

TYPES OF RISKS THAT ARISE DURING THE TRANSPORTATION OF DANGEROUS GOODS IN RAILWAY TRANSPORT

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Abstract

This article discusses the issue of protection systems against natural and man-made emergencies, informing and notifying employees in railway transport. The issue of risks in railway transport during the transportation of dangerous goods in railway transport through mountainous and near-mountainous areas is considered. . Methods of their prevention.

Keywords: Risk, probability, realizations of danger, degrees of risk, loss of life, mountainous and near-mountainous areas.

Introduction

Dangerous goods are substances and objects that, due to their inherent properties, pose a threat to human life and health, the state of the environment, the safety of buildings, structures, equipment and other material objects. These include: asbestos, life rafts, internal combustion engines, food additives, extracts, lithium batteries, polymer pellets, solid carbon dioxide (dry ice), magnetized material, magnetrons, unshielded permanent magnets without installed anchors, products and substances that emit a pungent smell. The rule for the carriage of dangerous goods by rail contains the following words: In the part not provided for in these Rules, when transporting dangerous goods, it is necessary to follow the relevant rules for the carriage of goods by rail. Transportation of dangerous goods in direct mixed rail and water traffic is also carried out in accordance with the rules for cargo transportation in direct mixed rail and water traffic. Transportation of dangerous goods in bulk is also carried out in accordance with the Rules for the transportation of liquid cargo in bulk in tank cars and bunker-type cars for the transportation bitumen.

Transportation of dangerous goods between States parties to the Agreement on International Rail Freight Transport (SMGS), but not members of the Commonwealth, is regulated Rules Transport of Dangerous Goods. Shippers, consignees, and railways are responsible for non-compliance with these Rules in accordance with the current legislation of their countries and international agreements.

Dangerous goods include substances, materials, products, industrial waste and other activities that, due to their inherent properties and characteristics, in the presence of certain factors during transportation, during loading and unloading operations and storage, can cause harm to the environment, cause an explosion, fire or damage to vehicles, devices, buildings buildings and structures, as well as deaths, injuries, poisoning, burns, or diseases of people, animals, and birds. Dangerous goods in accordance with the international requirements established by the UN Model Regulations (Recommendations for the Transport of Dangerous Goods) classification of substances and articles, according to the nature of their dangerous properties, are divided into the following classes: 1 class Explosives, 2 class gases, 3 class leks changing liquids, 4 class flammable solids, self-reactive substances, etc. solid desensitized explosives, class 5 self-igniting substances, substances that emit flammable

gases when interacting with water. Class 6 oxidizing substances, organic peroxides, class 8 toxic substances, class 9 infectious substances, radioactive materials, caustic (corrosive) substances, other dangerous substances and products.

Being realized in space and time, hazards during the transportation of dangerous goods or in the event of a man-made emergency cause harm to human health, which manifests itself in nervous shocks, injuries, illnesses, disabilities and deaths. Prevention of hazards 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 group (collective, city population, etc.) of people is estimated by the value of individual or social risk of forced loss of life, considering the risk as the probability of occurrence or realization of the danger. This occurs when the mass and/or energy flows from a source of negative impact in the living space increase rapidly and reach excessively dangerous values for humans (for example, in 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) – probability of realization of the hazard for a certain period of time (for example, for a year), the frequency of implementation of hazards to their possible number.

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

$$R = N_{\text{emergency}} / N_0,$$

where $N_{\text{emergencies}}$ is the number of emergency events per year.

N_0 – total number of events per year.

The degree of risk is estimated by the probability of fatal outcomes. For example, the probability of a person dying as a result of a car accident is 1 person in 4000, and the probability of death from a lightning strike is 1 person in 10 million.

There is a risk:

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

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

- - -individual risk (– the object of protection is a person;
 - -social risk (– the object of protection is a group or community of people.

Individual risk determined by the formula:

$$R_{\text{in}} = T_{\text{si}} / S,$$

where T_{si} is the number of victims (dead)

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

- –car accidents.
- –accidents at work;

- -murders.
- -lightning strikes.
- -insect and animal bites.
- -natural disasters (tornadoes, hurricanes), etc.

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

where Δp is the number of deaths from emergencies of one type per year.

P – the average number of people living or working in a given territory affected by an emergency.

Sources of social risk include:

- -especially dangerous objects, technical means that are prone to accidents;
- -urbanized areas with an unstable situation.
- -epidemics.
- -natural disasters.

BW sometimes uses the concept environmental risk (RR). 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:

where ΔO is the number of destroyed natural objects from their total

O numbers within the region under consideration.

Sometimes environmental risk is estimated by the ratio of the area of destroyed territories (ΔS to the total area (S) of the region, i.e.

Sources of environmental risk can include man-made impacts on the environment and natural events: earthquakes, floods, hurricanes, droughts, etc.

Many countries around the world, including Russia, have adopted concept of acceptable (acceptable) risk (RR, 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 is the frequency of implementation 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. If the costs of technical, natural and environmental safety increase, the risk decreases, but the risk in the social sphere may increase, as there will be a lack of funds for medical care, protection and health improvement of the population.

Security is defined as a level of danger that can be accepted at this stage of scientific and economic development. Security is an acceptable risk. In practice, complete safety is unattainable 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 all over the world are trying to reduce the risk, i.e. the probability of realizing a danger. But this is impossible, because the dangers are inherently dangerous:

- *probabilistic, i.e. random.
- *potential, i.e. hidden;
- *permanent, i.e. permanent, continuous; - total, i.e. universal and comprehensive.

Therefore, there is no person who is not in danger. But many people don't know it. Thus, the task of the BW is to ensure general human literacy in the field of security. A person who has mastered the basics of life safety is protected from dangers, will not harm another, and is able to act competently in conditions of danger.

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