A. Paliukh (PSACEA, Dnipro)
Scientific supervisor: M. Nalysko, Dr. Sc. (Tech), Prof.
Language consultant: N. Shashkina, Cand. Sc. (Phil), Assoc. Prof.

EVALUATION OF PROFESSIONAL RISKS ACCORDING TO EUROPEAN STANDARDS

Risk assessment as the main component of the health and safety management system of workers is provided for by the legislative requirements of many countries of the world. In particular, in the international standard ISO 45001, the need for this process is indicated as a basic requirement (clause 6.1.2), which helps to comply with the law, determine work priorities and protect the life and health of employees. [1]

The requirements for a risk-oriented system of employee health safety and risk assessment are declared in the documents of the International Labor Organization, the European Commission, which is the highest executive authority in the EU, and are prescribed in the legislation of most countries. For example, in Great Britain, the fulfillment of this requirement was legally defined 30 years ago.

International Labor Organization Convention No. 155 on Occupational Safety and Health and the Working Environment states that "Employers shall be required, as far as is reasonably practicable, to ensure the safety of workplaces, machinery, equipment and processes under their control, and absence of a threat to health from their side" (Part 4, Article 16, Clause 1).

The framework directive 89/391/EEC, which aims to introduce measures to encourage improvements in the health and safety of workers, lists the following general principles of injury prevention [2]: avoiding risks; risk assessment; overcoming risks at the source of their occurrence; adaptation of work to personality; adaptation to technical progress; replacement of dangerous with safe or less dangerous; development of an agreed general prevention policy; the priority of collective protection measures over individual protection measures; providing appropriate training to employees.

And it is also stated that “the employer must assess all risks for the safety and health of employees, in particular in the selection of work equipment, chemicals or drugs used, as well as the equipment of workplaces”. Therefore, the employer has an obligation to ensure the safety and health of employees in every aspect related to work. The purpose of conducting a risk assessment is to effectively take measures to protect workers.

The risk assessment process consists of [2]: 1) detection of dangers; 2) risk assessment; 3) ranking of risks; 4) documentation of results; 5) periodic review of assessment results.

There are no generally accepted prescriptions for risk assessment. However, there are several principles that should always be taken into account. The assessment process should be structured to ensure coverage of all important hazards and risks. Qualified specialists, as well as managers, should be involved in the identification of hazards in order to understand as precisely as possible what problems exist in the working environment. Once a risk is identified, the assessment should begin by asking whether and how it can be eliminated.

Various approaches and combinations of approaches are used to assess workplace risks. They are usually based on the following elements [2]: observation of the production environment (condition of the floor, safety of machines, temperature, lighting, noise, etc.); definition of tasks performed at the workplace and consideration of them from the point of view of risk assessment; bserving work performance and considering different work patterns to assess the impact of hazards; consideration of external factors that may affect the workplace, for example, weather conditions for workers who work outdoors; study of psychological, social and physical factors that can cause stress at work; consideration of organizational measures.

The results of the observations can be compared with the criteria for ensuring safety and health, which are based on the requirements of legislation, national standards and guidelines, and the principles of the hierarchy of risk prevention.

Risk assessment is not a one-time action. Risk management is a continuous process. The assessment results are reviewed at regular intervals. For example, the company does this on a regular

basis once a year. It is mandatory to review in the event of the appearance of new equipment, production, technological, other changes that have taken place at the enterprise.

Competent employees who are well versed in all the nuances of the operation of mechanisms, equipment, and other objects of evaluation, who are able to see comprehensively, deeply and recognize dangers, should be involved in reviewing the evaluation results. [2] Competence is critical, so when necessary, third-party qualified experts are involved in the evaluation.

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B. Petrenko (PSACEA, Dnipro)
Scientific supervisor: A. Petrenko, Cand. Sc. (Tech), Assoc. Prof.
Language consultant: L. Druzhinina, Assoc. Prof.

ENSURING NORMAL MICROCLIMATE CONDITIONS TAKING INTO ACCOUNT MATHEMATICAL MODELING OF HEAT EXCHANGE PROCESSES

Human health and performance are greatly influenced by indoor environmental conditions that affect heat exchange with surrounding surfaces. These conditions are determined by a combination of temperature, relative humidity, air velocity, surface temperature around humans, and thermal (infrared) radiation intensity [1].

Building envelopes play a crucial role in creating the indoor microclimate. Similar to clothing, they protect individuals from adverse environmental influences and allow them to live in almost any climatic conditions on the globe [2].

Heat exchange through radiation occurs between surfaces at different temperatures [3, 4,]. The geometric characteristics of shape and their mutual arrangement play a significant role in calculating the radiative heat exchange between heated surfaces. The influence of these characteristics is taken into account by scope coefficients φ, determining the geometric conditions for direct energy exchange between two surfaces in a non-absorbing medium. In accordance with the terminology of Y.A. Surinov [5], this coefficient is referred to as the generalized angular coefficient in certain publications.

It is convenient to use the concept of the irradiance coefficient φ, which is a geometric property.

The spectral composition and intensity of the radiation are also important for evaluating the influence of thermal radiation. Since the intensity of thermal radiation is spatially non-uniform, its evaluation should be done separately for each point. The irradia0nce of a given part of the body depends on its spatial orientation with respect to the source of thermal radiation. This quantity is vectorial in nature and multivalued at each point in space.

Various alternatives need to be considered to select the most appropriate human body model for further experimentation and mathematical modeling.

The problem of ensuring normal microclimate conditions will be considered, taking into account the mathematical modeling of the heat exchange process.

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