

*Batiuk O. V.,**Candidate of Juridical Sciences, Associate Professor,  
Senior Lecturer at the Department of Political Science,  
Public Administration and National Security  
Lesya Ukrainka Volyn National University*

## REGARDING THE UNDERSTANDING OF THE CONCEPT OF CRITICAL INFRASTRUCTURE FACILITIES AS A SUBJECT OF THE CRIMINAL STUDY

**Summary.** The author reviews the scientific opinions of leading scientists regarding the understanding of the concept of infrastructure. The author defines that the modern understanding of infrastructure is perceived as a complex of interconnected serving structures, which form and/or provide a basis for solving the problem (task). Based on the analysis of the opinions of leading scientists, the author comes to the logical conclusion that the understanding of the essence of critical infrastructure facilities and knowledge that they are classified as special facilities, on which the committing of crimes can lead to emergencies, has an important forensic importance. This affects the organization of the pre-trial investigation along the identified fact of event with signs of a crime, the order and limits of interaction of the investigator with other state and non-state structures, the nominating and verifying versions regarding the true purpose of criminal acts, the tactics of conducting separate investigative actions, etc. The correctness of involving specialists by investigator, the use of technical forensic tools, the appointment of forensic examinations and the formulation of questions for the decision of the expert, etc., also depend on this. An insignificant by results event at a critical infrastructure facility may be the result of a failed criminal encroachment on the work of the entire life support system of the region. The inability of the investigator to discern the factual circumstances of the event can lead to the avoidance of a real criminal from the criminal responsibility and to create the conditions for him to repeat committing another, but more dangerous and better-prepared assault on a critical infrastructure facility. As a conclusion, the author notes that the critical infrastructure facilities are important facilities of forensic study because, the knowledge of the location and the significance of a particular facility, at which the criminal event took place, in the general system of a critical infrastructure will allow to establish the true intent and direction of actions of the subjects of the crime, will indicate directions for the search for traces and other evidence, will help in their search and removal.

**Key words:** crime, forensic, infrastructure, providing, facilities, critical infrastructure.

**Problem statement.** The relevance of the chosen theme is determined by the fact that today the Ukrainian state is at a very complicated and even difficult stage of its development. The development of the country takes place in the difficult conditions of social and political, economic realities of today, which are significantly complicated by the openly unfriendly attitude of the former partner, the neighbor state, which tries to establish its own control not only over the political course of our country, but also

over its economy, foreign economic relations, political preferences of the general population. The confrontation in the conditions of undeclared hybrid war against the enemy, which has much greater resources, requires considerable efforts from Ukraine and the definition of specific priorities in its further development. This involves the directing of attention, efforts and appropriate material costs and organizational and legal measures primarily to protect key sectors of the economy and social structure, facilities, nodes, networks, systems, which play a crucial role in the functioning of state institutes, economy, politics, sphere of health care, etc. for the providing the normal life of the population, the maintain calm in society and, in fact, the existence of the state itself. Such a category of facilities in the developed world is called a critical infrastructure. The problems of critical infrastructure protection in Ukraine have arisen for a long time, in fact since the moment of the formation of the young independent state. Our country is not an exception to the general trends of the current of geopolitical and economic processes in the world. It is obvious that this issue is considered relevant for every country and international security in general.

The works of scientists such as S.O. Andreyev, D.S. Biriukov, S.F. Honchar, V.O. Yevseyev, O.P. Yermenchuk, S.I. Kondratov, H.P. Leonenko, H.P. Sytnyk, O.M. Sukhodolia, O.Yu. Yudin were dedicated to the scientific researches of studying of critical infrastructure facilities. However, it should be noted that in the legal literature there are no scientific researches that are dedicated to the problem of understanding the concept of critical infrastructure as a subject of forensic studying. This is what caused the need to prepare this scientific work in order to reveal the understanding of the concept of critical infrastructure facilities as a subject of forensic studying.

**The aim of the research.** In the provisions of this scientific research, we aim to implement the review of the regulatory and legal acts and scientific opinions of leading legal scholars and forensic scientists and on this basis to form the author's understanding of the concept of critical infrastructure facilities as a subject of forensic studying.

**Presentation of research material.** Domestic politicians and scientists point out that the practical realization of the priorities of the National Security Strategy of Ukraine involves not only the implementation of a number of organizational, legal, engineering technical and other measures to provide the security of critical infrastructure, but also connected with the need to adequately respond to a wide range of threats to national security, ie concerning the protection of vital national interests of Ukraine [1, p. 118].

The appearance and approval in science and public life of the concept of infrastructure is attributed to the late 1940s – early 1960s. The term “infrastructure” (from the Latin “infra” – “below, under” + “structura” – “structure, location”) was originally used in the military lexicon where it meant a complex of rear (auxiliary) structures that provide the actions of the armed forces (ammunition depots and other military materials, missile bases, test sites, missile launch areas, military airfields, etc.). In the economic literature, this term appeared in the works of foreign scholars in the late 1940s, characterizing a wide complex of industries that serve industry and agriculture, in particular, construction of highways, canals, ports, bridges, airfields, warehouses, energy facilities, railway transport, communications, water supply and sewerage, general and professional education, science costs, health care, etc. The materials R. Nurkse, P. Rozenshtein-Rodan, A. Khirshman, A. Yanhson etc., where the understanding of infrastructure as an ancillary entity is preserved, and an attempt to justify its importance for the efficient functioning of production was made, with the development of the social division of labor and the strengthening of the role of service units in the 1950s were published [2, p. 18]. Based on the semantics of this term, production infrastructure, for example, is defined as the foundation of the economy and is seen as somewhat ancillary to basic production. However, a meaningful definition of production infrastructure is offered not on the basis of semantic considerations, but on the analysis of its functional purpose in the process of social production. The concept of infrastructure is also considered at the level of essence: as a field of application of labor, that provides the circulation of products in the national economy; as a set of industries, ie organizationally separate enterprises or organizations that have their function of transportation, storage and realization of products; as a set of material objects that create conditions for the normal course of the process of social reproduction [3, p. 7–8].

Modern understanding of infrastructure is perceived as a complex of interconnected serving structures that form and/or provide a basis for solving the problem (task). The term “infrastructure” is often interpreted in two directions in the scientific literature: 1) a set of industries, activities, which are specialized in specific actions of systems in a broad sense, which directly provide the conditions and processes of the main system, having a subordinate, ancillary nature in relation to it; 2) material and technical base that is necessary for the functioning of the most specialized (industry) system [4, p.163]. Each of these directions and all their structural elements need reliable protection against unlawful encroachments. An expert in the field of economics – R. Greenberg defines infrastructure as a set of elements that provide the smooth functioning of several relationships of objects and subjects of the social economic system [5, p. 54].

In our opinion, the definition of infrastructure that was suggested by the domestic scientist O.V. Vasiliev is more successful, he considers infrastructure as a system of functional elements and relations that provide the realization of individual and collective interests of a group of economic entities [6, p. 23]. Another Ukrainian scientist, I.I. Chynyska is referring about systemic understanding of infrastructure, pointing out that infrastructure is an organic and orderly unity of interconnected structural components, is able to provide in reality and in perspective the smooth functioning of the relationships of subjects and objects of the social economic system and through the performance of certain functions to be included in providing social development [7, p. 252].

The consideration of infrastructure in terms of its membership in a particular system of production, livelihood, transport, armed forces, field or complex of fields of the national economy requires the coexistence of a certain ratio of components, which provide the stable functioning of the system as a whole. Thus, according to this opinion, each infrastructure plays the role of providing a certain process, an example of which may be a separate production or sphere of service delivery. Today, society is becoming increasingly dependent on the mass dissemination of information, goods and services. The accessibility of infrastructure benefits provides a high level of living in both urban and rural areas. At the same time, the livelihood of a particular area, and sometimes the region, is highly dependent on the continuity of functioning of infrastructure facilities, and their destruction or interruptions in their work have negative and sometimes catastrophic consequences. Of course, not all infrastructure facilities are so important for human existence or the economic or social well-being of a particular group of the population in a territory or region. Therefore, scientists and practitioners of many countries around the world at one time faced the question of isolating from the total mass of such facilities those, the negative influence on which is the greatest threat, and the threat itself, no matter who it comes from, is critically dangerous.

The term “critical infrastructure” has been used in the turnover of business, scientific and diplomatic communication since the mid-1990s and was originally associated with information infrastructure [8, p. 151]. Critically important infrastructure facilities act as a life support system for daily existence of people. The communities of people are supported by a rather complex and complicated network of infrastructure systems. Citizens expect and rely on the functioning of institutions and services in their countries in relation to their health, physical security, safety and economic well-being. The incapacitation, serious failures and even minor but permanent deficiencies in the operation and functioning of a particular infrastructure or its elements can create threatening and sometimes critical situations for a normal livelihood situation.

The scientific approaches to understanding and defining the very concept of “critical infrastructure”, which is understood today as systems and resources, physical or virtual, which provide functions and services, the violation of which will lead to the most serious negative consequences for the livelihood of society, social economic development and the providing of national security, were systematized in the Green Paper on issues of the critical infrastructure protection in Ukraine that was published in 2015 [9].

Domestic scholars also suggest something else, but not very different from the wording of the term “critical infrastructure” as physical and virtual systems, objects and resources, the destruction, destroying or reduction of efficiency of which will pose significant threats to the country, its national security, safety and security and health of society [10, p. 176].

The approaches to understanding the general essence of infrastructure seem logical, which are based on the functions that are performed by it, or the composition of economic entities that perform the specified functions. The lists of sectors that belong to critical infrastructure in different countries are mostly similar; after all, the development of modern society is almost by the same, although not fully convergent laws, rules, and schemes. There are differences, primarily are caused by national specifics, geopolitical conditions, traditions and features of the security policy of a country or international structure.

The legislative and departmental normative uncertainty in the area of critical infrastructure protection has led to that scientists, offering their own options for determining such a list of components, interpret its subject-object composition differently [11, p. 88]. For example, domestic scientist O.M. Sukhodolia includes to the main sectors of critical infrastructure in Ukraine: the fuel and energy complex, the transport, the networks of livelihood, the telecommunications and the communications, the financial and banking sector, the bodies of government and law enforcement, the sector of security and defense, chemical industry, the emergency services and the services of civil protection, the food industry and the agro-industrial complex [12, p. 65].

In 2015, the National Institute for Strategic Studies suggested a list of sectors that are included in the national critical infrastructure, which contained 16 such items: the chemical sector; the commercial facilities; the critical production; the dams and other hydraulic structures; the defense-industrial base; the emergency services to the public, the response to emergencies; the energy sector; the banks and the finances; the foodstuff and the agriculture; the government facilities; the healthcare and the medicine; the nuclear reactors, the materials and the waste; the transport systems; the water resources; the systems of water supply and wastewater [9].

However, in 2020 the Cabinet of Ministers of Ukraine adopted the Resolution of October 9, 2020 №1109 “Some issues of the critical infrastructure facilities”, which determines the order of the assignment and the list of the sectors (subsectors), basic services of critical infrastructure of our state and establishes four categories of the criticality. This normative document establishes the following categories of the criticality of critical infrastructure facilities:

I category of the criticality – especially important facilities that have the State-level importance, the significant influence on other critical infrastructure facilities and the violation of which will lead to the occurrence of a crisis situation of national importance;

II category of the criticality – the vital facilities, the dysfunction of which will lead to a crisis situation of regional importance;

III category of the criticality – the important facilities, the dysfunction of which will lead to the occurrence of a crisis situation of resident importance;

IV category of the criticality – the necessary facilities, the dysfunction of which will lead to the occurrence of a crisis situation of local importance.

Specific critical infrastructure facilities have been defined by sectors, subsectors and the type of the main service that is provided by a particular facility. They are as follows.

In the fuel and energy sector:

- the providing of the functioning of the market of electrical energy, the organization of purchase and sale of the electrical energy on the market; the management of transmission and power supply systems; the distribution of electrical energy;

- the oil production; the transfer (transit) of oil and oil products; the cleaning, recycling and processing of oil; the operation of oil pipelines; the storage and supply of oil and oil products;

- the gas production; the transfer (transit) of gas; the gas distribution; the operation of gas transmission system; the storage of the natural gas; the providing of the work of the liquefaction systems of the natural gas;

- the production of electrical energy at the nuclear power plants; the operation of the nuclear power plants; the cleaning, recycling and processing of the nuclear fuel; the radioactive waste management and the radioactive waste disposal.

In the informational sector:

- the provision of cloud services, including the data storage and processing in the data processing centers and/or in the cloud storage, the committing of the cloud computing;

- the providing of the functioning of the systems of e-government; the provision of electronic trust services;

- the providing of the functioning of the electronic identification systems;

- the provision of the services for the maintenance and technical operation of a multi-channel television network without the right of the provision of software (information) service in three or more regions of the country;

- the distribution of the digital terrestrial broadcasting with the using of a radio frequency resource in three or more regions of the countries;

- the providing of the functioning of the Internet traffic exchange points (IXP);

- the administration of the address space of the Ukrainian segment of the Internet, including the provision of services for the support and administration of domain name systems (DNS) on the Internet;

- the administration and maintaining of the registers of upper-level domain names on the Internet, including the domain.UA.

In the sector of livelihood system:

- the heat energy supply;

- the hot water supply;

- the centralized drainage;

- the household waste management.

In the sector of food industry and agro-industrial complex:

- the production and processing of the agricultural and/or the food production;

- the operation of large irrigation systems, canals;

- the providing of the storage of stocks of the state material reserve.

In the sector of health-care:

- the provision of emergency medical care;

- the provision of services of inpatient and outpatient treatment and other medical services;

- the production, purchase and supply of the pharmaceuticals, medicine, vaccines, blood and other medicines and medical equipment;

- the monitoring of the infectious diseases and/or epidemics;

- the functioning of the electronic health care system.

In the financial sector:

- the providing of the functioning of stock market.

In the sector of transport and post office:

- the air traffic management;

- the air transportation (work of air transport);

- the providing of the work of airports and ancillary equipment that is located at airports;

- the bus transportation (long-distance, international);

- the urban transport (buses, trams, trolleybuses, subway);

- the maintenance of transport infrastructure (roads, bridges, tunnels, overpasses) and the service of traffic control;

- the functioning of the intelligent transport systems (traffic management, mobility management, interaction with other types of transport);

- the passenger and freight railway transportation;

- the operation and maintenance of the railway;

- the providing of the work of train stations and hub stations;

- the control and management of shipping;
- the operations on the domestic, sea or coastal passenger and freight transport;
- the functioning of the managing bodies of ports or the subjects of operation of port equipment;
- the operation and maintenance of infrastructure (canals, dams, fairways, etc.);
- the providing of the services of postal.

In the sector of industry:

- the production of industrial gas;
- the production of fertilizers or nitrogenous compounds;
- the production of pesticides or other agrochemical products;
- the production of explosives;
- the production of main organic chemicals;
- the production of inorganic chemicals;
- the mining and metallurgical complex (metallurgical production and extraction of iron ores);
- the production of coke and coke products;
- the development, production, modernization and utilization of products of military (defense-industrial complex);
- the production and supply of space technique;
- the production and supply of aviation industry production;
- the shipbuilding and supply of shipbuilding production.

In the sector of civil protection of the population and territories:

- the system of emergency assistance to the population on a single telephone number 112;
- the emergency and urgent notification of the population, liquidation and emergency recovery, organization and coordination of rescue of residents and property [13].

At first glance, such a detailed description in the forensic study of an exhaustive list of the critical infrastructure facilities in Ukraine may seem excessive. However, the understanding of the essence of critical infrastructure facilities and knowledge that they are classified as special facilities, on which the committing of crimes can lead to emergencies, has an important forensic importance. This affects the organization of the pre-trial investigation along the identified fact of event with signs of a crime, the order and limits of interaction of the investigator with other state and non-state structures, the nominating and verifying versions regarding the true purpose of criminal acts, the tactics of conducting separate investigative actions, etc. The correctness of involving specialists by investigator, the use of technical forensic tools, the appointment of forensic examinations and the formulation of questions for the decision of the expert, etc., also depend on this. An insignificant by results event at a critical infrastructure facility may be the result of a failed criminal encroachment on the work of the entire life support system of the region. The inability of the investigator to discern the factual circumstances of the event can lead to the avoidance of a real criminal from the criminal responsibility and to create the conditions for him to repeat committing another, but more dangerous and better-prepared assault on a critical infrastructure facility.

In the process of pre-trial investigation of crimes at critical infrastructure facilities, it is necessary to establish the following fact data and circumstances that are related to the very understanding of the critical infrastructure: scale (in particular – the geographical coverage of the territory for which the loss of the elements of critical infrastructure has caused the significant damage); the relationship between the elements of critical infrastructure; the duration of harmful influence of emergencies (how and when

the damage has been discovered that is associated with the loss or failure, breakdowns or malfunction of the critical infrastructure facilities and how long the negative influence of the event lasted); the vulnerability of the facility to the influence of dangerous factors; the severity of consequences by indicators in the following groups: the economical security (impact on GDP, the amount of economic losses – both direct and indirect, share of the production in the market, number of employees, tax revenues to the budget); the health and safety of the population (number of victims, in particular, dead, persons who suffered injuries of varying severity, as well as the number of evacuees, costs of the work of emergency rescue services, emergency assistance to the population); the domestic political, state security (loss of confidence in the efficiency of the government, the authority of the state, the violation of management of government); the defense capability (the reduction of combat capability of the armed forces, disclosure of secret information); the environmental safety (influence on the environment), etc.

In **conclusion**, it should be noted that the understanding of the essence of critical infrastructure, knowledge of its constituent elements and the relationship between them and other facilities of criminal encroachment has an important forensic importance. This allows the prosecutor, investigator to correctly determine the actual circumstances of the committing of a crime at such facilities, to put forward versions regarding the essence of the event and its causes, to establish the circle of probable suspects, to put forward and to verify the reasonable versions. The knowledge of the location and significance of a particular facility where a criminal event occurred, will give the opportunity to establish the true intent and focus of actions of perpetrators of a crime, will specify directions for the search of traces and other evidences, will help in their search and seizure, in the general system of critical infrastructure.

#### References:

1. Ситник Х.П., Андреев С.О. Про дієві актуальні питання існування критичної інфраструктури в Україні. *Науково-інформаційний вісник Академії національної безпеки*. 2015. Вип. 3–4 (7–8). С. 116–131.
2. Новикова В.І. Інфраструктура: сутність, поняття, види, застосування у рекреаційній сфері. *Вісник Київського національного університету імені Т. Шевченка. Серія «Географія»*. 2016. Вип. 1 (64). С. 18–22.
3. Орешин В.П. Планирование промышленной инфраструктуры: комплексный подход. Москва : Экономика, 1986. 144 с.
4. Новикова В.І. Рекреаційна інфраструктура: суть поняття, види, методи дослідження. *Географія в інформаційному суспільстві* : збірник наукових праць : у 4 т. Київ : ВЛГ «Обрії», 2008. Т.І.В. С. 163–165.
5. Гринберг Р. Постсоюзное экономическое пространство: коллизии и сценарии развития. *Российский экономический журнал*. 1996. № 10. С. 53–60.
6. Васильев О.В. Методологія та практика інфраструктурного забезпечення функціонування та розвитку регіону України : монографія. Харків : ХНАМГ, 2007. 341 с.
7. Чуницька І.І. Інфраструктура фінансового ринку України: поняття, функціонування та статус еволюції. *Ділова інформація*. 2014. № 9. С. 248–253.
8. Курбанов Я.Л. Забезпечення природно-технічної безпеки в Україні та проблема визначення поняття «критична інфраструктура». *Південноукраїнський правочинний часопис*. 2016. № 2. С. 150–154.
9. Зелена книга з питань захисту критичної інфраструктури в Україні. 2015 рік. URL: [http://www.niss.gov.ua/public/File/2015\\_nauk\\_an\\_rozrobku/Green%20Paper%20-%20dopovid.pdf](http://www.niss.gov.ua/public/File/2015_nauk_an_rozrobku/Green%20Paper%20-%20dopovid.pdf).

10. Урядникова Ю.В., Чумаченко С.М., Кармазин С.В., Заплатинський В.М. Концепція захисту і управління технологічними ризиками на теплоенергетичних об'єктах критичної інфраструктури. *Вісник АМУ. Серія «Техніка»*. 2015. Вип. 2 (10). С. 172–185.
11. Манжук І.В. Захист енергетичної безпеки в контексті концепції створення державної системи захисту критичної інфраструктури України. *Міжнародний юридичний вісник: актуальні проблеми сучасності (теорія та практика)*. Вип. 1–2 (10–11). 2018. С. 87–93.
12. Суходоля О.М. Захист критичної інфраструктури: сучасні виклики та пріоритетне відновлення секторів безпеки. *Науковий часопис Академії національної безпеки*. 2017. Вип. 1 (13). С. 50–80.
13. Постанова Кабінету Міністрів України від 9 жовтня 2020 р. № 1109 «Деякі питання об'єктів критичної інфраструктури». URL: <https://zakon.rada.gov.ua/laws/show/1109-2020-%D0%BF#Text> (дата звернення 11.01.2020)

**Батюк О. Щодо розуміння поняття «об'єкти критичної інфраструктури» як предмета криміналістичного вивчення**

**Анотація.** У науковій статті автор здійснює огляд наукових думок провідних вчених щодо розуміння терміна «інфраструктура». Сучасне розуміння інфраструктури сприймається як комплекс взаємопов'язаних обслуговуючих структур, які становлять та/або забезпечують основу для вирішення проблеми (завдання). На основі аналізу думок провідних вчених автор доходить логічного висновку про те, розуміння сутності об'єктів критичної інфраструктури і знання того, що вони віднесені до особливих об'єктів, вчинення злочинів на яких може призвести до виникнення

надзвичайних ситуацій, має важливе криміналістичне значення. Це впливає на організацію досудового розслідування за виявленим фактом події з ознаками злочину, на порядок і межі взаємодії слідчого з іншими державними та недержавними структурами, на висунення і перевірку версій щодо справжньої мети злочинних дій, на тактику проведення окремих слідчих дій тощо. Від цього залежить і правильність залучення слідчим спеціалістів, використання техніко-криміналістичних засобів, призначення судових експертів і формулювання питань на вирішення експерту та ін. Незначна за наслідками подія на об'єкті критичної інфраструктури може бути результатом невдалого злочинного посягання на роботу всієї системи життєзабезпечення регіону. Невміння слідчого розпізнати фактичні обставини події може призвести до ухилення справжнього злочинця від кримінальної відповідальності та створення умов для повторного вчинення іншого, але більш небезпечного і з кращою підготовкою посягання на об'єкт критичної інфраструктури. Автор робить висновок, що об'єкти критичної інфраструктури є важливими об'єктами криміналістичного вивчення, оскільки знання місця і значення певного об'єкта, на якому сталася злочинна подія, в загальній системі критичної інфраструктури дасть змогу встановити справжній умисел і спрямованість дій суб'єктів злочину, вкаже напрями для пошуку слідів та інших доказів, допоможе у їх пошуку та вилученні.

**Ключові слова:** злочин, криміналістика, інфраструктура, забезпечення, об'єкти, критична інфраструктура.