ENSURING THE STABILITY OF THE RAILWAY TRANSPORT IN EMERGENCY SITUATIONS

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DOI: 10.5958/2278-4853.2022.00319.6

ABSTRACT

This article addresses the issue of natural emergencies. Affecting the sectors of the economy causing great material damage. The article considers the issue of natural hazards and catastrophes - which is an inevitable attribute of our lives. Some of them are caused by human activities. The issue of the risk of natural hazards and related potential emergencies (ES) is considered, in some cases it can be reduced as a result of such preventive measures as the creation of structures and special means of protecting people and nature, taking into account their socioeconomic aspects.

KEYWORDS: Geological Hazards, Earthquakes, Human Casualties, Landslides, Mountain Landslides, Floods, Floods And Mudflows, Stormy Mud Or Mud-Stone Stream, Heavy Rainfall, Rains.

INTRODUCTION

Natural emergencies include:

1. Geological hazards:

a) earthquakes resulting in human casualties, destruction of varying degrees of administrative and industrial buildings, technological equipment, energy supply systems, transport communications and infrastructure, social buildings and houses in the residential sector, disruption of the functioning of production and people's livelihoods;

Safety measures in case of earthquakes:

- During earthquakes it is forbidden to: use the elevator, light matches;

- Having felt tremors, it is necessary: to quickly leave the building, to stay farther from walls, fences, pillars;

- Do not enter buildings: tremors may be repeated;

- On the second and subsequent floors, stand in the opening of the entrance or balcony door, move away from the windows and take a place in the corner formed by the main walls.

b) landslides, mountain collapses and other dangerous geological phenomena that caused or may cause death of people and require temporary resettlement from the danger zone or resettlement of people for permanent residence in safe areas.

Landslides are sliding displacement of rock masses along a slope under the influence of gravity. They occur as a result of a violation of the equilibrium conditions of slopes, most often along the banks of rivers and reservoirs, the main reason for their occurrence is the saturation of clay rocks with groundwater to a plastic and fluid state, as a result of which huge masses of soil with all buildings and structures slide down the slope.

Landslide safety measures:

- Observe the situation, the behavior of animals, rain;

- At the first sign of a landslide, quickly evacuate people, animals and property;

- During a landslide, one should not enter buildings, approach buildings, one must be away from the area of soil displacement (Figure 1).



Fig.1. Landslide causing huge property damage

2. Hydro meteorological hazards:

a) Floods, floods and mudflows, resulting in the death of people, flooding of settlements, individual industrial and agricultural facilities, destruction of infrastructure and transport communications, disruption of production and life of people and requiring emergency evacuation measures;

Flooding - significant flooding of the area as a result of a rise in the levelwater in rivers, lakes, reservoirs as a result of an abundant and concentrated inflow of water during the melting of snow

and glaciers, prolonged heavy rainfall, ice blocking the channel, and also when dams break. There is also flooding, when water penetrates into the basements of buildings through the sewer network through various ditches and trenches [1].

Floods can be caused by:

- Heavy precipitation, rain;
- Intensive snow melting;
- Formation of congestion (ice floes in spring), ice jams (light snow, ice in autumn);
- Destruction of hydraulic structures;
- Earthquakes (causing giant waves tsunamis);
- A strong surge wind on the sea coasts and in the mouths of rivers flowing into the sea.

When there is a risk of flooding:

- Constantly listen to information about the situation and the proposed course of action;
- Food, valuables, clothes, shoes should be moved to the upper floors of the building;
- Evacuate the population from the most dangerous areas;
- Drive livestock to elevated places;

- With the beginning of the flood, first of all, take out the children from the flood zone; provide urgent assistance to people who find themselves in the water.

A mudflow is a turbulent mud or mud-stone stream, consisting of a mixture of water and rock fragments, which suddenly appears in mountain river basins. (Figure 2).



Fig.2. Heavy mudflow causing washout of roads and disruption of public transport

Safety measures in case of mudflows:

- Having received the information, immediately evacuate beyond the borders of the mudflow distribution zone;

- Try to climb the elevated places of the surrounding relief;

- A person who finds himself in a mudflow must be assisted using all available means at hand, leading him in the direction of the mass movement with a gradual approach to the edge of the stream.

b) Snow avalanches, strong (storm) winds, heavy rains and other dangerous hydro meteorological phenomena that have caused or may cause injuries and death of residents of settlements, vacationers in sanatoriums, rest homes, health camps, tourists and athletes.

Snow avalanches and storms are characteristic of the mountainous and foothill regions of our country. Sometimes they can last for several days.

Having received a warning about snow avalanches and storms, you must:

- If there are opportunities to leave the dangerous area in advance;
- Create reserves of water, food and fuel;
- Keep the radio broadcast loudspeaker, radio and TV set constantly on;
- Prepare emergency lighting, electric lights, candles, kerosene lamps;
- Take care of stocks of feed and water for animals;
- Try to insulate the room.

After completion, you must:

- Take part in clearing roads and streets from drifts;
- In places of possible avalanches, carefully follow the warning signs.



Figure 3. Protective structure against landslides

Dangerous natural phenomena and disasters are an inevitable attribute of our life. Some of them are caused by human economic activity [1-3].

The risk of natural hazards and related possible emergencies (ES), in some cases, can be reduced as a result of such preventive measures as the creation of structures and special means of

protecting people and nature, taking into account their socio-economic aspects. This approach is known as engineering and is widely used in practice [2,3].

A more significant role in reducing natural risk should be played by information about it. Timely information about the threat and the development of a dangerous phenomenon, knowledge of how to behave during a critical situation, can minimize the risk.

The risk will also be close to a minimum if regions, population concentrations, and hazard hotspots are sufficiently separated spatially. As experience shows, natural hazards can be prevented, and in some cases predicted, the consequences can be minimized, which justifies the cost of researching various types of natural risks in order to take priority measures when planning measures aimed at reducing the risks of emergencies [2].

It should be noted that there is no clear distinction between the types of natural risk, since emergencies almost always have a mixed origin. For example, flooding can be considered as a geological (by origin), as well as a hydrological and ecological (by consequences) phenomenon [2].

In many ways, the main components of risks that determine the scale of a natural disaster depend on economic and social factors, information about it, early protection measures, and promptness of measures to overcome the consequences of emergencies [2]. The sharp expansion of territories developed by man and their resettlement in life-threatening regions also contribute to the increased risk. About half of the world's global population currently lives in hazard-prone coastal regions.

To analyze natural risks, it is necessary to determine for which types (types) of risk this analysis should be carried out [3-5]. Studies indicate that modern exogenous processes are ubiquitous in mountainous areas, expressed in the formation of mudflows, landslides, landslides, avalanches and outbursts of mountain lakes. Among the catastrophic natural phenomena listed above, mudflows formed as a result of the breakthrough of glacial and dammed lakes, as well as intraglacial and intramoraine reservoirs, have especially destructive power.

Floods caused by the outburst of high-mountain lakes have a huge destructive power and can cause significant damage: flooding of riverine territories; destruction of residential buildings, recreation areas, industrial facilities; washout of roads and power lines; flooding or erosion of agricultural land; loss of livestock, human casualties.

In recent years, there has been an increase in the frequency and strength of all kinds of weather and climate anomalies - droughts, floods, hurricanes, mudflows, floods, tornadoes, sudden temperature spikes both up and down, which significantly increases the risk of creating dangerous situations in the area of outburst lakes, increasing the likelihood destruction of natural dams (the catastrophically high-water year 1969 or 1998, which was noted as extremely warm in the entire history of instrumental observations). Many researchers attribute this imbalance to climate change factors. These symptoms (sometimes called "swing") are typical of unbalanced systems and increase exponentially as destabilization develops.

Hazardous hydrological phenomena from risks lead to material losses in the economy, which, in many cases, turn out to be significant to the emergence of problems related to human health, and also affect the economies of countries. To improve environmental safety, which is defined as the

state of protection of the economy, population and vital human interests from the possible negative impact of dangerous hydrometeorological phenomena, it is necessary to investigate and evaluate the possible consequences of these phenomena. [Eight].

The above aspects of the problem of outburst lakes necessitate regular monitoring of their condition. Monitoring of outburst lakes is carried out in accordance with the Decree of the President of the Republic of Uzbekistan - "On measures to prevent emergency situations associated with flood, mudflow, snow avalanche and landslides, and eliminate their consequences" No. 585 dated February 19, 2007, which defines the tasks of those involved ministries and departments to organize monitoring of hazardous natural and man-made phenomena and eliminate their consequences.

An analysis of research materials and works carried out earlier in this area showed that the existing base and modern computer technologies can reduce the damage from the catastrophic consequences of outbursts of mountain lakes. Modern monitoring methods that allow obtaining the most accurate and reliable information about the state of outburst-prone lakes (space images, remote sensing data, etc.) are especially important if the lakes are located on the territories of neighboring countries, and their outburst threatens the territory of Uzbekistan.[8].

The accumulated information and the large amount of work required to maintain the research system and the cost of these works suggest the search for new approaches to solving the problems of monitoring mountain lakes in order to assess the potential risk and damage in case of their possible breakthrough.

With the information received, we can prevent the consequences of accidents and failure of the movement of vehicles, as well as the movement of the railway. Timely information about natural disasters will lead usprotection of emergencies and disasters, as well as the risk of natural phenomena affecting the sectors of the national economy and vehicles.

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