VOCATIONAL EDUCATION OF LABOUR RESOURCES AS A CONDITION FOR THE SAFE DEVELOPMENT OF THE ARCTIC LATITUDES

Bashkireva Tatiana¹, Bashkireva Anastasia¹, Alexander Morozov², Larisa Baykova¹

¹Ryazan State University named after S.A. Yesenin, Ryazan, Russia
²The Federal State Institution “Research Institute of the of the Federal penitentiary service of Russia”, Moscow, Russia

e-mail: bashkirevat@bk.ru

Abstract. The paper provides an analysis of the problems of vocational education and professional health of specialists who carry out their labour activities in the conditions of development of the Arctic latitudes. It understood that the low level of training of specialists, the lack of information on medical, environmental, educational and professional monitoring, could lead to technological disasters due to the human factor, which is unacceptable in the Arctic. The solution to the problem of vocational education of labour resources, their moral and ethical responsibility are extremely important in the implementation of biomedical, psychological, social health monitoring, which will rationally solve the issues of training specialists for work in extreme conditions of the Arctic latitudes.

Keywords. Professional education; professional, biomedical, mental, psychological, social health; human factor; technological disasters

1. Introduction
In connection with the intensive development of scientific and technological progress in the 21st century, the development of new climatogeographic zones of the Far North, Arctic latitudes, migration processes are activated, new professions appear that a person has to master for the first time. Under these conditions, it is extremely important to study the adaptation of various groups to changing environmental conditions in which a specialist has to perform labour activities within the framework of a particular profession. Human life and activity in modern society was inextricably linked with the periodic or prolonged intensive influence of such adverse factors or conditions as production, environmental, social and economic and others, to which the body responds with adaptive reactions and adaptation [11].

The need to study the professional aspects of the development of the need to cope with stress was aim at maintaining health in the interests of effective and safe fulfilment of tasks in the conditions of professional activity, including extreme situations. Extreme situations arise in any profession; the conditions that accompany work are associated with a risk to health and life. Arctic Russian latitudes are distinguish by extreme living conditions associated with the peculiarities of their geographical location. Stretching from west to east for almost ten thousand kilometres located in 11 time zones, this territory has diverse climatic, helio-geomagnetic, ecosexual and other features that are not well-understood [8]. The development of the Arctic is associated with the implementation of professional labour in those territories in which man has never lived. The ambitious plans for large-scale industrial
advancement in the Arctic, with the proposed infrastructure projects, will invade the evolutionarily "fragile" Arctic world.

In 2013, Russia approved the development strategy for the Arctic zone of the Russian Federation and adopted a federal program for the socio-economic development of this region until 2020, with subsequent correction until 2025 [15]. However, the documents relating to the development of the Arctic practically do not say anything about the professional training of specialists, taking into account the health safety of labour resources, which will implement this program. It contains such a phrase as providing people living in the Arctic with modern life support opportunities and satisfying their social and cultural needs. It is also plan to implement support for vocational education, for example, in the subprogram "Implementation of educational programs of vocational education", which applies in general to all regions of the Russian Federation. Unfortunately, the resolution does not indicate the need to monitor the training of specialists for work in the Arctic. An analysis of documents on the socio-economic development of the Arctic has revealed inconsistencies in the implementation of decisions, for example:

- the directions of socio-economic development of the Arctic are highlighted, but attention is not fixed on integrated biomedical, psychological and socio-environmental monitoring;
- the need for life support and the satisfaction of social and cultural needs is indicated, but there are no concepts related to the care of maintaining the professional health of labour resources and its monitoring;
- support for the implementation of educational programs of vocational education is supposed, but the directions of training and advanced training are not specified.

In connection with the foregoing, it is necessary to pay attention to the urgent problems of professional education of specialists, due to the provision of biomedical, mental, psychological and social health monitoring in the process of professional preparation for work in extreme conditions of the Arctic latitudes.

2. Materials and method
The paper provides an analysis of literary sources on the investigated problem. The psycho-diagnosis of health in our studies was carried out using the Varikard software and statistical complex in the statistical processing ISCIM7.3 developed by Ramena (Ryazan, Russia). The program includes more than 40 parameters of heart rate variability (HRV) and psychological indicators. A medical-psychological diagnostic non-invasive complex can be used in support of professional health of any workforce, and it will allow identifying marginalized groups with prerequisites for unjustified production and other risks.

3. Results and discussion
Vice-President of the RAS N.P. Laverov turned to the Security Council of the Russian Federation on May 19, 1997, with a letter about the need to consider and support proposals for medical and environmental monitoring of Russian regions and cities. The letter was initiated by specialists who understand the features of the course of modern natural, man-made, social processes. One of the important problems of professional activity is the health of labour resources [17]. Our analysis of scientific articles on biomedical health problems of specialists engaged in professional activities in the Far North of Russia (2005–2016) revealed that information on health problems is not systematized, but fragmented. The criteria for assessing health and adaptation, including the socio-psychological direction, remain undeveloped [18]. Accordingly, models of medical and environmental monitoring in the areas of medical, psychological, mental and social health have not been developed taking into account the cyclical phenomena of the Arctic latitudes. Here are some examples of these problems [9].
In the medical and biological aspect, the military, shift workers of oil-producing enterprises revealed violations of indicators of the cardiovascular system; vegetative balance; hormonal status; adaptive capabilities of functional reserves; increased manifestation of polar tissue hypoxia with hemodynamic compensation associated with the cyclic phenomena of arctic latitudes [6]. The genesis of polar hypoxia is due to the peculiarities of the inhaled air of arctic latitudes, which negatively affects the conduction of oxygen to the lungs and its delivery to tissues [16]. Some articles draw attention to sanitary and hygienic standards for sailors and submariners, their nutrition, clothing, which would be layer and other problems [1].

According to medical indications, the structure of diseases of workers in the Arctic latitudes has been compiled: 1) diseases of the eye and its adnexa, including; myopia; 2) diseases of the circulatory system (arterial hypertension, coronary heart disease, angina pectoris, cerebrovascular disease); 3) diseases of the bone and muscle system as well as connective tissue; 4) Diseases of the digestive system (peptic ulcer of the stomach and duodenum, gastritis, duodenitis, liver disease, gall bladder disease, pancreatic disease; 5) diseases of the genitourinary system [13]. Also, workers of various professions have established cold stress on the temperature parameters of climatic conditions at high latitudes [10].

The psychology of health includes such components as mental, psychological and social health. [2] Mental health reflects the interconnectedness of processes, properties, and conditions. Mental processes are involved in the formation of the image of professional knowledge, taking into account mental states. Consequently, the professionalism and competence of workers participating in the development of the Arctic will depend on the level of mental health. Studies have shown that more effective shift workers are introverts with rational thinking, emotional stability, a high level of self-control of behaviour, including interpersonal relationships and attitude to health [3-4; 14].

Psychological health is associated with the concepts of subject and personality. The subject, being the bearer of social values, puts functional responsibilities of labour activity in the first place. The personality, on the other hand, has greater independence, creative thinking, and self-regulation of its activities. Empirical studies have established that the psychological problems of shift specialists are unfavourable functional states (fatigue, monotony, psychological tension of interpersonal relationships, professional burnout), professional personality destruction (accentuation, professional deformation, professional incompetence and helplessness in taking independent decisions). It was revealed that workers who use a flexible style of self-regulation, self-control, are motivated by the social usefulness of work, creative activity, and personal control of their health have a high level of socio-psychological adaptation [7].

Social health is associated with social conditions and the quality of human life. Empirical studies have revealed that alcoholism and, as a result, alcohol delirium, including structurally complex psychosis, is an important social problem for workers engaged in high-latitude work. It is noted that the onset and duration of the psychotic state are associated with the onset of the polar night. The severity and course of alcoholic psychoses are caused by a change in natural and climatic factors, unsettled travel conditions, unsettled family relationships, a low level of education, a lack of constant medical supervision, and others [5].

Environmental monitoring is a comprehensive study of environmental conditions and the relationships between its components. In this case, we will talk about the moral and ethical responsibility of specialists at various levels. These problems are prerequisites for a high level of risk of technological disasters associated with the human factor. Therefore, vocational education of labour resources, their health, moral and ethical and moral responsibility, professionalism are extremely important in the implementation of medical and environmental monitoring, which will rationally address the issues of training specialists for work in extreme conditions of the Arctic [12].

The information obtained indicates that already at the stage of vocational education, it is necessary to prepare future labour resources for work in extreme conditions, including natural and climatic zones, to ensure the safety of health and the prevention of technological disasters. Health monitoring will identify marginalized groups with prerequisites for unreasonable production and other risks.
The ISCIM7.3 program, which includes psychological indicators developed by the RAMENA Institute staff, can be used in the psychological and pedagogical support of professional health in any workforce. A general area of dispersion is compiled, including individual indicators of each person (for example, aggression), in which one can see group norms of psychological health and a marginal group, the indicators of which represent a "risk group". (pic. 1)

Picture 1. A psychological study of a group of specialists (dispersal cloud) on the example of aggression in the context of professional activities.

The model of vocational education of the labour force as a condition for the safe development of the Arctic latitudes involves 1) financing to ensure: vocational education and advanced training; catering, sanitary and hygiene and living conditions; physical education and sports, cultural activities; the acquisition of medical and psychological equipment for monitoring the health of specialists; 2) training of competent specialists in the field of medical-environmental and vocational-educational
monitoring; 3) scientific and methodological support of vocational education and professional health of specialists in extreme conditions of arctic latitudes.

4. Conclusion

Thus, the results of the study, justifiably prove the need to include medical-environmental and educational-professional monitoring of specialists and in general labour resources as the most important, relevant directions in the development of the Arctic. It should be understood that the low level of training of specialists, the lack of information on medical, environmental, educational and professional monitoring, can lead to technological disasters due to the human factor. What is unacceptable in the Arctic. Solving the problems of vocational education and professional health of labour resources, their moral and ethical responsibility are extremely important in the implementation of medical and environmental monitoring, which will rationally solve the issues of training specialists for work in extreme conditions of the Arctic.

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