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F U. Otabekov

Tashkent State Technical University named after Islam Karimov

M Z. Naimova

Tashkent State Technical University named after Islam Karimov

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ANALYSIS OF POSSIBLE CAUSES OF INDUSTRIAL INJURIES AND ACCIDENTS AT COAL INDUSTRY ENTERPRISES**F.U. Otabekov, M.Z. Naimova***Tashkent State Technical University
University st.,2 100095, Tashkent, Uzbekistan*

Abstract: *In this article, the issues that a person may face unfortunate events due to a certain reason due to the influence of various dangerous and harmful factors in the course of his life activities are resolved. Depending on the type and degree of exposure or the cause of the accident, the type and degree of injury may also vary. In most cases, injuries and damages occur suddenly and can lead to unexpected and unexpected consequences. Let's imagine that an unfortunate event happened by chance. In this situation, many people lose their senses, start to panic, hurry, become overly nervous or wait for emergency medical help, but they cannot provide any help. But in life, such unfortunate events can happen that it becomes necessary to provide immediate help to save the victim's health and even life until the emergency medical service arrives.*

Non-observance of safety equipment, industrial sanitation and fire safety rules, standards and recommendations in manufacturing enterprises can lead to accidents, i.e. injury to workers, poisoning and occupational diseases. That's why any unfortunate event that happened in production enterprises is thoroughly investigated and accounted for.

Key words: *occupational injuries, industry, safety, risk factors, accident, analysis, accidents, causes.*

INTRODUCTION. An average of 5,000 people die from industrial accidents and diseases every day, which is 2 to 2.3 million per year. 350,000 of them are accidents at work and 1.7-2 million are caused by work-related diseases. Correctly defining the categories of buildings and structures, ensuring technical and labor safety in industrial enterprises occupies one of the leading positions in increasing labor productivity.

According to the regulatory documents for the classification of explosion-proof production buildings in the world¹, "Given that 32 out of every 436 explosions in the world are caused by a dust-air mixture", factors specific to each industrial enterprise, including dust and its intensity, height and area of the room taking into account unevenness, the transition of dust to a suspended state and participation in the process of explosive combustion dangerous production buildings and structures requires implementation of assessment. Determination of the category of rooms in the world with the risk of explosion due to the release of flammable or easily flammable dust, the lower concentration limit of dust flammability, the lower limit concentration of the flame and the dangerous amount of the dust-air mixture in the area Since the definition based on 65 g/m³ overstates the categories, it requires scientific research.

An analysis of occupational injuries depending on the type of economic activity showed that the types of economic activity with the largest number of injured included such activities as the coal industry, transport, agriculture, construction, and mining. According to statistics [3], the main types of accidents (hereinafter referred to as accidents) are: falling from a height (33.3%); - impact of moving objects and parts (25%); traffic accident (14.2%); - falling, collapse, collapses of objects, materials (12.5%); - other reasons (15%).

Table 1
Information of the State Committee for Industrial Safety on accidents that occurred in 2019-2020

№	Name of inspections	total number of accidents	Number of victims who lost 1 or more working days, as well as unfortunate employees who ended in death					Total number of documents sent to rights protection organizations
			of them:					
			Light weight	heavy	death	group	total number of casualties	
1	Inspection of industrial safety at coal, mining and non-metallic deposits	44	12	20	12	0	44	39
2	Industrial Safety Inspectorate in the Oil and Gas Sector	16	1	9	5	1	21	16
3	Industrial safety inspection during geological exploration	7	0	2	4	1	11	7
4	Industrial safety inspection in the chemical, petrochemi	6	0	4	1	1	8	5

	cal and metallurgical industries							
5	Industrial safety verification in steam boilers, lifting facilities and non-destructive testing	11	0	7	5	1	12	12
6	Industrial Safety Inspection in the Gas Industry	1	0	0	0	1	2	1
7	Inspection of industrial safety during storage and processing of grain	2	1	1	0	0	1	0
total		87	14	43	27	5	99	80

Traditionally, more than 75% of accidents are caused by organizational reasons, such as unsatisfactory organization of work, violations of labor protection requirements, deficiencies in training, violations of labor discipline. is carried out in organizations to identify the causes that lead to accidents and develop measures aimed at preventing them (Chart 1.). When conducting an analysis of industrial injuries, various methods are used to identify and eliminate its causes, one of which is statistical.

It is based on an analysis of the causes of injuries for a certain period of time according to official documents registering accidents that have occurred. Thanks to this method, comparative dynamics of injuries is obtained. With an in-depth statistical analysis by type of work, information about the victims (gender, age, profession, experience, etc.) and data on the time of the incident (year, month, day, shift, hour, etc.) are analyzed [2].

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MATERIAL AND METHODS. It is based on an analysis of the causes of injuries for a certain period of time according to official documents registering accidents that have occurred. Thanks to this method, comparative dynamics of injuries is obtained. With an in-depth statistical analysis by type of work, information about the victims (gender, age, profession, experience, etc.) and data on the time of the incident (year, month, day, shift, hour, etc.) are analyzed [2].

Table 2

Comparative data on NC in JSC "Uzbekugol" for 2018-2019

Enterprises	for 2018				for 2019			
	total	lightweight	heavy	death	total	lightweight	heavy	death
Branch "GT"	5	1	3	1	4		3	1
Branch "Razrez Apratak"	1		1		2	1		1
Branch "ATT"	1	1			1	1		
Branch "SMR"	1		1					
Branch "Razrez Angrensky"	3	1	1	1	2	1		1
Branch "DUSHS"					1	1		
Total:	11	3	6	2	10	4	3	3

Here are a few examples of accidents with different outcomes that occurred at the enterprises of Uzbekugol JSC during the first half of 2019.

1.(Easy outcome) on February 24, 2019, at about 4:30 am, electrician of the 3rd section of the DUSHS branch, Abduvakhobov I. (born in 1981) during the delivery of an electric motor 55 kW by a manual winch (zhak) by rolling with the help of a manual winch of the electric motor 55 kW, Abduvakhobov I. slipped from a jerk and pressed his right foot on the side of the metal support.

2.(Fatal) On March 9, 2019, at about 2:50 pm, at the Razrez Apartak branch, an accident occurred with the assistant driver of an excavator (EKG-4.6 B) of UZTM No. 19 Ismatullaev Abror Khalil ugli (born in 1994) at the site overburden mining and coal mining, during the repair work of the excavator, when tightening the central trunnion nut by turning the excavator, the locking pin jumped out, as a result of which the assistant driver received a head injury. After lying in a coma for 11 days, he died on March 20, 2019 at about 11 a.m. in a specialized multifunctional hospital No. 39 in Tashkent.

3.(Fatal outcome) On the night of April 3-4 at about 00:15 there was an accident with a fatal outcome with the driver of the excavator EKG-15 No. when the YAKNO door was closed, a power breakdown occurred on the YAKNO and on the cable with the release of an electric arc, while the YAKNO, which was at that time near the door on the control side, having received an electric shock from the step voltage, fell to the ground. After providing first aid, the victim was taken to the Angren city hospital, after which the doctors of the city hospital pronounced the death of the excavator driver Abdumannob Ruzievich Erkaev.

4. (Severe outcome) April 22, 2019 at about 12:15 pm on the railway track EKG No. 57 of the Podzemgaz station during the cleaning of the railway track with a forklift Acting head of section No. 2 of the track service of the ZhT branch Baltabaev Abduazim Abdujabbarovich 1991 of the year of birth was injured by crushing his left leg with a P50 rail. Below is a comparative table of accidents in JSC "Uzbekuol" in the period from 2018 to 2019 (Chart 2.)

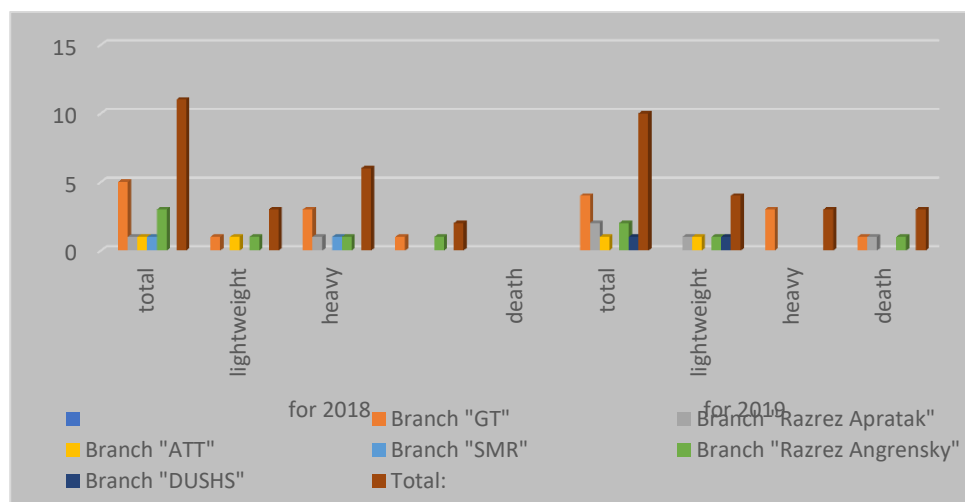


Fig1. Dynamics of accidents that occurred at the enterprises of “Uzbekugol” JSC in the period 2018-2019

In this regard, the purpose of the study is to identify and analyze the possible causes of industrial injuries through the use of a statistical method at the workplace of the organization of the coal industry. Figure 1 shows the results of the analysis of the National Assembly on the severity of injuries and injuries. Conducting an analysis in the divisions of the organization, it was determined that the most traumatic divisions are the “ZhT” Branch (40%), the “Angrensky

Mine” Branch (25%) and the “Apartak Mine” Branch (20%). In order to reduce injuries in these units, it is necessary to take measures to prevent industrial injuries, as well as to strengthen control over compliance with labor protection requirements and the provision of workers with personal protective equipment.

RESULTS AND DISCUSSION. As a result of the weakening of administrative control and personal negligence of employees at the branches of “Uzbekugol” JSC in the period of 2020, 12 accidents occurred, of which:

- 2 with mild, 1 with severe, 2 with a fatal outcome at the branch of "Railway Transport";
- 1 group (of which 1 with a mild and 2 with a severe outcome) at the branch "Razrez Apartak";
- 1 with an easy outcome at the ATT branch;
- 2 with a mild and 1 with a severe outcome at the Angren Open-Pit Mine;
- 1 with a mild and 1 with a severe outcome at the RGTO branch.

1. (Severe outcome) On January 11, 2020, on the second shift at about 10 p.m., an accident occurred with ERU foreman Turdiev Dilshod Saidulloevich, born in 1984, at the ERU site (electrical repair site) of the RGTO branch. During a visual inspection of electrical machines Turdiev D.S. walked over the electric motors and counted the number of electric motors that were stored in three rows, while descending, slipping with his right foot, hit the protruding shaft of a 100 kW electric motor, fell to the ground and was injured, after which he was taken to the city hospital of Angren.

Causes of the accident:

- Realizing the risk of injury, Turdiev D. climbed on the repaired electric motors, stored in a heap, which is a violation of safety. - Absence of corridors between the stored repaired electric motors;
- Weak labor discipline among the workers and engineers of the electrical repair section.

2. (Easy outcome) On February 15, 2020, in the first shift at about 2:20 pm, on the railway track No. 10 of the Uglesborochnaya station, during the shunting of locomotives, a diesel locomotive No. 058 and a railcar AGD-552 collided, as a result of which bodily injury was inflicted of the front area, the assistant to the railcar driver of the section of the depot for the repair of diesel locomotives of the ZhT branch, Inamov Sherzod Abdurahmon ugli, born in 1989, was injured.

Causes of the accident:

- Lack of caution and loss of vigilance on the way of the driver and assistant driver of the diesel locomotive DPT Uralov B., and Zhuraev F., and the driver of the railcar DPT Sultanov M.
- Violation of the requirements of the rules of negotiations by the duty officer Vokhobov A.
- Violation of the requirements of the TPA of the station "Uglesborochnaya" by the duty officer at the railway station Mirzaev Sh.

3. (Easy outcome) on February 15, 2020, in the second shift at about 01:50 am on the railway track EKG No. 86 of the Podzemgaz station when dispersing reinforced concrete sleepers using an auxiliary mount (crowbar) from a relaxed terminal bolt on one side of the railway b sleeper, unhooked from the rail, after which he pressed the first phalanx of the third and fourth fingers of the right hand of the track fitter of section No. 5 of the track service of the ZhT branch Baimuratov Bakhridin Abduganievich, born in 1973.

Causes of the accident:

- Personal negligence and loss of vigilance in the production of track work by the fitter of the track of the track service Baimuratov B.

-Weak labor discipline among engineering and technical workers of the track service in compliance with the rules and instructions for labor protection and safety. One of the main factors determining the propensity of an employee to injury is age. The dynamics of injuries in the organization, depending on age, revealed that employees aged 18 to 30 years old, as well

as over 50, have the greatest tendency to industrial injuries. In the first case, a high level of injuries is due to lack of experience, and in the second case, rather due to their great experience, they are too self-confident in their abilities and periodically neglect the requirements of labor protection, and attentiveness also weakens with age.

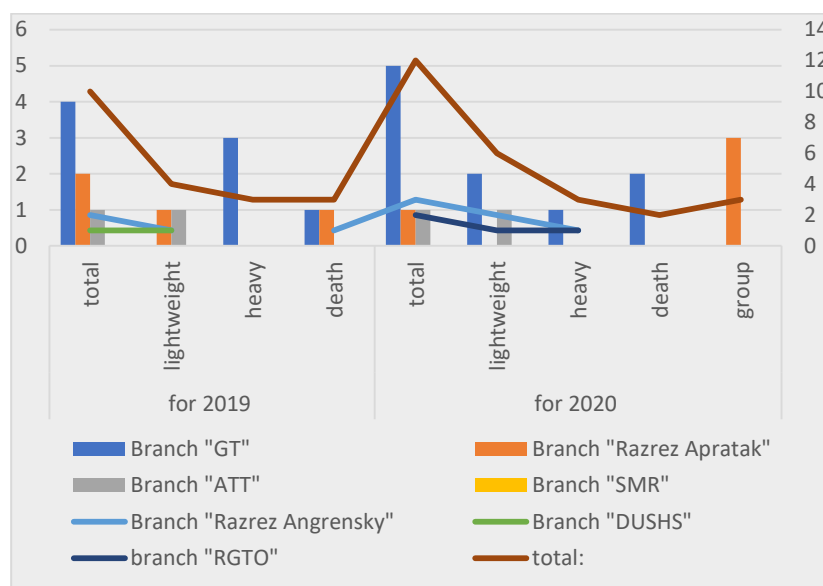


Fig 2. Dynamics of accidents that occurred at the enterprises of Uzbekugol JSC in 2020

All these data indicate that in order to reduce injury rates, it is necessary to use people over the age of 50 to perform the least intensive, complex and dangerous jobs. Young and inexperienced employees should only be paired with a more experienced employee (mentor), who will constantly monitor him during working hours and share his experience. To reduce the number of accidents, it is necessary to strengthen the conduct of labor protection briefings, more often conduct training in safe methods and techniques for performing work, on-the-job training and testing knowledge of labor protection requirements.

CONCLUSION. Thus, the analysis of industrial injuries in the organization showed that the most common types of accidents are: the impact of moving parts (29%), the deterioration of the employee's well-being (21%), road accidents (19%), falls from a height (13%). Based on this, the main reasons leading to NS were identified, which include: non-compliance with labor protection requirements (38%), violation of traffic rules (19%), deterioration of the employee's well-being (21%). Employees aged 18 to 30 and older than 50 are most prone to injury. Most accidents occurred between 8 and 10 am (42%).

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