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CRITICAL INFRASTRUCTURE OF IMPORTANCE FOR THE DEFENSE OF THE REPUBLIC OF SERBIA

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Abstract: *Critical infrastructure has received a well-deserved place as a subject of study within the corpus of security sciences, primarily from the aspect of national security protection, but also from the aspect of state defense. In this context, states take the first steps in identifying critical infrastructure sectors, and then, within each sector, they approach the determination of systems and facilities whose disruption has far-reaching consequences for national security, and above all, the ability to defend the country in conditions of emergency and war. Critical infrastructure as an important state resource dictates the necessity of undertaking measures and activities that, by deterring and protecting against attacks, will serve to ensure the uninterrupted operation of vital sectors in order to supply citizens, state authorities, the military and all legal entities with dedicated services and goods.*

The work is dedicated to the presentation of the definition of critical infrastructure at the national level, the arrangement of critical infrastructure in the defense system, as well as the measures taken to protect and improve the sustainability of the system in crisis situations and situations when the highest preparedness measures are taken.

Key words: *Critical infrastructure, Technical systems, Capital facilities, Sefense planning, Defense systems*

1. INTRODUCTION

Traditional definitions of critical infrastructure in the context of technical and technological systems intended to meet the basic life needs of the population, such as water, food, health care, energy, telecommunications, finance and others, in the medium-term analysis require supplementation. Although the United States of America and the countries of the European Union have paid considerable attention to critical infrastructure in the last two decades, knowing that superiority and supremacy in the security environment can be achieved without the use of military force. Following the example of developed countries, medium-developed countries are also setting up their legislative and institutional frameworks in order to protect critical infrastructure and apply good solutions.

In the last two decades, the most important critical infrastructures were electric power systems, transportation, water and food supply, agriculture, and vital industrial plants. In the modern world, information and telecommunications technology, mass media, banking and finance, and the environment have also become critical infrastructures (Protic, 2019).

Critical infrastructure precisely in the absence of crises requires commitment, in order to plan, organize, implement and test all aspects of protection measures.

2. CRITICAL INFRASTRUCTURE IN THE REPUBLIC OF SERBIA

Critical infrastructure sectors are defined in the Law on Critical Infrastructure as areas determined by this law, in which the process of identification and determination of critical infrastructure is carried out. Identification of critical infrastructure is the process of determining systems, networks, facilities or their parts in a certain sector which, in accordance with established criteria, is identified as critical infrastructure.

Competent authorities and organizations, citizens and other subjects are obliged to be guided by the following principles when undertaking measures and activities determined in the field of critical infrastructure: 1) the principle of an integrated approach, 2) the principle of responsibility, 3) the principle of protection against various types of threats, 4) the principle continuous planning of critical infrastructure protection and 5) the principle of data and information exchange and data protection.

Critical infrastructure are systems, networks, facilities or their parts, the interruption of functioning or the interruption of the delivery of goods or services can have serious consequences on national security, health and lives of people, property, the environment, the safety of citizens, economic stability, i.e. endangering the functioning of the Republic of Serbia (Zakon o kriticnoj infrastrukturi, 2018).

The Ministry of Interior regulates, plans, coordinates, controls activities, communicates and provides information related to critical infrastructure.

The law stipulates that the identification of critical infrastructure is carried out by sector in accordance with established criteria, which is the responsibility of the ministries responsible for certain areas.

The sectors in which critical infrastructure is identified and determined are: 1) energy; 2) traffic; 3) water and food supply; 4) healthcare; 5) finances; 6) telecommunication and information technologies; 7) environmental protection; 8) functioning of state authorities (Zakon o kriticnoj infrastrukturi, 2018).

In addition to the previously mentioned sectors, critical infrastructure can also be determined in other sectors, at the proposal of the ministry responsible for a certain area.

Critical infrastructure in the energy sector means systems, networks, facilities or their parts, the interruption of which causes:

1) breakdown of the power system, the re-establishment of which requires more than one day;

2) breakdown of the energy system, the re-establishment of which requires more than seven days;

3) loss of electricity supply in the area of life and work of more than 100,000 people for more than three days;

4) loss of supply of oil derivatives in the area of life and work of more than 100,000 people for more than three days;

5) loss of natural gas supply during the heating season in the area where more than 100,000 people

live and work for more than three days;

6) loss of heat energy supply during the heating season in the supply area of more than 10,000 people without an alternative heating system for more than three days;

7) daily costs due to loss of supply of electricity, natural gas and oil derivatives in the amount of 0.025% of GDP in the Republic of Serbia, calculated in the year preceding the year in which the critical infrastructure is identified.

Critical infrastructure in the transport sector means systems, networks, facilities or their parts, the interruption of which causes:

1) non-existence of an alternative road, i.e. the type and mode of traffic, which could be used for traffic that is prevented or hindered due to damage, i.e. disabling or hindered functioning of the system, network, facility or part of them;

2) interruption of traffic due to damage, i.e. disabling or hindering the functioning of the system, network, facility or part of it through which traffic is carried out, which serves for the flow of traffic or is in the function of the flow of traffic, if this interruption:

(1) prevents the supply of basic foodstuffs to more than 50 residents of a rural settlement in mountainous areas, more than 300 residents of a rural settlement in lowland areas, more than 1,000 residents in local self-government units, i.e. more than 5,000 residents in the city of Belgrade, for more than two days ,

(2) represents a threat to the life or health of more than 50 residents of a rural settlement in mountainous areas, more than 300 residents of a rural settlement in lowland areas, more than 1,000 residents in local self-government units, i.e. more than 5,000 residents in the city of Belgrade, for more than two days and consequences for the environment,

(3) significantly hinders, i.e. suspends the daily functioning of more than 50 residents of a rural settlement in mountainous areas, more than 300 residents of a rural settlement in lowland areas, more than 1,000 residents in local self-government units, i.e. more than 5,000 residents in the city of Belgrade, for longer than two days;

3) costs, i.e. damage that would occur due to interruption of the functionality of the system, network, facility or part of them through which traffic is carried out, which in the estimation amount to:

(1) 10.5% in the field of railway traffic,

(2) 10% in the field of road traffic,

(3) 7% in the field of water transport,

(4) 1.4% in the field of air traffic, GDP in the Republic of Serbia, calculated in the year preceding the year in which the critical infrastructure status of the system, network, facility or part thereof is determined;

4) that the system, network, facility or part of it through which traffic is carried out, which serves for the development of traffic or is in the function of the development of traffic, represents the carrier of other infrastructure (electric power, telecommunications, water supply and sewerage, etc.), i.e. that interruption or disrupting the functionality of a system, network, object or their part leads to interruption or disruption of the functionality of another system, network, object or their part that represents critical infrastructure;

5) that interrupting or interfering with the functionality of the system, network, facility or part thereof that significantly negatively affects the relations of the Republic of Serbia with other

countries, in a way that makes it difficult or impossible for international traffic, export/import, communications, etc. lasts longer than two days;

6) that the interruption or disruption of the functionality of the system, network, facility or part thereof significantly negatively affects the functioning of the emergency services: police, fire department, medical unit, crisis management.

Critical infrastructure in the water and food supply sector means systems, networks, facilities or their parts, the interruption of which causes:

1) interruption of the functioning of the high dam and reservoir filled with water managed by the body responsible for water management from the operational plan of flood protection, subject to the fulfillment of the conditions that:

(1) building height (distance from the lowest level of the foundation to the highest level of the dam) higher than fifteen meters,

(2) construction height (distance from the lowest elevation of the foundation to the highest elevation of the dam) lower than fifteen meters and higher than ten meters, if the length of that dam per crown is greater than 500 meters, or if the volume of water accumulation created by that dam is greater than 100,000 m3 or if the maximum flow of water released through that dam is greater than 2,000 m3 per second,

(3) the dam or reservoir is included in the flood defense operational plan,

(4) that the dam is in series;

2) interruption of the functioning of the water facility for water use, water supply facility, drinking water preparation plant, if the water facility is part of the regional drinking water supply system;

3) interruption of the functioning of the water facility for the collection, removal and purification of waste water and water protection, if the water facility is for an agglomeration of size ≥ 50,000 equivalent inhabitants;

4) destruction or damage of food stored for the needs of commodity reserves;

5) endangerment of the food and animal feed safety system, the supply chain of food and animal feed, the provision of sufficient quantities of food and animal feed, etc.

Critical infrastructure in the healthcare sector means systems, networks, facilities or their parts, the interruption of which causes:

1) complete or partial interruption in the provision of health care that may threaten national security or the life and health of people;

2) interruption, i.e. disruption of infrastructure functionality that prevents the provision of highly specialized specialist-consultative and laboratory activities, as well as stationary health activities with at least 1,000 beds in the area of adult health care, i.e. at least 300 beds in the area of children's health care;

3) interruption, i.e. disruption of the functionality of the infrastructure or part of it, which makes it impossible to receive and take care of emergencies of all citizens at the place of medical emergency, through regular work or on-call and medical transport, in a territory larger than 50 square kilometers;4) interruption, i.e. disruption of the functionality of the infrastructure, which makes it impossible to coordinate sanitary-hygienic and epidemiological surveillance, determine and implement the necessary measures on the territory of the Republic of Serbia;

5) interruption, that is, disruption of the functionality of the infrastructure that prevents the

preparation of blood and blood components, collection and testing, processing, storage and distribution of blood and blood components, production of medicines from blood and blood plasma;

6) interruption, i.e. disruption of the functionality of the infrastructure that prevents the production of serums, vaccines and other immunobiological and diagnostic preparations and means and the supply of vaccines and serums to health institutions for the territory of the Republic of Serbia;

7) interruption in the functioning of the system in which graded classified data is stored, processed and exchanged, in accordance with the Data Confidentiality Act, if this prevents the provision of quality health care or breaches of data confidentiality;

8) interruption in the functioning of the system in which data on the health of natural persons is processed, as a special type of personal data, in accordance with the Law on the Protection of Personal Data, which prevents the provision of quality health care or enables the violation of personal data.

Critical infrastructure in the financial sector means systems, networks, facilities or their parts, the interruption of which causes:

1) interruption or impaired functioning of public finances or the state budget used by state bodies and organizations, institutions, associations, public companies, special bodies through which the regulatory function is exercised and other legal entities entrusted with public powers, for a period longer than three days, which threatens the economic stability of the Republic of Serbia;

2) interruption or difficulty in the functioning of economic companies from the financial sector, carrying out their business activities, which has the effect of jeopardizing the economic stability of the Republic of Serbia;

3) interruption or difficulty in the performance of the activities of the National Bank of Serbia in terms of determining and implementing monetary and foreign exchange policy, managing foreign exchange reserves, issuing banknotes and coins and managing cash flows, as well as performing other tasks within its jurisdiction that are important for the economic stability of the Republic Serbia;

4) interruption or difficulty functioning in the performance of the activities of state administration bodies entrusted by law with tasks of exceptional importance for the financial, economic and monetary stability of the Republic of Serbia.

Critical infrastructure in the telecommunications and information technology sector means systems, networks, facilities or their parts, the interruption of which causes:

1) termination of the provision of services by electronic communications operators with the participation of at least 10% of users on the relevant market in the territory of the Republic of Serbia;

2) termination of the provision of services by the operator managing the broadcasting infrastructure on the territory of the Republic of Serbia;

3) interruption of the provision of electronic administration services for the citizens, economy and institutions of the Republic of Serbia in terms of critical infrastructure, which includes information systems as a whole - from the physical level of data centers where the systems are located, through communication and server infrastructure, to the application level;

4) suspension of construction, development, improvement and management of the educational and scientific research computer network of the Republic of Serbia;

5) termination of internet traffic exchange services ("internetexchangepoint");

6) termination of management of the national internet domain register and online naming system (DNS systems).

Critical infrastructure in the environmental protection sector means facilities whose disruption or interruption of operation can cause environmental pollution to a greater extent in an area of more than 700 ha for a duration of more than seven days.

Under critical infrastructure in the sector of the functioning of state bodies is meant the interruption of the information communication system of state bodies that prevents the work of state bodies for more than 24 hours (Uredba o kriterijumima za identifikaciju kriticne infrastrukture i nacinu izvestavanja o kriticnoj infrastrukturi Republike Srbije, 2022).

Each country defines information-communication, energy and water-food sectors as sectors that contain critical infrastructure (Akrap, 2019). Prepoznajuci svoje potrebe, ali i uvazavajuci resenja ostalih drzava, Republika Srbija je identifikovala kriticnu infrastrukturu u svim vaznim sektorima.

3. OBJECTS OF SPECIAL IMPORTANCE FOR DEFENSE

In addition to the term critical infrastructure, the defense system also includes the definition of facilities of special importance for defense. Facilities of special importance for the defense of the country are considered to be: large technical and technological systems, facilities where objects are produced, stored or stored or services provided for defense purposes, facilities where state bodies and legal entities of special importance for the defense of the country are located, as well as certain infrastructure facilities (Zakon o odbrani, 2007).

A large technical system is considered a whole, i.e. a set of mutually arranged parts and procedures that ensure the technical-technological unity and independence of the system or its functional connection with other technical systems of importance for defense (Odluka o određivanju velikih tehnickih sistema od znacaja za odbranu, 2014).

Large technical systems of importance for defense and technical means of importance for the functioning of those systems are determined in the field of telecommunications, traffic, energy, water supply and other areas of importance for defense.Types of objects of special importance for defense are:

a) facilities where large technical-technological systems are located, in accordance with the act on determining large technical systems of importance for defense;

b) facilities where items of importance for defense are produced, namely:

– facilities for the production and repair of weapons and military equipment and facilities of other companies, legal entities and entrepreneurs that are trained to produce weapons and military equipment - buildings and facilities for the production and repair of equipment for the needs of civil protection and observation, notification and warning services,

– facilities for the production of ferrous and non-ferrous metallurgy products,

– facilities for the construction and repair of aircraft and aircraft equipment,

– facilities for building and overhauling ships and ship equipment,

– facilities for the production and repair of engines, rail vehicles, road motor vehicles and tractors,

– facilities for the production of electrical machines and devices,

– facilities for the production of basic chemical products,

– facilities for the production of cement,

– rubber processing facilities,

– facilities for the production of food products, with a daily capacity of 10 t and more,

– objects of graphic activities - printing houses, for the production and processing of paper,

– grain mills and other facilities for the processing of food products, with a daily capacity of 10 t and more,

– hydropower plants and thermal power plants,

– heating plants with a capacity of 10 MW and more,

– land reclamation, regulation and protective embankments within the area of the settlement,

– dams over 5 m high and dams for reservoirs of 30,000 m³ and larger,

– facilities with installations for the production and processing of liquid fuels and gases of all capacities,

– facilities where nuclear raw materials and nuclear energy are produced and used,

– coal mines with surface and pit exploitation, lignite drying plants and lead, zinc and copper mines,

– facilities for the production of medicines and other pharmaceutical products;

v) objects in which items of importance for defense are stored or stored, namely:

– warehouses and pumping stations for liquid fuels and gases of all capacities,

– warehouses, silos and cold stores for food products and warehouses for permanent and marketable commodity reserves, with a capacity of over 2,000 m³,

– permanent warehouses of explosive, flammable and toxic materials, with a capacity of 1000 kg and more,

– warehouses for all types of weapons and military equipment,

– permanent warehouses for all types of civil protection equipment and the Service of observation, notification and warning;

g) facilities where services are provided for defense purposes, namely:

– inter-local and local telecommunications permanent cable lines (aerial, underground, underwater and equipment and devices for working on them),

– wireless telecommunication devices for all types of connections,

– radio base stations for mobile telephony,

– buildings and parts of buildings intended for telecommunications and connections,

– objects and devices of the radio-diffusion and television system,

– navigation systems and facilities that serve navigational purposes in inland navigation and air traffic,

– ships of inland navigation, technical navigable objects of inland navigation and scaffolding,

– hospitals with 100 patient beds or more and facilities of health organizations,

– large information systems that contain and process data important for the defense of the country,

– water pipes on all facilities for capturing and purifying water, as well as reservoirs and captured springs with a capacity of over 1000 liters of water per minute,

– sewage capacity for 20,000 inhabitants and more;

d) certain infrastructure facilities, namely:

– state roads of the first and second order, municipal roads, uncategorized roads and streets over 5 km,

– public railway infrastructure, industrial railways and metros,

– road facilities on the railway (bridges, overpasses, underpasses, viaducts, aqueducts, culverts, tunnels, galleries, supporting and facing walls, etc.) with a length of more than 10 m,

– facilities on artificial waterways, ports, wharves and wharves at depths greater than 2 m,

– transmission lines, transformer stations and switching facilities in the system of transmission lines with a voltage of 35 kV and higher,

– oil and gas pipelines of all capacities;

đ) facilities where the seat of state bodies and organizations trained in accordance with the law is located;

e) facilities in which the seat of a legal entity is located, which is determined by an act of the competent authority as a legal entity of special importance for the defense;

z) shelters and other public facilities intended for the protection of people and material goods and the protection of the environment (Odluka o objektima od posebnog znacaja za odbranu, 2008).

Objects of special importance for defense have been identified in all important segments of society necessary for normal functioning in peacetime conditions, but also in conditions of emergency and war.

4. PROTECTION OF CRITICAL INFRASTRUKTURE

At the strategic level, it is recognized that the security of the state, as well as other states in the region, is negatively affected by cyber attacks on critical infrastructure facilities. Therefore, cyber attacks on critical infrastructure facilities within the concept of hybrid and information warfare can have a negative impact on the functioning of the defense system. Therefore, in the domain of protecting the security of the Republic of Serbia and its citizens, ensuring the security of critical infrastructure is recognized as one of the strategic goals. Ensuring the safety of critical infrastructure facilities is of primary importance for the protection of the safety of the Republic of Serbia and its citizens. In this regard, the designation and protection of critical infrastructure facilities will be normatively regulated and harmonized with the European Union regulations. Also, special attention will be devoted to the full implementation of normative-legal solutions. In order to ensure the safety of objects of critical infrastructure, all preventive measures will be continuously taken, especially from the aspect of their protection against fire, explosions and terrorist attacks. An integrated information system for security monitoring of critical infrastructure facilities will be established (Strategija odbrane Republike Srbije, 2019).

Protection of critical infrastructure is a set of activities and measures aimed at ensuring the functioning of critical infrastructure in the event of disruption or destruction, i.e. protection in the

event of threats and prevention of the consequences of disruption or destruction. In case of occurrence of circumstances of endangerment, disruption of work or destruction of critical infrastructure, management and coordination of the implementation of measures and tasks in the said circumstances is undertaken by the Republic Headquarters for Emergency Situations (Zakon o kriticnoj infrastrukturi, 2018).

Operators of critical infrastructure are obliged to draw up the operator's security plan for risk management and obtain the approval of the Ministry immediately, and no later than six months after determining the systems, networks, facilities or their parts for critical infrastructure. Operators of critical infrastructure must have a liaison officer, that is, a person who serves as a contact between the operator and the Ministry, who ensures constant control of risks and threats, informs about changes in relation to critical infrastructure, informs the Ministry about the evaluation of risks, threats and vulnerabilities, coordinates the Security Plan operator for risk management, performs tests through exercises and other activities provided for in the plan and performs all other tasks related to critical infrastructure (Zakon o kriticnoj infrastrukturi, 2018).

The security of objects of special importance includes the organization and implementation of measures for their protection against damage or destruction, i.e. the disclosure of secret data about the objects or the objects themselves - locations (Odluka o objektima od posebnog znacaja za odbranu, 2008).

Compliance with the highest world standards and the establishment of preventive and control mechanisms in the sphere of protection of critical infrastructure are fundamental prerequisites for preserving the defense, security and foreign policy interests of the country, its credibility and integrity. In the context of global threats, the protection of critical infrastructure is a priority issue for the national security of every country (Petrovic, Berisa and Dzeletovic, 2019).

5. CONCLUSION

In the field of critical infrastructure, the Republic of Serbia legally regulated the identification and determination of critical infrastructure, the protection, jurisdiction and responsibility of authorities and organizations in the field of critical infrastructure, as well as information, reporting, decision support, data protection, management and supervision in the field of critical infrastructure. Also, in the defense system, ensuring the safety of critical infrastructure facilities is recognized as one of the strategic goals. Nevertheless, looking at the legal regulation of identifying critical infrastructure and the institutional implementation of critical infrastructure protection, the necessity of further work in this field can be seen.

As some authors point out, in the past, attacks on critical infrastructure were in function of attacks on other targets, but today there has been a change in the attack paradigm. The planning of existing and future conflicts and wars inevitably includes attacks on critical infrastructure, as the primary targets of an attack that tries to impose its own will on the attacked party without deploying military forces (Akrap, 2019). Bearing in mind this inevitability, states should direct their human and material resources towards the physical and technical security of critical infrastructure, as well as ensuring its smooth functioning in cyberspace.

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