

Analysis of adverse factors, impacting on the development of fatigue

В статье рассмотрены моменты, предрасполагающие к возникновению состояния утомления у персонала службы обслуживания воздушного движения, а также влияние утомления, на безопасность производства полётов. В частности, показаны виды, фазы и факторы, влияющие на развитие утомления. Представлены причины возникновения переутомления и его влияние его на работу службы управления воздушным движением.

This article considers the features, predisposing to the emergence of air traffic controller fatigue and the impact of the fatigue on the flight safety. In particular, some types, phases and factors influencing on the development of fatigue are submitted in this work. The reasons of origination of fatigue and its effect on activity of air traffic service are also described in this article.

Ключевые слова: утомление, усталость, служба обслуживания воздушного движения, опасный фактор, безопасность полётов

Key words: fatigue, frazzled, air traffic controller service, adverse factor, flight safety

Under the fatigue of air traffic service workers, temporary disbalance of the body's functional systems (especially neurons of the cerebral cortex) is understood, leading to a decrease in the reserve capabilities of the air traffic controller and its operability. Fatigue is a natural process of reversible decline in the working capacity of the body, signaling to a person about depletion of the body's resources and contributing to the cessation of activity and the transition to rest, which will restore the expended energy reserves. Thus, under fatigue, one can understand the protective reactions of the organism, which allows preserving the integrity of the latter.

When the air traffic controller service personnel become fatigued, the safety level of the flights decreases because in the state of fatigue the number of radio exchanges decreases, the number of errors in perception and transmission of voice messages increases, the vocabulary becomes depleted, the articulation accuracy and the speech rate decrease, there are missing information and the impossibility to concentrate on the performance of a certain tasks.

Since only after the cause of fatigue has been determined the measures can be taken to prevent fatigue in the future - by eliminating the factor that caused this state. As the factors predisposing to the emergence of fatigue among the personnel of the air traffic controller service are the following:

- intensive and long working load;
- the impact on the body of adverse environmental factors (noise), etc .;
- increased nervous and mental tension, emotional stress;

- disrupt shifts for air traffic controllers
- unfavorable service or household conditions;
- incorrect use of the time provided for rest (both in the working and vacation periods);
- low vocational training;
- illiterate and uncontrolled use of medicines;
- use before drinking alcohol;
- malnutrition (a small amount of food containing vitamins and proteins);
- sleep disorders.
- a long break between work
- residual functional disorders after diseases
- the presence of bad habits
- insufficient level of physical training

The dynamics of fatigue is affected by the nature of the air traffic controller, primarily its intensity and pace. There is an optimum intensity of the air traffic controller, in which fatigue occurs later. Increase or decrease of this intensity accelerates the onset of fatigue.

The fatigue of the personnel of the air traffic service can be of two types: - acute, i.e. Show up in a short time

- chronic, i.e. Wear a long character (up to several months).

And also we can distinguish two phases of fatigue:

- compensated (when there is no pronounced decrease in efficiency due to the fact that the reserve capabilities of the body are included);
- uncompensated (when the reserve capacity of the body is exhausted and the work capacity is clearly reduced).

Mental fatigue is especially dangerous for the mental health of the air traffic service staff, it is associated with the ability of the central nervous system to work long with overloads, and this ultimately can lead to the development of prohibitive inhibition, to sleep disturbance, to the disintegration of the interaction of autonomic functions.

It is known that the nerve cell is the source of motor impulses and trophic influences. In the process of muscle activity, both in the nerve cell and in the muscles, energy sources are expended and the conditions of the internal environment of the organism are changed. Therefore, during the developing fatigue, the state of the nerve cell depends on the processes occurring both in the nerve cell itself and in the working organs.

The development of fatigue affects:

Deterioration of blood supply of muscles;

Inhibition of enzyme activity;

Changes in receptors and contractile muscle structures;

Violation of the hormonal function of the endocrine apparatus;

Oxygen starvation of tissues.

Periodically, the resulting fatigue has the property of accumulating, and becoming overworked. Overfatigue is a condition that occurs in the course of work and is characterized by a decrease in working capacity with a qualitative change in

physiological, biochemical and mental indicators, so that standard rest does not bring renewal. Exhaustion can be considered as a discrepancy between the severity of the work done and the length of the rest. A distinctive feature of overwork is the preservation of signs of fatigue, weakness after rest. Overstrain is characterized by: sleep disturbance, fatigue, increased irritability, headaches and dizziness, a sense of weakness. All this leads to a decrease in noise immunity, the amount of attention, an increase in the number of errors, emotional disorders, memory impairment, and violations of mental activity. In some cases, fatigue can lead to neuroses (more often - neurasthenia).

Systematic performance of work against a background of non-restoration, an unreasoned work organization, excessive neuropsychic and physical stress can lead to fatigue of the air traffic service personnel, and consequently to overstrain of the nervous system, exacerbations of cardiovascular diseases, hypertension and ulcer diseases, Protective properties of the body of workers that can affect the safety of flights.

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