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# IDENTIFICATION AND ASSESSMENT OF LABOUR RISKS

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## Abstract

Every day in any workplace, especially in the workplace, the employee is at risk. It is he who is the main object of study of this article. The study of risks, as well as the methods of their assessment, despite a rather large study, still remains an urgent issue today, which is being investigated by a huge number of specialists, and will also remain so significant. This is because risk will haunt people for as long as they continue to exist, because it is impossible to get rid of hazards, especially in some areas, and reducing risks in the workplace is one of the most important issues that must be addressed. The text of the article provides an analysis of the concept of "risk" in the modern workplace, its properties from various points of view, examines the types of risks, their identification, risk-oriented approach, as well as methods for assessing risks, their comparison, as well as some possible measures to protect against risks.



*Keywords:* Risks, labour risks, identification of risks

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## 1. Introduction

The performance of labour functions and production processes today is unshakably connected with the impact of hazardous and harmful factors of production, as well as other dangers, which are likely to cause not only accidents, but also occupational diseases (Kuleshova & Pankov, 2020). Based on this, it can be said that there is no absolute safety state for the worker. In fact, there is always a chance of creating a situation in which the worker's body is inevitably influenced by danger. That is why in a modern enterprise one of the most important issues is ensuring comfortable and safe working conditions for employees, and research on the main causes of harmful and hazardous production factors is relevant (Engovatova & Davydov, 2018).

According not only to the legislation of the Russian Federation, but also international standards, enterprises need to regularly carry out work that is related to the identification of factors that endanger the employee and the assessment of possible accidental probabilities of adverse events. In addition, measures should be taken to reduce them, measures should be developed aimed at reducing or even preventing the action of hazardous and harmful production factors on employees of the enterprise (Manual on hygienic assessment of factors of working environment and labour process, 2005).

The random probabilities of adverse events mentioned earlier, including the degree of significance of their consequences, are commonly called risks.

If we consider the field of industrial safety and labor protection, then the risk is a combination of the probability of a dangerous event or impact and the severity of the injury or deterioration of health, which may be caused by such an event (GOST R 54934-2012/OHSAS 18001:2007, 2012).

## 2. Problem Statement

Any risk is endowed with different properties affecting the choice of the method of its management (Krishkin, 2020). It is worth noting the following properties:

- Probability;
- Force of impact;
- Controllability;
- Interconnectedness.

Probability. Since the term risk means an event that may or may not occur, it is possible to assess the probability of risk, that is, whether this event will occur within a certain period of time. To evaluate this value, various existing methods can be used, such as Bernoulli's formula, Poisson's formula, Laplace's local theorem.

Force of exposure. The realization of a risk has a specific impact. This effect is negative. Determining the size of the impact and is meant by this property.

Manageability. Any organization in one way or another has the ability to influence the force of influence, as well as the likelihood of risks. Such an influence depends on the degree of management of a certain risk. In this aspect, risks can be divided into two groups: the first includes those risks that the

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organization can manage, that is, the strength of the impact of which, as well as the probability of changes due to the actions of the organization; the second group includes risks, the force of impact and the probability of which is almost impossible to change despite all efforts (storm, flood, earthquake, etc.).

Interconnectedness. Since most of the risks have a dual nature, in other words, at the same time they can be not only risks, but also risk factors for other risks. Some risks can form risk chains. Based on this, it can be assumed that the root cause of many major accidents and accidents was at first glance insignificant risks.

## 3. Research Questions

There are many risks affecting the employee, but among them there are several that must be assessed. These include:

- Exposure risk;
- Risk of health damage;
- Situational risk.

Exposure risk. This term usually refers to the combination of the possibility of human exposure to danger and the severity of the consequences caused by such exposure.

Risk of health damage. By such risk is meant the possibility of health damage of varying severity during the performance of the work function (Makarova et al., 2012).

Situational risk. These words can be called the combination of the possibility of creating a situation, as well as the seriousness of the outcome of the situation, which does not exclude the risk of impact. At the same time, new dangers may arise in it, bearing the corresponding risks.

In part of the system, there is a need for risks to be detected, assessed and analyzed. Most decisions are applied on the basis of these points, that is, at present, such a management methodology as a risk-oriented approach is used.

The risk-based approach is part of the occupational safety system. In this system, it is necessary to ensure the implementation of a process that consists of several procedures: "hazard determination" - "risk assessment" - "development of risk management measures" (GOST 12.0.230.4-2018, 2018).

## 4. Purpose of the Study

Supposedly, the answers to the issues raised above will help achieve the goal and contribute to the development of recommendations on the management of labour risks.

## 5. Research Methods

Authors used the universal scientific research methods as well as methods for comparative and statistical analysis.

In the context of achieving a certain level of safety in the workplace, risk assessment is one of the priority measures that the employer must implement in order to protect the health of his or her employees,

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as well as for their well-being. Enterprises are responsible for preserving the life and health of their employees, so a risk-based approach can prevent or minimize the occurrence of an industrial accident and injury to workers.

The risk assessment process involves determining the degree of risk and assigning a certain rank (Feinburg, 2019). Three main levels of risk can therefore be identified:

- negligible degree of risk. The existence of this risk can be neglected, people can be allowed to perform labor functions, without using specially provided measures to ensure safety and means.
- permissible risk level. Personnel shall be allowed to work subject to strict observance of the prescribed regulations for the performance of work and the use of special means and safety measures.
- unacceptable level of risk. At this risk, the personnel is not allowed to perform the work.

## 6. Findings

There is currently no standardized uniform risk assessment methodology for all. For this reason, different methods are used. According to normative documents, qualitative methods as well as quantitative methods are used to assess labor safety (Kokangül et al., 2017). So let's take a look at them and identify the advantages and disadvantages of these methods (Table 1).

**Table 1.** Advantages and disadvantages of risk assessment methods

| Method Name | Advantages of the method | Disadvantages of the method |
|---|---|---|
| Method of a test leaf (check sheet) | Simplicity and efficiency<br>Possibility of taking into account the opinion of employees | Skipping Important Points<br>Poor quality issues |
| Elmery system | Risk assessment of the entire organization | Difficult to use for developing risk management activities |
| "What happens if...?" | Widely applicable<br>Review system-wide response to variances | Careful preparation<br>Qualified and experienced coordinator |
| Brainstorming method | Efficiency<br>Effectiveness in preliminary discussions | Inequality of methods |
| Delphi method | Equivalence of anonymous opinions<br>There is no need to collect all in one place at one time | Labor input<br>Need to clearly express opinions in documented form |
| Structured or partially structured interview method | Ensuring the participation of all stakeholders | Significant time costs |
| Matrix method | prevalence<br>clarity | Error in risk assessment |
| Fine-Kinney method | Easy to calculate<br>Visibility | Subjectivity |
| Hazard identification method | Early Hazard Analysis | Complexity |
| Hazard and Operability Study | Advanced Hazard Analysis | High time and material costs |

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| Method Name | Advantages of the method | Disadvantages of the method |
|---|---|---|
| | Identify inaccuracies in instructions | Availability of detailed documentation |
| Analysis of failure types and consequences | Complex Technical Systems Analysis | Significant Time Labour input |
| Failure tree analysis (faults) | Identification of causal relationships | Time factor is not considered<br>Only qualitative accounting of personnel-related errors |
| Event tree analysis | Presentation<br>Application at all stages of operation | Probability of non-detection of significant initial events<br>Record only good or bad system condition |
| Preliminary hazard analysis | Early identification of risks<br>Accounting for corrective measures to eliminate hazards | Does not provide detailed information about risks and ways to reduce them |
| Assessment of human factor influence | Formalized Way to Include Human Factor | Complexity and Diversity of Worker Characteristics<br>Personnel do not have a clear set of strictly correct or incorrect actions |

## 7. Conclusion

Depending on the advantages and disadvantages presented, one of the methods presented or a combination thereof may be selected for risk assessment.

Different approaches to occupational safety are based on risk assessment. To determine their essence, the risk pyramid created by the Russian scientist Fainburg (2016) is used. It is with their identification that any activity in the field of labor protection begins. The next step is exposure risks as well as health risks. And finally, at the very top are professional risks, that is, the possibility of disability or, in the worst case, life. Therefore, to prevent tragedy, it is necessary to take all measures at the stage of birth, that is, from production factors (Figure 1).

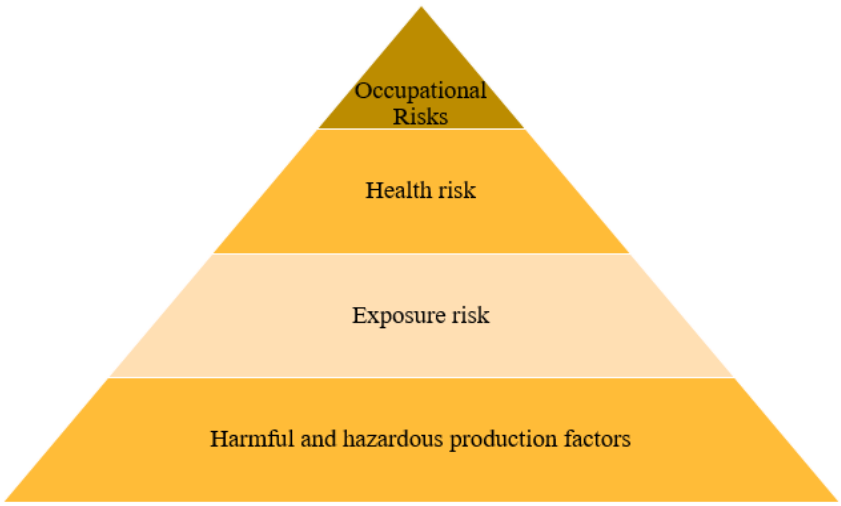


**Figure 1.** Risk pyramid

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Such measures to protect against risks can be:

- Change in technology and production process;
- The use of means of collective protection;
- The use of personal protective equipment;
- Use of preventive measures;
- Training in safe working methods of employees;
- Development of instructions, regulations.

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