Providing the evacuation, accommodation and shelter	Providing food and water for evacuated persons and animals	Technical assistance and interventions in agriculture	Management of the information about the victims and missing persons . Psychological assistance	Providing safe roads and railroads and means of transportation for people and goods	Providing the functioning of the public utility systems and special works	Providing the power supply and thermal energy	Communications and information technology
Ministry of Administration and Interior	P	P	S	S	P	S	P	P		P	P	S		S
Ministry of Economy and Commerce	S		P	S				S	S		S	P	P	S
Ministry of Transport, Construction and Tourism			S	S		S					S	S		P

Support function <ul style="list-style-type: none"> • Ministries • Central Authorities and organizations • NGO's 	Emergency services					Assistance for evacuated persons and animals					Infrastructure				
	Fire extinguishing	Search and rescue, extrication	Neutralization of hazardous materials effects	Providing decontamination and de-pollution	Maintaining and reinstatement of public order	Acordarea asistentei medicale si asigurarea sănătății publice Providing medical assistance and taking care of public health	Providing the evacuation, accommodation and shelter	Providing food and water for evacuated persons and animals	Technical assistance and interventions in agriculture	Management of the information about the victims and missing persons . Psychological assistance	Providing safe roads and railroads and means of transportation for people and goods	Providing the functioning of the public utility systems and special works	Providing the power supply and thermal energy	Communications and information technology	Rehabilitation of damaged area
Ministry of Health	S	S	S	S		P		S		S	S				S
Ministry of Communication and Information Technology									S				P	S	
Ministry of Agriculture Forest and Rural Development	S							S	P		S	S			S
Ministry of Environment and Waters Management	S		S	P							S	S			S
National Administration of State Reserves						S		S	S		S				
National Agency for Special Issues						S	S	S	S		S				
Special Telecommunications Agency										S				S	S

INCIDENT COMMAND SYSTEM, COMPONENT OF THE EMERGENCIES MANAGEMENT. CASE STUDY

In chapter seven of thesis is presented one of the most efficient management systems of emergencies in the world- National Incident Management System (NIMS), USA. The system represents a systematic approach which integrates the best procedures and methods in the national framework of emergencies management. The emergencies management is defined as the assamble of activities in direction of prevention, protection, response, risk reduction and recovery. This framework forms the base for interoperability and

compatibility which insure the integration of private and public structures response in an efficient manner. Within NIMS, the Incident Command System-ICS- represents a a flexible interinstitutional management tool of emergencies which involve governmental and non governmental institutions and private organizations.

ICS is an management system, generally valid , designed to provide an effective and efficient management of emergencies, by the integration of equipments, personell, procedures and means of communication within a unitary organizational structure. It is designed in a standard format having as main goal to allow identification by managers of tactic objectives related with the emergency, without being obliged to manage all types of response actions, as resources evidence or reporting activities.

ICS is used to organize the response actions for all types of emergencies, routine or large scale emergencies generated by nature or by man. In the field, the operational personell fulfill the tactical decisions by operative actions under the authority of the incident commander.



Figure 7.1. ICS structure

(Source: National Incident Management System, 2008, Homeland Security Department of United States of America, www.dhs.gov, www.fema.gov/nims, pag. 53)

The comparison between the north american and the Romanian is highlighting the necessity of implementation in Romania of an flexible and reliable incident command system which could be use for all types of emergencies regardless of their dimensions.

CASE STUDY – DECISIONAL SUPPORT SYSTEM FOR EVACUATION MANAGEMENT IN CASE OF AN EMERGENCY

As in the case of small number of evacuees, the evacuation operation does not raise special problems, in case of hundreds of evacuees the lack of an decisional assistance system might generate victims. In Romania does not exist such a system and the experience of the late floods shown the necessity to identify solutions in this area.

A group from the Inspectorate for Emergency Situations of Bihor county decided in November 2007 to develop such a solution. The success of the project was confirmed by the implementation of TEVAC application by all inspectorates for emergency situations starting with April 2010.

The designing stage of the project started by defining the general context in case of evacuation. Thus were established the stages during the evacuation process, from the issuing moment of evacuation order up to accommodation of the evacuees, according to legal provisions and international practice. Taking in consideration the ambiguous provisions of the law, the participation to the international exercise “Olympic Offspring” and the consultation with the Dutch experts was beneficial for this stage of the project.

The exercise consisted in the real evacuation of more than 700 people from Terneuzen-Holland to Zelzate-Belgium, being tested simultaneously four different soft applications used in the management process of the evacuation operations. Actually, this was the starting point of the TEVAC project.

But this kind of application must be tested in conditions as close as possible to real conditions. This was possible during the international exercise EU-HUROMEX 2008 where were participated more than 500 people from 8 countries. During the exercise were evacuated more than 160 persons from Gyula-Hungary to Chisineu-Cris – Romania.

The distribution of the evacuees on accommodation facilities is made automatically having as objective to group the relatives, the distribution of elderly people on the lower floors of the buildings, and to group people from the same locality.

The software had also an psychological impact giving the possibility to perform very fast the identification of an evacuated person, registered in the system.

SHORT DESCRIPTION OF THE INTEGRATED INFORMATIONAL SYSTEM FOR DECISIONAL SUPPORT IN CASE OF EMERGENCIES (SSD-SU)

SSD-SU is designed to support the decision making process for the two inter-institutional structures responsible for the management of the emergencies at county level, which are County Committee for Emergency Situations(CJSU) and County Center for Command and Coordination of the Intervention (CJCCI). It was chosen the county level from two reasons, first because a project developed at this level it is easy to be replicated to the other counties and second because most of the emergencies are managed at county level without any intervention of the central authorities.

The module – “Alert by SMS “. The process of transmitting the warning messages was radically improved since August 2005, moment when the Inspectorate for Emergency Situation of Bihor County implemented the SMS system for the first time in Romania. This system reduces the delivery time of the message to only 30 minutes; this period includes also the time necessary for the confirmation of the message. The following table presents the difference in performance between the SMS system and fax system.

The SMS system use special software accessed by internet, owned by a mobile telecommunication operator and installed on his SMSC server. The success of the system determined another nine inspectorates to implement it.

Table 8.6.. The duration necessary for the transmission and confirmation of the messages towards local authorities

Fax	[Timeline bar for Fax]											
AUTOFAX	[Timeline bar for AUTOFAX]											
SMS1	[Timeline bar for SMS1]											
SMS2	[Timeline bar for SMS2]											
CB	[Timeline bar for CB]											
Legend:	[Legend description]											
	transmission of the alert message starts			the message is received by all local authorities			the message is confirmed to be read by the president of the local authority			the receipt of the message is confirmed by all local authorities		

The SMSC module is connected to the SMSC server of the Special Telecommunications Agency.

Module for logistics resources management in case of emergencies. In case the user of the system needs information about the resources available at one economic agent or institution, the module searches and displays automatically the information using different filters selected by the user. In the same time can be displayed relevant information about the owner of the needed resource(address, contact information).

Using the georeferencing capabilities of the SSD-SU through GIS module, there are generated reports about a specific resource in an area defined by a polygon drawn on the map or by a circle(the radius of the circle being the maximum distance accepted from the resource to the place where will be used). Also using GIS system can be calculated the deployment time of the resources to the intervention place, the itinerary being displayed on the digital map and the generated image of the itinerary can be sent by SMS to intervention vehicles.

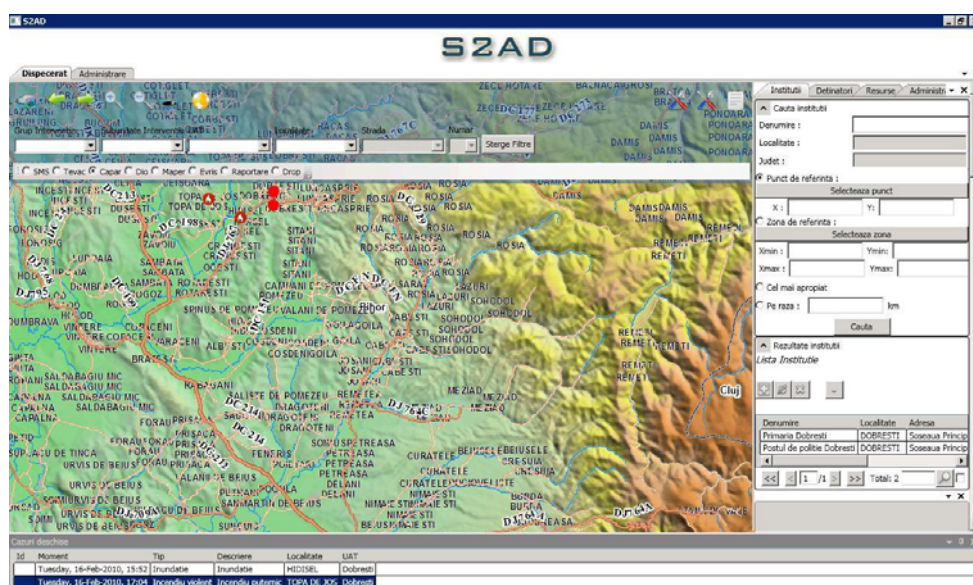


Figure 8.17. Interface of the module for logistics resources management

The module for the management of emergencies generated by hazardous materials. In case of an accident in urban area involving a hazardous material, the dispatcher identifies the neutralizing material or the absorbent using this module.

The module identifies the company which have on stock the neutralizing material, displaying useful data as: address, contact information, quantity of neutralizing material on stock, etc..

This module includes two sub modules:

- The first sub module is designed to identify the hazardous materials by the UN number, to identify the related safety measures and to define the isolation area.
- The second sub module is designed to manage the data about the economic agents which store or produce hazardous materials and neutralizing substances. The sources of information are security reports, external emergency plans and intervention plans.

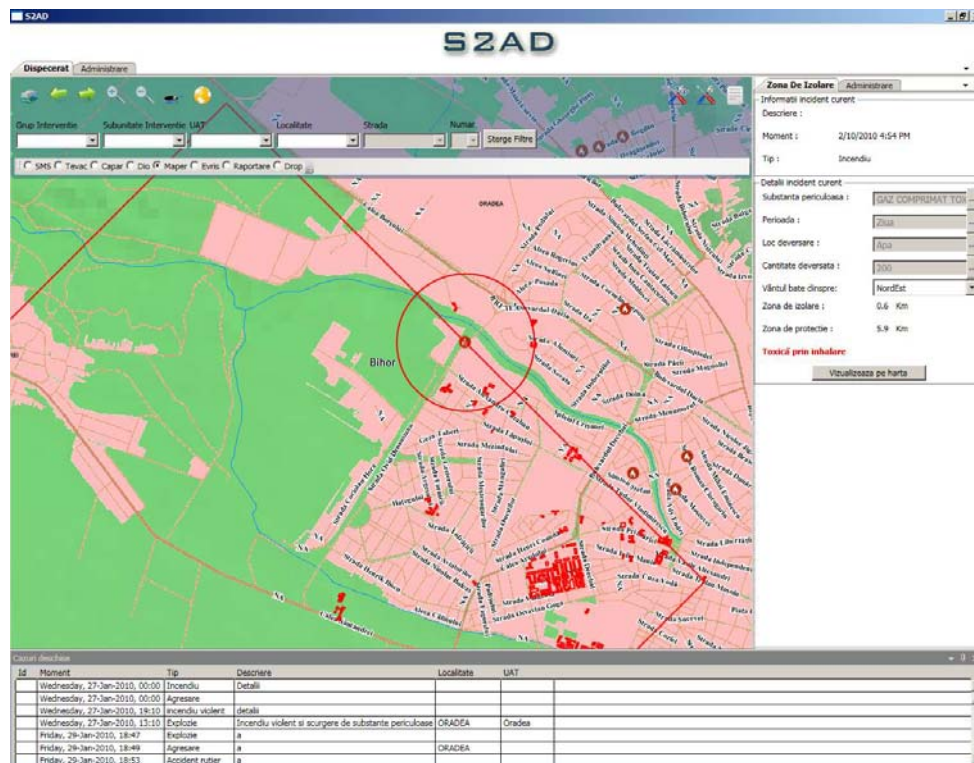


Figure 8.18. The identification of vulnerable buildings(hospitals, schools) placed within the isolation and protection area

CONCLUSIONS AND PERSONAL CONTRIBUTION

The contributions, concepts and the proposals presented within the thesis provide a real base for documentation in the field of developing and improving the mechanisms specific to emergencies management as well as their implementation solutions.

The thesis is approaching aspects related to the management of professional emergency services and emergencies management in a structured format, the specific concepts being presented in a logical succession.

Chapter one presents the main management techniques and methods which are adopted by professional emergency services as well as the instruments created and used by the Inspectorate for Emergency Situations “CRISANA” of Bihor County. There are presented the also Risks Register and the board panel adopted by the inspectorate as a result of the researches realized.

From the analyze of the methods used in Romania for selection, preparedness and evaluation, compared with the same methods used in Great Britain and United States of America resulted a range of major conceptual differences. Within this context, in the Second Chapter where identified the objectives of a project designed to generate major improvements in this field. From the study obviously resulted that there is necessary a change of paradigm regarding the career within the professional emergency services in Romania. Thus, it is necessary to clearly define the competences and the career evolution to be made by completing compulsory stages by and accumulating new competences specific to the next stage.

The main result of the implementation in Great Britain and USA of systems based on these principles, consisted in the fact that each position in the system is occupied by competent persons which knows in detail the specific of the activities of the inferior positions by their own experience. The implementation of this kind of system assume an approach on steps, starting with pilot subsystems, with a complex process of documentation, by consulting experienced foreign partners in order to avoid the already identified difficulties and to use their “best practices” and “lessons learnt”. Starting from this principles, the study is

proposing the creation of national training centers, their location being established in relation with accommodation and training facilities and human resources availability.

Chapter three contains concepts regarding the logistics, content and functions of the logistics management within the professional emergency services. There are presented aspects regarding the providing of technical capacities and material resources and also aspects regarding the acquisitions management, being identified improvement measures for public acquisitions.

The internal system for decisional support - SIAD presented in chapter four represents a personal contribution which proved it's efficiency, two of the application's modules being already implemented at national level. The system was developed during the preparing stage of the thesis and has integrated concepts identified within the specific literature and "best practices" identified in Great Britain, Holland, Germany and USA. The system provides the necessary information for decision making process and also the optimization of the inspectorate activities.

The decisional support system was designed to work at county level having the potential to be extinguished at national level in the context of administrative costs reduction. In the same time, starting with 2010 was connected by VPN all the fire stations of the inspectorates offering the possibility to input the raw data from station level. The system offers facilities to be used in case of large scale emergencies, like in the case of floods waves in the mountain area of the county, when the volume of the information to be processed is very big.

The system was designed as a modular structure in order to allow it's sequential development, each new version having new modules linked with the old modules through application's interface. As an example in SIPER module are registered the functions on which are nominated persons registered before in the system by ISUTEL module. In order to develop an soft application in sequential mode imply to consult periodically the users of the system in order to solve the errors and to identify improvement solutions. This was

possible in the situation of the Inspectorate for Emergency Situations “CRISANA” of Bihor county, because within the institution was constituted a project management team, which developed the SIAD system between 2006 and 2010, documented the implementation activities by specific procedure and realized the “user’s manual” for each module. From this perspective the system represents a national premiere.

After the analysis of the emergency situations from other countries it is proposed the modification of emergency situation typology. Thus were identified some missing hazards for the original classification as pandemic or panic in areas with people agglomeration, the conclusions of the study being presented in chapter five. In the same chapter are presented the elements of the National System for Emergencies Management from the point of view of actual legal provisions having as main goal the identification of improvement possibilities in relation with similar systems from other countries.

The legislation which regulates the field of emergencies management does not treat adequately the aspects related with interventions logistics. This situation was generated by the sequential development of the specific concepts, not always properly used and related with other concepts. In this direction a relevant indicator is represented by the ambiguous terminology which often creates confusions.

Therefore in chapter six are presented the contributions in the field of logistics management in case of large scale emergencies as proposals on three directions:

- 1) improvement of the conception regarding resources coordination
 - the adoption of “support function” definition;
 - the modification of some support functions denomination and the reconsideration of their repartition to institutions with a specific role in emergencies management. Also were defined new support functions as “management of the information regarding the victims and missing persons”;
 - the simplification of the documents for planning the intervention resources in case of emergencies, by replacing of three different document by only one, presented within the thesis.
- 2) Regulation regarding formation and activation of the financial resources

- Creating the obligation of allocation by authorities at county and local level of a fund amounting 5% from total budgetary expenses in the field of emergencies, fund which will provide a prompt response even at local level, in the situation when is urgently needed goods or food for evacuees or affected people;
 - simplification of the procedures regarding the providing of humanitarian aid in the first stage of intervention, to affected people, by decision decentralization.
- 3) Adoption of technical regulations regarding the material resources for intervention
- Identification of the necessity to elaborate and to adopt an unique nomenclature for intervention resources in case of emergencies, assuring the principle of interoperability with similar EU structures;
 - Argumentation, relying on established standards, of the necessity to elaborate new endowment standards on specific types of emergencies and according to regulations regarding the prevention and management of emergencies and to the unique nomenclature of the resources.

From the study of the response mechanisms in emergencies created by UN, NATO and EU results that the intervention logistics in large scale emergencies is still deficient, the level of providing the intervention resources being most of the times insufficient in relation with the phenomena produced. It is considered that the adoption of European regulations in the field of intervention logistics will solve the problem.

After comparing analysis of the management systems of emergencies from Romania and USA, presented in chapter seven, results two main conclusions which can sustain the initiation of a project for improvement of National System for Emergencies Management. Thus it is obvious that Romania does not have defined the Incident Command System, each institution having its own system used successfully in routine but which may become inefficient in the situation when inter-institutional cooperation is needed. The analysis of the results obtained by countries like Great Britain or USA after the implementation of ICS leads to the conclusion that is necessary to adopt at national level of an unique command

system for all types of hazards, system which should be used by all the institutions involved in emergencies management at all levels.

The second conclusion refers to the necessity of adoption of a communication system used in emergencies management.

The necessity to improve the activities of professional emergency services implies the preparedness of operational personnel, improvement of technical endowment and inter-institutional communication mechanism. The achievement of these objectives is possible by complex projects utilizing external resources.

Thus, within chapter eight are presented the stages and results of the project Phare CBC 2006/INTERREG III A (2006/018-446.01.01) "Floods prevention and the reduction of their consequences by using in decision making process of an integrated informational system". The project was implemented by the Inspectorate for Emergency Situations "CRISANA" of Bihor County in a period of 16 months starting from 15.08.2010.

The objective of the project was the development of a decisional support system in case of large scale emergencies. Therefore were created modules which automatically send the warning messages, allow the information of operational use to be georeferenced, such as water supply sources or risk source companies, provide the rapid identification of the institutions which assure support functions and allow the rapid identification of the safety measures in case of accidents which involves hazardous materials. One of the most useful modules –TEVAC was tested successfully within three international exercises and was implemented at national level starting from April 2009. The implemented system represents a premiere at national level proving its utility in large scale emergencies.

It is considered that the study provides a real base for documentation in the field of developing and improving the mechanisms specific to emergencies management as well as the solutions for their implementation. Certainly, one of the concepts to think about in the near future is the integrated management of all resources which participates to the response in case of emergencies by realizing an incident command system.

SELECTIVE BIBLIOGRAPHY

1. Alazard, Cl., Separi S., *Contrele de gestion*, Dunod, Paris, 1994, p. 523-537.
2. Androniceanu, A., (2005), *Noutăți în managementul public*, Editura Universitară, București.
3. Androniceanu, A., (1998), *Managementul schimbărilor*, Editura ALL, București
4. Baș, I., Zoicaș, C., *Utilizarea hărții digitale a municipiului Oradea în situații de urgență*, Revista Market Watch, octombrie 2005.
5. Baș, I., *Considerații privind implementarea managementului calității totale în domeniul serviciilor publice de urgență* - Conferința internațională de apărare împotriva incendiilor și catastrofelor, Băile Felix, România, 27 – 29 septembrie 2006.
6. Baș, I., *Sistem de asistare decizională pentru evacuare în situații de urgență* – Lucrările Sesiunii de Comunicări Științifice cu participare internațională din Facultatea de Pompieri din cadrul Academiei de Poliție „Alexandru Ioan Cuza”, ediția a XI – a, 30 mai 2008.
7. Baș, I., *Asistare decizională pe durata intervențiilor la substanțe periculoase* – Lucrările Sesiunii de Comunicări Științifice cu participare internațională din Facultatea de Pompieri din cadrul Academiei de Poliție „Alexandru Ioan Cuza”, ediția a XI – a, 30 mai 2008.
8. Baș, I., *Transmiterea mesajelor de prevenire utilizând tehnologia Cell Broadcast* – Lucrările Sesiunii de Comunicări Științifice cu participare internațională din Facultatea de Pompieri din cadrul Academiei de Poliție „Alexandru Ioan Cuza”, ediția a XI – a, 30 mai 2008.
9. Baș, I., *Evacuation management in large emergency situations* – Lucrările Conferinței internaționale “Managerial challenges of the contemporary society” organizată de Facultatea de Științe Economice și Gestiunea Afacerilor, Cluj Napoca, 2009.
10. Baș, I., Zoicaș, C., Ioniță, A., *The management of large emergency situations- a best practice case study based of GIS for management of evacuation* – World Academy of Science, Engineering and Technology, Paris, june 2010.
11. Bășanu, G. & Pricop, M., (2003), *Managementul aprovizionării și desfacerii*, Editura ASE, București.

12. Bălan, C., (2006), *Logistica*, Editura Uranus, București.
13. Bibu, N., Foltean, F. (2002), *Managementul organizațiilor publice*, Proiect coordonat de Universitatea de Vest, Timișoara.
14. Borduș, E., Căprărescu, G., (1999), *Fundamentele managementului organizației*, Editura Economică, București
15. Carter H., Rausch E. (2000), *Management in the fire service*, National Fire Protection Association, USA.
16. Cornescu, V., (2004), *Management*, [Editura Universitatii](#), [Bucuresti](#).
17. Craciun, I., (2006), *Managementul situațiilor de urgență*, Editura Bren, București.
18. Carroll, T., (2001), *The risk factor; How to make risk management work for you in strategic planning and enterprise*; Take That Ltd., England.
19. Chatfield, C., (2002), *Microsoft Project, Version 2002, Step by step*; Microsoft Press; A Division of Microsoft Corporation, One Microsoft Way, Redmond, Washington 98052-6399, USA.
20. Covrig, M., Opran, C. (2002), *Managementul proiectelor*; Agenția Managerială pentru Cercetare Științifică Inovare și Transfer Tehnologic - POLITEHNICA; Editura Pritech 2000; București.
21. Coyrtot, H., (2001), *La gestion de risques dans les projets*; Collection Gestion, Economica, rue Hericart, 75015, Paris, France.
22. Covey, S., 2000, *Eficiența în 7 trepte*, București, Editura Allfa.
23. Dauphine, A., (2001) *Risques et catastrophes: Observer – Spatialiser – Comprendre – Gerer*, Collection U, Armand Collin, Paris.
24. Denis, H., (1993), *Gerer les catastrophes, l'incertitude a approvoiser*, Les Presses Universitaires de Montreal, Montreal.
25. Denis, H., (2002), *La reponse aux catastrophes: Quand l'impossible survient*, Presse International Polytechnique, Montreal.
26. Druker, P., (2001), *Eficiența factorului decizional*, Editura Destin, București.
27. Heisbourg, F., (2006), *Le terrorisme en France aujourd'hui*, Editions des Equateurs.
28. Ilieș, L., Baș, I., (2009), *Managementul operațiunilor de evacuare în cazul situațiilor de urgență de amploare* – Conferința internațională „Provocări manageriale ale societății

- contemporane”, Universitatea Babes-Bolyai, Facultatea de Științe Economice și Gestiunea Afacerilor, Cluj-Napoca.
29. Ilieș, L., (2000), *Managementul transporturilor*, Editura Risoprint, Cluj Napoca.
 30. Ilieș, L., (2003), *Management logistic*, Editura Dacia, Cluj Napoca.
 31. Ilieș, L., (2003), *Managementul calității totale* Editura Dacia Cluj Napoca.
 32. Ilieș, L., Stegorean, R., Osoian, C., Lungescu, D, (2005), *Managementul firmei*, Editura Risoprint, Cluj Napoca.
 33. Ilieș, L., (2003), *Managementul firmei* Editura Dacia Cluj Napoca.
 34. Ilieș, L., Crișan, E., (2009), *Managementul firmei si planul de afaceri*, Editura Risoprint, Cluj Napoca.
 35. Ilieș, L., Crișan, E., (2009), *Managementul logisticii*, Editura Risoprint, Cluj Napoca.
 36. Johns, G., (1998), *Comportament organizational*, Editura Economica, București.
 37. Kerzner, H., (2001), *Project management, a system approach to planing, scheduling and controlling*, John Willey & Sons Inc, New York, USA.
 38. Luthans, F., (1992), *Organizational Behavior*, McGraw-Hill International Editions.
 39. Mărăcine, V., (1999), *Decizii manageriale. Îmbunătățirea performanțelor decizionale ale firmei*, Editura Economică, București.
 40. Mihuț, I., (coordonator), (2000), *Management*, Editura Universității “1 Decembrie 1918”, Alba-Iulia.
 41. Mihuț, I., Lazăr, I., Pop, I., Popa, M., Mortan, M., Lungescu, D., (2003), *Management general*, Editura Universității “1 Decembrie 1918”, Alba-Iulia.
 42. McCarty, S., (2000), *How to negotiate, administer, manage and finish an EU R&D contract*, Course EARMA - European Association of Research Manager and Administrators; Brussels, Belgium.
 43. Nica, P., Iftimescu, A. (2004), *Management. Concepte și aplicații*, Editura Sedcom Libris, Iași.
 44. Nicolescu, O., Verboncu, I., (1992), *Management*, Editura didactică și pedagogică, București.
 45. Nicolescu, O., Verboncu, I., (2001), *Fundamentele managementului organizației*, Editura Tribuna Economică, București.

46. Nicolescu, O., Verboncu, I., (2008), *Fundamentele managementului organizației*, Editura Universitară, București.
47. Opran, C., Stan, S., (2008), *Managementul proiectelor* Editura Comunicare. Ro, București.
48. Opran, C., Stan, S., (2003), *Planificarea, elaborarea și implementarea proiectelor*, Școala Națională de Studii Politice și Administrative, Facultatea de Comunicare și Relații Publice “David Ogilvy”, Departamentul ID, editura comunicare.ro.
49. Pastor, I., Petelean, A., (2004), *Principiile managementului modern*, Editura Dacia, Cluj – Napoca.
50. Popescu, L., (2001), *Resurse umane, comportament si management*, Editura Cimer, Bucuresti.
51. Perrow, C., (1999), *Normal Accident: Living with High-Risk Technologies*, Princeton University Press.
52. Perilhon, P., (2002), *Du risqué a l'analyse de risqué – Mosar-, Methode organisee et systematique d'analyse du risqué, Cours de Mastere Securite Industrielle et Environnement*, Ecole des Mines d'Ales.
53. Quarantelli, E.L., (1990), *Similarities and differences in institutional responses to natural and technologica disasters*, Preliminary paper, Disaster Research Center.
54. Ross, J.E., (1994), *Total Quality Management*, Editura Kogan Page, London.
55. Lagadec, P., (2000), *Ruptures Creatrices*, Collection tendaces, Editions d'organisations.
56. Tabără, N., Chetrariu, G., (2002), *Tabloul de bord - coordonată a managementului modern*, Revista Gestiunea si contabilitatea firmei, nr. 7 - iulie, p. 2-8.
57. Tabără, N., (2004), *Contabilitate și control de gestiune*, Ed. Tipo Moldova, Iasi, p. 197-209.
58. Turban, E., (1993), *Decision support and expert systems*, Mc Pub. Company New York.
59. *** Hotărârea Guvernului nr.1489 din 9 septembrie 2004 privind organizarea și funcționarea Comitetului Național pentru Situații de Urgență.
60. *** Hotărârea Guvernului nr.1492 din 9 septembrie 2004 privind principiile de organizare, funcționarea și atribuțiile serviciilor de urgență profesionale.

61. *** Hotărârea Guvernului nr. 2288/2004 privind aprobarea repartizării principalelor funcții de sprijin pe care le asigură ministerele, celelalte organe centrale și organizațiile neguvernamentale privind prevenirea și gestionarea situațiilor de urgență.
62. *** Hotărârea Guvernului nr. 762/2008 privind aprobarea Strategiei naționale de prevenire a situațiilor de urgență.
63. *** Hotărârea Guvernului nr. 762/548/2008 privind aprobarea Strategiei naționale de informare publică în situații de urgență.
64. *** Legea nr. 481/2004 privind protecția civilă.
65. *** Legea nr. 138/1999 privind salarizarea și alte drepturi ale personalului militar
66. *** Legea nr.363/2001 pentru aprobarea Ordonanței Guvernului nr. 88/2001 privind înființarea, organizarea și funcționarea serviciilor publice comunitare pentru situații de urgență.
67. *** Legea nr. 80/1995 privind statutul cadrelor militare.
68. *** Legea nr. 188 din 8 decembrie 1999 republicată, privind Statutul funcționarilor publici.
69. *** Logistica forțelor de manevră ale armatei de uscat, Biblioteca A.I.S.M., Traducere, cota T.III, (1982).
70. *** *Manual Managementul proiectelor*, Institutul Național de Administrație, Bucuresti 2006.
71. Manualul NATO, 2001, Bruxelles, Office of Information and Press.
72. *** National Incident Management System, 2008, Homeland Security Department of United States of America, www.dhs.gov, www.fema.gov/nims.
73. *** National Response Framework, 2008, Homeland Security Department of United States of America, www.fema.gov/NRF.
74. *** Ordonanța de Urgență nr.21 din 15 aprilie 2004 privind Sistemul de Management al Situațiilor de Urgență.
75. *** Ordonanță de Urgență nr. 92 din 10 noiembrie 2004 privind reglementarea drepturilor salariale și a altor drepturi ale funcționarilor publici pentru anul 2005.
76. *** Ordonanța nr. 2 din 12 ianuarie 2006 privind reglementarea drepturilor salariale și a altor drepturi ale funcționarilor publici pentru anul 2006.

77. *** Regulament privind organizarea serviciilor trupelor de uscat ale S.U.A. în Europa, Biblioteca A.I.S.M., Traducere, cota T.III, (1980).
78. *** Regulament privind organizarea serviciilor trupelor de uscat ale Germaniei, Biblioteca A.I.S.M., Traducere, cota T.III, (1982).