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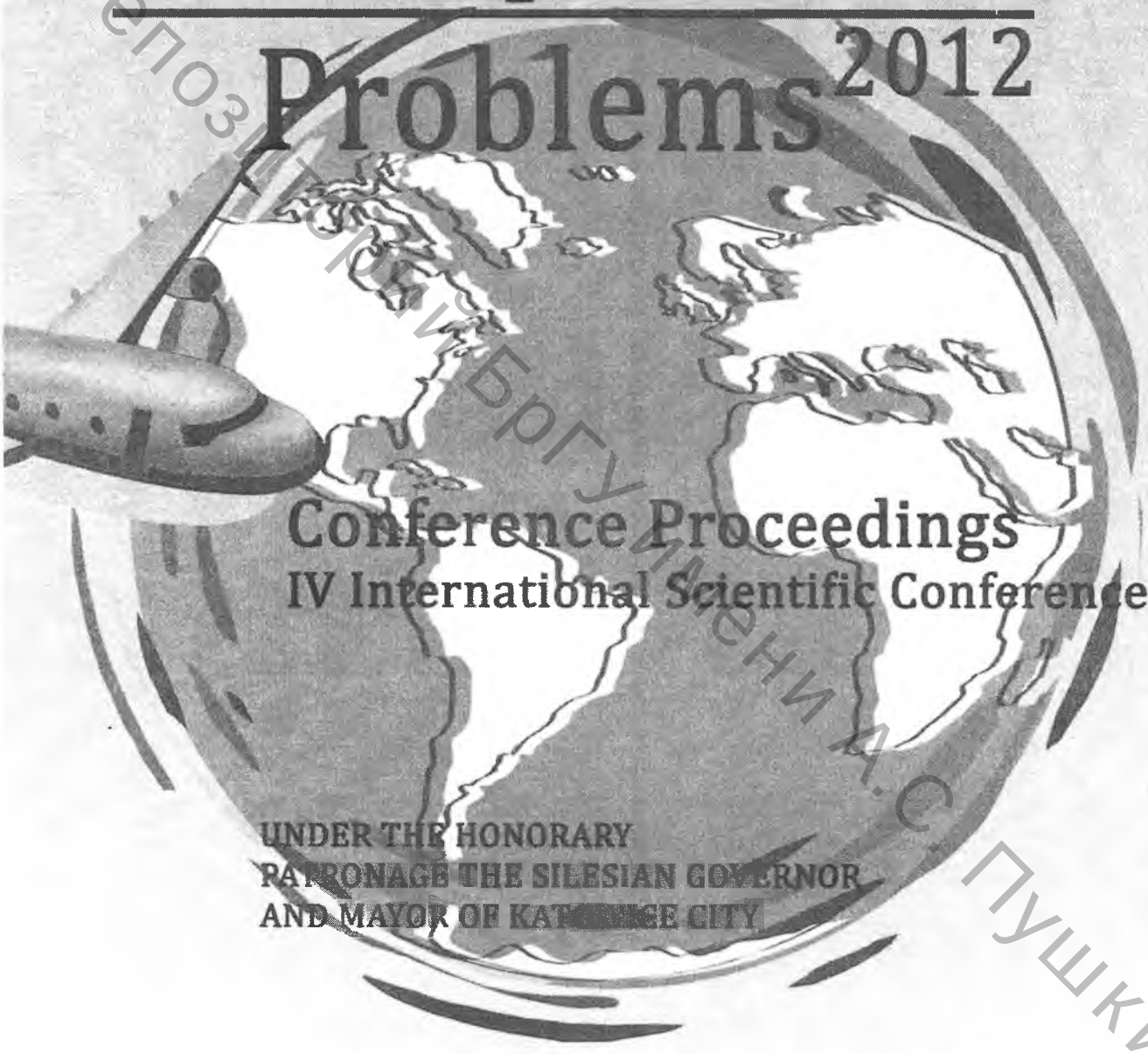

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THE FORMATION OF PROFESSIONAL RELIABILITY OF LOCOMOTIVE DRIVERS

Summary. Any activity accustoms on the base of the general abilities which develop in this activity, and "special" abilities are the general abilities which have got lines of efficiency under the influence of requirements of activity. And the more technical is the activity, the bigger role in its realization is played by "special" abilities [8, 9]. Hence, definition of effective receptions of psychophysiological and psychological diagnostics should be combined with a finding of optimum ways of vocational training.

ФОРМИРОВАНИЕ ПРОФЕССИОНАЛЬНОЙ НАДЕЖНОСТИ МАШИНИСТОВ

Аннотация. Любая деятельность осваивается на фундаменте общих способностей, которые развиваются в этой деятельности, а «специальные» способности – это общие способности, приобретшие черты оперативности под влиянием требований деятельности. И чем «техничнее» деятельность, тем большую роль в ее реализации играют «специальные» способности [8, 9]. Следовательно, определение эффективных приемов психофизиологической и психологической диагностики должно сочетаться с нахождением оптимальных способов профессионального обучения.

1. INTRODUCTION

Specificity of concrete kinds of work makes certain demands to the general both more private psychophysiological and psychological properties and qualities of the person which presence defines professional suitability to this or that trade. Therefore experimental activity should be directed on studying of those professionally significant qualities (PSQ) and their integration which are required in professional work, and regulation of this activity to be carried out in the conditions comparable to real conditions. The activity modelling specific features of psychological structure of professional work should act as the testing [9]. Thereby will be modelled a so the «internal conditions» of this activity.

Specific feature of labour activity of the locomotive driver of the main movement is work in the conditions of long influence of monotonous factors. Hence, maintenance of high level of readiness for emergency action (REA) in conditions of monotony has huge value in activity of the locomotive driver of the main movement [4], and the condition of the lowered vigilance is considered as the internal, psychophysiological precondition for occurrence of failrules, emergencies and debacles [5].

Essential necessity of professional work of the locomotive driver is the requirement to long concentration of attention with simultaneous ability to its emergency switchings, and the exit for frameworks of optimum values can even interfere at achievement of high level of professional skill [5]. Besides «in difficult kinds of activity there can be intense situations – the circumstances generating considerable difficulties and at the same time demanding from the person

fast, exact and faultless actions» [2, p. 3]. In this connection emotional stability to any of intense factors of professional work is considered as professionally significant quality.

The level of uneasiness raises and mental function of self-checking is overloaded because of insufficiently developed PSQ. On the one hand, it partially helps to compensate insufficiently developed PSQ, but on the another – the level of pressure raises up to intensity. It is expressed in infringements of logic structure of operating actions, and also in increase in time of their performance. There is also because in normal conditions repeatedly and regularly fulfilled actions lead to formation of skills which it is not enough in extreme conditions of activity. Developing any system of self-control, the locomotive drivers get quality of actions, skills and the abilities similar professional that helps to cope with adverse conditions with smaller expenses, keeping power resources [3, 4].

On possibility of diagnostics, formation, perfection, correction professional reliability (as integrated professionally significant quality) the locomotive driver specified by following positions:

– PSQ is a cash level of possibility of display of function (mental and psychomotor processes), necessary for efficiency of professional work;
– PSQ – merge of congenital and acquired;
– PSQ are a part of structure of the person and the general macrostructure of the person;
– Abilities in development and specialisation in activity are realised in PSQ;
– Neurodynamic basis of PSQ are typological qualities of nervous system [8, p. 58-59].

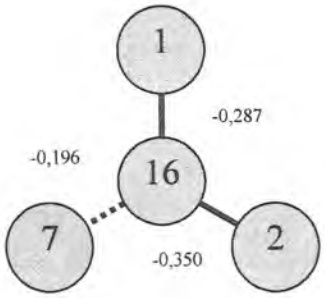
2. THE ANALYSIS OF RESULTS OF ASCERTAINING EXPERIMENT WITH LOCOMOTIVE DRIVERS

The estimation of the articulation of PSQ was defined by means of the techniques applied in engineering psychology for carrying out psychophysiological inspections on a railway transportation that has allowed to reveal interrelation of reliability of activity with a level of development of these qualities.

During ascertaining experiment were estimated: level of development PSQ – readiness for emergency action in the conditions of monotonously operating factors (REA): difference between reactions to signals with the prevention and without the prevention (Prea), number of admissions of signals (Nrea); speed of switching the attention (SA): time of performance of the mixed search of black and red numbers (SAt), time of switching attention (Tsa), quantity of errors during performance of the mixed search of black and red numbers (SAer); emotional stability (ES): time of performance of the mixed search of black and red numbers at active hindrances (ESt), a difference in time of performance of the mixed search of black and red numbers with hindrances and without hindrances (Tes), quantity of errors during performance of the mixed search of black and red numbers with active hindrances (ESer); difficult visually-impellent reaction (DIR): Time of performance of difficult impellent reaction (Tdir), quantity of incorrect pressing (Ndir); time of performance of simple impellent reaction (SIR); time sense (TS); time of reaction for moving object (RMO); attention volume (Va); the tepping-test (TEPP); an expert estimation (EE).

For revealing of interrelations of expert estimations and professional reliability with indicators PSQ the received results have been subjected to inter correlation analysis on which basis a number of correlating galaxies has been constructed. The indicator of professional reliability of activity of locomotive drivers (n=100) (by an expert estimation) significantly correlated with indicators of readiness for emergency action in the conditions of monotonously operating factors (REA – r =-0 287,-0 350); and emotional stability (ES – r =-0 196) (fig. 1) which, in turn, are closely interconnected with indicators SA (r=0,229-0,664), DIR (r=0,196; 0,316), SIR (r=0,560).

The presented results testify the importance of revealed PSQ for success of professional work of the locomotive drivers and possibility of their formation with the help of psychological and pedagogical training.



1 – The difference between average arithmetic time of reaction for emergency signals and average arithmetic time of reaction for signals with the prevention (Prea);
2 – Quantity of admissions of signals (Nrea); 7 – The difference in time of performance of the mixed search of black and red numbers with hindrances and without hindrances (Tes); 16 – The expert estimation of professional reliability (EE); $p < 0,05$ at $r=0,196$; $p < 0,01$ at $r=0,258$
Fig. 1. The Basis of a correlation galaxy round an indicator of an expert estimation of professional reliability of locomotive drivers

On level of professional reliability locomotive drivers have been distributed in groups "the best level", "the average level", "the worst level" (fig. 2).

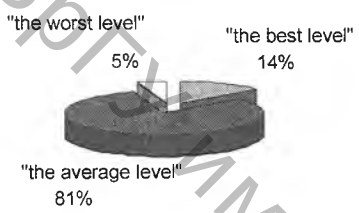


Fig. 2. Distribution of locomotive drivers on groups with a miscellaneous level of professional reliability

Among locomotive drivers of the main movement, carried to groups of "the best level" and "the worst level", authentic distinctions by results of testing of such professionally significant qualities as REA and ES (tab. 1) were found out.

Tab. 1

Indicators of testing of some PSQ locomotive drivers with various level of professional reliability

Indicators		Groups of locomotive drivers by results of expert estimations				
		The best level (n=14)	The average level (n=81)	The worst level (n=5)	U (best - worst)	p (best – worst)
REA	Prea	0,133±0,02	0,145±0,02	0,194±0,03	17	>0,05
	Nrea	0,714±0,31	1,37±0,14	2,17±0,55	11	**<0,05**
ES	ESt	245,00±10,68	239,40±6,44	292,00±56,07	25	>0,05
	Tes	26,43±7,16	38,63±3,17	85,40±23,79	11	**<0,05**
	ESer	8,86±3,61	11,51±1,33	21,20±5,79	16	**<0,05**

On the basis of comparison of results of testing of "the best level" and "the worst level" locomotive drivers by U-criterion the Mann-Whitney statistically authentic distinctions of indicators of readiness for

emergency actions in the conditions of monotonously operating factors (REA) and emotional stability (ES) ($p < 0,05$) are revealed. It allows to draw a conclusion on higher level of the articulation of these PSQ and, hence, higher level of self-checking and self-control in group of "the best level". The received results will be coordinated with correlation is communications of indicators of readiness for emergency actions in the conditions of monotonously operating factors, emotional stability with expert estimations of professional reliability (fig. 1 see).

3. TECHNOLOGY OF FORMATION OF PROFESSIONAL RELIABILITY OF THE LOCOMOTIVE DRIVERS

In the course of activity PSQ act in a role of those internal conditions through which external influences and requirements of activity [6] refract, hence, the formation of PSQ is a focal point of formation of professional reliability of the locomotive drivers.

On the basis of the spent theoretical and bibliographic analysis of the literature and results of ascertaining experiment, for increasing the professional reliability the technology of formation of professional reliability where professional reliability acts as the integrated, complex quality allowing to the locomotive drivers effectively to carry out target problems in extreme conditions during demanded time has been developed, approved and introduced.

The technology of formation of professional reliability of the locomotive drivers is understood as purposeful formation PSQ, individual receptions, ways and their sequence, the set parametres of activity providing preservation in difficult conditions. Following components are included in structure of the developed technology of formation of professional reliability of the locomotive drivers: target, substantial, organizational, operational, diagnostic.

Target component, – the backbone factor – formation of professional reliability of the locomotive drivers on the basis of generated professionally significant qualities.

Substantial component – realisation, methods and means of psychological and pedagogical training, among which: modelling of extreme conditions of professional work for formation of adequate representation of structure of algorithms of actions in critical situations; exercises for formation of speed of processing of the information and stability of gnosis functions, a self-estimation of a current condition, ability of self-control.

Among the reasons causing infringements of structure of actions, it is possible to allocate the loss of elements of algorithm of actions in long-term memory the affective disorganisation or braking of behaviour as consequence of emotional reaction to a situation and insufficient knowledge of ways of overcoming of this or that situation. All these reasons can be appreciably eliminated in the course of training by modelling the critical situations and training self-control receptions in the given situations. It will promote storing and fastening of ways of actions in this or that emergency situation, removal the emotional intensity and, thus, liquidating the reasons causing infringements of spatial structure of actions.

Organizational component – use in educational-training employment of various influences and hindrances corresponding to professional work, methods and means of psychological and pedagogical training to increase readiness for emergency actions in the conditions of monotonously operating factors, emotional stability, concentration of attention, self-control, removal of mental pressure. The formation of professional reliability of each locomotive drivers was realised in the individual form, depending on modelled conditions, characteristics of nervous activity, personal qualities and algorithms of the organisation of the actions.

Operational component – actualisation of skills and flexible sense of motor schemes of actions, existential structures of a complex of operating actions in critical situations, abilities of self-control of a current condition, activity performance in extreme conditions, display PSQ in professional work.

During training it is necessary to define level at which the organism practises. Practice shows that at high level of motivation it is difficult to come to the generalised mastering of decisions, and at low one it is possible. It is possible to fix, accelerate, automate only qualitatively irreproachable skill, therefore employment become complicated gradually. But completely to use the skills received at high

levels of motivation, the organism should have stronger motives in an activity situation, than in situation business is in a case with the skills received at smaller levels of motivation.

The certain models of people's behaviour, as a rule, are put in action by some one element of the information. This unique peculiar feature plays a trigger role, it often appears very valuable as the correct decision without the careful and full analysis of all other elements of the information in a concrete situation allows the individual to make. When this or that representation operates on the subject, it causes in it the corresponding installation [7]. Various combinations of anticipating alarm irritants can through long physiological aftereffect predetermine, on which ways excitation from the subsequent prearranged signals will go, that is to create preliminary installation, working readiness or adjustment of certain functional structure [1]. Thus, the maximum simplification of functional stages of process of regulation, transfer of regulation of separate actions and operations on the level which is not demanding developed realized control, are meaning increase of reliability of the locomotive drivers.

Diagnostic component – realization of operative feedback: the included supervision, conversations with locomotive drivers-instructors, locomotive drivers, initial and total control of degree the articulation of PSQ on indicators of hardware psycho diagnostics and productivity of professional work.

The diagnostic purposes applied to feedback, included: revealing the level of expressiveness and display of professionally important qualities of locomotive drivers in an educational and training process and professional work. In the beginning and at the end of forming experiment psychophysiological testing was held.

Revealed statistically authentic communications of a professional assessment of works of locomotive drivers (n=25) with indicators REA, SA, ES, SIR, DIR ($p<0,05$-$0,01$) after forming pedagogical experiment testify that the selected indicators for locomotive drivers have appeared rather objective and informative.

On the basis of results of the spent pedagogical experiment it is possible to take for granted that the technology of formation of professional reliability of locomotive drivers is effective enough. Positive changes after the end of pedagogical forming experiment at locomotive drivers of experimental group (n=25) are observed on indicators of performance of techniques: readiness for emergency action in the conditions of monotonously operating factors (REA), attention switching (SA), emotional stability (ES), simple impellent reaction (SIR), difficult impellent reaction (DIR), attention volume (Va) ($p <0,05$-$0,01$). In control group (n=25) the quantity of errors has significantly decreased ($p <0,01$) during performance of test DIR, on other indicators of significant distinctions is not revealed.

CONCLUSIONS

1. At the locomotive drivers, within the limits of the surveyed contingent, force of nervous system does not play crucial importance in formation of high indicators PSQ.
2. Purposeful development of PSQ promotes additional growth of professional reliability of the locomotive drivers. PSQ naturally are developed during professional work, however in preparation of the locomotive drivers it is necessary to use the various conditions modelling activity, receptions and the tasks promoting more effective display of these qualities.
3. Approbation of technology of forming the professional reliability of the locomotive drivers has confirmed its high efficiency that has allowed to raise reliability of professional work.

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