Project Safety Management

Deshy Musostova¹, Valentina Dzobelova², and Isa Basnukaev³

¹Kadyrov Chechen State University, Sheripova Street, 32, 364024, Grozny, Russia
²North-Ossetian State University named after K.L. Khetagurov, Vatutina str., 44-46, 362025, Vladikavkaz, Vladikavkaz, Russia
³Grozny State Oil Technical University, Kh. Isaev Ave., 100, 364061, Grozny, Russia

Abstract. An integral component of effective project management is the minimization of economic, technological, informational, personnel, and environmental threats to the safety of the project. Within the framework of this article, the essence of design safety, the main stages and mechanisms for its provision are considered.

1 Introduction

When implementing project activities, the problem of safety management is one of the key components in the overall model of project management. Researcher A.T. Zub describes the security of the project as a factor contributing to the achievement of its goals and reliable protection against internal and external threats [1]. The concept of design safety can be characterized within the framework of two main approaches - substantive and functional (Fig. 1).

![Fig.1. Approaches to the definition of design safety](image)

2 Materials and Methods

There are at least three characteristic features that distinguish project safety management from the traditional idea of risk management in project implementation.

*Corresponding author: goldzr@yandex.ru

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Firstly, risk management is designed to identify problems that affect the cost of the project, while safety management is aimed at identifying situations that may threaten the life and health of project participants, as well as cause equipment failure, lead to the destruction of structures or create various type of threat to the population living in the project area. Actions aimed at optimizing the project should be evaluated from the point of view of ensuring safety for all its participants. Secondly, a team of professionals is created to manage risks, giving recommendations to all project participants, security management is distributed among all project participants, while control is carried out by the implementation group of this project. Third,

The basis for effective project safety management is the concept of Safety Culture. The term came into use after the Chernobyl disaster and was first used in the "Final Report of the International Advisory Group on Nuclear Safety on the Meeting to Review the Causes and Consequences of the Chernobyl Accident" published by the IAEA in 1986 as part of safety publications. The concept of Safety Culture has been developed over the years and has become a basic management principle in the field of nuclear energy today.

Safety culture is understood as characteristic features in the activities of the organization and all its employees, aimed at solving safety problems in the operation of nuclear power plants and being a priority, due to their importance in this industry.

There are two fundamental characteristics of safety culture:
- each employee must represent the consequences of illiterate or untimely performance of the duties assigned to him;
- the implementation of security measures is a priority for all employees and for the organization as a whole.

Project safety management begins at the concept stage and continues throughout the life of the project, and also covers all its resources. The main stages and stages of project safety management are shown in Figure 2.

![Fig.2. Stages and stages of safety management in the project](image-url)

At the planning stage, the main directions for ensuring project safety are approved, safety criteria are established, measures are assigned, the implementation of which will be responsible for increasing the level of project safety.

The stage of organizing interaction and powers consists in appointing those responsible for all areas of project security, developing their job descriptions, duties and powers.

The implementation of measures to ensure the safety of the project provides for the timely implementation of the measures envisaged at the planning stage.

Motivation for the implementation of project safety measures includes the following measures:
- incentive measures: bonuses, thanks, promotion);
- reprimands: reprimands, fines, penalties for violation of safety regulations;
- mixed measures: the dependence of the size of the bonus or material compensation in case of injury on compliance with established safety rules.

Safety control is carried out in all selected areas. Conducting control reveals the relationship between the actually achieved safety indicators and the activities that are planned for the future. As part of the control, existing problems in the field of security are identified and urgent response measures are developed in those areas where critical deviations are found.

### 3 Results and Discussion

The project security mechanisms are designed to ensure the effective operation of the organization, the preservation of financial and production potential, the formation of stable conditions for reliable functioning and further development. These mechanisms can be considered from the point of view of a structural approach, highlighting the following key elements (Fig. 3).

![Fig.3. Types of security mechanisms in the project](image)

Legal mechanisms ensuring project safety include federal and regional legislative acts regulating legal relations with business entities in the course of economic transactions and activities aimed at ensuring economic and technological safety. The legal mechanism for ensuring security can be defined as a set of legal norms involved in the legal regulation of the activities of the organization and the projects it implements.

Proper use of legal mechanisms is the key to comprehensive project security.

Organizational Arrangements project safety measures include legal and technical measures that the officials of the organization develop based on the requirements of risk reduction at all levels of the project.

Organizational activities according to their content can be divided into the following categories (Fig. 4).

![Fig.4. Organizational mechanisms for ensuring design safety.](image)
Organizational and technical mechanisms for ensuring project safety include measures to comply with safety requirements, automate production processes, develop collective protective equipment, ensure labor safety and prevent potentially dangerous situations.

Organizational and legal mechanisms for ensuring project security are measures to draw up internal rules and regulations of the organization, approve job descriptions for those responsible for security, and form management systems.

The following one-time activities in this area can be distinguished:
- drawing up methodological foundations of design safety;
- development and implementation of technical means of protection;
- development of internal documents regulating the duties of officials responsible for security during the implementation of the project;

Periodic events include:
- analysis of the state of security and evaluation of the effectiveness of existing security measures;
- coordinating project safety requirements;
- distribution of details for access control to protected objects (setting passwords, encryption keys, etc.).

Regular activities include the following:
- checking the level of security of all facilities, including control of fire safety, security of premises and access control;
- Permanent monitoring of electronic systems. Responsible for security settings;
- Monitoring compliance with safety rules by all employees included in the project team.

Technical mechanisms project security is a set of protection tools, which include fire alarms, instrumentation, internal and external communication systems, access security systems, computer data protection, economic security protection systems.

Software mechanisms security measures are represented by measures to protect against unauthorized access to protected objects. According to M.A. Borisov, software tools are “objective forms of representing a set of data and commands intended for the functioning of computers in order to obtain a certain result, as well as materials prepared and fixed on a physical medium obtained in the course of their development, and the audiovisual displays generated by them” [2].

First of all, we are talking about programs for the implementation of design, data storage, financial analysis and accounting. The most popular product for automating all reporting in an organization is the 1C: Enterprise program. There are also many programs for financial analysis during project implementation, assessment of existing risks, control of production and other processes.

4 Conclusions

Information security programs are used to control access to various security objects, address issues of user identification and their terms of reference, protect economic and design information. Antivirus programs serve to protect corporate information and block malware that can disrupt computer systems [3].

Analytical Mechanisms ensuring design safety include a set of specialized statistical methods aimed at identifying possible threats of an economic, industrial and informational nature. These mechanisms are one of the foundations in management activities, they allow you to justify and prepare management decisions on a wide range of issues. Analytical mechanisms are designed to ensure the adoption of key decisions based on a thorough analysis of available information and to help find reserves to improve the efficiency of project implementation.
The sources of information for economic analysis are accounting data, which make it possible to identify the effectiveness of the policy being pursued and assess the threats to economic security. The analysis of production activities is carried out on the basis of statistical data, it allows you to find vulnerabilities in the security system at the workplace and make timely corrections.

Moral and ethical mechanisms ensuring project safety consists in maintaining responsibility within the project team, compliance with moral standards, internal rules and principles of corporate ethics. The internal rules include rules for the safe conduct of production processes, requirements for compliance with the rules for protecting internal information and access to individual objects. Main element corporate culture is a code of corporate ethics. Containing the principles of professional ethics that employees of the organization must adhere to, regardless of their position [4].

Thus, we can conclude about the fundamental importance of observing safety rules at all stages of project implementation. The security system is a set of measures aimed at maintaining economic, industrial, labor and information security. The entire team takes part in ensuring security during the implementation of the project, while responsible for certain positions are appointed, and all employees receive clarifications regarding their duties and powers to comply with the internal rules of the organization in the field of security.

To assess the effectiveness of measures to ensure the safety of the project, methods of analyzing economic reporting, production results, and statistical data are used. The design safety system can be defined as a complex of management of economic, legal, technical, software and moral and ethical mechanisms. Project safety management allows you to ensure the effective implementation of a specific project and maintain the stability of the organization's business activities.

References