



ANALYSIS OF THE CAUSES OF TRANSPORT ACCIDENTS IN RAILWAY TRANSPORT, INCLUDING THE TRANSPORTATION OF DANGEROUS GOODS THROUGH THE MOUNTAIN AREAS OF UZBEKISTAN

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Annotation. The article deals with the issue of the process in case of accidents during the transportation of dangerous goods. Considered the study of a large number of accidents that were accompanied by fire, the result of burning state property and property of private entrepreneurs.

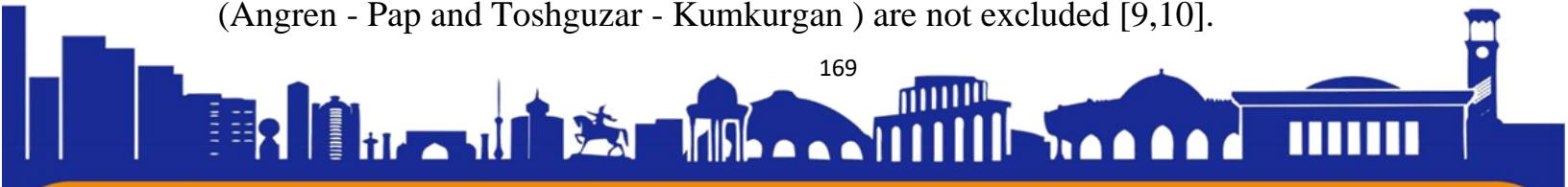
Key words: emergency situations in railway transport; features of the organization; restoration work; prompt response; recovery train; fire train.

Railway transport of the Republic of Uzbekistan is the leading industry in the road transport complex. It provides freight and passenger transportation. The Republic of Uzbekistan occupies one of the leading places in terms of freight traffic on the Central Asian continent [1,2,3].

The main goal is to summarize information about the current state and features of the organization of rescue and urgent work in the elimination of emergency situations in railway transport [4,5].

Research methodology. In the course of the study, the analysis method was used to determine the meaning and main provisions of scientific publications, regulatory legal acts of the Republic of Uzbekistan and other sources on emergency situations in railway transport, the features of the organization of rescue and urgent work in the elimination of their consequences, followed by their comparison and generalization [6,7,8].

The results of the study showed that the causes of accidents that occurred in railway transport are most often the derailment of rolling stock, collisions, collisions with obstacles at crossings, fires and explosions directly in the cars. During the transportation of dangerous goods (OG), as liquefied gases, flammable, explosive, poisonous substances, leaks, explosions occur, resulting in contamination of the area. Erosion of railways, landslides, landslides, floods, especially in mountainous places (Angren - Pap and Toshguzar - Kumkurgan) are not excluded [9,10].





The main risk factors in railway transport include the transportation of a large amount of OG (many items). They are a potential source of emergencies with a large number of victims, significant material losses, and the onset of adverse environmental and sanitary consequences [11,12,13].

Practice shows that the most dangerous accidents are those accompanied by fire, because in this case, the elimination of the consequences of the accident is primarily associated with the need to eliminate combustion. Only after the localization of the fire is it possible to carry out the entire complex of works to eliminate the consequences of the accident and restore the movement of trains [14,15,16].

A study of a large number of accidents that were accompanied by a fire showed that as a result of burning, the emergency situation becomes much more complicated, and in cases where effective measures to combat fire are not applied, it is the development of the fire that creates conditions under which the size and consequences of the accident increase significantly [17, 18].

Each accident can have two principal development options [19,20]:

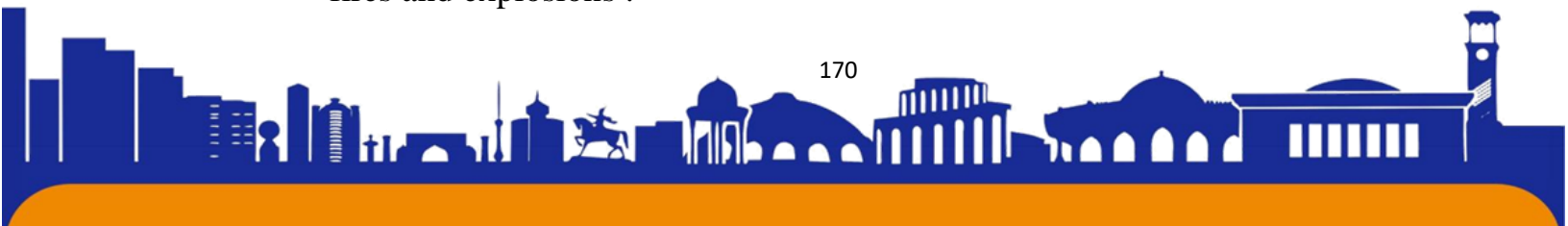
1. An accident without a fire (collision, overturning of a wagon, derailment, spillage or outflow of dangerous goods, etc.).
2. An accident accompanied by a fire (burning of tanks, burning of bulk or liquid products, burning of passenger and other cars and stationary structures).

The characteristic features of railway transport, which must be taken into account when planning and organizing rescue operations in emergency situations, are [21,22]:

- a large mass of rolling stock (the total mass of a freight train is 3-5 thousand tons, the mass of a passenger train is about 1 thousand tons, the mass of one tank is 80-100 tons);
- high speed of the rolling stock (up to 200 km / h), while the emergency braking distance is hundreds of meters;

Accidents are divided into the following categories:

- collision, derailment of rolling stock of railway transport;
- accidents at railway crossings;
- accidents with dangerous goods;
- fires and explosions .





Signs (consequences) of crashes are: a collision of a railway rolling stock with another railway rolling stock, with a vehicle, a derailment of a railway rolling stock on a stage or a railway station, during train or shunting work, equipment or other movements [23,24,25].

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A study of a large number of accidents that were accompanied by a fire showed that as a result of burning, the emergency situation becomes much more complicated, and in cases where effective measures to combat fire are not applied, it is the development of the fire that creates conditions under which the size and consequences of the accident increase significantly.

- the presence of dangerous sections of roads on the route (bridges, tunnels, descents, ascents, crossings, marshalling humps)
- presence of high voltage electric current (up to 30 kV)
- the influence of the human factor on the causes of the accident (locomotive control, staffing, dispatching service)
- variety of damaging factors and the danger of their combination;
- inaccessibility of the accident site for rescuers, firefighters, specialists (swamps, bushes, high embankments; a significant number of railway tracks at large stations and junctions) [29,30].

It should be noted that in cases of terrorist acts, accidents occur in railway transport: undermining bridges, railway tracks, wagons, power transmission towers and other objects and structures. For the safe performance of emergency recovery work, it is necessary to first search for and neutralize ammunition and explosives. Special sapper units should be involved in such work. [31,32].

To eliminate the consequences of the derailment of a single rolling stock at the stations of the Directorate of Railway Transportation, state-owned enterprises organize emergency recovery teams. To eliminate the consequences of derailment and collisions of rolling stock, as well as to provide assistance in case of natural disaster, a recovery





train is intended, which is on the balance sheet and subordinate to the Directorate of Railway Transportation [33,34].

When organizing rescue operations to eliminate the consequences of railway accidents and disasters, the following features should be taken into account [35,36]:

- accidents and catastrophes occur on the route, as a rule, suddenly, in most cases at high speed, which leads to bodily injury to the victims, the occurrence of a shock state and death;

- untimely receipt of reliable information about an accident or catastrophe can lead to a delay in providing assistance, an increase in the number of victims, including in the absence of survival skills in the victims;

- the absence, as a rule, at the initial stage of rescue operations, special equipment, the necessary fire extinguishing equipment and the difficulty in organizing effective evacuation measures from the accident site;

- difficulty in determining the number of victims at the scene of an accident or disaster, the need to distribute them and send them to medical institutions, taking into account the specifics of treatment;

- aggravation of the situation in the event of an accident or catastrophe during the transportation of dangerous goods;

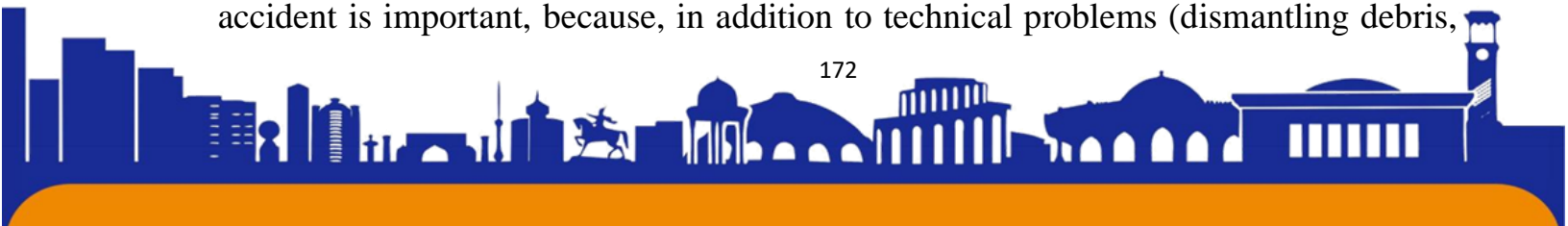
- the need to organize a search for the remains of the dead and material evidence of the disaster, often over a large area;

- the need to organize the reception, accommodation, maintenance (food, communication services, transportation, etc.) of the arrived relatives of the victims, the organization of the departure of the dead to the place of their burial;

- the need for a quick resumption of traffic on damaged tracks [37,38].

As practice shows, most of the emergency and restoration work of the railway is carried out on its own and by means within a day. But, in the event of an emergency with a large number of injured and dead, when it is necessary to carry out complex rescue work to extract people from the rubble and destroyed cars, additional forces and means that are part of the territorial subsystem of the state system of emergency situations are involved in the elimination of accidents.

In such cases, the clear interaction of all participants in the liquidation of the accident is important, because, in addition to technical problems (dismantling debris,





extinguishing fires and restoring railways), it is necessary to solve other tasks that require the involvement of additional forces and resources [39,40]. These tasks include: protecting public order, ensuring the work of the fire and rescue and medical services, sending the injured from the place.

Emergency situations, identification and identification of the dead, search, notification, meeting and accommodation of relatives of the dead.

In accordance with the requirements of the statutory documents, UTY JSC has established a clear management scheme for the units involved in fire extinguishing and emergency recovery operations.

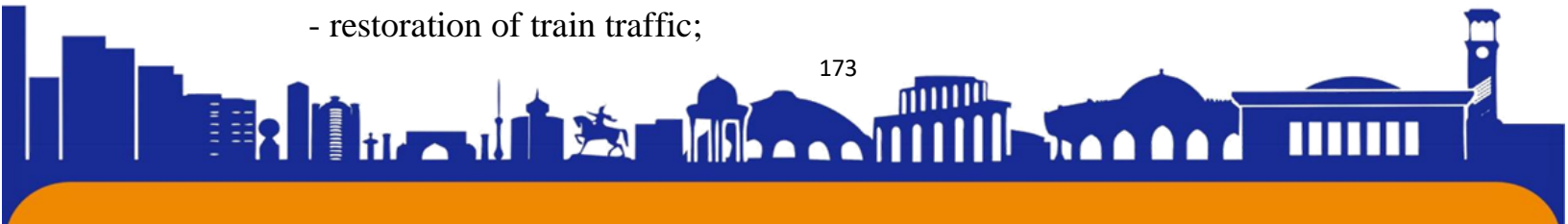
For the operational management of the liquidation of an emergency situation in the directorates of railway transportation and railway departments, operational headquarters are created with the participation of the heads of leading services with the involvement, if necessary, of the specialists of the sender or recipient of the cargo [41,42] .

The heads of the operational headquarters, together with representatives of the emergency services of the territorial subsystem of the Unified State System for the Prevention and Elimination of Emergency Situations, promptly develop and implement an emergency response plan [43].

The second level of management includes the head of the fire extinguishing (GTP) and the operational headquarters involved in the liquidation of the accident and managing the fire extinguishing activities.

The following tasks belong to the competence of the first level of management:

- organization of fire extinguishing;
- evacuation of people, equipment and rolling stock from hazardous areas of the accident;
- protection of facilities and rolling stock;
- reconnaissance of the site of a dangerous event;
- establishment of the boundary of the danger zone and notification of the population;
- organizing the provision of medical care to the victims;
- taking the necessary security measures during the emergency recovery work;
- liquidation of the consequences of the accident;
- restoration of train traffic;





- ensuring the actions of fire departments;
- attraction to the work of divisions and formations of the railway.

A special place in solving these problems is occupied by the analysis of the situation that has developed as a result of an accident, which is accompanied by a fire. Important components of such an analysis of the situation are the establishment of primary information about the fire: the location of the fire, rolling stock and type of burning cargo, external signs of fire, rolling stock and type of cargo in the fire zone, objects and terrain in the accident zone [44].

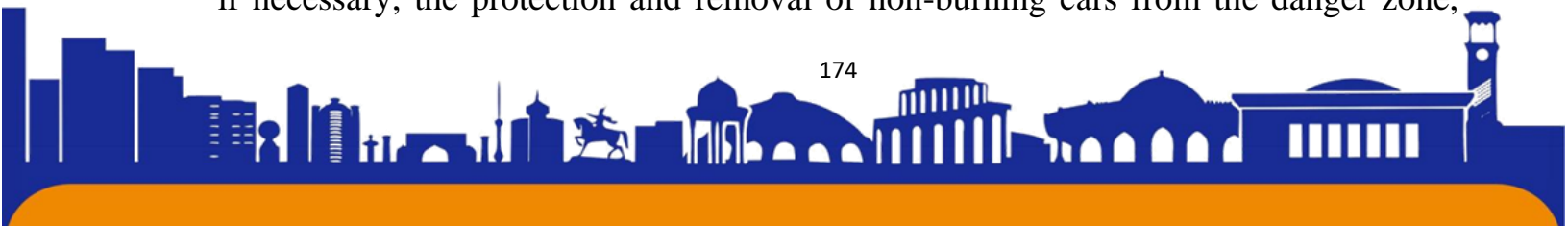
Based on the initial information about the emergency with members of the operational headquarters, he develops a scenario for the possible development of the accident, determines the parameters of its dangerous zones and establishes the objects and rolling stock of railway transport that are located in these zones.

Based on the number of objects and rolling stock suffering from the dangerous factors of an accident accompanied by a fire, determining the required number of fire departments to extinguish a fire, protect objects and rolling stock, as well as railway departments and formations for emergency recovery work [45].

Tasks of the second level are directly related to the organization and taking measures to eliminate the fire.

When extinguishing a fire in rolling stock, freight and marshalling yards, taking into account the information about the fire obtained as a result of reconnaissance, the SCC is obliged to:

- establish the degree of implementation by railway transport employees of measures for uncoupling and diverting neighboring cars and de-energizing electrical networks, as well as obtain written confirmation from the energy dispatcher about de-energizing;
- find out ways and methods of laying hose lines, taking into account the movement or maneuvering of trains;
- taking into account the peculiarities of railway transport, appoint persons responsible for compliance with security measures;
- establish the degree of threat to neighboring trains, the possibility of withdrawing the entire rolling stock or individual burning cars to a safe place - organize, if necessary, the protection and removal of non-burning cars from the danger zone,





primarily with people, explosive and poisonous cargo, as well as tanks with flammable and combustible substances;

- in case of spreading of a burning liquid, organize the construction of an earthen obstacle or trays to drain this liquid to a safe place;
- take measures to protect personnel from poisoning by toxic substances.

All these tasks are solved in close relationship between the first and second levels of management.

The totality of decisions that are made by the leaders of the liquidation of the accident and extinguishing the fire constitute a hierarchy of decisions that determines the structural links between them.

Obviously, for the effective management of subdivisions (sections, sectors), it is necessary that decisions be coordinated among themselves both at one and at different levels of management. Of great importance is the content of the decisions of the head of the liquidation of the accident, especially at the stage of determining the required number of fire departments. It is also important to exercise control over the execution of orders at all levels of management [46].

The functions and tasks of the governing bodies, forces and means of the functional subsystem for the prevention and elimination of emergencies for the prevention and response to threats or the occurrence of emergencies at the regional and facility level are determined. The organization of interaction between operational headquarters, coordinating bodies and civil protection forces during emergency response is described.

Taking into account the specifics of the conditions in which rescue and emergency recovery work will be carried out in railway transport will increase the efficiency of work and the effectiveness of interaction between the authorities and the forces of the functional subsystem for preventing and responding to a threat or the occurrence of emergencies [47].

Based on the analysis of the causes of transport accidents in railway transport, including the transport of dangerous goods, it can be concluded that a significant part of these events occurs through commercial malfunctions of freight cars, catastrophic wear and tear of fixed assets.

But the cause of accidents in railway transport is also a violation of safety requirements, which entails significant material damage.



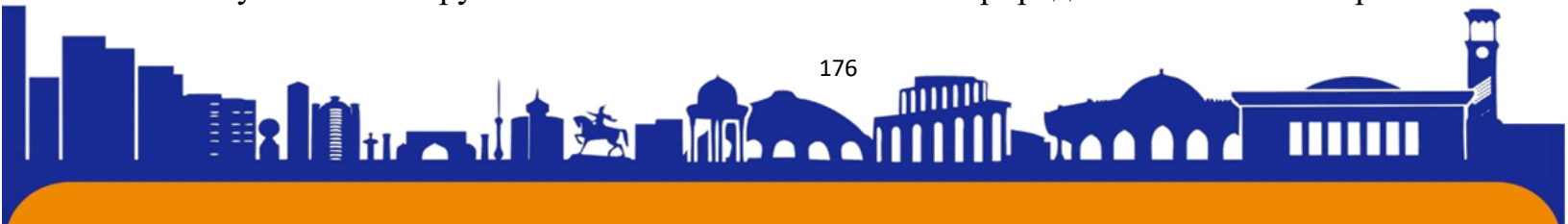


Taking into account the accumulated experience in organizing and carrying out emergency recovery work in the event of emergency situations in railway transport, we propose to further improve the warning system about the threat and occurrence of traffic accidents, prompt response to eliminate their consequences, as well as coordination and close interaction of the forces of the warning functional subsystem and elimination of the threat or occurrence of emergencies in railway transport in the structure of a unified protection system [48] .

A qualitative increase in the safety of train traffic, due to modern requirements, is possible only if the elements of the transportation process are improved: organizational, technical, technological, informational, personnel, etc.

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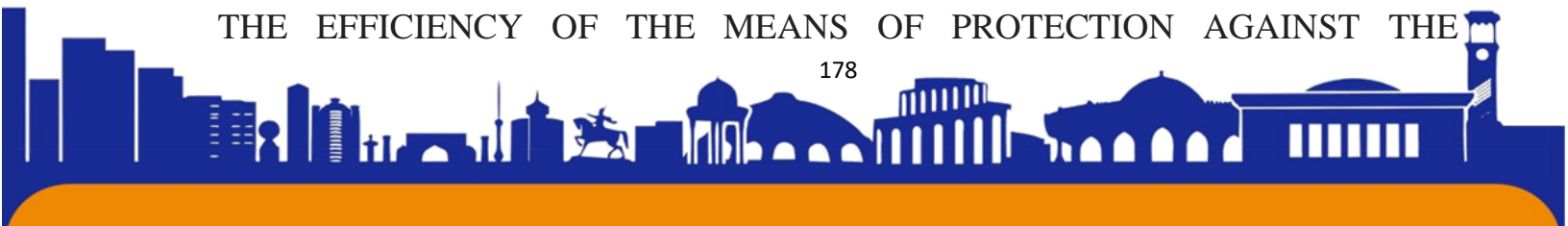
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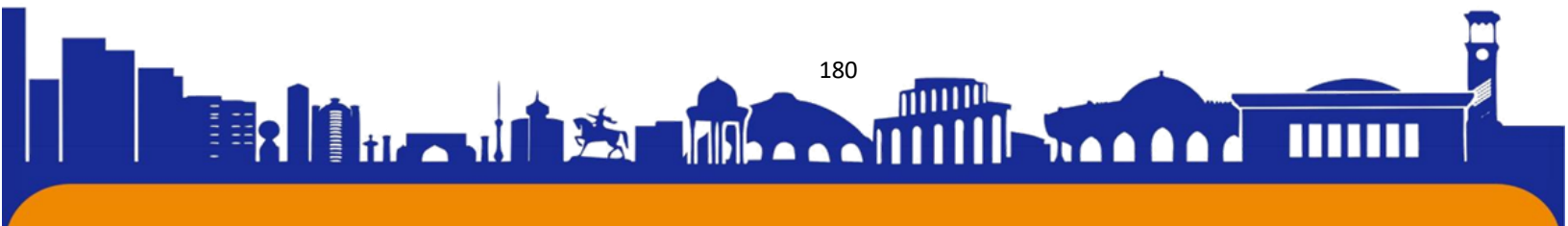
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