

# Introduction to the issues of engineering of anthropogenic objects of state security infrastructure

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## Abstract

The article discusses the meaning of the terms used in the title of the conference, such as: security, state security, anthropogenic facility, state security infrastructure, engineering of anthropogenic facilities and highlights the most important problems of engineering of anthropogenic facilities of state security infrastructure. These problems include the issue of the definition of this concept and the state of quality and protection of this infrastructure on the example of our country.

**Keywords:** security, state security, anthropogenic facility, state security infrastructure, engineering of anthropogenic facilities

## 1 Introduction

The subject of the article are the problems of engineering of anthropogenic objects in the field of state security infrastructure. For a proper understanding of the thematic scope of the conference, it is necessary to explain, in particular, the meaning of the terms used in the title of the conference, such as: security, state security, anthropogenic facility, state security infrastructure and engineering of anthropogenic facilities. In the further part of the paper, the most important problems of the state security infrastructure are highlighted, including the issue of the definition of this concept, the state of quality and protection of this infrastructure on the example of our country.

The title of the article is particularly relevant due to the state of war in Ukraine and the state of threat to the security of other European countries, including Poland.

It should be emphasized that the current conference is another (sixth) conference devoted to the issues of safety engineering of anthropogenic objects, initiated by in 2014 by the Building Expertise Center. Conferences in this thematic series enjoy the interest of the scientific community and high attendance and activities of its participants.

## 2 The concept of "security"

According to numerous works, including S. Koziej (2011) [13] and B. Szmulik (2012) [30] security:

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- has a subjective nature and is one of the basic existential needs of a human being, resulting from his psyche and attitude towards the environment and the social environment, classified as needs of a higher order, necessary for the healthy functioning of a human being;
- it is both a basic need and a priority goal of the activity of the state, individuals and social groups, and at the same time it is a process involving various measures, guaranteeing a stable existence and development of the state, free from disturbances, including:
  - protection and defense of the state as a political institution and
  - protection of individuals and the entire society, their goods and the natural environment against threats that significantly limit its functioning or
  - into goods subject to special protection.
- is an interdisciplinary concept appearing in various areas of life and science and knowledge describing the reality in which man lives, and many different fields of science deal with the study of its aspects - such as: history, psychology, sociology, legal sciences, political science, military sciences and many others - where each field of science deals with various aspects of security;
- is characterized by a lack of fear of losing values, such as life, health, feelings, respect, work or goods, both tangible and intangible;
- includes the theory and practice (according to the BBN dictionary (2019) [24]) of ensuring the ability of a given entity to survive (existence) and pursue its own interests, in particular through:
  - taking advantage of opportunities (favorable circumstances),
  - taking up challenges,
  - risk reduction and
  - counteracting (preventing and resisting) all kinds of threats to the entity and its interests.

Security problems have occupied humanity since the beginning of its existence.

### 3 The concept of "state security"

The state is the most perfect form of ensuring the security of individuals and social groups (cf. W. Kitler (2011) [7] and J. Prońko and B. Kaczmarczyk (2015) [18]), as it plays a key role in their lives. Along with the progress of civilization development, the state fulfills more and more functions for the benefit of the population (or citizens), among which ensuring the security of the state (internal and external) has been of key importance since the beginning of the state organization.

State security is the most important value, need and priority objective of the activity of the state, individuals and social groups, and at the same time a process involving various measures guaranteeing a stable, uninterrupted existence and national development (of the state), including:

- protection and defense of the state as a political institution and
- protection of individuals and society as a whole, their goods and the natural environment against threats that significantly limit or compromise its functioning into goods subject to special protection.

According to the work of L.F. Korzeniowski (2012) [12], the issue of state security is closely related to the issue of threats to state security, which is an undesirable condition, but to which both the individual and the state are susceptible. B. Szmulik (2012) [30], discussing the concept, essence and issue of national security, emphasizes that a threat to security is primarily a mental state, manifested by a negative assessment of phenomena perceived as unfavorable or dangerous. and external.

The state, like any other entity, is subject to these threats. Hence, in the legal language (also at the constitutional level) there are internal terms and external threat to the state (cf. S. Pieprzny (2014) [17]):

- **Internal threat to the state** - defined as one of the aspects (types) of a threat to the state's security, consisting in the emergence of a specific state of affairs, a set of various types of circumstances occurring in all areas of its internal activity, which cause or may cause a disturbance of its internal stability and harmonious development in various fields of its activity, including the weakening or even loss of the ability to survive in the international environment (cf. W. Kitler (2023) [9]).

- **External threat to the state** - defined as "one of the aspects (types) of a threat to the state's security, consisting in the emergence of a specific state of affairs, a set of various types of circumstances in the state's environment, which cause or may cause disruption of its internal stability and harmonious development in various fields of its activity, including the weakening of its position or even the loss of the ability to survive in the international environment (cf. W. Kitler, M. Wojciszko and G. Lewandowski (2023) [10]).

Currently, the most important factors threatening the security of the state are: destabilization of the political system, poorly functioning economic mechanisms and social, massive violations of human rights, impoverishment of society, social conflicts that state authorities are unable to resolve, actions of mass social movements (e.g. strikes), environmental degradation and natural disasters (e.g. floods, droughts, earthquakes, tsunamis, hurricanes), environmental degradation, illegal migration, organized crime; terrorism, IT (cybernetic) threats (cf. S. Dworecki (1994) [5]).

According to the work of S. Koziej (2011) [13], nowadays state security (identified with national security) is of an integrated nature (comprehensive and multidimensional), in which there are natural and deliberately established: couplings and interactions between its various entities and their elements, links and types, fields, sectors, departments, areas, etc. integrating state security into an internally coherent whole (constituting the state security system) and, thanks to the synergy effect, ensuring its greater effectiveness.

As part of the **integrated state security**, the following can be distinguished:

- **two of its constitutional areas:**
  - external security and
  - internal security;
- **four basic areas of security:**
  - defense field,
  - protective area,
  - economic field,
  - the social field;
- **two security areas:**
  - the military sphere - including security in the field of defense and
  - non-military sphere - including security in the field of protection, field economic and social fields.

Hence, when we talk about integrated state security, it should be understood as state security:

- in all the listed security areas (defensive security, protective security, economic security and social security) and
- in all sectors falling within the scope of individual security areas or
- in the two security spheres mentioned above (the military security sphere and the non-military security sphere).

State security is one of the most important values protected by the Republic of Poland, which is why many documents deal with this subject and regulate issues related to security. The most important documents dealing with the security issues of the Republic of Poland are: The Constitution of the Republic of Poland, Acts describing the tasks and the basis for the functioning of institutions protecting security in Poland [31-41], the White Book of National Security of the Republic of Poland [4] and the National Security Strategy of the Republic of Poland of 2020 [28], which takes into account the context of Poland's presence in the North Atlantic Alliance and the European Union.

## 4 State security system

In general terms, the security system of a given state (identical to the concept of national security SBN) consists of all bodies and institutions responsible for security belonging to the executive, legislative, judiciary and local authorities. The national security (state security) system functioning in Poland was initially defined in 2013 in the so-called White Paper [4] as a whole of forces (entities), means and resources allocated by the state for the implementation of tasks in the field of security, organized (in subsystems and links), maintained and prepared

appropriately for these tasks. It was finally defined and described in the National Security Strategy of the Republic of Poland of 2014 and unchanged in the National Security Strategy of the Republic of Poland of May 12, 2020 [28].

It consists of a control subsystem and executive subsystems, including operational subsystems (defence and protection) and support subsystems (social and economic). The considerations of W. Kitler (2014, 2023) [8, 9] show that the national security system is a collective set of all public authorities and administration bodies, other state bodies and institutions, local government bodies, the armed forces, entrepreneurs, non-governmental organizations and other entities, as well as all citizens fulfilling missions in the sphere of national security (resulting from national values and needs), and relations (including general principles and norms) regulating mutual relations between them. It is a set of internally coordinated and interrelated elements by means of ordering relations, due to the mission, which is:

- defense and protection of the state as a political, territorial and social institution,
- ensuring uninterrupted living and development conditions for individuals and the entire society, and
- protection of people's lives and health, their goods (tangible and intangible) and the natural environment in all states of the state's functioning (in normal times, including during crisis and in states of emergency).

W. Kitler, considering the national security system in the context of threats and legal aspects of the functioning of the state [10] (2023), states that the above-mentioned system by acting) y the entire force, means and resources allocated by the state to carry out tasks in the area of national security, properly organised, maintained and prepared - consists of:

- steering subsystem and
- executive subsystems, including:
  - operating subsystems (defense and security) and
  - support subsystems (social and economic).

**The management system** is a key element of the state security system ensuring its efficient and effective functioning. It is an element of this system, covering public authorities and heads of organizational units that perform tasks related to national security, command bodies of the Polish Armed Forces, together with advisory bodies and administrative (staff) apparatus as well as operating procedures and infrastructure (positions and control centres, communication system).

**The defense system** fulfills the missions related to national defense, which have two faces. Firstly, by influencing the environment from which the cause of political and military threats originates, i.e. all challenges and threats to the vital interests of national security. Thus, it is influencing the behavior of other subjects of international relations, individuals, various organizations and groups of people, and shaping favorable conditions in the material world (natural environment, country infrastructure). It is shaping the preferred state of affairs in the state and its environment in order to obtain a high level of protection and defense of the state and society. This sphere of activity can be described as an offensive strategy of national defense, shaping the offensive, but non-aggressive form of this system.

**Protective systems** are a relatively separate set of related, detailed operational (intervention) elements intended for the protection of the state as a political (sovereign), territorial and legal institution, and above all social, protection of the constitutional order, protection of national security infrastructure, protection of the population, protection of public safety, protection of the state border, protection of tangible and intangible assets, protection of information security and protection of the natural environment against threats that significantly limit the functioning of the state and society or undermine national assets subject to protection, in all states of functioning of the state.

The elements of the above protection systems are primarily public administration bodies, organizational units of the Ministry of Justice, state control and law protection authorities, prosecutors, advocates, special services, guards, services and inspections, specialized in protecting public order and state borders, civil protection entities, including rescue services, commercial protective formations, pro-defence, rescue and humanitarian NGOs.

According to the work of A. Baryłka (2022) [2], despite the introduction of the term "state security system", the law does not maintain a systemic approach to the issues of state security, using terms such as:

- state security and defense needs,
- necessary for the purposes of state defense and security,

- particularly important for the security and defense of the state,
- the field of state defense and security,

which may give the impression that we are dealing with systemically independent concepts, when in fact the concept of state security is superior to the concept of state defense which is a component of the concept of state security. In the State Security Strategy of 2020 [28], this inaccuracy was avoided by using only the notion of state security.

## **5 State security environment**

The term "security environment" is one of the most important conceptual categories of security science (cf. J. Stańczyk 2015, 2016, 2018) [25-27]. It often appears in various international documents, as well as national documents concerning the security conditions of individual countries. In addition, it is a concept close to the concept of the international environment.

The state security environment always has individual characteristics resulting from its specificity, but it is also conditioned by objectively occurring phenomena and processes both internally and internationally. Due to these factors and their volatility, it is characterized by dynamics and sometimes also unpredictability. Acting in a specific security environment, a sovereign state, as a security entity, independently defines its own national interests and strategic goals, based on the needs and recognized values, which result from historical experience, existing political and systemic conditions and the potential of a given state (J. Stańczyk, 2015 [25]).

State security is closely related to space through environmental conditions of both natural and anthropogenic nature, including with the quality of anthropogenic objects that are created by man to satisfy his life needs. In terms of ensuring the security of the state, it is extremely important to locate civil engineering structures that are important for security in the space of the country, such as: public roads, railway lines, waterways and other structures serving the needs of state security (A. Baryłka, 2022 [2]).

The security environment is perceived as a system shaped by many factors remaining in various relationships with each other. These factors include, among others: geographical (geopolitical) location, interactions between states, and their place and role in international structures, as well as the degree of technical advancement of the armed forces. Hence, according to the provisions of the National Security Strategy of the Republic of Poland of 2020 [28], the contemporary security environment is increasingly complex and uncertain. Political, military, economic and social interactions are growing on a national, regional and global scale. This has a significant impact on both the strategy and the main directions of transformation of the national security system.

The development and implementation of the National Security Strategy of the Republic of Poland results from the need to ensure the state's ability to counter threats and meet the challenges resulting from the changing conditions of Poland's security. It also aims to take advantage of the opportunities that will make it possible to improve the security of the state and its citizens, ensure its further development and strengthen the position of the Republic of Poland on the international arena.

From the point of view of challenges and threats, the functioning environment of a given state becomes its security environment in international relations. Thus, the dominant features of the security environment will be the multitude and variety of interactions taking place in it, which results in instability, and thus: volatility, surprise and uncertainty.

## **6 Anthropogenic objects of state security infrastructure**

### **6.1 The concept of an anthropogenic object**

The subject of interest of this study are anthropogenic objects, which are construction objects created intentionally by man, intended to meet his various needs, including the need for human safety (cf. A. Baryłka (2022) [2]. Next in the report:

- I focus on the security infrastructure of the state, the objects of which are building facilities serving the needs of security in the fields of: defence, protection, economic and social,

- I accept the concept of security of a building object of state security infrastructure - as the condition of this object serving the needs of security in the above-mentioned subjected to specific threats occurring during its operation - is able to fulfill its tasks related to its intended purpose at a satisfactory level.

Building structures occurring in the human environment have a significant impact on the safety of their users. Some of these objects, due to their intended use, i.e. the utility functions they perform, are assessed as objects of significant importance for the security of the state. In new provisions of the law, without maintaining a systemic approach to the issues of state security (cf. point 3), three generic groups of building objects were distinguished, the importance of which for state security was defined by various names, as: necessary, particularly important and critical (without specifying mutual relations between these concepts):

- Act of August 21, 1997 - on real estate management [38] - referred to as real estate considered necessary for the purposes of national defense and security;
- the Act of November 21, 1967 - On Defense of the Homeland [31], referred to as objects particularly important for the security and defense of the state requiring special protection (Article 6(1)(5) of the Act [31]);
- Act of 26/04/2007 - On Crisis Management [32] referred to as critical infrastructure, understood as systems and their functionally related objects, including buildings, devices, installations, services crucial for the security of the state and its citizens and to ensure the efficient functioning of public administration bodies and institutions and entrepreneurs.

## 6.2 Engineering of anthropogenic objects

In the dictionary sense, "engineering" is the activity of designing, constructing, modifying and maintaining cost-effective solutions to practical problems, using scientific and technical knowledge. This activity requires solving problems of various nature and scale. More generally, "engineering" also deals with the development of technique and technology. In a stricter (systemic) sense, "engineering" is the use of the properties of matter, energy and objects necessary to create objects designed to meet specific human needs.

The work of A. Baryłka (2022) [2] shows that the safety engineering of anthropogenic objects:

- Deals with the issues of broadly understood security of technical objects created by man to meet his various needs, including building objects, which are the basic elements of the human living environment. Due to the high durability of technical anthropogenic objects, they shape the conditions for the safety of human life for many years. Safety engineering above. includes knowledge in the field of their safety engineering understood as the method of: shaping, i.e. designing and implementing, safe building objects, as well as their exploitation, i.e. using and maintaining them,
- taking into account the rules guaranteeing their safety.
- It consists in taking actions to immunize these objects against specific threats, consisting in the use of immunization methods described in section 5.3 of the paper.
- It requires not only interdisciplinary, general technical and specialist knowledge in terms of knowledge of the basic methods and tools used in solving engineering tasks related to broadly understood security, but also knowledge of the principles of security engineering adopted in the law.

We refer to the set of activities aimed at creating a safe building facility as "security engineering of a building facility". Such activities are referred to as "immunization of a building object" to specific threats. They are implemented, primarily at the stage of building a building (i.e. its design and construction). However, they can also be carried out, if necessary, at the stage of operation of a building structure (as part of the so-called secondary immunization) - however, the possible scope of these activities is limited (economic and technical reasons) by the fact of the existence of a structure with specific physical characteristics and a fixed location.

Two closely related areas of security engineering of construction facilities of the state security infrastructure can be distinguished:

- 1) **Safety engineering in spatial planning and development** including processes related to space planning, its development and long-term exploitation. State security conditions are constantly changing, which is why it is important to adapt security engineering to current threats. Rational planning of space is extremely

important for the security of the state. One of the non-military security tasks is precisely such planning and development of space, thanks to which spatial structures are created that are characterized by durability, ease of use and resistance to threats.

**2) Safety engineering in the field of technical solutions for building structure** results from the high durability of building structures, which causes the state to adopt legal provisions aimed at influencing such shaping of building structures so that during their long-term use (according to various human needs) they retain their safety values throughout the entire period of their existence. Such legal regulations are contained in the provisions of the Construction Law Act [35] and in the executive acts to this Act (as well as in many separate acts closely correlated with the provisions of the aforementioned Act, e.g. the provisions: - On spatial planning and development [34] - On fire protection [39]), which is the basic factor of order in the construction process, in the creation and maintenance of building substance in Poland.

In the work of A. Baryłka (2022) [2], it was emphasized that the reliability of the security of the state security infrastructure should be assumed as the main criterion of quality and the main postulate formulated in the design, implementation and operation of state security infrastructure - the basic premises for which are:

- design, construction and operation of the above-mentioned objects according to current knowledge (including various types of regulations), and above all
- management of the process of designing, construction and operation of the above-mentioned facilities focused on the required high quality of the above-mentioned objects.

In the construction process of buildings serving the needs of state security, general principles of security engineering should be observed, understood as a system of activities of a legal, spatial, organizational, functional and spatial, technological, installation and material-technical nature aimed at designing, building and then operating the above-mentioned facilities. buildings that will be able to ensure the implementation of their expected functions at the required level in the event of possible threats throughout their lifetime.

In the case of security infrastructure, threats are understood as direct or indirect destructive impacts on specific elements of this infrastructure. Threats can be distinguished here: potential and real, subjective and objective, external and internal, military and non-military (political, economic, social, informational, ecological, etc.), crisis and war, as well as intentional and accidental (random). In the case of the above probable threats that may occur in the foreseeable period of the object's existence should be considered, broken down into: source of origin (natural and anthropogenic), form, as well as the form and characteristics of the threat.

### 6.3 Methods of immunization of building objects

In engineering practice, the following methods of immunization of state security infrastructure buildings are used (cf. A. Baryłka (2022) [2]):

**1) Active (active) methods** - assuming impact on the sources of hazard in order to reduce or eliminate hazards, consisting of:

- elimination of sources of danger,
- limiting the functioning of the facility which is a source of danger,
- changing the way of using the object focused on the generated constraint threats,
- intentional change of the direction of the threat generated by the source object threat in a way that eliminates the possibility of the threat reaching the protected area object,
- introduction of technical compensatory measures or limiting the possibility the spread of the threat generated by the object that is the source of the threat,
- conducting special protection of facilities, etc.

The use of active methods in the field of state security infrastructure constructions in the aspect of introducing technical compensatory measures or limiting the possibility of spreading the threat generated by the facility or in its surroundings results from the high durability of constructions resulting in the adoption of legal provisions by the

state, the purpose of which is to influence such shaping buildings, so that during their long-term use (according to various human needs) they retain their safety values throughout the entire period of their existence.

With regard to facilities that are particularly important for security, including state defence, the law emphasizes the conduct of special protection of facilities (classified as active methods of immunization) including:

- direct physical protection of facilities and their technical protection;
- other activities aimed at protecting the facility, which result from its specificity and the nature of the threats to its operation;
- projects implemented as part of the alerting and notification system and exchange of information on threats;
- defense activities, including in particular engineering development of the area at approaches and inside the defended object, firearms fire system, common anti-aircraft defense and protection against contamination.

It is worth suggesting at this point to consider the need to undertake, as part of active methods of immunization, scientific and research work on the use of modern material technologies ensuring safety, durability, usefulness and reliability of construction facilities of the state security infrastructure by developing new constructions and building materials that are safe for health and the environment, and at the same time with high durability and high strength and thermal parameters using the achievements of modern technologies that allow you to design and modify the structures of building materials in accordance with the expected properties.

**2) *Passive methods (passive)*** - assuming reconciliation with the fact of the existence of threats and consisting in taking actions aimed at adapting to this situation, through:

- immunization of the implemented building object by its location, in such conditions that eliminate or significantly reduce the impact of threats and
- immunization of the implemented building object by compensating or limiting the design of the impacting threats.

Passive methods of immunization of state security infrastructure construction objects also include actions in the spatial aspect aimed at ensuring the security of spatial structures of the national economy.

**3) *Mixed methods*** using the principles of active and passive methods.

Each construction object of the state security infrastructure is associated with the required rules of conduct specifying the so-called security engineering specified in the provisions of the Act - Construction Law:

- formulation of the need to create a building (resulting from the need to meet specific human needs),
- designing the location and location of a building,
- designing a building (requiring determining the method of material and technical solution of the building appropriate to its purpose and location, which should be in accordance with applicable standards, regulations and principles of technical knowledge);
- construction of a building object that meets specific social needs. There are many types (types, forms and varieties) of production: due to the goals, complexity, number, scale, work organization, continuity of production, type of product objects and their assortment,
- operation of a building object, which is a long-term process in which four basic types of activities are distinguished: use, operation, power supply and management,
- liquidation of a building object.

## **7 Problems of the state security infrastructure**

### **7.1 The concept of state security infrastructure**

The concept of state infrastructure is defined as facilities, equipment and systems necessary to ensure the proper functioning of the national economy and the life of society. On the other hand, the state security infrastructure (cf.



A. Baryłka (2022) [2], R. Radziejewski (2013, 2014) [19, 20]) is the totality of elements (objects, devices, systems) deliberately separated from the state infrastructure, the destruction of which or damage may pose a significant threat to human life and health, property and the environment, or cause serious material losses, as well as disrupt the functioning of the state. This concept applies to infrastructure which, due to its usefulness for the existence and national development and the threats that its operation causes, affects the security of the state, human life and health, property and environment, national economy, economic development and historical and cultural heritage.

Referring to the contemporary understanding of state security, which agrees z [13] has an integrated character, constituting the state security system - in the work [2] it was assumed that the term state security infrastructure applies to two spheres of state security, namely:

1) *state security infrastructure in the military sphere*, including state security infrastructure in the field of defense (sectors: diplomatic, military, intelligence and counterintelligence) and

2) *state security infrastructure in the non-military sphere*, including:

- state security infrastructure in the field of protection (sectors: internal special services, law, internal order and security, rescue, food, health protection);
- state security infrastructure in the economic field (sectors: financial, energy, critical infrastructure, other sectors in the economic field) and
- state security infrastructure in the social field (sectors: cultural, educational, social, demographic, ecological, information, religious).

The lack of a systemic approach to the issue of state security caused that in the law [31, 32, 38], the following three generic groups of the state security infrastructure were distinguished (assuming different methods of its protection), which only partly refer to the above-mentioned division of the state security infrastructure:

- National security infrastructure including recognized real estate deemed necessary for the purposes of state security [38];
- State security infrastructure including facilities of particular importance for state security requiring special protection (Article 6(1)(5) of the Act [31]) and
- State security infrastructure, including critical infrastructure [32], understood as systems and their functionally related objects, including buildings, devices, installations, services crucial for the security of the state and its citizens and serving to ensure the efficient functioning of public administration bodies as well as institutions and entrepreneurs.

In the absence of a systemic formulation of the concept of state security infrastructure in the law, in the work of Kitler W., Wojciszko M., Lewandowski G. [10] (2023) having in mind:

- purpose (defensive, protective, economic or social),
- importance for state security (particularly important, important or less important for defence, economic interests of the state, public safety and other interests of the state - subject to mandatory protection) and
- spatial range of its impact (national, regional and local range it was rightly proposed to divide the state security infrastructure into three categories:
  - category I - infrastructure crucial for safe existence and national development, of national and European importance and impact, located within the competence of central authorities;
  - category II - particularly important for safe existence and national development, of regional importance and impact, which is within the competence of regional authorities;
  - category III - important for safe existence and national development, of importance and local impact, under the jurisdiction of local authorities.

For the above the category of state security infrastructure, the required forms of protection of this infrastructure should be established.

## 7.2 The issue of protecting the state security infrastructure

The state security infrastructure, regardless of its purpose, importance for state security and spatial range, should be subject to the protection of state authorities - understood as all activities aimed at ensuring the functionality, continuity of operations and integrity of this infrastructure in all conditions and states of functioning of the state - in order to prevent threats, risks or weak points, limit and neutralize their effects and quickly restore this infrastructure in the event of failures, attacks and other events disrupting its proper functioning.

The concept of security infrastructure protection should be understood jointly as activities relating to legal, technical, physical, personal and ICT protection and plans for its recovery. The following concepts deserve special attention:

- **Legal protection of security infrastructure** - understood as a set of regulations/laws related to spatial planning, design, construction and operation of security infrastructure, taking into account technical protection measures taken to minimize the risk associated with foreseen or random actions that may lead to destruction or disruption in the functioning of the above-mentioned infrastructure. Such actions also consist in legally limiting access to information on the state security infrastructure, the unauthorized disclosure of which would or could cause damage to the Republic of Poland or would be unfavorable from the point of view of its interests, also during its development and regardless of the form or manner of expressing.
- **Technical protection of the security infrastructure** based on constant improvement infrastructure resistance to threats, increasing interoperability and cohesion with other security systems, ensuring continuity, timeliness, efficient management and commanding protection, achieving the expected level of cooperation between entities constituting elements of the protection system and using all available protective resources, technologies and terrain features to multiply the effectiveness of protective forces in a state other than the normal state of operation. Technical protection of the state security infrastructure includes: monitoring, recognizing and assessing threats to the protected facilities, devices, areas and systems, preventing the impact of threats on the protected infrastructure that may cause loss of life, failures, destruction and other negative effects in the infrastructure, removing the effects of dysfunction, disruption or destruction of infrastructure. The protection of the state's technical security infrastructure is supported by the provisions of the Construction Law [35], which regulate the principles of designing, construction and maintenance of buildings, including in particular the requirement to comply with the formulated basic requirements in the construction process, which should be met by buildings.
- **Physical protection of security infrastructure** – understood as a set of undertaking minimizing the risk of disruption or destruction of the existing elements of the security infrastructure by persons found within it in an unauthorized manner - preventing unauthorized persons from entering the protected area, and covering various forms resulting from their intended use, such as: technical security measures consisting in the use of fences, barriers, closed-circuit television systems, access systems, etc. funds.

Legal protection of security infrastructure in relation to civil engineering structures (structures and buildings serving the needs of state security) is ensured in particular by the system of legal provisions:

- providing for the possibility of establishing closed areas and establishing protection zones of these areas (Act - Geodetic and Cartographic Law [33]), and introducing established closed areas to spatial development plans at the voivodeship and local level (Act - On planning and spatial development [34]), as well
- affecting the course of the construction process of the above-mentioned facilities located in closed areas and determining as appropriate in the above-mentioned case facilities of public administration bodies at the voivodeship level (Act - Construction Law [35]).

Baryłka (2015) discussing the issues of security engineering in legislation UE [1], I point to the development of documents in the form of directives and regulations containing the rules of conduct in the field of safety engineering in the spatial area and in the area of individual types of anthropogenic objects, the arrangements of which oblige the Member States to directly apply or to introduce them, within a certain period, into national provisions of law, which are also applicable to state security infrastructure constructions.

*The issue of technical protection of the state security infrastructure* in terms of solutions for building structures results from the high durability of building structures, which results in the adoption of legal provisions by the state, the purpose of which is to influence such shaping of building structures so that during their long-term use (according to various human needs) they retain their safety values throughout its existence. Such legal regulations are included in the provisions of the Construction Law Act [35] and in the executive acts to this Act (as well as in many separate acts, closely correlated with the provisions of the aforementioned Act, e.g. the provisions of the Acts: On Spatial Planning and Development [34] and On fire protection [39]), which is the basis of order in the entire construction process of all buildings in Poland.

*Physical protection of the state security infrastructure* in relation to construction facilities serving the needs of state security) is ensured in particular by the provisions of law contained in the Regulation - of the Council of Ministers of April 21, 2022 - On facilities of particular importance for state security and defense and their special protection [22] issued on the basis of the delegation contained in the Act of March 11, 2022 - On Defense of the Homeland [31].

### 7.3 The problem of the quality of the state security infrastructure

Of particular importance for state security is the quality and spatial arrangement of building structures serving the needs of state security, forming the state security infrastructure.

State security needs are always implemented in a specific space (in a specific area), in particular through the design, construction and operation (including their use, maintenance and management) of construction facilities of the state security infrastructure.

M. Szruba (2010 in the paper [29] discussing the creation of permanent buildings with high security reliability emphasizes that the quality of these facilities:

- is a particularly important factor in construction, which translates into durability and safety of the constructed buildings.
- reduces maintenance and repair costs and minimizes environmental impact.
- it is implemented thanks to products and technologies with unique properties, which increase the life of buildings,
- it is also shaped by appropriate solutions in the field of renovation and strengthening and repairs of objects, corrosion protection, diagnostics or methods of foundation.

As A. Biegus (2010) rightly emphasizes in [3] that "Safety reliability is the essential quality criterion and the main postulate formulated in the design, implementation and operation of building structures. The basic prerequisites for ensuring it are: design and construction of a building in accordance with the current knowledge (including various types of regulations), and above all, investment management focused on the quality of the created building.

The safety and reliability of a building facility is affected by all participants in the investment and operational construction process, and the impact of these entities varies according to their level of technical knowledge and knowledge of applicable law, in particular knowledge of the requirements contained in the technical conditions that the objects should meet.

The safety quality of a building is determined by (cf. [2]):

- in particular, its designer, developing a construction project in a specific location, taking into account possible impacts that may occur during the expected period of use of the facility, and then
- its contractor, who may knowingly or unknowingly implement the facility in accordance with the approved construction design or departing from the design provisions due to unreasonable economy, and then
- user of the facility using the facility in accordance with its intended use or using the facility with a deviation from its intended purpose, and also

- owner or manager of a building facility responsible for proper technical maintenance of the facility in the process of its operation.

The problem of the quality of building objects results from the fact that the broadly understood construction production is an area of the economy characterized by high volatility and uniqueness of tasks and processes. The listed conditions of the quality of building structures should be taken into account in the construction process of civil engineering structures (structures and buildings) serving the needs of state security, forming the state security infrastructure.

The final quality of a building is a verification of design and execution works and the sum of all factors related to the two basic creative aspects of the building, namely:

- **material aspect** - resulting from technical correctness and technological use of appropriate quality materials and
- **the personal aspect** – resulting from the employment of people with appropriate qualifications and skills to perform direct manufacturing work and the ongoing proper use and maintenance of the functional facility.

Both of these causal groups, under the conditions of properly conducted operations, are subject to various supervision and control procedures, which are included in various legal, normative or organizational frameworks.

The analysis of various sources (cf. [2]) describing the causes of faults, failures and catastrophes of building structures in Poland shows that the main source of them are errors made in the process of:

- **designing objects,**
- **performing construction works related to:**
  - the use of poor quality basic materials used for the execution of works, non-compliance with the requirements of the design documentation, poor quality of element connections, and lack of knowledge and skills,
  - negligence of production employees and technical staff, which include, among others: failure to comply with the requirements for the control of manufactured prefabricated elements or elements, failure to control the installation of appropriate construction products, failure to comply with contractual requirements, etc. and
- **operation of the facility,** related to its improper use and maintenance of the facility and underestimation of the threat and, consequently, failure to inspect the condition, not undertaking maintenance and repair activities and disregarding the findings resulting from periodic inspections of the technical condition of these facilities.

When considering the issue of the quality of building structures, it should be borne in mind that with the proper conduct of entities involved in the construction process, the above-mentioned one can hope that the process of their degradation will be slow enough for them to meet the functional requirements in the designed period of their use. However, each building, even the most solidly designed and constructed, should be observed and controlled during operation (use and maintenance) in order to always be able to determine its degradation and the possibility of further safe use. Hence the need:

- ensuring constant monitoring of the technical condition of important state security infrastructure facilities, using modern technical solutions;
- carry out periodic inspections of construction facilities in the process of their operation and prompt removal of irregularities found regarding damage and deficiencies that may pose a threat to human life or health, property safety or the environment, in particular a construction disaster, fire, explosion, electric shock or gas poisoning, and
- making technical diagnostics of the technical condition of objects in the event of symptoms of a threat to a building object, which may lead to the state of damage or destruction of these objects.

According to the work of A. Baryłka (2022) [2], the importance of regular periodic inspections of a building is noticed by the legislator, ordering the owner (manager) to carry out such inspections and use their findings to plan

not only maintenance but also renovation activities that restore or improve the utility value of the building construction. This is a field of activity for building surveyors.

Correctly diagnosed technical condition of a building in the process of periodic inspection and paying attention to the need to undertake specific technical maintenance and repair activities allows for their proper planning and then execution in a timely manner - which significantly reduces the operating costs of buildings. Uncontrolled destruction of the object can be the cause of failures and even construction disasters.

With regard to construction facilities of the state security infrastructure, the findings resulting from periodic inspections carried out in the process of their operation may be insufficient and cause the need to make an in-depth diagnosis of the quality of the above-mentioned facilities. objects, concerning the state of meeting individual requirements that should be met by construction objects specified in art. 5 section 1 of the Act - Construction Law [35]. With regard to a building, we should pay special attention to its safety quality resulting from failure to meet the basic requirements regarding: load capacity and stability of the structure, fire safety and hygiene, health and the environment, which often determine the emergence of: threats to the health and life of the users of the facility, damage or destruction of the equipment of the facilities, deterioration of the environment inside the facility and its surroundings, as well as the occurrence of states of damage and destruction of part or all of the building.

## 8 Conclusions

1. Construction facilities of the state security infrastructure serve the needs of security in:

- military and non-military spheres and
- fields: defense, protection, economic and social. If they are subjected to specific hazards that may occur during their operation, they should be able to fulfill their tasks related to their intended use at a satisfactory level.

2. Buildings of the state security infrastructure should be considered in the systemic approach, which requires treating these objects as systems functioning in a specific environment and being in mutual relations with this environment.

3. Designing objects from a system perspective requires considering these objects in two problem areas:

- in the area of the interior of buildings, which can be associated with the concept of "internal security", understood as a state expressed in the lack of threat to the structure of buildings, their technological and installation equipment and users by risk factors originating from these facilities and risk factors originating from their surroundings;
- in the area of the surroundings of buildings, which can be associated with the concept of "external security", understood as a state of no threat to the environment (natural and anthropogenic) with threats generated in buildings.

4. The concept of a safe construction facility of the state security infrastructure should be understood as such a condition of the facility which, subject to specific threats that may occur throughout its existence, is able to fulfill its tasks related to with its intended purpose at a satisfactory level with regard to both internal and external security.

In practice, in many cases, we are dealing with the occurrence of building objects that can be classified as dangerous objects due to the fact that they are dangerous due to the assessment of their internal or external safety.

5. With regard to state security infrastructure facilities, it is extremely important to identify security threats (of a natural nature and anthropogenic) that may occur in the construction process regarding:

- building objects - generated in these objects and their surroundings, and
- surroundings of objects - generated in these building objects,

in terms of all types of possible adverse impacts of various nature that may occur during their implementation and subsequent operation.

6. Of particular importance for the security of the state is the quality and spatial arrangement of building structures serving the needs of state security, forming the state security infrastructure, which are shaped in the construction process of these facilities.

7. Lack of a systemic formulation of the concept of state security infrastructure in legal regulations justifies the need to verify the current division of the state security infrastructure into categories (and determine the required forms of its protection) taking into account the purpose, importance for state security and the spatial range of its impact.

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