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RESEARCH OF THE RELATIONSHIP BETWEEN THE CONCEPTS OF “CRITICAL INFRASTRUCTURE” AND “NATIONAL SECURITY”

In the world, the issue of ensuring an adequate level of global security in conditions of unstable development of economic systems has become particularly acute. At the same time, the problems of ensuring the stability and protection of critical infrastructure [1-4], taking into account modern challenges and barriers that restrain the effective development of the security environment, as well as threats to the national security of states [5-7] in the international security system [8], are gaining special relevance.

Therefore, the governments of most countries of the world pay considerable attention to the development of appropriate national security strategies, concepts of protection and programs for the development of critical infrastructure from the point of view of national security.

In this article, in order to identify the relationship between the terms “critical infrastructure” and “national security”, a bibliometric analysis of scientific publications indexed in the Scopus database was carried out. According to the concepts of “national security” and “critical infrastructure” in titles, abstracts and keywords, 1981 documents were found for the period 1980-2023. As the analysis

showed, the first publication on the selected topic appeared in the international scientometric database Scopus in 1980. This is the article “Suggestions of a pharmacist to improve the use of drugs” (G. Antognini) [9], which highlights the issue of drug safety with pharmaceutical point of view. This is a matter of life safety.

And then, until the 2000s, a fairly low level of publishing activity was observed. And only starting in 2005, the works of scientists began to appear in the scientometric base, focusing attention on the current problems of cybersecurity, energy security, substantiation of scientific and methodological approaches to the protection of critical information infrastructure from the standpoint of national security, etc.

In the future, the authors set limitations for the study of the relationship between national security and critical infrastructure. The general sample of the study was limited by field of knowledge and type of documents. That is, only Article, Conference paper, Review, Book, Book chapter were selected. The fields of knowledge studied were: Engineering; Computer Science; Social Sciences; Decision Sciences; Energy; Business, Management and Accounting; Economics, Econometrics and Finance. The new sample consisted of 1722 publications for the years 1988-2023.

Among the most cited publications, the article by S. Rinaldi, published in 2004 [10], which was cited 346 times in a journal indexed by the scientometric database Scopus, deserves special attention. The author of this article emphasizes that national security, economic prosperity and national well-being depend on a set of highly interdependent critical infrastructures. Given the importance of their reliable and secure operation, understanding the behaviour of these infrastructures, especially during times of stress, crisis or terrorist attacks, is crucial. At the same time, modelling can provide a significant understanding of the complex nature of the behaviour of critical infrastructure objects and their operating characteristics.

Among the key publications that publish works on the development of critical infrastructure from the standpoint of national security, the following can be noted: International Journal of Critical Infrastructure Protection (24 documents); International Journal of Critical Infrastructure (18); Computers and Security (13), Journal Of Homeland Security And Emergency Management (7), NATO Science For Peace And Security Series C Environmental Security (6), Journal Of Critical Infrastructure Policy (5).

There are 11 documents of the researcher F. Skopik in the Scopus database; 10 – M. Lehto; 8 documents each – E. Matheu, A. Rashid, J. Schneider; 7 documents each – J. Day, A. Masys, H. Thomas and others.

The key organizations involved in solving critical infrastructure development problems in the context of ensuring the country's national security are Sandia National Laboratories, New Mexico (35 documents); Oak Ridge National Laboratory (20); University of Jyväskylä (17); U.S. Department of Homeland Security (16); Idaho National Laboratory (15).

The results of the analysis show that most of the works on the researched issues are published by scientists from the USA (708 documents), Great Britain (190), Italy (69), China (58), and India (56). In Ukraine, 21 documents were found based on the established search details.

According to the types of documents, scientific works can be ranked as follows: conference materials (47.6%), scientific articles (32.2%), chapters of books or monographic publications (14.1%), review articles (3.1%), books (3.1%). For the most part, scientific works on the studied issues are published in the following fields of knowledge: Computer Science (836 documents), Engineering (836), Social Sciences (557), Decision Sciences (174), Environmental Science (161), Mathematics (157), Energy (142), Business, Management and Accounting (111 documents).

The main sponsors that finance scientific publications on the problems of energy infrastructure transformation include the following: National Science Foundation (37 documents); U.S. Department of Energy (25); Horizon 2020 Framework Program (22); Engineering and Physical Sciences Research Council (19); European Commission (16).

So, the analysis of publishing activity confirmed that starting from the beginning of the 90s of the 20th century, there is a growing scientific interest in the study of security aspects of the development of critical infrastructure. The main reasons for the growing popularity of these scientific studies are the fact that the development of the global world takes place in conditions of constant natural cataclysms, disasters, climate changes, armed conflicts, wars, terrorist acts, and cyber threats.

In view of this, the strategic task of ensuring national security in the international security system of the countries of the world is the protection of critical infrastructure facilities in the context of the effective functioning of the security space. At the same time, the interdisciplinary nature of research is followed, and the geography of scientists and researchers studying this topic is diverse (but with a noticeable predominance of scientists and institutions from the USA, Great Britain, Italy, and China).

Prospects for further research are scientific and methodological justification and development of a security strategy for the development of critical infrastructure in the context of ensuring the national security of Ukraine.

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