



A SYSTEMATIC APPROACH TO THE MANAGEMENT OF WORKING CONDITIONS, HEALTH STATUS AND RISK FACTORS OF THE WORKERS OF COPPER PRODUCTION ENTERPRISES

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Abstract. The copper production industry of Uzbekistan is strengthening its position year by year. After all, our country occupies one of the leading positions in the production of ferrous and non-ferrous metals in the Central Asian region due to the presence of a powerful mineral raw material base and copper production enterprises. The importance of the mining and metallurgical industry in the development and strengthening of the economic potential of the country is important. Among them are the Navoi Mining and Metallurgical Combine, Almalyk Mining and Metallurgical Combine, "O`zmetkombinat" Joint-Stock Production Association, "O`zolmosoltin" Association, and the Republican Organization "Maxsusqotishma". About 40,000 miners and metallurgists are united in "Almaliq mining and metallurgical combine" alone, and 7% of the industrial products produced in the country and 15% of the export amount are accounted for by this combine. In this industry, the copper production enterprise occupies a leading position, and more than 30% of the workers of "Almaliq mining and metallurgical combine" are employed. Therefore, increasing the labor efficiency of workers in enterprises is inextricably linked with the working conditions and, of course, the health status of workers. This sets the task of further improving the medical service provided to the workers of industrial enterprises, shows the need to develop science-based comprehensive measures to optimize working conditions and improve the health of workers.

Key words: *mining industry, copper, age, length of service, health status, illness, Harmful and dangerous working conditions, risk factors, temporary incapacity for work.*

The most important indicator of public health is the health of the working population, which determines the quality of labor resources, labor productivity, and the value of the gross domestic product. Maintaining and strengthening the health of the working population is one of the most important social reasons that must be addressed by the state policy, because the country's socio-economic development and national security depend on it (6,7,1).

The global strategy of the World Health Organization (WHO) for the protection of the health of the working population is to protect health at the workplace, maintain and strengthen the working capacity of employees of enterprises and institutions, create production conditions that meet the requirements of safety and health, and improve health at the workplace development of complex measures aimed at creating a positive psycho-emotional and social environment in production together with increasing labor productivity. The strategy of the WHO defines a number of priority tasks, including issues of reducing and eliminating harmful and dangerous factors of production conditions and scientific justification of protection systems. (5)

Many studies conducted in our country and in foreign countries show serious changes in the health of the population under the influence of environmental pollution and various factors. (15,16,17,18,19,20)

Unfavorable working conditions are the main reason for the deterioration of the health status of representatives of various professions and the development of occupational diseases. (1,2)

Scientific information about working conditions and health indicators of workers of copper production enterprises, which is a separate branch of industry, is diverse and often contradictory in the scientific literature in recent years. A number of authors have emphasized the relative stability of working conditions, that is, in most cases they admit that they pose high and extremely high occupational risks (32,33,34,35).

In other scientific sources, researchers indicate the need to re-equip enterprises and introduce new technology in order to reduce the intensity of exposure to harmful and dangerous factors of the working environment and to organize a satisfactory work process (3)

According to the experts of the International Labor Protection Organization (ILO), the mining and metallurgical industry is considered as a unique sector, in which workers are affected by harsh working conditions, harmful and dangerous production factors. (23,24,30)

The working conditions of the employees of the copper production enterprise are characterized by a number of unfavorable production factors, mainly high levels of dust, fibrinogenic aerosols, strong noise, vibration and unfavorable microclimate, the severity of work, the levels of which significantly exceed hygienic standards. (10,11,31)

Harmful and dangerous working conditions, occupational and production-related diseases, accidents and medical-social and economic damages caused by a high level of disability are one of the important problems of occupational hygiene and health. (12,13,14).

The mining and metallurgical industry, which occupies one of the leading positions in the country's economy, continues to be characterized by the most harmful and dangerous working conditions. At the current stage of technical re-equipment of underground and open-pit mining enterprises, labor productivity is increasing and the number of workers is decreasing due to the use of powerful, high-performance mining equipment. At the same time, in such conditions, the introduction of effective means against dust, noise and vibrations, and the normalization of microclimate indicators in workplaces often lag behind. All this can lead to the deterioration of existing working conditions, changes in the indicators of general and occupational morbidity of miners. Closure of medical units and their removal from the structure of enterprises require improvement of measures of providing medical services to workers of copper production enterprises, especially in hard-to-reach, remote regions of our country. Hygienic studies conducted in a number of metallurgical industries have shown that the health of workers is affected by a set of factors of working conditions, the levels of which often exceed permissible concentrations (PC) and permissible levels (PL). At the same time, dust, noise and vibration factors are leading in the formation of working conditions (5,7)

Mineral resources are one of the foundations of human existence and determine the future of world civilization. The volume of use of mineral raw materials increases naturally with the development of science and technology and the increase in the standard of living of the world's population. (21,22)



Solving issues of health care of the working population should occupy a special place among the priorities of the state policy in the field of labor protection and health care (1,2,3,4,8,15)

In the Republic of Uzbekistan, great attention is paid to the protection of the health of the working-age population, which especially applies to economic sectors with unfavorable factors of working conditions, which have a negative impact on the main contingent of workers. According to the statistical data of the Scientific Research Institute of Sanitary, Hygiene and Occupational Diseases, the level of occupational disease of workers in the metallurgical industry (per 10,000 people of working age) is significantly higher than in other sectors of Uzbekistan (9).

Due to the specific characteristics of work in production, physical and excessive stress, adverse environmental factors, mining workers are a group with a high risk of developing various somatic and reproductive diseases. The state of their health affects the economic indicators of the enterprise, so it can be considered an important component of the productive power of society. (25,26,15)

The introduction of new technological processes of mineral concentration and modern powerful equipment can significantly affect the level of production and occupational factors and the health of workers of processing enterprises. A complex of harmful production factors not only causes the development of professional occupational diseases among workers of processing enterprises, but also affects the prevalence and course of general somatic diseases. (27,28,29)

In the modern conditions of copper production enterprises, workers are affected by a complex of unfavorable production factors that determine the level and character of occupational disease. Failure to comply with the normalized operating modes of dust control means increases the amount of dust in the air at workplaces. 82.3% in underground works and 56.2% in open-pit mining fall into the 3rd class of various degrees of danger.

At the same time, the dynamic observations of various research and medical institutes show that the main unfavorable production factor in underground works remains dust, the formation of which is accompanied by the performance of all production processes. The level of dust emission depends on the geological conditions of the mine, the strength of the rocks, the conditions of formation, and the equipment used. Combine drivers and support operators of cleaning complexes may be exposed to tens or hundreds of mg/m³ of dust in their work area (17).

The concentration of dust in the workplaces of ore mines is quite low, and as a result of the use of a complex of anti-dust agents and their effective use, the amount of dust is reduced to a level close to hygienic standards. It should be noted that a particularly acute situation has arisen in the Far North mines, where almost all production operations are carried out without the use of dust control equipment, and air dusting during drilling operations reaches very high values. (18,29,19)

The analysis of literature sources showed that in the copper-producing countries, the analysis of the state of health of workers and the assessment of occupational risks, ensuring their safety, and researches related to the health and labor protection of workers are being carried out. A number of scientific studies were conducted by foreign scientists in order to determine the impact of production factors on the body of workers engaged in copper production (12,28,35). Based on the analysis of literature sources, it has been determined that

there are scientific works dedicated to the study of production factors such as industrial dust, noise, vibration and heavy physical labor typical of copper mining workers in the open and underground method (15,26). The works of a number of foreign scientists have been devoted to the study of common diseases and occupational diseases of copper industry workers. The effects of dust on morbidity rates associated with temporary disability have been investigated (9,16,18). There are a number of scientific works dedicated to the protection of miners' health and ensuring labor safety in foreign countries (33,34,35). Studies have been conducted on the influence of unfavorable factors of working conditions (noise, vibration, dust) on the development of production-related and occupational diseases and their prediction.

A comparison of the data of the studied scientific literature on the study of the working conditions of workers working in copper production enterprises with the prevalence of disease by disease classes and their levels may be pathogenetically related to the factors of the working environment.

The authors often focused on the effect of physical and chemical factors. Most scientific research data does not cover the effects of climate conditions. Collective, complex scientific works have not been conducted to connect the whole set of risk factors with production conditions and lifestyle of workers.

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