

# A NORMATIVE MODEL OF EMERGENCY RESPONSE IN CASE OF EMERGENCY SITUATIONS

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**Keywords:** risks management, management of emergency situations

**Abstract** Self-protection is in human nature. In order to protect, you shall develop a risk management approach that consists in identifying vulnerabilities (the so called “hot spots”), the hazard assessment and the risk assessment. The goal of the present study is to analyse scenarios that could facilitate the cooperation between the integrated information systems in order to develop an initial set of applications and reference models which covers the main needs of a Disaster and Emergency Management system for restoration activities based on safety and security systems installed in Critical Infrastructures Facilities. This methodology analyses emergency authorities’ business processes in case of emergency, the first response reactions and coordination of public institutions.

## 1. INTRODUCTION

The global development, the social and economic realities have lead to a major change regarding systemic analysis. Thus, there can be isolated at least three main coordinators in the area of the security system analysis, namely: interconnection, the interdependence of the complex systems and the intention factor. We can say that the systemic analysis suffered a translation of perspective from the ongoing, internal, passive risks, associated with the system seen as half-closed whole to the systems vulnerability (internal, external, active) seen from the functionality “systems of systems” space point of view .

The risk represents the probability of loss and depends of three elements: potential danger, vulnerability and exposure degree. The vulnerability is defined as the susceptibility of a system of suffering losses in exposure conditions at the pressure of changes – internal or external.

The specific difference between risk and vulnerability derives from the fact that the risk refers at the threats (origins, causes), characterizing the consequences of the manifestations (losses, damages), the perception of the importance of consequences and the probability of threat’s manifestation, while the vulnerability refers to the subject/subjects of the exposure at the threat’s manifestation, characterizing the type and the level of susceptibility, the subject’s reaction to stress of bearing the exposure to threat’s manifestation.

## 2. RISK EVALUATION

One of the main features of the risk’s evaluation is the development of the response simulation models of a system to a series of disturbing events which can lead to a state of dysfunction of it. The models and the evaluation methods of risk cover (more or less successfully) the problem of minimizing the impact which an abnormal evolution of system can have on the environment in which evolves. On a closer look, we can notice that the risk evaluation is done depending on:

- the possibility of an event taking place
- the level of the event’s consequences
- the environment and health impact of the event.

The vulnerability analysis represents the expansion tendency of the risk analysis horizon by including the related fields of the analysed activity, and also of a certain parts belonging to non-physical systems. This approach can be seen when the analyst gets too far away from the studied process, seen from the actor’s perspective.

In literature, the concept of risk and of that of vulnerability refers mainly to natural disasters. This is the reason why we have to understand how these concepts apply in the case of critical infrastructures, showing the similarities between the management of natural disasters area and that of the protection of critical infrastructures. Most threats on a vital substructure have associated a certain degree of probability, thus the risk model regarding the critical infrastructures is no longer a danger function, but a threat function, critical elements and vulnerability.

At the end of 2008, on December 8<sup>th</sup>, the Directive 114/2008 has been adopted. This Directive deals with the identification and the designation of the European critical infrastructures and also of the evaluation of the necessity of improving their protection. Adopting this Directive has been done after a long period of debates between the politicians and the specialists which has begun on October 20<sup>th</sup> 2004 by the European Commission of Communication regarding the protection of critical infrastructures with the fight against terrorism.

This Directive intends to organize in Europe the protection of the European critical infrastructures. Since the beginning, we have to emphasize the fact that the responsibility goes to the member states, the activity regarding the protection of critical infrastructures obeying the principles of proportion and subsidiarity. Even if in the beginning the European commission wanted a general document, given the major differences in between the main fields of discussion, this Directive approaches only two areas, namely the energy sector and transports.

Related to this document, the critical infrastructure is defined as “an element, a system or a part of a system, which is within the European states, which is essential to maintain the vital social functions, the health, safety, security, social and economic welfare of people, and their damaging or disturbing would have a major impact on a member state as a consequence of the impossibility of maintaining those functions”.

### **3. CURRENT SITUATION**

Starting from the fact that the management of the crisis situations envisages measures and actions in the following fields: economic, social, military, etc., and considering that the way that the Central and Local Public Administration reacts, (promptly and appropriately) depends on the manner of resolving crises situation, one can say that: the management of emergency situations is the set of measures and actions set by the Government, ministries, prefectures and mayors aiming to ensure safety, national security and legal order.

Currently, in Romania, managing emergency situations is carried out as follows:

Aiming to resolve daily / routine situations by: The National System for 112 Emergency Calls and the specialized forces of the National System of Management of Emergencies destined to this type of interventions: professional forces of IGSU, Ambulance, Police and Gendarmerie;

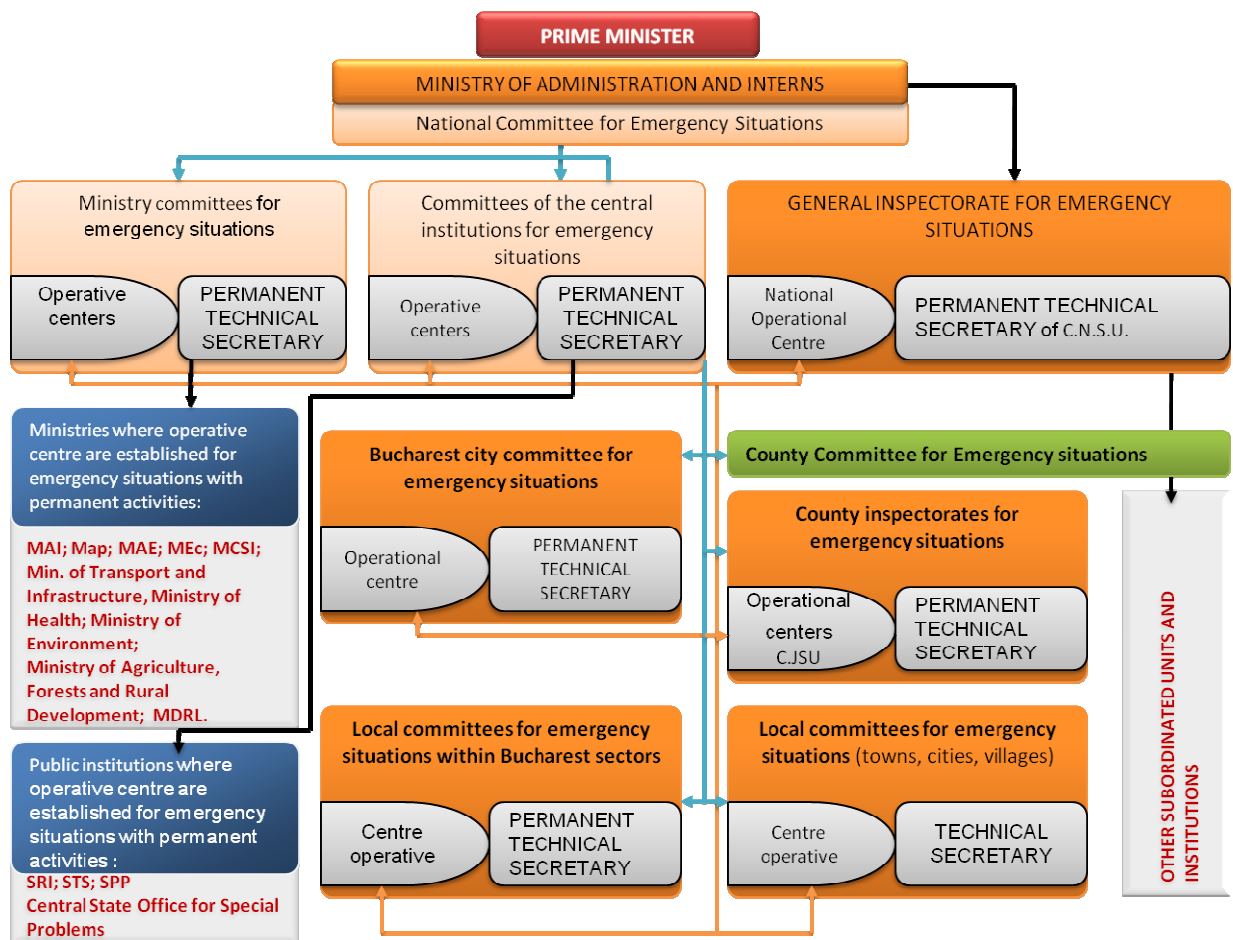
In case of situations involving the danger of life, property or the environment by: Enabling the elements of the National System of Management of Emergencies - National \ County \ Local Committees for Emergency Situations, which coordinate and lead the forces and means available (including the international ones) to respond adequately to the situation created (forces and means of M.A.I., M.A.P. N., and of other ministries and agencies).

Current development of some supporting systems needed by the local authorities for management of situations arising in the community - utilities, traffic management, urban video - survey and the fact that they are not integrated and sometimes are not interoperable with the existing ones, drives in most cases to the failure in solving the events.

The National System for Emergency Calls (112) represents an important component of universal service obligations, as stipulated in the Directives for the policies of the telecommunications sector in the EU acquis.

Calling 112 is a quick way to communicate with the emergency dispatchers (Police, ISU, and Ambulance) at occurrence and during an event. 112 System operates throughout the country and in all fixed or mobile telephone networks.

112 emergency system aims to protect citizens and ensure a high degree of assistance regardless of where they are. The Unique National System for Emergency Calls (SNUAU) is built by creating centers of taking-over emergency calls and equipping them with an operative telecommunications system intended to announcing, receipt, processing and transmitting to the services required by the emergency calls, all these in a centralized and unitary manner. The system is used for communication between the intervention specialized services of Police, ISU, Ambulance, which are required to act upon receipt of requests arrived by SNUAU.



**Information and decision streaming schedule of the National System of Management of Emergencies**

#### **4. NEW CONCEPT FOR CENTRALIZED INTEGRATED MANAGEMENT OF EMERGENCY SITUATIONS**

In this context, we propose a new concept of security and safety of citizens, integrating modern solutions for analysis of vulnerability and risk assessment of new technologies to provide emergency services for high performance.

Current security environment is marked by unprecedented magnitude and complexity of manifestations of the geo-strategic context which constitute new challenges to national security and are characterized by:

- accelerating trend of globalization;
- existence of radical climate changes;
- increasing the weight of asymmetric risks;
- proliferation of terrorist phenomenon vested of unexpected events forms;
- development of scientific experiments with unpredictable effects;
- diversification of economic activities, legal or less equal, that use, produce or sell hazardous substances;
- existence of an infrastructure of roads and housing increasingly crowded and insufficient;
- large concentration of population in urban settlements that cope more and more difficultly with the needs of services of all kinds;
- computerization, cybernetics and robotics applied to an increasingly broad range of areas of service and communication.

The Management Integrated Center for Emergency Situations is meant to protect life of citizens, property and environment, its effectiveness residing both in the interoperability of its component systems, and in the readiness of the actions of the intervention teams.

Implementation of such solutions eliminates the disparate action of institutions, achieving the interoperability of the structures participating at intervention, ensuring a minimum response time in case of events that could affect citizens and community. The essence of such concept of Integrated Center for the Management of Emergency Situations is management staggering by three operational levels as follows:

- Operational management of the daily activities of the community
- Management and coordination of interventions in case of emergencies
- Integrated management of crisis situations

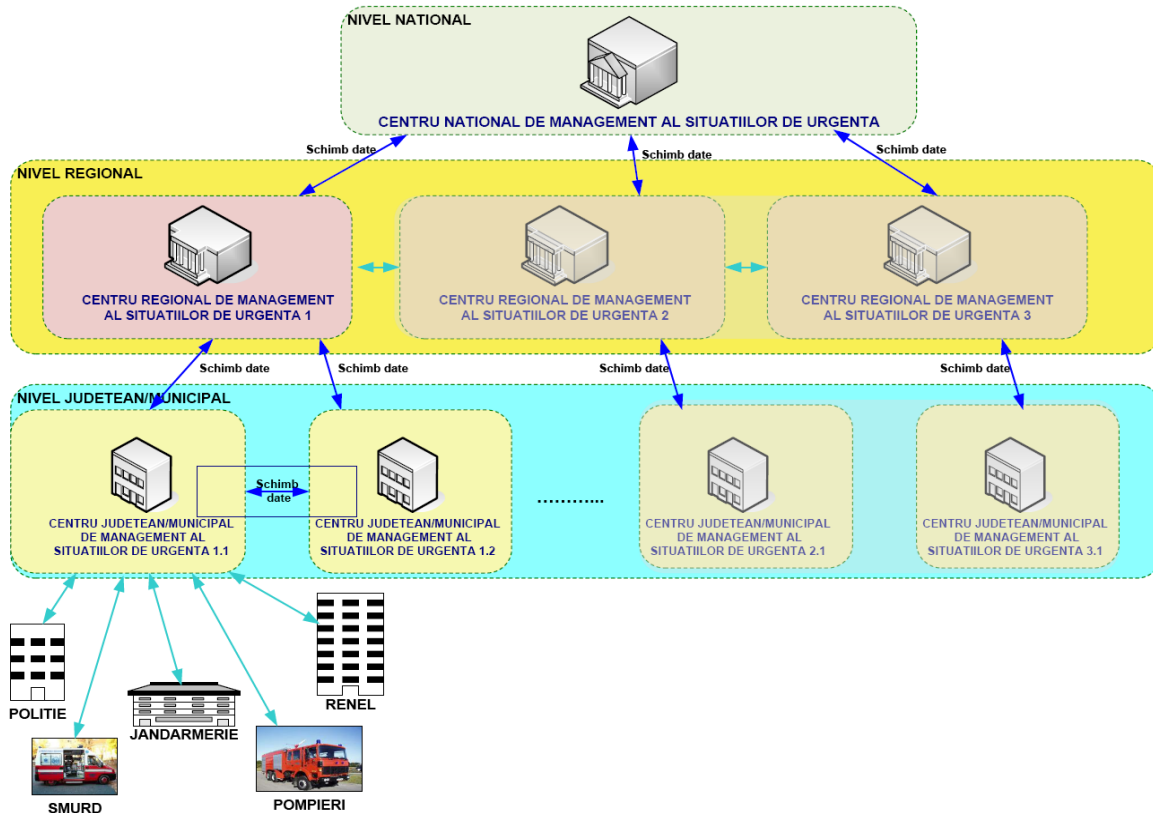
Planning the intervention in emergency and crisis situations is based on risk and existing resources analysis. Even if the total available resources apparently covers the needs that arise in most scenarios, though it does not guarantee a solution acceptable to all the particular situations that may appear in the evolutionary emergence of complex situations. The ability to quickly mobilize and allocate the available resources is critical and vital. Obtaining favorable results will always be conditioned by the possibilities to cover as fast and efficient as possible the needs arising at the incident place with the existing resources. According to G.O. no. 34 / 2008, Art 8.b: an integrated centralized structure is where the unique emergency calls center and the emergency dispatchers of the specialized intervention agencies are physically realized in the same location of the company's headquarter office, as an integrated emergency dispatcher .

Such solution for an Integrated Center for the Management of Emergency Situations based on an integrated centralized structure is used for an efficient management of emergency services having the operational capacity to use at maximum the existing human and material resources.

The advantage of integrating all structures within an emergency community is manifested through the permanent interoperability of all structures that are involved in the

management, a better structured decision-making process, reduced intervention time, which lead to saving more lives.

As the Integrated Centers for Management of Emergency situations are designed, they may be able to manage the emergency situations at regional level, only through a structural change, without requiring organizational changes, while preserving the ability to act locally.



*National Architecture of Emergency Management Network*

## 5. CONCLUSIONS AND RECOMMENDATIONS

Integrated Management Centers for Emergency Situations aim at protecting citizens' life, property and environment, its effectiveness being given by the interoperability of its component systems, as well as by the promptness of action of the emergency teams.

- Development of medium and long term national / regional / local strategies, for the prevention and control of the main risks and threats that we face, so we have a proactive manner of management of all emergency situations.
- Establishment of 8 operational bases (regions) for the management of emergency situations. Until clarification of the concept of the administrative region of economic and social development, these bases are meant as bases for storage of equipment and materials for emergency situations.
- Ensuring interoperability of the safety and security systems of the critical infrastructures with the management centers for emergency situations.

Essential conclusion of this project is the need for these INTEGRATED CENTER OF MANAGEMENT FOR EMERGENCY SITUATIONS, imposed by the spectrum of present

and future threats, representing one of the requirements of the European Union, under the current trends of coordination of the forces of intervention, not only at local, regional or national levels but also implementation of strategies concerning the INTEROPERABILITY OF THE EMERGENCY SERVICES AT EUROPEAN LEVEL.

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