

APPLICATION OF SAFETY MEASURES AT WORK AND ANALYSIS OF INJURIES IN PK "VRTLIŠTE" RMU "KAKANJ"

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Review article

<https://doi.org/10.58952/nit20231101055>

Summary

Safety at work is achieved through the application of modern, technical, health, social and other measures to prevent and eliminate the causes of injuries and health impairments at work. Today, when changes, especially those of a technological nature, have become almost the only certainty of modern business and long distances have become insignificant, most mines face the challenge of survival in the global market. Modern companies have recognized the necessity of quality and effective application of safety measures at work, but also their role in achieving a competitive advantage.

The paper will show which safety measures at work can increase the readiness of mining machines and devices, and protect workers from injury at PK „Vrtlište“ RMU „Kakanj“ d.o.o. Kakanj, because carelessness and speed are the most common causes of injuries, and they mostly happen on mining sites.

Keywords: *Protection measures, PK „Vrtlište“, mining sites, carelessness.*



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1 INTRODUCTION

Health and safety in the workplace are the main factors of sustainable development. In times of economic crisis, it is important to remember that poor safety and health in the workplace represents a significant financial loss and expense. It has been scientifically confirmed that work organizations that manage occupational safety and health (OHS) well have improved productivity and economic development. As a standard of human rights, the right to work basically means that access to work must be provided to every individual, without discrimination in working age. It is obliged to take concrete measures to increase the number of jobs and ensure fair working conditions. Important dimensions of the right to work are those that ensure dignified work, i.e. safe and healthy work. In order to protect the life and health of employees and the protection of the property of the Mine, the organizational units of the Mine are obliged to implement occupational safety measures prescribed by the Law on Mining, the Law on Occupational Safety, the Law on Environmental Protection and valid technical regulations adopted on the basis of laws and provisions from the Rulebook, as well as other normative acts that regulate safety at work, fire protection and protection of the human working and living environment.

According to the current legal regulations, every worker, economic unit and facility of the Mine is obliged to participate in the implementation of the prescribed occupational safety and health measures, to participate in the control and improvement of the existing occupational health and safety status, as well as the analysis and preparation of the Report on the occupational safety and health status.

2 PROTECTION MEASURES

At PK "Vrtlište", RMU "Kakanj" d.o.o. How are the occupational safety measures prescribed by the applicable laws, regulations and regulations in the field of mining and occupational safety applied. In addition, special safety measures at work specified in the GRP and other technical documentation are applied, on the basis of which work is carried out on PK "Vrtlište".

In order to delineate the obligations and responsibilities in the vertical and horizontal sense of management at PK "Vrtlište" the "Mining Law" is applied, which was published in the "Official Gazette of the Federation of BiH" number: 26, dated 5/5/2010, Sarajevo., Rulebook on the systematization of workplaces ZD RMU "Kakanj", "Regulation on occupational safety measures" ZD RMU "Kakanj" d.o.o. Kakanj, Rulebook on organizing the rescue unit and other regulations issued and approved by ZD RMU "Kakanj" d.o.o. Kakanj.

2.1. Special safety measures at work

- Training employees to work on specific business and work tasks.
- Acquaintance with the dangers that threaten the execution of certain jobs and work tasks, as well as the measures that must be taken in emergency circumstances.
- Conducting training and control examinations in the field of occupational safety in accordance with the "Law on Mining", which was published in the "Official Gazette of the Federation of BiH" number: 26, dated 5/5/2010, Sarajevo.
- Placement of warning and prohibition signs in all visible places.
- Increased supervision during work in extraordinary circumstances.

The Technical Manager of PK "Vrtlište" (Plant Manager) organizes and controls the keeping of all proper and necessary records and the book of reports, in particular:

- Shift report book (report book),
- Book of mining supervision,
- A book of written reports from the held exercises of the Specialized unit PK "Vrtlište",
- Book of work with explosives,
- Book of records of unexploded mines,
- Diary of machines, plants and devices,
- Book of issued and delivered instructions,
- Book of field visits and coal quality monitoring (geologists).

When organizing open pit mining, all legal regulations in the field of mining, the Law on Occupational Safety and the Rulebook on Technical Norms for Surface Mining of Mineral Resources should be followed. All dangerous factors for human life and health are difficult to predict in advance because certain factors occur only under certain conditions, very often short-term, regionally or generally.

According to the adopted technology and equipment, the following factors dangerous to the life and health of the employees may occur to a greater or lesser extent in the surface mine:

- sliding of the floor during dredging,
- blocks falling or material falling from the floor during dredging,
- unprofessional handling and equipment malfunction,
- improper work on digging-loading, transport and disposal, moving parts of machines and mechanisms,
- flying pieces of the processed material or tools with which the material is processed,
- thermal action (flame, steam, etc.),
- electrical voltage, air conditioning, dust, noise, vibrations, atmospheric discharges, etc.,
- unprofessional handling of flammable

liquids and explosives,

- non-use of personal and protective equipment,
- fluids under pressure,
- water, fire,
- occurrences of oxidation processes on exposed coal deposits

In order to reduce the mentioned dangers to a minimum, it is necessary to comply with the following valid legal regulations and regulations:

- Mining Law ("Official Gazette of FBiH" No. 26/10),
- Rulebook on technical standards,
- Rulebook on technical norms for the surface exploitation of mineral deposits ("Official Gazette of SFRY", no. 4/86 and 62/87),
- Rulebook on general measures and norms of occupational safety on work tools and devices (Official Gazette of SFRY No. 18/67),
- Rulebook on means of personal protection at work and personal protective equipment ("Sl.list SFRJ", no. 35/69),
- Law on the Traffic of Explosive Substances and Flammable Liquids and Gases - revised text ("Official Gazette of SFRY" no. 39/89 and 36/90),
- Law on the Transportation of Dangerous Goods ("Sl.list SFRJ" no. 27/90 and 45/90),
- Rulebook on technical standards for handling explosives and blasting in mining ("Official Gazette of SFRY", no. 26/88 and 63/88),
- Rulebook on protective measures when handling explosives and blasting in mining ("Official Gazette of the SFRY", no. 8/87 and 12/88),
- Rulebook on conditions for determining workplaces with special working conditions and medical examinations of workers in those workplaces ("Official Gazette of SRBiH" no. 2/91),
- Rulebook on technical measures and occupational safety when working on surface mines of coal, metallic and non-

metallic mineral raw materials ("Official Gazette of SFRY", no. 18/1961; 37/1964; 6/1967),

- Fire Protection Law, (Official Gazette of the Federation of BiH No. 64/09),
- Rulebook on means of personal protection at work and personal protective equipment,
- Law on Occupational Safety, (Official Gazette of the Federation of Bosnia and Herzegovina, No. 79/20),
- Rulebook on technical norms for electrical plants and devices in mines with surface exploitation of mineral raw materials; ("Official Gazette of the SFRY", No. 66/87, "Official Gazette of the SRJ", No. 16/92 and "Official Gazette of the RS", No. 37/2009),
- Rulebook on mandatory periodic inspections and tests of work tools, working and auxiliary rooms, as well as the procedure and manner of performing those inspections and tests.

Instructions for work and handling based on the aforementioned legal regulations, the instructions of the equipment manufacturer, as well as the specifics of the technological process, are issued by the technical manager of the surface mine (plant manager) with the consent of the occupational health and safety service.

- Protection measures during the execution of works on the surface mine "Vrtlište" are covered in the existing project documentation.
- In addition, the technical manager of PK "Vrtlište" (Plant Manager) issues all necessary instructions for the work and behavior of the staff employed at PK "Vrtlište".

3 ANALYSIS OF INJURIES AT WORK

3.1. Tabular overview of major and minor injuries 2020/21 year

Analyzing work-related injuries for 2020 and 2021, we can see that a total of 22 minor work-related injuries occurred. From the reports of accidents/injuries at work in 2021 (a total of 8 minor injuries), one injury was due to defective transport roads and roads, one due to worker fatigue, five due to carelessness when moving and one due to personal carelessness.

Analyzing this situation, one can come to the conclusion that in many cases, workers can be held responsible for this situation that arose as a result of their carelessness and lack of general control when performing their daily work activities. Every person employed in a mining company is responsible for the immediate implementation of safety measures at work within the scope of their work, which is determined by the Rulebook on safety measures at work in RMU "Kakanj" d.o.o. Kakanj, and as defined by the Law on Mining ("Official Gazette of the Federation of Bosnia and Herzegovina", number 26/10 of May 5, 2010).

Based on the review of injuries according to the sources of the accident, it can be concluded that the source of injuries was most often material, in 87.9% of cases (of which metal, stone, wood and coal are distinguished).

The material means caused the injury (12.1%). The source of these injuries is most often due to insufficient attention when handling and manipulating objects. From the review of injuries by age and qualification structure, it can be seen that most injuries are among workers between 35-45 years of age and 25-35 years of service. As far as the qualification structure is concerned, the most injured were

qualified workers, injuries and unqualified workers, followed by VK workers.

Regardless of statistical data, in order for the number of injuries to be as low as possible, all workers should be additionally trained practically and theoretically in order to improve their knowledge in the field of regulations and safety at work.

3.2. Overview of injuries by working days and shifts

Based on the examination by working days and shifts, the most injuries occurred on Mondays and Wednesdays and the least on Sundays and Saturdays. Most workers were injured in the first work shift, and the fewest workers were injured in the third work shift.

3.3. Evaluation of the degree of protection at work

The degree of protection at work for the year 2021 can be qualified as relatively satisfactory considering that in the mentioned period there were relatively favorable statistical data. It is important to note that in 2021, not a single serious injury occurred at the "Vrtlište" plant, and there were no fatal injuries.

However, despite relatively favorable statistical data, the fact is that most injuries at work in 2021 are of a minor nature, but there is still a large number of minor injuries that, due to their severity, were not even registered as injuries at work in the past years. A certain number of injuries are registered through the injury sheet in order to cover the costs of treatment of workers who were treated at the Cantonal Hospital in Zenica.

In the coming period, it is necessary to invest more in the education of workers in the knowledge of elementary regulations and measures in the field of occupational safety, more strictly conduct control examinations, as well as the introduction of sanctions for workers who endanger personal and collective safety in any way.

CONCLUSION

In 2021, the following activities were carried out at the PK "Vrtlište" plant when it comes to the state of occupational health and safety of workers and equipment observed by the mining and machinery inspector:

- Roads in work sites and landfills should be built as high quality as possible, with as few climbs as possible in order to obtain the highest quality and safest transport of tailings and coal,
- Regular maintenance of the existing perimeter channels and regular maintenance of protective barriers. At the intersections of main and multi-level roads, check the correctness and existence of traffic signs "speed limit and priority of passage", and in case of lack thereof, supplement them,
- It is necessary to open a lending facility in order to obtain quality stone (limestone) for road filling, it is also necessary to acquire suitable machines to perform the necessary works,
- Work on all floors should be done with a slight rise, in order to obtain natural drainage of precipitation and other water,
- Regular dusting on all roads. Regularly deliver fresh drinking water for the needs of workers at work sites,
- Repair air conditioners on all machines that are faulty, and on other machines that do not have air conditioners, perform adequate heating and cooling of the cabin space, as well as ventilation,
- Regularly procure sufficient quantities of high-quality personal protective equipment and protective equipment for the needs of workers,
- On the Bosna river, in addition to the current pump, it is necessary to install a pumping plant with a larger capacity that will meet the needs for water, the needs of PPPiU, car washes, cisterns for dust collection on dumper roads P.K. "Carousel",
- Bring running drinking water for the needs of workers of the transshipment

- system, as well as for workers in the workshops of the old circle,
- Perform anti-corrosion protection of fences on all stairways and the bridge of the transshipment system,
 - Resolve insulation, lighting and drafts in the hall of the auxiliary machinery maintenance workshop, introduce adequate heating in winter days and introduce ventilation,
 - Get the appropriate tools and aids (mandatory a crane with a weight capacity of at least 25 t),
 - Install roller doors in the hall of the Repair Center in order to reduce uncontrolled air flow,
 - Introduce adequate heating of the repair center hall as well as the VJS workshop,
 - Make an adequate surface (concrete or asphalt) in front of the repair center hall, the repair center section - gate 3, as well as the parking area,
 - Solve storm water drains around the workshops in the old circle as well as on the plateau of the repair center and in the part of the road repair center - gate 3, laundry,
 - Regularly cut vegetation around all workshops, oil and grease, gas and oxygen warehouses, around all hydrants, VNR, BTS stations and the pumping station on the river Bosna,
 - Regular cleaning and disinfection of the wardrobe area, spa and wet areas,
 - Sufficient medical supplies should be provided to supplement first aid on the means of work.
- Herzegovina, No. 79 of October 30, 2020).
4. Rulebook on technical standards for surface exploitation of mineral deposits ("Official Gazette of SFRY", no. 4/86 and 62/87);
 5. Rulebook on keeping records, keeping documents and content of the annual report in the field of occupational safety ("Official Gazette of the SR BiH", number 2/'91).

LITERATURE

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