

SECURITY ANALYSIS OF THE NATIONAL MARITIME TRANSPORTATION SYSTEM AS PART OF THE MARITIME CRITICAL INFRASTRUCTURES

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Abstract. The authors analyze the Bulgarian legislation in the maritime security domain and the national maritime transportation system in order to determine the bodies and their functions in favor of the security of the shipping and to look for a way for improvement. When the complex system theory (system approach) is applied and the maritime transportation infrastructures are counted as a part of maritime critical infrastructures, the security analysis in the framework of the whole system will be spread over its part - the transportation system. When common standards for security environment are established the control of the security processes in the regional aspect and the crises management in the security domain will be easier and more effective.

Introduction

If we turn back to the history, we could obtain the information that the establishment and maintenance of the seaways and ports security was an important priority of coastal state authority such as in the ancient Greece (6th-4th centuries BC). For instance, a port fee was introduced as a kind of tax amounting up to 2% of goods on board because warships patrol the sea lanes, keeping safe merchants from pirate's raids. Normally, when the pirates intensify their invasions, the taxes have been raised temporarily even up to 10% [8]. Nowadays, globalization provoke intensification and sophistication of the transport connections. Moreover, maritime transportation system becomes more complex in structural aspect than ever. The paper 'National prospective for transport infrastructure development' adopted by Bulgarian Ministry of transportation' says that the "Safety and security of the transportation system" is set as paramount priority. The Sectoral Operational Program "Transport" has been developed due to need of enhancement the fundamental national sectoral policy. It delineates detailed way for implementation of the Strategy for development of transport infrastructure. The main objective is to materialize sustainable transport connections between all economic actors. The specific objectives define the framework for integration of the national transportation system into the EU transport network thus achieving a balance between wide spectrum transport subsystems. It gives noticeable indications that the government should be obligated to develop a sustainable transportation system.

The research problem identification

The IMO Concept of a sustainable maritime transportation system [7] determines its elements and the way to create favorable conditions to maintain the sustainable system state. This concept recognizes the international maritime transport system as a mechanism for global trade economic growth and sustainable development.

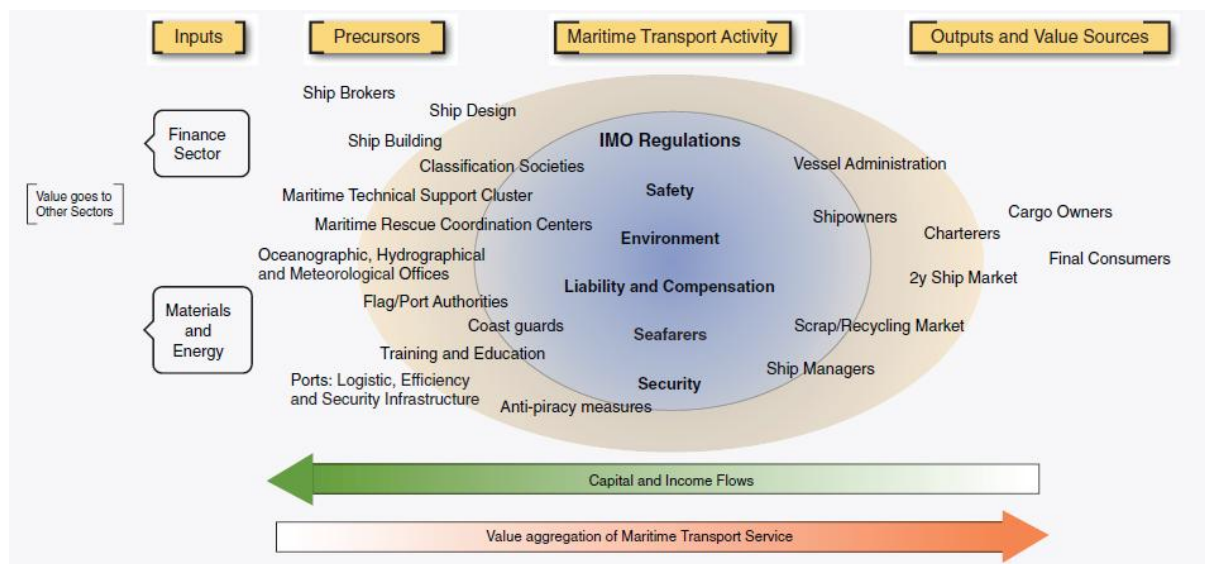


Fig.1 The maritime transport system [7]

One of the key elements of the ‘Maritime transport activity’ area is Security. The implementation of security here is based on IMO regulations [1].

The Bulgarian maritime transportation system is part of the international transportation system and includes components, connected with transport infrastructures, maritime business, regulatory legislation and bodies, service providers, owners, customers, educational bodies, logistic chains etc. It continues and connects the routes of other modes of transport - land and air. The preference of a particular type of transport for a given activity is determined by economic, tourist, geographic, temporal and other considerations, including the security (environment). The modern criterion of security is increasingly high. In a theoretical sense, the term "security" is associated with the "risk" and "protection" categories.

Bulgaria has adopted own national legislation on the subject synchronizing it with the relevant international one (IMO and EU level).

Nevertheless, it is called “system”, in fact only geopolitical, financial and investment aspects are concerned. The element physical security is replaced with the operational safety. But the security environment has to be controlled and improved.

Normally, the term “maritime security” is applicable to describe distinctive unique characteristics of maritime environment concerning the functional aspect of studied system. It is used in official documents by the International Maritime Organization and relates to the security of the maritime transportation system, port facilities and offshore infrastructure. It concerns a system’s resilience to withstand against transboundary aggression, terrorist activities and other deliberate destructive impacts. It could be defined as a combination of preventive measures aimed at protecting shipping and port facilities against threats related to illegal activities [1]. This definition is also quoted in the ISPS Code adopted on 12 December 2002 by Resolution 2 of the Conference of Contracting Governments to the International Convention for the Safety of Life at Sea, 1974, and in Regulation (EC) No 725/2004 of the European Parliament and of the Council of 31 March 2004 concerning the improvement of security of ships and port facilities [6]. Furthermore, there are discrepancies between

linguistic representation and the meaning of the term. More often than not it still is beyond comprehension to wide auditorium. For instance, in the official translation into Bulgarian of this Regulation, published on the Executive Agency Maritime Administration website, the term "maritime security" in the definition is replaced by "maritime safety". The analogous analysis of the term "maritime safety" links it to the protection of human life, the marine environment and property in the maritime environment from unintended direct or collateral impacts. It is defined in the above mentioned document as continuously maintaining and enhancing resilience of the system in terms of safety of navigation and protecting of human life, health, property and the marine environment in general. It includes:

- Safety of the ship, its crew, passengers and / or cargo carried.
- Navigational safety.
- Environmental safety, including crisis prevention and response measures such as protecting the sea against pollution caused by ships. It includes a possibility of enforcing sanctioning forbidden pollution and intervening of competent authorities in order to limit the harm caused by incidents.
- Responsibilities and compensation for damages caused by ships [5].

Tendentious or not, an incorrect definition is created. It directs efforts to ensure only the safety of the Maritime transportation preventing possible unintended impacts. In addition, the document creates confusion due to the use of the two terms, both safety and security, in the same context. The Strategy for Development of the Transport Infrastructure of the Republic of Bulgaria [10] carries out an analysis of the national infrastructure and outlines the directions for the development of the sector. It takes into account solely the impact of geopolitical and economic factors upon the transportation connections and elements of transportation system, presenting the objectives and priorities for development, the expected final results and the projects for their realization. In Chapter Three, entitled "Analysis of the strengths, weaknesses, opportunities for development and potential threats", it is revealed that there is "insufficient security in ports". It is figured out as a weak side of maritime transport, but no analysis has been made of the level of security, desirability of security and there are no mechanisms for enhancing the security of ports thus neglecting essential provisions of the ISPS Code.

In the National port development program, developed pursuant to Article 103a (2) of the Maritime Spaces Act, inland waterways and ports of the Republic of Bulgaria [2] it is only stated that the analysis of strengths and weaknesses, opportunities and threats (SWOT analysis) suggests "improving security and safety systems in ports" as an "opportunity". Actually, the notion of security does not appear in the "weaknesses" or "threats" sections. Only the organizational, technical, infrastructure and financial aspects related to economic and investment security are taken into account.

Based on the security situation of ports and other critical infrastructure concerning economic activities at sea, the program provides specialized proactive measures to increase maritime security and safety by implementation of:

- Assessment of port security by all competent governmental institutions.
- Improvement of the port control and security regime by means of audiovisual surveillance and control systems, electronic access control systems, barriers, fencings, permanent or removable enclosures and wide spectrum of measures that increase level of physical security. Responsible for the implementation of this group of measures are border control authorities.
- Synchronization of Bulgarian standards and norms for safety and security of ports with the international and European standards.
- Synchronization of Bulgarian standards and norms for environmental protection to international and European norms.

- Introducing an adapted management and control system to ensure healthy and safe working conditions.

Sustainability of the Transportation system is considered to be one of baseline requirements for resilience after The Warsaw Summit Resilience Commitment held in July 2016. Actually, it is made as a political link between defense, deterrence and resilience concerning safety and security of society related with the civil preparedness. The work on resilience is inspired from the Article 3 of the Washington Treaty stressing national obligations and contribution to the allied defense and deterrence.

Obviously, using system approach, it is necessary both elements and connections between prominent subsystems and elements to have specific characteristics enhancing resilience and cohesion of the National Maritime Transportation System. The system surrounded and influenced by maritime security environment requires timely and adequate management in order to withstand against unfavorable external impacts. It is vital to preserve its structure, purpose and delineated spatial and temporal boundaries.

Moreover, the resilience of the National Maritime Transportation System could be maintained efficiently by using NATO-EU Cooperation and focused national efforts. The national legislation framework provides needed basis for synchronization of wide spectrum activities originated by competent governmental institutions interacting with international organizations and foreign governments. Next, the building resilience process should be initiated at national level by implementing detailed analyzes and self-assessment. Last but not the least, education and training are other milestones marking the road ahead [11].

The reassessment over the last decade of energy policy and in particular the specific role of the state in the provision of energy services through energy market liberalization in the "energy sources and supply" sector, has been reflected in the Energy Strategy of Bulgaria. However, under term security of energy supply is meant to increase interdependence in the use of the country's key geographic location for increasing transit of Russian and Asian resources such as natural gas, oil and electricity to the west and south. Another point is the possibility of diversification of the energy sources and suppliers [9]. Similarly, the maritime infrastructure could be related to the production and transport of hazardous and dual-use goods and components such as chemical, biological, explosive, etc. Typically, users of this infrastructure meet safety standards and environmental requirements. However, the protection of these maritime critical infrastructures is not adequate to the potential threats and possible ways of their implementation from the sea. The relation between security and contemporary threats to maritime infrastructure and transportation system infrastructures it is not mentioned neither in the Operational Program "Regions for Growth 2014-2020" of the Ministry of Regional Development and Public Works [3], nor in the regional development plans of the districts of Varna and Burgas.

Security analysis of National maritime transportation infrastructure

The maritime transport infrastructure supports the maritime transport system and is the physical base to provide all the necessary services for the system functions. It consists of ports with their intermodal connections, seaways, ships and management systems. All those elements are recognized by Bulgarian national legislation as critical infrastructures¹. The security of the physical and the informational maritime transport infrastructures is fundamental for the system functions.

¹ There is officially issued (by the Council of Ministers decision) list of the national strategic objects and those that are recognised as critical infrastructures.

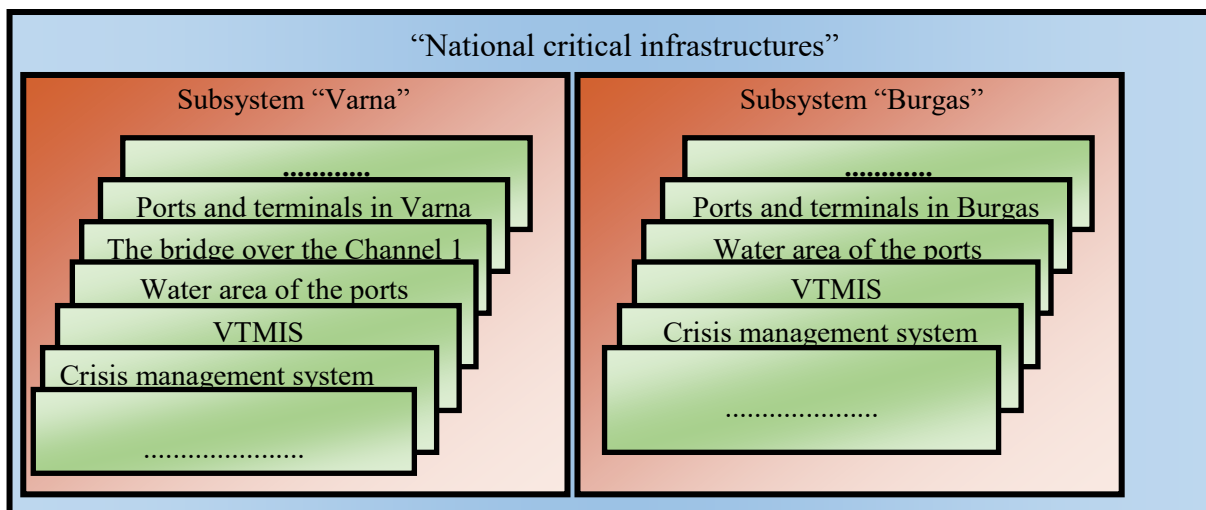


Fig.2 National critical infrastructure system

The analysis of the present security condition of the Maritime transportation system infrastructure elements (shown at fig.2 as part of the national critical information system) indicates that the protection of maritime shore infrastructure is organized only landward. Generally, it is built by modern facilities used to control access to objects, including incoming and outgoing traffic thus preventing unauthorized access. However, the security of transportation system elements, assets at sea and the adjacent infrastructure against threats raised seaward is established based on the assumption that there is a low possibility it to appear there. This way the possibility of unauthorized access from the sea side is not as risky as from the land side and the prevention is not so firmly organized. Another specific factor shaping security environment characteristics is, that there is a feeling that there is at national level a well-organized and working system, which has the capability to detect and counteract timely the deliberate security threats to the maritime transportation system elements originating from seaside.

Usable outcomes for the analysis could be drawn derived from the analysis of the conceptual security aspect of the maritime transportation infrastructures elements. On one hand, the establishment and management of modern national maritime transportation system that meets both national and European requirements is an important national priority. The Government is actively involved in this process, striving to harmonize national legislation with the norms of the European Union and creating favorable conditions for the development of the sector. Next, efforts of national level to ensure the security of the Maritime transportation system are fragmented to the responsible authorities and the operators of the infrastructure. Military authorities have got considerable scientific, analytical and technical potential, as well as network capabilities to operate in coalition environment, but to a certain extent they are not the national leader for the research, organization and protection activities.

On the other hand, researchers and developers of maritime safety regulations are handling a conceptual apparatus that does not provide a homogeneous understanding of categories, their scope and compliance on national and European level. So, introducing ship's or port facility's security plans, criterion of setting security levels, port security officer or security officer on board the ship, etc. is a progressive step towards creating a favorable environment for the functioning of National maritime transportation system's elements. These actions are result of

the necessity international security regulations and standards to be applied. Another illustrative outcome is that the actual security threats are not taken into account in the process of protection development. Analyzing the security of the maritime transportation infrastructures by departmental cross-section approach, the main focus is on resource management in order to achieve maximum financial efficiency under a vaguely defined security environment.

Possible applicable approach to address the described deficiencies is to consider the security of the maritime transportation system / infrastructures in the context of regional or local crisis management activities. The logic is based on the fact that security incidents occur having a local (geographically) character rather than a departmental realization. Threat detection, neutralization, incident response and recovery activities are performed locally, within the established organization on a national and regional scale, from the forces and resources of different competent governmental and non-governmental agencies and organizations. The management of these activities should be inter-institutional in structural aspect, local in spatial aspect, continuous, and sustainable in functional aspect in order to be effective.

Let us assume that the crisis management activities are designed so that to be applicable in a sense of the National transportation system and interpreting the implementation of general provisions of modern security paradigm. Because we divide the crisis management process generally on three phases (prevention, reaction and recovery), on the preventive actions phase all the activities of accurate risk prediction and precise risk analysis are implemented, followed by control of the technical parameters of the infrastructure security, education and training of the operating personnel as well as the critical services involved personnel and monitoring of the environment and subsequent early warning. Certifications and verifications are carried out intended to establish the quality, performance, and reliability of security plans and readiness to act when security incidents appear. Security plans are developed and coordinated during the planning stage and organizing the protection of the National maritime transportation infrastructures. Co-ordination takes place in both the governmental and regional institutional formats.

In general, prescribed standard procedures recommend to promulgate warnings through the current communication channels or through the existing common search and rescue system in the immediate response to a security incident. Mitigation of unfavorable environmental effects and emergency restoration procedures should be implemented during rescue operations with rendered assistance of specialized additional modules. Without a doubt, it is necessary the private sector to be involved sharing human resources, financial resources, assets and equipment. The quantity and quality of the planned activities during last two phases are selectively executed depending on the type and scope of the given crisis or security incident. Applying the system approach in order to analyze the security of social and economic systems including transport in the context of the crisis management system and applying uniform standards, procedures and tools is a guarantee for determining timely and adequate level of risk and defining commensurate activities at different levels by departments of agencies and organizations. It will overcome in considerable extent existing differences between agencies and organizations in their approaches concerning system analysis and risk assessment.

In this aspect it is appropriate to apply a comprehensive system approach for analyzes on a relevant scale - global, national, and regional. The objects of the transportation system as well as the other maritime infrastructure elements do not exist and operate separately and independently. They are permanently linked in functional, physical and informational way. Due to this inherent connectivity, security analyzes and assessments will be more impartial if it is taken into account all existing interrelationships and all measurable resulting outcomes. On this basis, the National maritime transportation infrastructures, in terms of infrastructure security, should be seen as part of the National Critical Infrastructure system because of the following:

- The transportation system is one of the critical infrastructure sectors, due to the severity of the potential cascading social and economic effects caused by potential security incident on each of the elements of the National maritime transportation system.
- The geographic, physical and information connectivity between critical infrastructure elements, regardless of the sectors to which they belong, determines the existence of connections with a certain strength that can be exploited in a framework given by potential security incident.
- All elements of particular regional subsystem of the National Critical Infrastructure, including transport, operate under identical security environment conditions typical for the region.

According to the definition, the security of the system is a dynamic balance between potential threats and active measures taken to protect system's elements. Thus, the balance means a normal system's state that has to be sustainable. In other words, the analysis of the system is carried out in order to study the criticality of the individual elements and to identify proper timely and adequate measures for their protection. The security analysis and the level of security of the transportation system infrastructure could not vary from the same for the other sectors of the national critical infrastructures.

The establishment and maintenance of a favorable security environment is not related to any changes of the national legal framework. It is recommended the Council of Ministers to adopt an uniform methodology for critical infrastructures risk assessment in the framework of the security crisis management process. The adoption of uniform standards for security assessment by applying the integrated approach, methodologically and expertly provided especially by the Bulgarian Army (Navy) together with Coast Guard and emergency services, would support the protection of National maritime transportation infrastructures. It will facilitate the selection process of adequate security level appropriate to the current environment during operation of critical infrastructure with its wide spectrum of sectors, relations and elements.

CONCLUSION

The maritime transportation system, in terms of infrastructure security, should be treated as part of the national critical infrastructure system. The security in the framework of the National Critical Infrastructure system is interpreted as a dynamic balance between potential threats and the protection measures against them. The analysis of the system is carried out in order to study the criticality of the individual elements and to identify measures for their protection. The departmental approach to performing asset security applied to the protection

of the marine transportation system infrastructures is not productive in current security environment.

The recommendation for creation and maintenance of a favorable security environment is a uniform methodology for assessing the risk of security crises management (based on the existing ordinance [4]) to be adopted. By applying the integrated approach, the adoption of uniform standards for security assessment, methodologically and expertly provided by the Bulgarian Army (Navy) together with Coast Guard and emergency services, will ensure the planning and achievement of an adequate level of security in the current environment for the maritime transportation infrastructures operation.

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