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FEATURES OF WORKING CONDITIONS OF EMPLOYEES IN THE TASHKENT METROPOLITAN

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Abstract

The relevance of the research topic is determined by the need for comprehensive modernization and restructuring of transport networks and transport infrastructure through the formation and development of transport hubs that ensure the most effective interaction of all elements of the transport system. The primary objective of passenger transport is to fully meet the public's transportation needs. Transportation is one of the most pressing challenges facing large cities and metropolitan areas, and with their growth and development, it is becoming increasingly pressing socially, urbanistically, and economically.

Keywords: Working conditions, hazardous production factors, noise, vibration, microclimate, subway.

Introduction

Characteristic features of modern large cities around the world include rapid population growth, the development of transportation arteries and energy systems, and increasing environmental threats. One of the main challenges is addressing urban transportation, primarily due to the increasing number of cars, which is four to five times faster than the population growth rate, the exhaustion of thoroughfares, and the lack of parking spaces [6,8,9].

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The metro is of great social importance as the most efficient and convenient form of urban transport, providing high-speed, regular, mass transit for passengers with intervals of 1,5 to 5 minutes and guaranteed travel times. The role of the metro is growing significantly due to population growth and the expansion of city boundaries, particularly with the development of suburban areas [1,3,10]. At the same time, the metro is a large and complex complex of various engineering structures equipped with modern automated technology designed to ensure uninterrupted passenger service on a precise schedule.

Metro trains operate regularly according to a schedule. The metro boasts high speeds (up to 80 km/h) and high carrying capacity. Metro lines can be built underground in tunnels, on the surface, or on elevated tracks [2,7].

The metro plays a vital economic and social role, evolving in terms of engineering technology, strategically, and economically, supporting the development of remote and hard-to-reach regions. At the same time, the development of high-speed rail allows rail to compete with air transport for passenger service between major population centers [4,5].

Purpose of inspection: Based on the study of the impact of complex factors on the body of workers in the metro, to determine the class of working conditions of harmful and dangerous factors and to develop comprehensive measures aimed at optimizing working conditions and improving work ability.

Inspection methods: Meteorological indicators were measured with the help of the meteoscope-M device in the working area at a height of 1,25-1,5 m from the ground. The obtained results were evaluated based on SanN and R №0324-16 "Sanitary norms of the microclimate of production rooms".

Noise level measurements were carried out in accordance with Gos. St. 12.1.050-86 “Methods for measuring noise in workplaces”. The sound pressure level was measured directly at workplaces using the SVAN-943 instrument. The results

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obtained were evaluated in accordance with SanN and R № 0325-16 "Permissible sanitary norms for noise levels in workplaces" and SanN and R № 0326-16 "Sanitary norms for general and local vibrations in workplaces".

The results and their discussion. Every day, at least 780,000 passengers, visitors, and tourists use the Tashkent metro. The Tashkent Metro is the only metro in Uzbekistan and the first in Central Asia. It ranks 68th in the world by length of operating lines. The metro is a complex of above-ground and underground engineering structures that encompass virtually all hazardous and dangerous industrial factors—physical, chemical, biological, and ergonomic—that can negatively impact workers' health and lead to occupational diseases. Therefore, ensuring safe working conditions during work is one of the most important tasks for metro management. As an element of the transport system, the metro possesses all the characteristics of an industrial environment. Traffic management issues and the sustainability of the transport process also create specific challenges.

he level of performance of a metro worker depends on his health and age, length of service and professional skills, the specifics of the production process, work organization and work environment.

The specific nature of metro work places increased demands on creating conditions that ensure safety, health, and productivity. According to literature, the work of metro train drivers and assistant drivers involves high levels of emotional stress, limited time for decision-making, and responsibility for passenger safety. In combination with other production factors, such as increased noise levels in the workplace, local and general vibration, microclimate, complete or partial absence of natural light, changes in lighting, abrupt changes in artificial and natural lighting, high work stress, people employed in these professions may develop chronic fatigue, overexertion, accelerated biological aging, occupational and work-related diseases.

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At metro facilities, including stations, underground passages, and rolling stock, all groups of environmental factors are present: physical, chemical, and biological, which impact human health.

Noise is the main occupational factor affecting unscheduled call-outs among locomotive crew members. Noise exposure leads to the development of sensorineural hearing loss, which affects more than a third of the working population; the majority of those affected are men. The primary cause of this condition is inadequate hearing protection. Locomotive crew workers are considered to be the primary occupational risk group for developing sensorineural hearing loss. Among occupational diseases among locomotive crew workers, sensorineural hearing loss ranks first, occurring in over 50% of cases. In recent years, it has been reported that the risk of developing sensorineural hearing loss increases in the presence of uncontrolled hypertension. On the other hand, chronic noise exposure can increase the risk of developing hearing damage.

Sound and sound pressure levels in workplaces and passenger areas exceeded the established standards in 46-54% of the studies conducted. Analysis of noise study results showed that noise levels in metro stations were, on average, 86% higher than expected, and during peak hours, 98% higher than expected. Additionally, on station platforms, exceedances of the permissible level were detected, with an average value of 97% and a 100% increase during peak hours. Equivalent sound levels on underground metro station platforms during peak hours are up to 90 dBA, and up to 85 dBA during off-peak hours. At outdoor stations, these levels are up to 77 and 71 dBA. The maximum sound level on underground metro station platforms during peak hours is up to 104 dBA, up to 98 dBA during off-peak hours, and 90 and 85 dBA at outdoor stations. This indicates that the increase in sound levels during peak hours is due to increased train traffic and passenger flow. General vibration levels at most subway worker workstations exceed the maximum permissible level. The highest levels are recorded in the driver's cabin

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when the train is moving, exceeding the maximum permissible level by 14-20 dB.

Microclimate parameters in the driver's compartment of electric trains were studied during the cold season. The air temperature in the cabs of electric trains on lines with access to open surfaces ranged from 14 to 20,6^{0}C, which is below the permissible level (21 to 23^{0}C). On the line without access to open ground, temperatures ranged from 19,6 to 22,2^{0}C. Relative humidity in the workplace ranged from 36 to 54%, while the permissible range is 40 to 60%. Air velocity was 0,1 to 0,18 m/s, while the permissible range is 0,1 m/s. As can be seen from the data provided, the air temperature in the commuter train cabins was below the permissible limits. Lower temperatures and a greater range of temperature fluctuations were observed on lines extending to open ground. Temperature fluctuations at the driver's workstations were small and close to acceptable levels. Relative humidity and air velocity in the train cabins were within acceptable limits or only slightly above them and were independent of line type.

Thus, the working conditions of the drivers working in the metro belong to the 2nd level of the harmful 3rd class based on SanN and R№ 0141-03 "Hygienic description of the working conditions according to the harmful indicators and dangerous factors in the production environment, the severity and intensity of the work process".

Conclusion

Metro workers are exposed to harmful and hazardous factors in the work environment. This places increased demands on their body's compensatory capabilities and leads to increased morbidity, necessitating the development of preventive measures.

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