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CRITICAL INFRASTRUCTURE SUSTAINABILITY

Abstract. *The contemporary conflicts are rarely manifested only through open opposition of the armed forces of the opposing countries. It is not possible to explain the dynamics of the world security policy without taking into consideration some new aspects that have found a lasting place in the modern concepts. Critical infrastructure sustainability analysis is the key for achieving security and reflecting risks and threats in both national and allied format.*

Keywords: *security, critical infrastructure, sustainability*

Introduction

Within the different historical epochs each community has been and will be subjected to trials and threats from the surrounding environment. In the course of time, depending on the levels of the technological, economic and social development, only the forms of risks and threats occurrences change - from the invasion of hordes and foreign troops to modern cyberterrorism. In any case, the targets are the same - what we define today as critical infrastructure.

Critical infrastructure sustainability

The term 'critical infrastructure' is used in many countries to systematize and consolidate the potentially hazardous sites, the destruction of which could have tangible consequences. Even though the term "critical infrastructure" is not used in the former socialist countries, serious attention is paid to the "improved sustainability of the national economy sites" in an armed conflict, even in a nuclear war, as well as in natural disasters and accidents.

It is becoming increasingly apparent today that the critical infrastructure protection is a strategic priority. Natural disasters threats, financial instability, pandemics, cybercrime, social riots, terrorist acts and other disruptive events resulting from the globalization process are now part of our daily lives. These and a number of other events as well as the evolution of global technological development have led to a complete change in the approach to the increase of the "critical sites" sustainability. The critical infrastructure is crucial for the functioning of the economy and the society as a whole. The risks and security challenges in comparison with that infrastructure have increased enormously in recent years due to the reduction of the main hydrocarbon resources underlying the modern economy (oil and natural gas); the growing competition for the access to them; the increasing distance between the countries where they are extracted, and the countries with the highest consumption; as well as for the computerization of the main processes in their production and transportation (Milina 2013). The critical structure is directly related to economic security (Tsonkov, 2014).

Globalization is leading to an increasing interconnection and interdependence of key sectors of the economy and in other sectors of the critical infrastructure. Even brief disruptions in the critical infrastructure operation could lead to dramatic consequences. A serious challenge facing the critical infrastructure functioning is the growing uncertainty of the security environment, both in connection with the activation of the enemy in the face of international terrorism, for example, and in view of the unpredictability of time and place against attacks on sites of the respective infrastructure.

Add to this the new challenges in the critical energy infrastructure management in relation to the significant privatization and liberalization of energy sector regulation, the picture becomes really complex. It is why the up-to-date vulnerability analysis and the construction of protection systems are of key importanance.

It is essential to plan and secure the prevention of the potential threats deployment, both physical and those related to technology and communications. An

attribute of the site, as opposed to sustainability, is the conditional vulnerability, i.e. under the action of external load. The conditional vulnerability characteristics coincides with the sustainability characteristics: this is the critical load setting the starting point of destruction. In broad terms, vulnerability is understood as the property of a material target to lose its ability to perform its functions as a result of external influences (Vishnyakov, 2008).

To fully clarify the content of the "vulnerability" concept, it is necessary to focus on another concept as well, which also refers to the critical infrastructure. The concept is "sustainability" and it can be used in the analysis of all critical infrastructure sites and systems. Sustainability is a property of the target to keep its parameters within the established values and to perform its functions during and after the action of external factors.

The most common definition of "sustainability" is: "A property of a given system to retain its basic characteristics under a relatively small change of a given parameter." The synonymous cluster levels of the word is too broad and include the following lexemes: *firmness, strength, sturdiness, robustness, solidity, steadfastness; peace, stillness, motionless; resistance, resistivity, resilience, tenacity, persistence, endurance, indomitableness, steadfastness, resistance, perseverance, immutability, durability, staunchness, stability (Dicti, 2012).*

Many proponents of globalism share the view that due to the sustainable development the gap between the rich and poor countries will be reduced drastically and the well-being of the people will increase considerably worldwide. Nevertheless, today the Third World poor countries have become even poorer, and the rich have enlarged their wealth multiple times, thus, deepening the differences between the hegemons of the world capitalist system, on the one hand, and the countries located within its periphery,on the other.

This explains why the problems of sustainable development are present in national government programs, in the strategies of the World Bank, the European Bank for Reconstruction and Development, as well as in the investment policy of the leading

commercial banks and financial institutions. The supporters of the "sustainable development" approach point out that its implementation requires:

- to stop population growth;
- to implement a strategy meeting the basic needs of the people, to close the scissors "rich-poor" as soon as possible;
- to provide food for the population;
- to stop the destruction of the flora and fauna diversity;
- in the field of energy consumption - to reduce drastically the use of non-renewable energy sources and replace them with renewable ones;
- to use technologies preserving the resources and the natural environment;
- to stop the uncontrolled growth of large cities and to stimulate the formation of small towns in closer proximity to arable land thus to be used to meet the needs of the people living in them;
- the World Bank and other affected organizations to adopt the philosophy of sustainable development and to integrate it into their programs;
- to place the supranational ecosystems under public control;
- to avoid wars;
- to attract and use common sense

The world-renowned sustainable development concept is: a way of development meeting the current needs of humanity, preserving the required potential and resources for the needs of the future generation by combining the economic and social development goals with the requirements for protecting and improving the quality of the environment.

The concept of 'sustainability' should be defined above all in terms of human impact. Sustainability is not only a natural characteristic of things and phenomena, but also of the external influences on them. Only in this way the sustainable development could lead to global balance. This argument was justified in 1972 in the famous report of the Club of Rome, entitled "The Limits of Growth".

The sustainability affects all levels of social development - local, regional,

national and global. It is a matter of choice of values and balanced planning. In this sense, the idea of sustainability is a product of the crisis and an alarm signal. It is, therefore, not a mere chance that the word 'sustainability' today is found in different phrases in various fields of science and practice, such as: 'sustainable policies', 'sustainable cities and regions', 'sustainable buildings'. 'sustainable agriculture', 'sustainable transport' and of course 'sustainable critical infrastructure'.

One possible definition of sustainable critical infrastructure is: “The infrastructure sustainability is the ability to reduce the magnitude and/or the duration of destructive events. The effectiveness of a given sustainable infrastructure depends on its ability to predict, absorb, adapt to and/or recover quickly from a potentially destructive event.” It should be clear that a given system may have different levels of resilience to different destructive events. In fact, different destructive events will have different effects on the system and, therefore, different processes will be required to restore it.

The critical infrastructure sustainability is outlined as a set of activities focusing on prevention. While the critical infrastructure security policies focus primarily on the prevention of terrorist acts, accidents and other destructive phenomena, the resilience of critical infrastructure aims at strengthening its ability to continue to provide goods and services, even in the event of destruction/disrupted functionality.

Applied together, the security strategies and the critical infrastructure sustainability provide a more complete set of activities for achieving a higher level of readiness of the critical infrastructure systems to operate in an insecure environment with multiple hazards.

Sustainability is a systematic quality. The sustainability of the entire system is achieved by setting up the sustainability of the separate subsystems. It should be prioritised by the degree of risk as well as accounting the dependencies on other system. The main difficulty is most often related to the way the infrastructure dependencies are presented. The critical infrastructure sustainability has four dimensions: technical (logical and physical), personal, organizational and cooperative, and is attained under developed capacities for prevention, adaptation and recovery.

The assessment of the system sustainability could be reduced to evaluating the existence of sustainability indicators in the various characteristics, capacities and dimensions of the assessed system.

Sustainability achievement is the key strategy in terms of critical infrastructure, which makes the state and business stronger, the society better prepared and the nation more secure. Implementing this type of strategy ensures continuity of services and functions and reduces to a minimum the impact of destructive phenomena (including terrorist and cyber threats and attacks which by their nature are "asymmetric" – with little efforts and investments they could cause huge damage).

Conclusion

Critical infrastructure sustainability analysis is key factor for achieving security and for covering the risks and threats in both national and allied format. The transition from modernity to postmodernity leads to reversal of the existing security paradigms. It is the result of the civilisation changes, the globalization, the transition towards a society of "knowledge", where information is the main resource.

The policy to foster the critical infrastructure sustainability should be based on the complex systems theory and the management theory. Their proper implementation would help to ensure the effective protection formation through optimum usage of the state mechanisms for interaction with businesses and the critical infrastructure operators, both vertically and horizontally in the system structure.

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