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Professional Risks in Construction Industry

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Abstract

The construction industry is the most dangerous sector of economy. The paper analyses the occupational risk assessment methods recommended in the normative documents and scientific publications. The selection of methods that can be used for the assessment of risks in construction industry is conducted. The largest building organizations of the Irkutsk region, engaged in the construction of housing, as well as the working conditions of construction workers are considered. The results of the assessment of occupational risks in 6 building organizations of the Irkutsk region are introduced using three methods. According to the assessment results it is established that the electric and gas welder, bricklayer, concrete worker, carpenter are constructional occupations with the greatest occupational risks. The greatest relative occupational risks are observed in the construction and investment company LLC ISK Vysota and JSC Sibaviastroi, which indicates the low level of organization of labor protection here, as well as the technical condition of the equipment used for the execution of works. Practical recommendations to improve working conditions and reduce occupational risks in building organizations of the Irkutsk region are given.

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1. Introduction.

Construction is one of the largest sectors in the world that meets the requirements of the economy and the programs of construction, reconstruction, maintenance and removal of buildings in all countries. It eliminates the consequences of natural and man-made disasters. A large number of employees are employed in the construction industry. As estimated by the US Bureau of Labor Statistics, 6.34 million people were employed in the construction

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industry in 2015; the number of people employed in the construction in Russia reached 1.78 million people. According to the Ministry of Construction of Russia, 132.8 thousand companies carried out activities in the construction industry in Russia on November 2015, including 110.5 thousand companies were engaged in construction and reconstruction, 39.7 thousand more in planning and design organizations, and 10.6 thousand companies performed engineering surveys. At the same time 94% of companies are micro and small businesses, and 3% are for medium and large businesses.

The construction industry is the most dangerous sector of economy. According to the assessment carried out by the International Labor Organization, up to 60 000 fatal work injuries occur annually on the construction sites all over the world. This means that one fatal work injury occurs every 10 minutes in this sector, and about 17% of fatal work injuries (one out of six accidents) occurs on the construction sites.

Experts consider the following objective reasons for the high injury rate in this sphere of economy: lack of supervision over the correct and safe work execution - up to 30% of accidents; deficiencies in the training and testing of knowledge on labor protection - 11.9%; unserviceable equipment operation - up to 23%; a flagrant violation of safety rules - up to 16%; violation of technological rules, the lack of projects for construction organization, work production plans, and other documents or their poor-quality development - up to 14%.

It is known that the highest rate of occupational injuries was registered in construction organizations of small businesses, where there is a lower level of production discipline and administrative control over labor and its protection statutory compliance.

Despite the mechanization and occupational risks for workers, the construction industry requires a lot of manual labor and is one of the most significant sectors of economy. Due to peculiarities of the work on construction sites, the working conditions in the workplace often change, changing occupational risks to workers too. In addition, traditionally large number of migrants from countries with low wages, hired informally and on a short term basis, are employed in the industry.

According to Rospotrebnadzor [1], the main adverse factors, affecting the construction workers and leading to the reduction of efficiency and loss of health, are increased levels of noise and vibration, dust and fumes in the air in the working area, unfavorable microclimatic conditions, chemical factor, as well as the severity and intensity of labor process.

It is found that on average about 16% of construction workers are exposed to harmful chemicals during half the working hours. Harmful chemicals include paint, resins, mortars, combustive and lubricating materials, adhesives, products of combustion during electrical and gas welding, the exhaust gases of vehicles, etc.

Among occupational diseases that are widespread in the enterprises of the construction industry, and that occur due to the influence of chemical factors are: acute and chronic intoxication and its consequences with the isolated or combined lesions of various organs and systems; skin diseases (contact dermatitis, photocontact dermatitis, toxic melasma, oil folliculitis); metal fever; chronic toxic-dust bronchitis; chronic professional bronchitis of mixed etiology; chronic toxic (obstructive) bronchitis, as well as pneumoconiosis (silicosis, siderosilicosis, anthracosilicosis, silico-asbestosis, asbestosis, carbon pneumoconiosis and other pneumoconiosis resulted from fibrogenic dust) [2,3].

Electric welders of manual welding, painters and repairmen are those who usually suffer from chronic occupational diseases.

A significant number of occupational diseases that the construction workers suffer from are due to harmful physical factors. The most common pathologies are sensorineural hearing loss, vibration disease, autonomic-sensory (angioneurosis) or sensorimotor polyneuropathy of hands, actinic ray ophthalmia, cataracts, neuritis, vegetovascular dystonia, asthenic syndrome, overheating (heatstroke, convulsive state), chronic overheating (vegetative-vascular dysfunction of permanent and paroxysmal flow), obliterating endarteritis, autonomic-sensory polyneuropathy (angiopathy), polyradiculoneuropathy, etc.

Professional risks of injury rate of construction workers are associated with the specifics of the work, including high-altitude activities (falling from roofs, building timbers, ladders, etc.), earthwork operations (trench collapse, exploitation of earth-moving machinery), the use of lifting equipment (cranes and hauling winches), the use of electrical equipment and manual tools, as well as vehicles on the construction sites. Construction sites are often a mess and cluttered, which cause different accidents.

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