CHARACTERISTIC OF SEA AND RIVER PORTS AS OBJECTS OF CRITICAL INFRASTRUCTURE OF THE STATE

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Abstract
The concept of the object of critical infrastructure of the state, based on the analysis of the concept of the potentially dangerous object and the critically important object which includes sea and river ports is presented. It is shown that the classical structure of the port is provided by three components: the water area, the coastal part and hydraulic structures, which are under constant control of the security services. New elements were identified: the water column, the seabed and the airspace above the port, which are systemic vulnerabilities of sea and river ports for terrorist attacks.

Keywords: seaport, river port, terror, critical infrastructure, water area, airspace

INTRODUCTION

The independence of the state is determined by the implementation of the set of factors which are commonly called as the ability of the state. These factors include the ability of the state to ensure its sustainable development and rational use of natural resources, the harmonious development of the individual and society, the performance of state and public institutions. This is the ability of the state to maintain its territorial integrity and national security, cultural values and national treasures, state potentials and the identity of ethnic peoples. Now, for the enslavement of the modern state, it is not necessary to storm its strategic objects with troops. It is enough to distinguish among these objects the key enterprises and institutions which ensure the vital activity of the state and its management, and influence them. These enterprises and institutions are called critical infrastructure [1].

At the end of the 20th century, in connection with the growing terrorist threat in developed countries, discussions are started about the vulnerability of national infrastructures [2]. The attention of experts was directed not only to information (cybernetic) infrastructures, but also to all other areas of ensuring the vital functions of society.

After the events which were held in USA in September 11th, 2001, the United States adopted the National Strategy for the Physical Protection of Critical Infrastructure in February 2003. Now legislative acts of a similar content have been adopted in almost all developed countries of the world [3].

The purpose of this work is to show the systemic vulnerabilities of sea and river ports as objects of critical infrastructure of the state.

To achieve this goal, it is necessary to consistently clarify the following tasks. First of all analysis of the concept of a critical infrastructure object of a state must be done. Then consideration the classic structure of sea and river ports and, finally the selection of systemic vulnerabilities of sea and river ports which are not the part of their classical structure.

OBJECTS OF CRITICAL INFRASTRUCTURE OF THE STATE

Potentially dangerous object (PDO) is an object that uses, produces, processes, stores or transports radioactive, explosive, fire hazardous, chemical hazardous and biological substances that poses a real threat of an emergency source [4].

To the similar objects are also included objects on which, in accordance with the project documentation, more than five thousand people can be.

These objects are also commonly divided

into technically complicated and unique objects. The first one, technically complicated objects, usually consist of the following structures: nuclear power facilities (nuclear power plants, nuclear fuel and radioactive waste storage facilities); hydroelectric stations and other hydraulic structures; sea, river ports and terminals; communication facilities (radio and television towers, ground and underground points of communication nodal connections, antenna fields and telephone exchanges); thermal power plants and boiler rooms; power lines and transformer distribution stations; objects of aviation, rail and road transport and other hazardous industries (enterprises).

The second one are unique objects, which possess structures that are not included in the group of technically complicated, but have one of the following technical characteristics. The height of the object is more than 100 meters; spans or one of the spans of an object is more than 100 meters; consoles or one of the object's consoles is over 20 meters; the underground part of the facility is deeper than 15 meters below the planning level of the earth.

Critically facility object (CFO) is an object whose violation or cessation of operation leads to control loss of the state's economy, one or more state entities or their irreversible negative change (destruction) or a significant decrease in the population safety [5].

According to the significance or scale of potential threats, it is customary to divide the CFO into the objects of the national, subject or regional level, municipal (territorial) or local level.

According to the types of specific threats, CFO is characterized as dangerous enterprises or objects according to one or several classification criteria. Nuclear and radiation hazardous facilities; chemically and biologically hazardous objects, technologically dangerous, explosive fire and hydrodynamically dangerous objects information and telecommunication dangerous objects can be referred to it.

In addition, national systems may provide for the installation of additional classes of CFO depending on their significance, the level of expected threats and the predicted spatial-temporal consequences of their occurrence.

Thus, from the standpoint of assessing the components of critical infrastructure, the concepts of the potentially dangerous object and the critical facility object which are constantly used in the home scientific literature can be considered identical.

CLASSICAL STRUCTURE OF THE SEA (RIVER) PORT

Port (French - port, from Latin portus - harbor, marina), a section of the sea, lake, reservoir or river and the adjacent water area, protected naturally or artificially from disturbance and equipped for parking and ship maintenance, handling and other operations. The main elements of the port are the water area (water part) and the territory (the coast part of which also includes hydraulic structures).

The complex of the water area usually includes water approaches to the port, raids and inland basins. Water approaches can be natural (in the form of a section of the sea or river) or artificial (with the construction of access channels connecting the port with natural depths). Raids are areas of the sea protected from heavy seas, where vessels can anchor in anticipation of permission to approach berths or to leave the port. In the absence of deep-water berths at the port, transshipment operations are also carried out on roads, for which purpose auxiliary vessels, such as lighters and barges, are used. Sometimes indoor pools are called harbors. They are adjacent directly to the port territory, and are intended for the mooring of ships at berths, where they carry out basic and some auxiliary cargo operations. The shipping lane to the port is equipped with navigation signs.

The port territory includes land approaches, the near-side part and the rear part. Land approaches include railways, roads and transport pipelines. The side part adjoins directly to the mooring line. Here are located reloading devices and mechanisms, warehouses and platforms, for short-term storage of goods, and the passenger station. The rear part is occupied by intra-port railways, roads, long-term cargo storage warehouses, utility enterprises, as well as office and administrative buildings.

Port hydraulic structures are protective structures in the form of breakwaters and breakwaters. These are berthing facilities such as piers and port promenades. These are ship-lifting and ship-repair facilities like boathouses, slips, docks. Port hydraulic structures also include sea lighthouses and navigation signs located within the port's water area.

Thus, the classical structure of the port consists for three components: the water area, the coastal part and hydraulic structures.

SYSTEMATIC VULNERABLE PLACES OF SEA AND RIVER PORTS NOT INCLUDED IN THEIR CLASSICAL STRUCTURE

At each guarded critical infrastructure object there are security services, security and physical protection of these objects. These services are aimed to the protection and security of these objects from terrorist influence [1]. Sea and river ports belong to objects of critical infrastructure. The coastal territory of the ports is under the supervision of these services. The perimeter - the border of the protected area is equipped with video surveillance systems, infrared surveillance with various systems which give signals about the attackers approaching this line, as well as systems (barriers) that prevent coming into the territory of the ports. A well-functioning carrying capacity system, on the other hand, allows you to monitor the movement of people and goods within the controlled territory.

Monitoring of the port's water area is carried out by radar stations of various ranges and visually constantly. This is done in the interests of ensuring the safety of navigation and regulating the movement of water vehicles pulling to the port, ensuring entry into and exit from the port, safe parking of ships in waiting areas and at berths. Any water vehicle, no matter how small it is, cannot move through the water area of the port, enter or leave the port without proper permission from the port's dispatching services. All port rules require this. Everyone respects them. Failure to comply with these rules immediately attracts widespread attention. This ensures not only the safety of navigation, but also counteraction to terror.

Everything that is located below the water surface remains unprotected. None of the dispatching and surveillance services under her jurisdiction will be able to detect a scuba diver attaching a mine to the bottom of a transport or passenger liner. No port surveillance system will detect a torpedo moving at a depth of 5-10 meters. Moreover, no observation system will detect a bottom mine installed on the fairway, the multiplicity mechanism of which can ensure its explosion when not the first vessel passes over it, but the third or ninth. Consequently, the water column and seabed of the port are a vulnerable place for terrorist attacks. From here, strikes can be made both on water vehicles and on the hydraulic structures of the port.

The development of unmanned aerial vehicles currently shows that they can be used not only for observation. Unfortunately, there are no special systems for monitoring the airspace of the port. Moreover, in the legal aspect, there are no such concepts. At the same time, the problem of detecting drones weighing several tens of kilograms is a rather complicated problem that Ukrainian scientists solve together with the military specialists in the war zone. Therefore, the second vulnerable point of the port is the airspace located above it, that is, above its water area and coast part. Here in the airspace of the port not only all means of aerospace attack can be used, but also unmanned aerial vehicles.

Thus, the systemic vulnerabilities of sea and river ports that are not part of their classical structure are the water column, the seabed and the airspace above the port, from where the whole arsenal of underwater and air attack weapons can be used by terrorist influence.

CONCLUSION

1. From the standpoint of assessing the components of critical infrastructure, the concepts of a potentially dangerous object and a critical object which are constantly used in the home scientific literature can be considered identical.

2. The classical structure of the port provides for three components: the water area, the coast part and hydraulic structures.

3. Systemic vulnerabilities of sea and river ports that are not part of their classical structure are the water column, the seabed, and the airspace above the port, from where the whole arsenal of underwater and air attack weapons can be used by terrorist influence.

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