

## **RESEARCH INFORMATION SECURITY SYSTEMS AND RELIABILITY OF TELECOMMUNICATION NETWORKS IN CRITICAL INFORMATION INFRASTRUCTURES**

Sadıgov U.K.  
Azerbaijan Technical University; Baku, Azerbaijan

Modern systems for processing confidential information and personal data require the mandatory use hardware and software for protecting information in communication systems in critical information infrastructures [1]. They ensure the reliability and security of the functioning of telecommunication systems and networks of various types.

In connection with the development digital technology and the emergence of new requirements for ensuring the security and reliability of critical information infrastructure facilities of the telecommunications system and networks, it is necessary to update the rules for the operation and response of information security systems to various incidents [1, 2].

It is known that the category - the concept reliability and security - is one of the components that determine the efficiency hardware and software complexes of telecommunication networks [1, 2, 3].

Danger in [1] is interpreted as a concept defining the threat of causing any damage or harm. Accordingly, the term "security" means a concept that does not contain the threat of causing any damage to communication systems or telecommunications networks, as well as protection from various unauthorized access [4, 5].

In addition, the main aspects of the information security component - protection from unauthorized access and information leakage, a high level, as well as a sufficient volume information sources have different directions and hardware and software support.

To solve the problems of reliability hardware and software systems, an unambiguous interpretation of the term "reliability" is required, since there is an objective need to take into account literally each of the many factors that affect the performance of the information security system using the example critical information infrastructure objects [1, 5].

In this case, both parametric and functional definitions of reliability are unacceptable [4].

In this case, reliability means the property of an important critical object to maintain over time, within established limits, the values of all parameters characterizing the ability to perform the required functions in specified modes and conditions use, maintenance, storage and transportation.

Based on the specified terminological definition, the work [--] concludes that reliability is [1, 4]:

- a property of a technical system, and a generalized property of the quality of its functioning;

• maintaining the continuity of the values output parameters within the established limits over time:

$$P(t, \lambda_i) \in [P_l(t, \lambda_i), P_u(t, \lambda_i)], \quad (1)$$

where  $t$  – current operating time;  $\lambda_i$  – failure rate of hardware and software complexes important critical facilities;

$P_n(t, \lambda_i)$  and  $P(t, \lambda_i)$  – respectively, the lower and upper limits of the permissible values of the parameter  $P(t, \lambda_i)$ .

In this case, in the simulation model for assessing the indicator of information security management efficiency, we will use the following multiplicative form [1, 4, 5]:

$$E_{EF}(t) = P(t) \cdot P(t) \cdot P(t) \cdot P(t), \quad (2)$$

where  $P_{ic}(t)$  – the probability timely collection all information necessary for decision-making;  $P_{cd}(t)$  – the probability correct decision making;  $P_{tcd}(t)$  – the probability of timely and correct decision-making;  $P_{ii}(t)$  – the probability of timely implementation of decisions taken.

Here, timely implementation decisions taken means timely communication of the relevant commands to the components of the information security system.

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