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Critical infrastructure and strategic resilience of the state

Abstract: Recently, the COVID-19 pandemic and the events related to Russia's aggression against Ukraine, as well as the general increase in tension in international relations, have put the global, regional and national security systems of individual countries to a severe test. Experiences from these events provide many conclusions that should be used in the process of adapting security systems to the new and constantly changing political-military, economic, social and natural environment. These experiences have highlighted the importance of the strategic resilience of the state, as well as of alliances. This was reflected in both national and allied normative documents. In the North Atlantic Alliance, the Resilience Committee was established as the highest advisory body for strategic resilience and preparing the society to function in times of crisis and war. In several countries, intensive work is underway to develop a state resilience strategy linked to a national security strategy. Unlike the latter, state resilience strategies are designed to limit the risk of disruption to the most basic functions of the state and society to an acceptable level and ensure that they can be restored in a reasonable time and at a reasonable price.

Keywords: Critical infrastructure; Strategic Resilience; National security

One of the fundamental areas addressed by the state resilience strategy is the construction of strategic resilience of critical infrastructure. The war in Ukraine, in its entirety, has demonstrated the importance of protecting this infrastructure in the context of the overall resilience of the state and society. These experiences should be carefully analyzed by the appropriate public administration bodies and scientific centers dealing with national security. Even a very general analysis of the state and functioning of basic critical infrastructure systems in Poland indicates their worrying vulnerabilities, which should be eliminated as quickly as possible to ensure that the risk level of their disruption becomes acceptable.

Among the systems classified as critical infrastructure in Poland, the energy supply system, including the provision of raw materials, fuel, electricity, and heat, exhibits particularly many weak points. A striking example of this vulnerability is the fact that the destruction of Poland's five largest thermal power plants would deprive the country of a quarter of its energy system's capacity, and the most important Polish refineries as well as oil and gas ports are within the strike range of Russian short-range rockets. The Polish transport system is also vulnerable, especially along the most important West-East axis for Poland. The system for civil protection and civil defense is almost entirely in collapse; it is not currently classified as critical infrastructure according to existing laws, but it is a very important system for the strategic resilience of the state, including in terms of preventing uncontrolled mass migration of people. Without proper protection, the population is highly susceptible to such phenomena. Improvements in resilience are also needed for other critical infrastructure systems, particularly in health protection, water and food supply, telecommunications, and information technology. A new approach is also required for the very important issue of the strategic resilience of the armed forces, especially maintaining an adequate reserve army capable of quickly taking over the functions weakened by initial strikes against the active army. Properly solving this strategically important problem involves building and adequately securing the appropriate military infrastructure, ensuring, among other things, the ability to decentralize the active army as well as armaments, military equipment, and material resources

necessary to activate the reserve army. In summary, to enhance the strategic resilience of our state and society, very urgent actions are necessary in many areas.

Dynamic changes in the security environment that we are experiencing in the third decade of the 21st century have subjected national security systems, as well as coalitions, to scrutiny, both externally and internally. Practical examination has particularly targeted political, military, economic, and social security systems, including health security. The global Covid-19 pandemic and the epidemic of this disease in individual countries exposed the weaknesses of both the World Health Organization, the instrument intended to protect the world from such threats, and national health protection systems. This pandemic also severely impacted both the global economy and individual countries' economies, disrupting supply chains and production in many industries, including those driving the global economy, such as the automotive industry.

Meanwhile, Russia's aggression against Ukraine revealed the weakness of the international security architecture, once built for different political purposes, and its inefficiency in the current situation. It turned out that despite the UN or the OSCE, it is possible to break international agreements and carry out brutal unprovoked aggression against a neighboring state. Total aggression aimed not only at the military forces of the attacked country but also at its nation, economy, culture, and education, using all available conventional warfare instruments, with the threat of using nuclear weapons. Military strength has returned to the top of the list of tools for achieving political goals. Tensions in international relations are also rising in other parts of the world. Chinese military maneuvers around Taiwan, the return of Al-Qaeda to Afghanistan, Iran's unfriendly policies towards its neighbors, and the increasing number of failed states or those ruled by dictators. Overall, the international situation has become the most dangerous for security since World War II.

In such a situation, it is appropriate to draw lessons from the events of recent years and use them to review security systems. This review should serve as a prelude to the restructuring of these systems in almost all known areas of security. This also applies to Poland, which has become a frontline state, heavily involved in aiding fighting Ukraine, a country with an economy under the pressure of the energy raw materials crisis and economic sanctions imposed on Russia, which also affect our economy.

Among the various security system areas for consideration, critical infrastructure was selected in terms of its impact on the state's strategic resilience. The aim is to highlight the most important conclusions for Poland arising from recent experiences and outline the necessary actions in the area of critical infrastructure to strengthen the strategic resilience of our state.

The concept of "critical infrastructure" has become well established in our country both in security sciences and in the practice of public administration actions and the owners of the facilities that constitute this infrastructure. However, it is worth recalling that this is a relatively new concept and appeared in the Polish legal system only after our country's accession to the European Union, when Poland was forced to transpose legal provisions and EU standards, including those concerning the activities of public administration bodies. As a result, a crisis management system was organized, the fundamental framework of which is contained in the Act of April 26, 2007, on Crisis Management. The solutions adopted in this act aim to counteract the effects of large-scale crisis events. At the same time, this act defines the authorities competent in crisis management matters, their tasks and scope of action in this field, as well as the principles of financing crisis management tasks [10].

For our considerations, it is important that this act contains the definition of the term "critical infrastructure" applicable in Polish law. According to this act, "critical infrastructure" means: "{...} systems and functionally interconnected objects within them, including buildings, devices, installations, key services for the safety of the state and its citizens, and

serving to ensure the efficient functioning of public administration bodies, as well as institutions and entrepreneurs [9]." Subsequently, the act lists 11 systems that make up critical infrastructure [9]. Despite multiple amendments to this act, neither the definition nor the list of systems classified as critical infrastructure have been changed.

For further considerations, it is pertinent to ask whether the list presented in the cited act includes all systems that make up the state's critical infrastructure and whether the definition itself is correct. In this case, one must agree with those who believe that our crisis management system, including legal regulations, only covers crisis situations related to natural disasters and terrorist events. In other words, this system is only suitable for the state's permanent defense readiness status. In the event of introducing a state of defense readiness during a crisis (recently officially abolished for unclear reasons) or during wartime, this system would need to be reorganized and operate based on different legal regulations than those in which critical infrastructure is defined. Therefore, one must also agree with the opinion expressed in the National Security Strategy 2020 that one of the tasks in the area of state and citizen security is the integration of the national security management system, including directing the state's defense through the consolidation of existing systems, particularly national security management, crisis management, and cybersecurity [8] (p. 13).

In practice, this means that the list of critical infrastructure systems should be supplemented with systems that current law classifies as particularly important for the state's security and defense, as listed in the Council of Ministers Regulation of June 24, 2003, although it also contains significant exclusions, such as facilities designated for public authority bodies in leadership positions [6]. The recommendations of the National Security Strategy 2020 are moving in this direction, proposing, among other things: "Adapt the national crisis management system to the NATO crisis response system so that it also covers the area of political-military conflict and allows for a smooth transition from peacetime to crisis and wartime, as well as creating effective tools to combat and counter threats, including hybrid threats" [8] (p. 13). Recognizing this recommendation as fully justified, our further considerations took into account an expanded list of critical infrastructure systems and facilities, including those related to defense and internal security.

Unlike the "state's critical infrastructure," the concept of "state's strategic resilience" is not anchored in the Polish legal system. Before this term appeared in scientific and political discourse, security scholars used a similar concept, "the state's internal strength." Professor Ryszard Zięba and Doctor habilitata Justyna Zając, in their expertise on building an integrated national security system for Poland published in 2010, used this term, emphasizing that the state's internal strength is expressed in two characteristics: the first is the modern organization of the state, the efficiency of public administration bodies, the ability to mobilize to address sudden challenges and eliminate threats, and the second is the level of socio-economic development enabling the rapid and effective deployment of resources and security policy instruments [5] (p. 20).

The concept of strategic resilience of the state was more broadly addressed in the public forum by Professor Stanisław Koziej in the mid-second decade of the 21st century. In 2016, in one of his publications, he stated that the National Security Strategy of the Republic of Poland from 2014, which he was certainly a main author of, "{...} invokes the need to build the country's strategic resilience against all kinds of threats and to build universal territorial security {...}" [7] (pp. 84-85). In reality, the term does not appear in the mentioned strategy, but the strategy does dedicate much space to building Poland's resilience against all kinds of threats. However, in the same work, we find an explanation of what Professor Koziej understands by the term strategic resilience of the country. In his opinion, it is: "{...} its ability to resist and survive aggression" [7] (p. 86). Among the ways to build this resilience,

the professor mentions operational preparation of the country's territory and the protection of critical infrastructure facilities [7].

It is easy to notice that, in Professor Koziej's understanding, the strategic resilience of a state (country) is a way to repel all kinds of threats, threats defined in the national security strategy. However, such an approach to this issue is not widespread. Among specialists dealing with the topic of a state's strategic resilience, the prevailing opinion is that building this resilience requires a separate strategy, fundamentally different from the national security strategy. Proponents of this approach argue that in the modern era of globalization and increasing unpredictability of the security environment, the concept of national security must give way to the concept of national resilience, and consequently, building a secure state must be replaced by building a resilient state. It is simply impossible under these conditions to ensure the expected security of the state and society [1] (pp. 120-123). As a result, in several countries, without abandoning the national security strategy, work has begun on formulating a national resilience strategy. These countries include, among others, Canada, Australia, the Netherlands, New Zealand, the United Kingdom, and the USA, of which the first three have already adopted a national resilience strategy linked to the national security strategy [1] (pp. 114-115).

The author of this study advocates for a balanced approach in this matter. To explain this approach, the author cites Christian Fjaedera – a renowned Finnish expert in the field of strategic resilience. According to him: "On the one hand, security and resilience are fundamental elements of resilience, whose specific aim is to reduce the probability of a serious event occurring and to limit its consequences in order to avoid irreversible damage and loss of life, as well as to facilitate effective recovery by maintaining the most essential structures and resources in as intact a state as possible. On the other hand, resilience could be perceived as an integral part of national security, whose specific aim is to ensure readiness for unforeseen and sudden threats, against which a preventive security approach is not possible or at least not cost-effective" [1] (p. 123). This means that when considering strategic resilience, the strategic goal should be to limit the risk of disrupting the most basic functions to an acceptable level while ensuring the ability to restore the basic functions of the state and society within a reasonable time and at a reasonable cost.

At the same time, the author agrees with the general definition of "critical infrastructure resilience" expressed in the report by the American National Infrastructure Advisory Council (NIAC). This definition states that it is: "The ability to reduce the size, impact, or duration of disruptions to the functioning of critical infrastructure" [1] (p. 120). According to the same agency, critical infrastructure resilience has three basic characteristics: robustness – the ability to maintain critical functions and absorb impacts in the event of a crisis or disruptions; resourcefulness – the ability to prepare for, respond to, and manage crises or disruptions by creating and maintaining adaptive capabilities and flexibility to redirect resources and assets; and rapid recovery – the ability to return to normal operations as quickly and efficiently as possible [1]. These formulated characteristics of resilient critical infrastructure will be fully taken into account in the course of further considerations.

Strategic resilience of the state has become, in recent years, a subject of interest for the most important bodies responsible for security both at the national and international levels. The aforementioned National Security Strategy of the Republic of Poland – 2020, when discussing one of the pillars of national security for which national security management was deemed responsible, assumes that one of the tasks in this area is: "… to increase the state's resilience to threats by creating a system of universal defense based on the efforts of the entire nation and building an understanding of the development of resilience and defensive capabilities of the Republic of Poland" [8] (p. 15). Among the proposed specific detailed tasks related to building state resilience, those associated with critical infrastructure are also

mentioned. The mentioned strategy, among other things, advocates for increasing resilience to threats primarily in the areas of: continuity of government and state functioning, effective energy supply, uncontrolled movement of people and population relocation, collection, protection, and management of food and water resources, the ability to respond to mass events, resilient telecommunications networks and information systems, public information and warning systems, and an efficient transport system [8] (p. 16). Considering the experiences of the war in Ukraine, such a task should be recognized as appropriate. However, in the entire set of initiatives encompassing 20 proposed tasks, there is a lack – according to the author – of tasks related to such an essential element of the state's strategic resilience as the ability to quickly and effectively rebuild the armed forces by creating all necessary conditions to build appropriate personnel and material reserves. There is no doubt that significant losses in the active part of the armed forces and the possible swift rebuilding of their basic capabilities must be taken into account when considering state security. In the discussed strategy, issues related to the armed forces are addressed in another part, but it concerns strengthening the operational capabilities of the Polish Armed Forces to deter and defend against security threats, with particular emphasis on increasing mobility and technical modernization [8] (pp. 18-19). Meanwhile, the aim is to create a reserve army that can be utilized when needed for the effective and rapid rebuilding of active armed forces.

Within the NATO environment, strategic resilience is anchored in Article 3 of the North Atlantic Treaty, and the renewed focus on this resilience was initiated during the NATO Summit in Warsaw held on July 8-9, 2016. One of the strategic documents adopted by heads of state and governments at that time was the document titled “Commitment to Enhance Resilience.” It highlighted the particular importance of building the resilience of allied states to the full spectrum of threats, both military and non-military. In the fourth point of this document, the essence of strategic resilience in relation to NATO can be read. It states, among other things: “Recognizing that the readiness of society is primarily the responsibility of member countries, we will strive for agreed-upon requirements concerning national resilience. We will protect our people and territory by strengthening the continuity of government, the continuity of essential services, and the security of civil critical infrastructure; and we will work to ensure that our national and allied armed forces can always be adequately supported by civilian resources, including energy, transport, and communications” [3]. As can be easily seen, critical infrastructure has become the focus of the highest allied body, with particular emphasis on the energy, transport, and communications systems.

One of the outcomes of the cited document was the establishment of the Resilience Committee as NATO's highest advisory body on resilience and societal preparedness. Thanks to the work of the aforementioned committee, on June 14, 2021, at the next NATO summit in Brussels, heads of state and government issued a document titled “Strengthened Resilience Commitment.” Reading this document clearly indicates that strategic resilience is associated with societal preparedness and is the fundamental way to prepare NATO member states and the entire alliance to effectively counter the full spectrum of threats and challenges, both military and non-military, including hybrid threats. In the eighth point of this document, it is emphasized that: “We will increase our efforts to secure and diversify our supply chains, as well as ensure the resilience of our critical infrastructure (on land, at sea, in space, and in cyberspace) and key industrial sectors, including by protecting them from harmful economic activities” [4]. The above quote confirms that, in the assessment of NATO's highest decision-making body, the resilience of critical infrastructure is one of the most important tasks for individual member states and the entire NATO alliance.

The NATO Resilience Committee is supported by six specialized planning groups. The purpose of these groups clearly indicates the main area of NATO's focus in the field of strategic resilience. These are, respectively, the groups:

1. **Civil Communications Planning Group (CCPG)** – advising on building the resilience of the communications sector;
2. **Civil Protection Group (CPG)** – dealing with ways to ensure the continuity of government and the ability to effectively manage uncontrolled population flows;
3. **Energy Planning Group (EPG)** – responsible for advising on stable energy supplies;
4. **Food and Agriculture Planning Group** – addressing issues of resilience in the food and water sector;
5. **Joint Health Group (JHG)** – dealing with NATO members' ability to cope with mass casualties and destructive health crises;
6. **Transport Group (TG)** – advising on building the resilience of the civil transport system, divided into land, sea, and air transport.

A review of the scope of responsibilities of the planning groups working for the NATO Resilience Committee is a clear reference to the areas on which our national decision-making bodies should focus in terms of the state's strategic resilience. The compatibility of the work of allied and national bodies in this area would undoubtedly result in a synergy effect in the final outcomes of our national teams' efforts, which would work towards solving problems on the NATO-wide scale while simultaneously utilizing the results of allied groups to address these problems in our country.

After establishing the essence of the concept of "state strategic resilience" and its connections with the protection of critical infrastructure resulting from the content of national and allied normative documents, we can proceed to assess Poland's current strategic resilience. In the subject literature, it is difficult to find a direct assessment of Poland's strategic resilience level or the so-called "state's internal strength." Generally, authors make partial assessments, from which an overall picture cannot always be composed. However, when such an assessment is made, the prevailing opinion is that our country's resilience level is average. Weaknesses include, for example, improper organization of the rescue system, an inefficient warning and alert system, politicization of special services resulting in personnel turnover negatively affecting their effectiveness, etc. [5] (pp. 20-21). As can be easily seen, these are factors that are difficult to measure and precisely estimate.

The situation is easier regarding most critical infrastructure systems, for which quantitative indicators can be used. Such a case is the energy supply system, including the provision of energy raw materials and fuels. It is sufficient to compare, for example, the demand for energy raw materials and fuels with domestic production to see how sensitive this issue is for Poland. In 2020, Poland consumed 52,153 thousand tons of thermal coal, 25,757 tons of crude oil, and 18,366 million cubic meters of gas, importing 11,056 thousand tons of coal (21.2%), 24,906 thousand tons of oil (96.7%), and 16,510 million cubic meters of gas (89.7%) respectively. Despite efforts to diversify the sources of these raw materials, the dominant supplier was Russia, which sold Poland 9,448 thousand tons of thermal coal, 16,396 thousand tons of crude oil, and 9,049 million cubic meters of natural gas (including gas from Azerbaijan), accounting for 18.1% of Poland's thermal coal demand, 63.7% of oil demand, and 49.3% of natural gas demand (Own calculations based on data from the "Mineral Raw Materials Economy in Poland in 2020" Yearbook, IGSMiE PAN). Russia's aggression against Ukraine caused Russia to cease supplying energy raw materials to Poland, but our country - despite difficulties - has so far found alternative sources of such raw materials. However, the accompanying sharp price increases caused mainly by the global energy crisis triggered by the war in Ukraine raise the question of whether the cost of this change will be acceptable for the Polish economy and society. Only then will we obtain answers to whether our energy raw materials supply system is strategically resilient.

However, rising energy raw material costs are not the most important long-term problem for the resilience of our energy supply, energy raw materials, and fuels system. This

system has several very vulnerable points related to the transportation of energy raw materials, fuel production, and electricity generation. These are points that make Poland very vulnerable in the event of a political-military crisis and war. Two major investments related to gas diversification—the Baltic Pipeline and the gas port in Świnoujście—are associated with the sea. A pipeline running along the bottom of the Baltic Sea can be easily destroyed (as confirmed by the damage to the Nord Stream 1 and 2 pipelines) by Russian naval and special forces. LNG transport by sea and its unloading in Świnoujście can also be blocked from the sea side, and installations used for unloading and further land transport of gas can be destroyed by missile strikes or using aviation. Poland alone is currently unable to ensure adequate security for these installations. NATO allies' support is necessary.

Moreover, liquid fuels produced in Poland come predominantly from refineries in Płock and Gdańsk, with the latter refinery dependent on crude oil supplies by sea through the Gdańsk oil port. All three of these installations are located within a range that allows the use of short-range missiles or drones from the Russian Kaliningrad Oblast to destroy them. This constitutes a sort of Achilles' heel of Poland's fuel supply system. All of this must be taken into account when considering Poland's strategic resilience. Poland must develop a scenario of a destructive strike on fundamental facilities related to sea-based natural gas transport and liquid fuel production and seek solutions that enable the survival of our country under these adverse conditions. It seems that the best solution would be to increase the connections of Polish pipelines to the European gas and fuel networks.

The Polish energy-electricity system is equally vulnerable. In 2020, the total production of this system amounted to 157.7 TWh, of which 125.9 TWh (80%) were produced by thermal power plants, with 46% running on hard coal and 24% on brown coal. Only 18% of the energy came from power plants generating electricity from renewable energy sources [11]. The fundamental problem is the concentration of installed capacities in thermal power plants. In 2022, the total capacity of all power plants in Poland was nearly 60,000 MW (59,578 MW), of which almost 27,000 MW (45%) came from the 20 largest thermal power plants using hard and brown coal. Poland's five largest thermal power plants (Bełchatów, Kozienice, Opole, Połaniec, and Rybnik) have a capacity of 16,142 MW [2]. Their destruction would eliminate 26.9% of Poland's power plant capacity. With the current precise missile and aviation strike means, destroying these few power plants may not be too difficult if they are not adequately secured with air and missile defense measures. The prospect of building nuclear power plants in Poland will likely increase the sensitivity of our power system. These are high-capacity energy installations whose elimination would cause a sharp drop in electricity production. On the other hand, experiences from the war in Ukraine indicate that a potential aggressor must consider the negative consequences of destroying nuclear power plants, such as radioactive contamination of their own territory. Nevertheless, the best general way to increase the resilience of the energy-electricity system is to increase the share of renewable energy sources produced in a large network of relatively small power plants. The second way is to adequately connect to the European energy system, allowing for the import of significant amounts of electricity when needed.

Transportation systems in Poland also require efforts to increase their resilience. Maritime transport is particularly vulnerable, as two out of three main ports are within the range of Russian short-range missiles. Without the help of allied naval forces, Poland is also unable to prevent their blockade by the Russian Navy. In the land transport system, the most important aspect is maintaining the efficiency and capacity of the West-East axis, essential for the efficient transfer of allied and own military units and ensuring the logistics supply chain for units deployed in the northeastern parts of our country. In the event of an armed conflict, this system will gain particular strategic significance, as previously noted by Colonel Ryszard Kukliński, albeit in different politico-military realities. Meanwhile, the rail transport system

has two systemic weaknesses. The first is related to the different track gauges on our eastern border, including with Lithuania and Ukraine, which are crucial strategic partners. On the border with the Federal Republic of Germany, the barrier is the difference in the power supply system of electric locomotives, requiring the use of locomotives with two types of electric motors. Since rebuilding our system would require significant financial investments, it would be necessary to consider solutions essential for increasing the capacity of railway lines crossing our western border. In the future, our railway lines should gradually be adapted to the system used in Western Europe.

In road transport, as well as in rail transport, the problem is the channelization along three rivers: the Vistula, Warta, and Oder. Due to these rivers, appropriate road crossings and typically accompanying railway crossings have been created. This has led to the creation of several large road-rail junctions covering crossings over wide water obstacles and usually also having large communication airports. The largest such junctions are those of the Warsaw agglomeration with six communication, military, and sports airports, the Poznań agglomeration, the Wrocław agglomeration, and the Bydgoszcz-Toruń and Szczecin junctions. Several road-rail crossings over the Vistula (Tczew, Grudziądz, Włocławek, Płock, Dęblin) and the Oder (Kostrzyn, Rzepin-Świecko, Cigacice, Brzeg) also hold significant importance. The primary way to increase the resilience of these junctions should be their missile defense and initiatives aimed at the rapid reconstruction of crossings and the preparation of temporary crossings.

The war in Ukraine has once again highlighted the importance of the rescue system and the closely related system of civil protection and civil defense. As previously mentioned, due to the "peaceful" nature of the crisis management system, the protection of the population in the event of war and civil defense is seriously neglected in our country. There are not even appropriate legal regulations. The Act on Universal Defense of the Republic of Poland from 1967 had an entire section dedicated to civil defense. The Act on the Defense of the Fatherland introduced on March 11, 2022, does not contain regulations regarding civil defense. In light of the experiences from the war in Ukraine, further delays in legally regulating this issue are completely incomprehensible. Especially since the aforementioned National Security Strategy of 2020 contains a very important proposal to redefine and restructure the civil defense and population protection system [8] (p. 16). The importance of these two elements of state and societal resilience is also emphasized by the aforementioned NATO normative documents. The European Union also dedicates much space to these issues.

At this point, it is necessary to clearly emphasize that neglecting the protection of the population and civil defense directly leads to uncontrolled mass migration and population displacement in the event of a crisis and war. Defense against such mass events is one of the fundamental tasks in building the resilience of the state and society. In this context, it should also be noted that Poland's two primary rescue systems—the National Rescue and Fire Fighting System and the State Medical Rescue Service—are organized and capable of operating during peacetime and without major natural disasters. The COVID-19 epidemic exposed the weaknesses, especially of the medical rescue service. Overall, there is an urgent need to create a rescue, population protection, and civil defense system that ensures adequate strategic resilience of our state and society.

The lack of established quantitative indicators makes it impossible to precisely address the remaining critical infrastructure systems. Nevertheless, even a general look at these systems leads to the conclusion that their strategic resilience must be carefully assessed. This especially applies to the financial system, communications and information networks, food and water supply, and ensuring the continuity of public administration functions.

In the final part of the discussion, the author would like to return to a very important element of the state's strategic resilience—the resilience of its armed forces. The war in

Ukraine has once again proven how crucial the decentralization of the active army is to protect it from excessive losses resulting from an initial strike, as well as the existence of a reserve army intended for the rapid rebuilding and expansion of the active army. By a reserve army, it is meant personnel reserves, stocks of military equipment and armaments, and a wide range of logistical materials, including especially ammunition and fuel. It is no secret that Ukraine, without support from NATO and EU countries and partner nations of both organizations, would no longer be able to conduct defensive operations due to the exhaustion of ammunition and various types of military materials. In summary, an appropriate level of strategic resilience of the armed forces requires, among other things, a sufficiently developed defensive infrastructure. Meanwhile, in Poland, after joining NATO and as a result of the transformation of our armed forces, many garrisons, including airfields—especially in the western and central parts of the country—were closed in the first decade of the 21st century to reduce the costs of maintaining military units. Currently, our country faces the challenge of rebuilding defensive infrastructure resources to enable the decentralization of the armed forces, especially the air force, the efficient reception of allied reinforcement units transferred to our country, including by air, and the rapid initiation of special production, particularly ammunition. Additionally, there is a need to create a sufficiently developed training base for reserves and the formation of units. In this regard, the possibility of cooperation with allied countries possessing appropriate resources in this area should also be considered.

In conclusion, the author would like to present the most important conclusions, in his opinion. First - in the face of globalization in the modern world and the increasing unpredictability of the contemporary security environment, Poland should, in addition to a national security strategy, have a separate but related strategic resilience strategy, in which one of the most important issues should be the resilience of critical infrastructure. Second - when considering critical infrastructure, not only the systems covered by the current legal framework should be taken into account, but also those related to defense and public security areas. Third - when assessing the resilience of critical infrastructure, it is necessary to define the most important variables regarding its state and indicators to measure these variables. Fourth - given the experiences of recent years, especially the Russian aggression against Ukraine and the Covid-19 pandemic, climate change, as well as previous economic crises, the greatest attention should be paid to critical infrastructure systems such as energy supply, energy raw materials and fuels, transport, health protection, rescue and population protection, and water supply and information-telecommunication systems. Fifth - in the energy supply, energy raw materials, and fuels system, it is essential to ensure the reliability of sources supplying energy raw materials, the safety of transporting these raw materials, and the elimination of bottlenecks in their transport, as well as building multi-directional international connections of the Polish energy and gas pipeline networks with the appropriate systems of the most important and reliable allies. It is also necessary to significantly increase the capacity for storing gas and liquid fuels, based on properly air-defended storage facilities. Sixth - it is necessary to develop a plan for rebuilding and strengthening the Polish Armed Forces, based on a sufficiently dispersed and secured military infrastructure, including those located in allied countries. It is also important to expand the resources of infrastructure serving military purposes so that it is possible to quickly decentralize active armed forces, as well as mobilization materials and resources, and to receive significant reinforcement forces from other NATO countries. Seventh—it is necessary to conduct a review of protection (as well as defense) procedures for critical infrastructure, especially regarding the actual needs in terms of protection forces and the ability to rebuild individual systems, as well as eliminating any bureaucratic obstacles that block initiatives by owners or users of these infrastructure facilities towards restoring capabilities in the event of failures and destructions. And eighth - it is necessary to rebuild the civil defense forces in our country, an essential element of protecting

critical infrastructure and the population, both during natural disasters and political-military crises and wars.

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