



## TYPES OF RISK ARISING IN RAILWAY TRANSPORT

Sh.Kh.Abdazimov

Associate Professor

Department of "Technosphere safety".

Tashkent State Transport University.

The Republic of Uzbekistan. Tashkent city. Temiryulchilar st. 1.a.

abdazimov\_sh@mail.ru.

A.S. Khamidov

Senior Lecturer

Tashkent Institute of Textile and Light Industry

<https://doi.org/10.5281/zenodo.8008483>

### ANNOTATION

This article addresses the issue protection systems against natural and man-made emergencies, informing and alerting workers in railway transport. The issue of risks arising in railway transport is considered. Prevention methods.

**Keywords:** Risk, probability, realization of danger, degree of risk, loss of life.

### АННОТАЦИЯ

В данной статье рассматривается вопрос о системы защиты от ЧС природного и техногенного характера, информирования и оповещения работников на железнодорожном транспорте. Рассмотрен вопрос о рисках возникающие в железнодорожном транспорте. Методы предотвращения.

**Ключевые слова :** Риск, вероятность, реализации опасности, степени риска, потери жизни.

Realized in space and time, hazards cause harm to human health, which manifests itself in nervous shocks, injuries, illnesses, disability and death. Prevention of dangers and protection from them is the most urgent humanitarian and socio-economic problem, in the solution of which the state is particularly interested.

The impact of hazards on a person or a group (collective, city population, etc.) of people is assessed by the magnitude of the individual or social risk of forced loss of life, considering the risk as the probability of the occurrence or realization of danger. This happens when the mass and/or energy flows from the source of negative impact in the living space grow rapidly and reach values that are extremely dangerous for humans (for example, during accidents). The risk of negative impact on a person in the living space is usually associated with the development of natural and/or man-made emergencies.

Risk (R) is the probability of a hazard realization over a certain period of time (for example, a year), the frequency of hazard realization to their possible number.

The risk of emergencies is assessed on the basis of statistical data or theoretical studies. When using statistical data, the risk value is determined by the formula:

$$R = N_r / N_e,$$

where  $N_r$  – is the number of emergency events per year;

$N_e$  – the total number of events

ty per year.

The degree of risk is estimated by the probability of deaths. For example, the chance of a person dying in a car accident is 1 in 4,000, while the chance of being killed by lightning is 1 in 10 million.

The risk is:

- potential - real;
- forced - voluntary;
- known - unknown;
- professional - ordinary;
- distant death - near death;
- individual - group (social);
- controlled - uncontrolled;
- hidden - explicit;
- continuous - constant.

In the BZ, the risk of extremely dangerous negative impacts is assessed using the following types of risk:

- individual risk ( $R_{in}$ ) - the object of protection is a person;
- social risk ( $R_s$ ) - the object of protection is a group or community of people.

Individual risks are determined by the formula:

$$R_{in} = T_{nv} / C,$$

where  $T_{si}$  - the number of victims (dead) from a certain factor or hazardous impact per year;  $C$  is the number of people exposed to these factors per year.

As you move away from the source of danger, the individual risk decreases. Sources of individual risk include:

- car crashes;
- industrial accidents;
- murders;
- lightning strikes;
- bites of insects and animals;
- natural disasters (tornadoes, hurricanes), etc.

Social risk characterizes the negative impact of emergencies on groups of people. Its value is calculated by the formula:

$$R_c = \frac{\Delta P}{P},$$

where  $\Delta P$  is the number of deaths from an emergency of one type per year;

$R$  - the average number of people living or working in a given territory affected by the emergency.

The sources of social risk include:

- especially dangerous facilities, technical means prone to accidents;
- urbanized territories with an unstable situation;
- epidemics;
- natural disasters.



In the BZ, the concept of environmental risk ( $R_e$ ) is sometimes used. It is estimated as the ratio of the number of destroyed natural objects to the total number of objects in the territory under consideration during the year and is determined by the formula:

$$R_s = \frac{\Delta O}{O},$$

where  $\Delta O$  is the number of destroyed natural objects from their total  $O$  numbers within the considered region.

Sometimes the ecological risk is estimated by the ratio of the area of destroyed territories ( $\Delta S$ ) to the total area ( $S$ ) of the region, i.e.

$$R_s = \frac{\Delta S}{S}.$$

Sources of environmental risk can be man-made impact on the environment and natural phenomena: earthquakes, floods, hurricanes, drought, etc.

In many countries of the world, including Russia, the concept of acceptable (tolerable) risk ( $R_{dop}$ ) has been adopted, i.e. the risk at which protective measures allow maintaining the achieved level of safety ( $10^{-6}$ ) and minimal risk ( $10^{-8}$ ), i.e. practically safe.

**Acceptable Risk**- such a frequency of occurrence of hazards that combines technical, economic, environmental and social aspects and represents a compromise between the level of safety and the ability of society to achieve it for a given period of time. With an increase in the cost of technical, natural and environmental safety, the risk decreases, but the risk in the social sphere may increase, as there will be a shortage of funds for medical care, for protection and for the improvement of the population.

Security is understood as a level of danger that can be put up with at this stage of scientific and economic development. Security is an acceptable risk. In practice, complete safety is not achievable as long as there is a source of danger. The risk may remain unrealized for a long time or manifest itself in the form of an accident.

Scientists around the world are trying to reduce the risk, i.e. the likelihood of a hazard. But this is not possible, because dangers by their nature:

- probabilistic, that is, random;
- potential, i.e. hidden;
- permanent, that is, constant, continuous; - are total, i.e. universal and comprehensive.

Therefore, there is no person who is not in danger. But many people are unaware of this. Thus, the task of the BZ is to ensure the general literacy of a person in the field of security. A person who has mastered the basics of BZ is protected from danger, will not harm another, and is able to act competently in danger.

### References:

1. In the Sendai Hadley program to reduce the risk of disasters for 2015-2030 "On measures for implementation in the Republic of Uzbekistan" // Resolution of the UPR VM dated April 12, 2019 No. 299.
2. Aizman R.I. et al. Fundamentals of life safety / R.I. Aizman, N.S. Shulenina, V.M. Shirshov. - 2nd ed., revised. - Novosibirsk: Sib. univ. publishing house, 2010. - 247 p.
3. Arustamov E.A. Life safety: textbook. - M.: Publishing and Trade Corporation "Dashkov and K", 2007. - 456 p.



4. Life safety: textbook / ed. A.I. Sidorov. - M.: KNORUS, 2007. - 496 p.
5. Life safety: textbook / ed. L.A. Mikhailov. - M.: Academy, 2008. - 272 p.
6. Belov S.V. and others. Life safety: a textbook for students of secondary special. textbook institutions / S.V. Belov, V.A. Devisilov, A.F. Koziakov [i dr.]. - M.: Higher School, 2004. - 360 p.
7. Vangorodsky S.N. etc. Fundamentals of life safety: textbook for general education. institutions / S.N. Vangorodsky, M.I. Kuznetsov, V.N. Latchuk, V.V. Markov. - M.: Bustard, 2008. - 208 p.
8. Vishnyakov Ya.V., Vagin V.I. Life safety. Protection of the population and territories in emergency situations. - M.: Academy, 2008. - 304 p.
9. P.A. Makkambaev., R.S. Rozikov "Emergency situations and civil protection" in railway transport T.TashIIT 2019