

# ENVIRONMENTAL RISK MANAGEMENT SYSTEM IN REGIONAL CONSTRUCTION

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## Abstract

*Construction is one of the most capital-intensive and organizationally complex sectors of the economy. This leads to a high degree of risk for all participants in the construction services market, who may face not only objectively determined risks associated with the complexity and duration of the production cycle, but also with the dishonesty of contractors and potential partners. In operation are varied and are usually measured in significant amounts. In addition, recently from the side of financial institutions and banks to ensure the protection of the financial resources they provide, requirements have been put forward for compulsory insurance of construction risks, which requires building a system of relationships that takes into account the interests of all participants in the construction process.*

**Keywords:** world economy, environmental risk, natural resource, sustainable development, ecological development.

## I. Introduction

Environmental safety is just as important a component of the country's security, life and health of people, as is economic security, as is the security of the country's borders. If the problems of the country's defense, economic security are solved by specialized structures with a developed management system (the Ministry of Defense, the economy, other departments), then the management of environmental safety, including the environmental safety of construction, is the main technogenic factor of impact on the environment, on the quality of life and human health. , until now it has not been comprehensively decided. Separate studies and practical steps in this direction have been undertaken for a long time, but the accumulated experience and scientific potential are not fully utilized, which is actually felt in everyday life by every person. The issues of environmental safety management in large cities and industrial centers are especially relevant, where the intensity of environmental problems often develops into social and political problems. Investment activity is a prerequisite for the development and competitiveness of Russian construction enterprises, since construction is the most capital-intensive sector of the economy. It traditionally involves design and engineering organizations, uses expensive technologies and unique equipment, and concludes large supply contracts. It is obvious that the risks inherent in each stage of the project are varied and significant, and the possible losses during its implementation can be measured in huge amounts. Insurance of construction risks as part of the construction investment process at all its stages from the development of a feasibility study to the commissioning of an object allows participants to compensate for unforeseen losses incurred during construction and provides protection for investment in construction.

The construction area in all countries is considered a high-risk area where there is a high probability of unfavorable and unpredictable situations during the implementation of an investment project (an increase in investment costs, a decrease in profits, etc.). In investment and construction activities (ISD), research, identification and identification of risk factors underlies the effective implementation of the economic interests and needs of all stakeholders. The study of risk management problems in the context of political, economic and regulatory transformations of the basic rules of doing business in the construction industry is one of the most difficult economic problems and provides the following main approaches: avoidance, prevention, insurance, transfer and acceptance of risk.

Unfortunately, as world and domestic practice shows, despite significant efforts to reduce risk (introduction of new standards, use of innovative technologies), the developer, when carrying out construction and installation works (CMP), often faces the problem of situations that are difficult to predict and can lead to an increase in construction time due to damage or loss of building materials, construction equipment, equipment during installation and installation, property of third parties, damage to life and health of people, and there is also a risk of a significant increase in the cost of objects from the initial investment amount.

## II. Methods

A possible solution to ensuring the environmental safety of construction is the creation of an analysis of existing classifications of risks in relation to the investment and construction sector and an attempt to create on the basis of this classification a unified long-term methodology for increasing the efficiency of investment resources of construction organizations remains unrealized. As a rule, these techniques are aimed at solving specific tactical problems. The reasons for the occurrence and the degree of influence on investment activities for each risk is individual.

The most optimal solution in the context of analyzing the objectively evolving situation and taking into account the economic interests of IUD participants is the insurance of construction and installation risks. In this case, there is no need to accumulate funds on the accounts of the reserve fund to cover possible damage and the contractor can use these funds as working capital, in addition, the terms of restoration of the object can be significantly reduced by compensating the insurer for additional costs associated with the urgent delivery of building materials, equipment and overtime.

Construction and installation insurance is a real guarantee of ensuring economic protection of project participants from losses caused as a result of various types of dangerous situations. Unlike other types of property insurance, insurance of construction risks has a specific format of insurance coverage provided, the peculiarity of which is that due to the multiplicity of possible risks of a construction object, the insurance contract for a construction object does not contain a list of them, but, on the contrary, contains a list of cases, the damage from which is not subject to reimbursement by the insurer.

In international practice, insurance coverage does not cover losses:

- caused by defects and errors arising in the design and manufacture of materials;
- as a result of gross negligence of the policyholder and deliberate damage caused by him or his representative;
- as a result of extraordinary and military events, the arrest of property by a court decision;
- as a result of strikes or mutiny;
- damage caused by exposure to nuclear energy.

Thus, insurance can cover all civil and industrial construction projects, with the exception of those listed in the list.

### III. Results

Environmental risk is the likelihood of an event that has adverse consequences for the life of humans, animals, plants and other living organisms, caused by the negative impact of economic and other activities on the environment [2].

In popular science literature on economic issues (both foreign and domestic), a special place is occupied by a range of issues related to the interaction of the economy and the environment. The central place is occupied by the problem of environmental risk and the possibility of managing this risk through the system of insurance protection. Environmental risks can be divided into risks of technogenic and natural origin [4]. In statistical analysis, the insurer takes into account the following patterns: risks of a man-made nature in practice are much more common, but the damage from natural disasters is much greater in monetary terms, and in this case, a large number of people and areas of territories are involved. Insurance is one of the main recognized methods of risk management, but by no means the only one. All methods of risk management can be conditionally subdivided into economic and non-economic.

Environmental risk assessment is a complex and ongoing scientific and technological process that includes the possibility and necessity of iterative approaches, i.e. improving the results of risk assessment by repeatedly improving the quality of the initial information. Each of the types of risks requires its own risk assessment methodology, but all of them are characterized by common principles and approaches to risk assessment, regardless of where the risk is considered, in the "human-environment" system or in the "social and hygienic monitoring" system. The methodology for analyzing and managing risks procedurally is fairly well developed. It is reflected in the guidelines of environmental protection agencies in various countries.

The risk identification scheme consists of several blocks (stages).

First stage: qualitative identification of hazards. This is the process of identifying a problem: for example, sources of pollution, potentially hazardous harmful substances, and their toxicity are identified. In this case, various methods of risk identification are used [2]:

- statistical, based on the analysis of the accumulated statistical data of the events that have occurred, their repetition rate;

- analytical, based on the study of cause-and-effect relationships;

- expert assessments of events, implying an assessment of the probabilities of manifestation of environmental hazard factors by processing the results of expert interviews.

Second stage: defining the boundaries of the risk zone. The process of quantitative hazard assessment includes consideration of the scheme of the maximum possible flow of a harmful substance and the establishment of the geographical boundaries of its impact, i.e. complete product life cycle; for example, for a chemical, this is an exposure assessment: obtaining information about what real dose loads are faced by certain groups of the population. The third stage: assessment of the ways of exposure to the stressor. It provides for the consideration of the general scheme of the impact of the harmful substance on the biota, as well as its direct impact on human health, as a result of which a quantitative assessment is made between the exposure dose of the pollutant and the cases of harmful effects, and the "dose effect" relationship is established.

At these stages, parameters are selected by which the following is assessed:

- the degree of toxicity of the harmful substance;

- content in various environments;

- changes in the activity of various biochemical parameters in organisms of animals and plants, primarily enzymes;

- violation of reproductive functions and the survival of various test objects (daphnia, microorganisms, fish, etc.).

#### IV. Discussion

Summing up the above, we note that, given due attention to such an important aspect of the economic activity of a construction organization as environmental protection, it is possible to significantly minimize the negative impact on the environment by factors of construction production, including on natural objects with increased vulnerability and objects, protection and the preservation of which is of particular importance. Only the correct and responsible organization of work at the preventive stage - the analysis and calculation of environmental risks, the adoption of timely measures to prevent, and not eliminate the consequences of man-made factors and emergencies, can ensure the preservation of a favorable environment for current and future generations. Integrated environmental safety management system, the unification of management of all aspects of environmental safety within a single specialized structure. The management should be based on an information center that continuously receives information about the state of the environment in the controlled area, in particular, about the state of the environmental background at each point of the territory, the state of the ecosystem, the degree of concentration of construction (real estate), and the proposed construction. The same environmental safety management structure carries out an independent assessment of the environmental impact of a new object declared for construction, performs an examination of the location of the construction object, determines the environmentally friendly boundaries of the selected construction site, carries out legal expertise of construction projects, controls compliance with the boundaries of the land allotment, promptly responds in case of violation of legal environmental norms, in case of violation of the environmental parameters of the construction project, bringing to administrative or criminal liability for violations of the law. The system for assessing the environmental safety of construction (SOEBS) should be built on an extra-regional, extra-administrative principle, in order to exclude the pressure of the administrative authorities of the territories. And also to interact with sectoral and interstate structures of environmental safety management. The creation of an integrated environmental safety system will ensure environmental control of construction throughout the entire life cycle of a construction facility, from the emergence of an idea to the liquidation of the facility.

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