PhD dissertation
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Seaports protection as an element of the structure
maritime security of the state
on an example of the port of Gdańsk

Sea transport remains the "core" of international trade, serving over 80% of the global volume of trade in goods. The development of logistics strengthened the role and importance of seaports, and containerization and multimodalism changed the conditions of their functioning. Seaports, by carrying out the tasks of transport hubs, in which the means of transport are changed, play an important role in the process of economic development. Polish ports of primary importance for the national economy reach next transhipment records and ports authorities pay almost 10 percent of total revenues from taxes due: VAT, excise duties and customs duties to the state budget. The multi-plant structure of the port system, its activities at the port-sea interface, and the international nature of freight turnover and passenger traffic mean that port security and port facility security issues are the most important strategic management problem in seaports. For strategic thinking about the security of the future of the port economy, it is important to diagnose and forecast possible threats, with particular emphasis on where they arise, and to assess the status of port security.

Undertaking research on the protection of seaports was initiated by the perception and identification of a problem situation that requires knowledge and a scientific solution related to the subject of this dissertation. Research, in contrast to other forms of cognition, they are purposeful and conscious cognition of a specific segment of reality. Threats to seaports and their impact on the maritime safety of the state were assumed as this section, and as a result - the research subject was: threats that may destabilize the function of seaports and good practices that increase the effectiveness of seaport protection.

In the dissertation submitted two research objectives were set:
- cognitive - assessment of existing and future threats, their impact on the protection of seaports,
- pragmatic - defining the determinants of safety and security of the port of Gdansk as part of the maritime security system of the state.

The adoption of such goals is key to clarifying and understanding the existing ones and future threats to seaports as part of the scientific search of the subject of research in relation to the achievements in this area to date.

In order to achieve the research objectives, they were decomposed into four specific objectives:
1. Determining the role of the Polish seaports of primary importance for the national economy.
2. Identification of the main threats to the safety and security of seaports.
3. Analysis of threats occurring in areas managed by the Port of Gdansk Authority.
4. Determining the postulates regarding the possibilities of preventing and eliminating threats in the port areas of the Port of Gdansk Authority.
Objectives 2 and 4 were considered to be the most important specific objectives. Determining the subject of research and research objectives constituted the basis for formulating the research problem presented in the form of the question: *What threats determine the state of protection of seaports and what are the possibilities of counteracting and neutralizing threats?*

Based on the problem situation that arose, four specific problems were formulated with the following questions:

1. What role do seaports play in the transport chain due to:
   - achieving next generation seaports;
   - development of port infrastructure as a factor affecting seaport competitiveness;
   - transhipment potential?

2. What are the threats to the safety and security of seaports in the context of:
   - contemporary needs for the protection of sea ports;
   - legal protection of shipping and seaports in maritime safety countries;
   - safety protection procedures applied in seaports in Poland?

3. What threats occur in areas administered by the Port of Gdansk Authority due to:
   - location and characteristics of the port of Gdańsk;
   - preparing the port security for contemporary threats;
   - the current implementation of the protection of the port of Gdańsk?

4. What port security model is able to effectively counteract and level threats in proper organization:
   - physical protection;
   - technical security of facilities?

The detailed problems presented constituted the basis for the undertaking and set the direction of research in the area of contemporary threats to seaports.

Based on the analysis of the literature on the subject of research, experience arising from professional work, and based on an advanced research problem, a working hypothesis was generated, which assumed that - *seaports as areas important for the economic interest of the state are obliged to adapt the potential of forces and measures in the area of site protection, and ensuring a high level of port security will be possible by maintaining the ability to counteract and mitigate threats in port areas.***

Solving specific problems and verifying the working hypothesis was possible thanks to the implementation of the research process in which various methods and techniques were used and research tools. The main criterion for the selection of methods was the rationalization of research, and the priority was to obtain objective results. The process of scientific cognition consisted of four stages, which were consecutive or parallel activities that reflected the research procedure. In the first stage, an analysis of available literature was carried out. An important element of the research process was the continuous verification of the research results obtained, carried out during a series of exercises in which the author of the dissertation participated. In the second stage, the working hypothesis, main problem and detailed problems were formulated as the basis for further research stages. The leading method was analysis - including analysis and criticism of the literature on the subject, used to a large extent in relation to Polish literature and comparative analysis. The institutional and legal analysis has been used to assess the provisions in international law relating to the protection of shipping and seaports. At this stage of the research, experience gained while working at the Port of Gdansk Security Office was used. This allowed, in the first place, to assess the state of knowledge, views and theories in the field of research issues. The third stage was verification of the developed research results, where the method of synthesis, induction, deduction, inference, generalization, comparison and
analogy was used during the conducted scientific exploration. At the stage of relevant research, the focus was on the implementation of research projects formulated at the initial stage regarding the issues of security policy dimensions and the development of substantive chapters of the dissertation. The author would like to emphasize that the verification of the substantive content of the dissertation and the thoughts contained therein was significantly influenced by participation in numerous conferences and scientific seminars and exercises, which allowed to reduce the distance between theoretical considerations and practice. The fourth stage involved the final development of the scientific report.

The dissertation consists of an introduction, four substantive chapters, ending, bibliography and attachments. The introduction contains: an outline of the problem situation, the methodological concept of the dissertation, and specifies: the subject of research, research objectives, specific objectives, main problem, detailed problems and working hypothesis. The main content of the first chapter is the analysis of the role of seaports in the transport chain. The second chapter analyzes security threats and needs for port security. In the third chapter, an analysis of threats occurring in areas managed by the Port of Gdansk Authority was carried out, including internal and external threats as well as preparation of the protection of the port of Gdańsk. The fourth chapter includes proposals for solutions in the field of physical protection and technical security of facilities, with the intention of creating a guide or a set of good practices in ensuring effective protection of seaports. In the end, the final conclusions of the research were formulated, and limitations affecting the final shape of the presented work were indicated. The bibliography includes the literature on the subject that was used in the study of the subject matter, while the attachments supplement the main content of the dissertation.

As a result of research on the security threats and needs of seaport protection, it was found ambiguous to define in the Act of 4 September 2008 on the protection of shipping and seaports the entity which is the port manager. The analysis showed that within the administrative boundaries of the port of Gdańsk, which includes 2444 ha of land, 20 independent port facilities operate. On the other hand, the entity managing the port of primary importance for the national economy listed in the Act of 20 December 1996 on seaports and marinas (in the case of Gdańsk - the Port of Gdansk Authority) manages an area of 686 ha. There are 7 port facilities out of 20 outside the area managed by the Port of Gdansk Authority port facilities, including Gdańsk and Remontowa shipyards, Lotos Petrobaltic and Polish Mills port facilities. Considering the statutory obligations of the port manager in the field of:

- implementing the port security plan developed by the Maritime Office;
- conducting annual port security exercises;
- cooperating with entities such as the Border Guard, the Police, the State Fire Service and the Customs and Tax Service in order to implement, in the manner specified in the Act, security in the port area and to provide them with conditions for performing official duties, assigning these tasks to the Port of Gdansk Authority is erroneous.

The conducted research proved that in Polish conditions, including for seaports, assuming the source of hazard classification as the criterion for classification of hazards, the division into natural, technical and social hazards should be adopted. The research shows that for adverse events that may occur at the port of Gdansk, in the field of natural hazards, first of all, include:
- storms and excess water in port channels
- severe frosts and heavy snowfall
- epidemics.

The most likely technical hazards that may occur in the seaport area include:
- fire;
• technical failures (including the release of toxic industrial substances, explosion of dust mixtures, pipeline or conveyor belt rupture, damage to cargo, improper bunkering of the ship, failure of ship mooring systems, failure of the gantry crane, explosion of a gas or liquid fuel tank, fire and explosion of transport fuel pumps, dropping a container containing dangerous substances, breaking oil barriers);
• unexploded ordnance and unexploded shells remaining after war operations;
• chemical contamination (including the release of toxic industrial substances);
• communication disasters (especially collisions of ships, including the release of hazardous substances);

and a lack of key personnel.

In terms of social threats, the most likely threats include:
• terrorism (including the proliferation of weapons of mass destruction);
• cybercrime (among cyber threats, those related to critical infrastructure of the state controlled by means of information systems (operational technology - OT, information technology - IT) are particularly important;
• crime (organized and unorganized);
• employee theft or intentional damage caused by employees on the premises.

The conducted research indicates that the stages requiring special attention and diligence are risk assessment as well as the development and implementation of the protection system. The protection system should apply to all types of identified threats, and be prepared to restore the functions performed by a given device, installation or service as quickly as possible. Therefore, the actions taken to ensure security are aimed at minimizing the risk of interference of the indicated elements by:
- reducing the likelihood of a hazard occurring;
- reducing vulnerability;
- minimizing the effects of hazards

and should be achieved through:
- ensuring legal security;
- maintaining business continuity and reproduction;
- providing physical protection and technical security;
- ensuring personal security;
- ensuring IT security.

Answers to research questions contained in the content of individual chapters and subsections confirmed the adopted working hypothesis and were the basis for the synthesis of conclusions regarding the whole of the scientific problem. The analyzes of threats in the areas managed by the Port of Gdansk Authority carried out at work show that port authorities have the necessary tools to enable effective protection of port areas. The legal acts in force allow the port authority to introduce methods and control measures in the field of shipping security and seaports recommended by the author of the dissertation. In the author's dissertation opinion due to the fact that port authorities collect port fees and lease fees from operators and lessees performing tasks in port areas, port authorities should implement the obligation to protect the port in prescriptive mode, not discretionary. An active role in the process of strengthening / maintaining an appropriate level of security should be played by the Maritime Administration, which during verification and efficiency tests should directly affect the security policy pursued by the port authorities.

The results of the research and the conclusions resulting therefrom constitute the content of this dissertation. The result of the work is above all a vision of what potential management
of seaports should have in terms of ensuring an adequate level of security. Collecting rich factual material increases the cognitive and scientific value of work, while making a significant contribution to the development of seaport security as part of the maritime security of the state. In the sphere directly related to the mainstream of the conducted research, the direction of their further conduct should be an in-depth analysis related to the development of tools enabling the assessment of the state’s maritime safety environment. This would allow for the development of strategic analyzes of the safety environment in the country’s environment and observed trends in an international environment. Such analysis should cover the long-term aspects of a probable security environment that may be caused by social change, the development of new technologies, and the effect of globalization. This approach will allow to define the directions of changes and the development of capabilities that should be developed by both the non-military system and the armed forces.

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