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Anti-stress System Support for Ensuring Reliability of Flying Activities

The specifics, the current state and perspectives of the solution of the problem of anti-stress system support for ensuring reliability of flight activities (FA) are analyzed. The positive results of conducting of the systematic relaxation (SR) experiment are shown. The stress curves:

1) without the application of SR and 2) with the application of SR are discussed.

One can agree with the author of the work [6] that "stress is defined as *individually* conditioned reaction of the individual to the situation", leading to significant changes in the psychic, psychosomatic, motivational and behavioral spheres.

The state of *tension* in a human body is a hindrance to his activity. "Tension" should not be confused with "strain" (stress), that necessarily accompanies any difficult activity of a person.

The purpose of the research is to analyze the state and perspectives of the solution of the problem of anti-stress system support, to offer an appropriate solution for ensuring reliability of FA.

Reviewing the specificity of SR, we must point out that SR has the following peculiarities: taking off, isolation and enclosed space; expressive emotional field of labor; the possibility of a sudden occurrence of a dangerous situation; increased load of analyzer systems (overload of visual and auditory *analyzers*); shortage of time for decision making; the activity under the condition of nervous-psychic strain or *stress*. These factors influence mental processes in a human body.

The scientific work [4], reveals the main psychological content of the human factor in aviation. It is emphasized that the activity of a pilot is carried out under difficult conditions, for example, the perception of the position of his own body is provided by a complex set of *analyzers* and high alertness. In our opinion, the author gives the necessary psychological content of the human factor. But we would like the author to expand the conclusion, adding the necessity to conduct their own training to ensure stress tolerance.

The theoretical ground of the clinical application of *relaxation* methods to eliminate stress reactions (see [3], pp. 24-28) suggests leading active life having learnt how to manage stress. The authors of the scientific paper [3] believe that the most widely used behavioral relaxation techniques are meditation, neuromuscular relaxation, respiratory control, and the method of biological feedback. It is necessary to note that making the final conclusion, the *clinical* psychologist should evaluate the expediency of applying each relaxation technique taking into account the

individual characteristics of the patients, i.e. there are some *limitations* in the application of these techniques.

In our opinion, the most reasonable is to neutralize a particularly conditioned reaction of a person in the form of a response *systematic* counteraction of the same person. We mean the creation of a supplementary subsystem of self-management (SS) into the existing system of self-regulation of the body (see, please, [1], [2]). It is theoretically grounded and tested in removing excessive strains in a human body. A new, *non-trivial* direction in the science of man (cybernetic-synergetic aspect) - the result of many years of research, carried out by the author - provides the ability to control their own state.

As an example, we present the results of the experiment for one study sample during the express training of 32 students. Quantitative evaluation of SR was carried out on the basis of the well-known method of self-assessment of psychological states of the SUM (state of health, activity-mood). The integration of the obtained data showed (Fig. 1) that before carrying out SR, the common state of the students was estimated 4.3 ± 0.85 points, while the parameters of state of health, activity, mood (SUM) were respectively 4.41 ± 0.87 ; 3.54 ± 0.83 ; 4.91 ± 1.07 points , i.e. below the norm of 5.0 - 5.5 points. After conducting SR, the total number of points increased by 11.8%, the state of health - by 13.2%, activity - by 23.4%, mood - by 3.5%. It means that they *were*

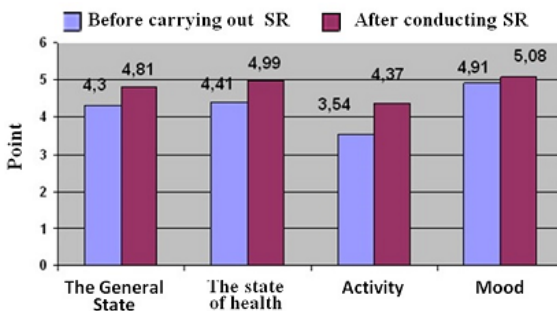


Fig. 1. Results of self-appraisal by the students own states.

coming to the norm. The increased activity of the respondents after the training (it lasted 15-20 minutes) is their *own* ability to change under the influence of irritants, which are inputting by the participant's organism at his own demand.

Moreover, we must mention, that besides the quantitative results we found out the following qualitative differences of the SR: a significant improvement in the functioning of the *analyzer* systems (first of all, skin and the visual system), a great decrease in various types of tensions, the normalization of work of cardiovascular and respiratory systems, some rest for the brain etc. A new ability of a person to generate *microvibrations* in the body appears.

The picture shows: the curve 1 - usual case of stress flow [5] and the curve 2 - the case when stress appears while applying SR. In the first stage of *anxiety*, the negative external influence on the body is neutralized by the action of the SS, the

level of activity of the organism does not decrease (see, please, Fig. 2, the curve 2, “the Reaction of anxiety”).

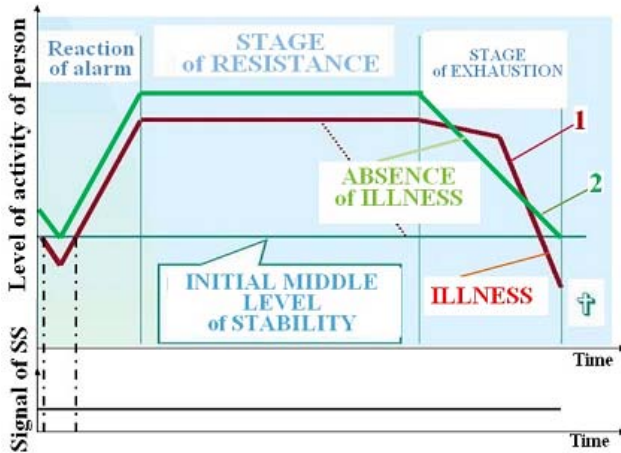


Fig.2. Curves of stress for the case of absence of RS (1) and in the case of application of RS (2).

In the first stage, we can notice the mobilization of the body's defenses, first of all, due to SS, this contributes to the successful development of other stages, since the SR removes excessive strains (stress). At the third stage, the action of the pathogenic stimulus ends, and the activity of the organism is set at the initial level: ” the absence of the disease”.

It should be mentioned that for the *traditional* case, the stress curve 1 ends in the third stage with the result “disease” (the level of activity is less than initial one). So, the state of the organism in the case when there are psychic and other strains (stresses) arising in the human body during the time of the most difficult activity, can be *systematically* improved with the help of SR which has a wide range of actions.

Conclusions:

The problem of ensuring the reliability of flight activities (anti-stress aspect) can be solved by implementing self-management subsystem into an existing system of self-regulation. All participants can conduct by themselves their own quantitative and qualitative self-assessment of SR, gaining *stress resistance*.

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