Psychological Assessment of Corporate Culture as a Factor of Occupational Safety

Vasiliy Belov [1], Evgenia Bojko [1], Irina Gayvoronskaya [1], Anatoliy Maklakov [1], Irina Kunitsyna [1], Irina Sidorova [1*]

[1] *Pushkin Leningrad State University, Pushkin, Russia*
[*]*Email: i.sidorova.lengu@gmail.com*

ABSTRACT

The article gives the psychological assessment of corporate culture concept being perspective to ensure occupational safety and reduce the occupational risk in the construction companies. It is shown that the components of the corporate culture for Russian small and medium construction companies concern fulfilment of the work time rates for employees and organisation of breaks within work time, a motivational factor of occupational safety observance, the occurrence of accidents, occupational safety in general. It is detected that accidents in the construction companies depend on the season, workers' availability of their own rules, which they consider correct; hurry during plan fulfilment. It is determined that in all groups of respondents, the maximum average values were found out by the index of clan corporative culture, for which availability of common valuables and principles, friendlike, confidential relations between employees, teamwork style, aim to help and train are specific. Degradation of the clan corporative culture can appear as irresponsibility and permissiveness. Moreover, it is detected that there is a difference in perception of the corporative culture by the top managers and the on-site managers.

Keywords: Corporate culture, Occupational safety, Top managers, Mid-level managers, On-site managers, Occupational safety, Professional risks, Components of corporate culture, Type of corporate culture.

1. INTRODUCTION

Problem Research Relevance. According to the International Labour Organisation data, construction is considered one of the most hazardous production areas for people's health and life in any country. Thus, it is necessary to search for theoretically substantiated approaches to developing occupational safety standard systems and their efficient implementation in construction companies.

Analysis of causes for accidents in construction by the regions of the Russian Federation was performed by A. Bakaryagina. She indicates their repeatability in different regions of Russia. In construction, the main causes of accidents are as follows: violation of the safety requirements (25–31%), unsatisfactory organisation of work execution (20–28 %), violation of labour discipline (7.8–14 %), non-use of protection means (10.5–13%) [1].

In relation to Saint Petersburg and Leningrad Region, the injure rate in the construction holds different positions within different years. Still, on averagely, by several injures, it gives way only to the injure rate for transport [2].

E.S. Edamenko analyses the causes for injure rate in construction based on acts of a special investigation of the group, severe and fatal cases, special examinations and checks performed by the superior business units and supervision authorities. The performed analysis of accidents allowed detecting three types of causes: - organisation (poor work organisation on the construction site, insufficient training of workers, absence of the required supervision for work execution, violation of the manufacturing procedure, violation of work and rest schedule, use of workers not by professions); technical (failed state of scaffolding, trestles, devices and tools, as well as design defects of

vehicles, mechanisms, hoisting devices, building structures and equipment); psychological (insufficient attention to work execution, loosening of workers' control for their activity) [3].

Evaluating the result of this analysis, it is necessary to emphasise that though the author puts the psychological factors in the third place, but also refers them to the main causes. It is assumed that the different causes, referred to as the organisational ones, are also psychological: for example, absence of the required supervision for work execution, violation of manufacturing procedure, violation of work and rest schedule. In the same way, some technical causes also have psychological nature, particularly, failed state of scaffolding, trestles, devices and tools.

Yu.A. Laamarti, A.V. Kofanov rest on the regional approach and study the problem of injure rate on the construction sites of Moscow. These authors pay attention that reduction in the number of accidents sometimes has pseudo positive nature, as except for financial and economic causes (economic activity falling) abandonment of the state license for construction activity, implementation of self-regulating organisation institute influenced reduction in number production injuries. Again, this fact confirms our idea that the statistical data shall be analysed by specialists, preferably by a team of specialists. Yu.A. Laamarti, A.V. Kofanov distinguish three basic causes of injure rate in the construction. According to the observation materials, it is known that industrial injuries are mainly associated with the causes of organisational, technical and medical nature [4].

It is important to highlight two moments associated with interpreting the injure rate causes. Firstly, the authors distinguish the medical causes are mainly psychological factors. Secondly, as in E.S. Edamenko's research, the causes, which are referred to as psychological ones, are classified as organisational and technical.

The necessity to analyse the approaches existing in psychology to investigate and solve the occupational safety problems is conditioned by reforming of the occupational safety management system based on the principles, particularly: transfer from the principles of response on accidents to actions directed for their prevention; support on the "professional risk concept", use of the system approach to reforming of occupational safety sphere [5].

In relation to the *study degree for the problem of occupational safety in psychology,* it is necessary to highlight that in native psychology; this problem is weak developed, the separate publications appear.

When referring to the research of foreign specialists, then one of the design solutions is a psychological approach to the corporate culture, which penetrate all elements of the company life and all its levels. This approach allows studying injury prevention based on the formation of safe behaviour culture for employees of construction companies during their professional training.

This research is directed to detect the psychological features of the corporate culture for safe behaviour of workers from the construction companies at all three levels: at the top-management level setting the cultural standards for safe behaviour in the form of the rules system; at the management-level organising the production process based on these rules; at the execution-level supposing assimilation of the rules and their implementation in practice.

2. LITERATURE OVERVIEW

In domestic and foreign psychology, the occupational safety problem is not new. Within almost 100 years, several so-called traditional approaches to studying the occupational safety problem have formed: medical and psychological, psychotechnic, psychological and educational, social and psychological [6, 7].

Analysis of the existing psychological approaches to solve the occupational safety problem allows concluding the necessity to integrate the considered approaches. This integration is achieved based on the system approach. The initial theoretical basic research of safe behaviour of specialists from the construction companies is the professional risk concept developed in recent years. This concept is interdisciplinary. The psychology of the professional risks is the execution stage [6].

In our opinion, the psychology of occupational risks can't occur based on the electric connection of risk psychology and occupational safety psychology. The necessity of profound theoretical and methodological developments and determination of conceptual basis arises [6].

In our opinion, the theoretical and methodological basis for the psychology of professional risks is a system approach, which shall be supplemented by the subjective approach [6, 7].

M.F. Dobrolyubov indicates the necessity of the system approach for research and occupational safety culture forming [8]. It should be noted that a significant part of the authors consider that the development of the organisational occupational safety culture is not completed [5-11].

In terms of the subjective system approach, the critical thing is developing the professional risk management system. The search for a conceptual basis becomes necessary to improve the efficiency of the management system functioning. It should be noted that

the specialists in the management area emphasise the organisation valuables [12]. The subjective system approach to the professional risk problem resting on the concept of the corporate culture allows considering this issue in a new way. This point of view is set to personal, professional safety. The basic idea of this point of view is the reduction of professional risks due to non-negative setting of hazardous situation avoidance and based on forming of the positive setting for survival [1, 6].

Based on this required, it is possible to suppose that the theoretical grounds for implementing the efficient, professional risk management system is a concept of the corporate culture. Foreign psychologists attach significance to the occupational safety culture. So, S.A. Dontsov notes that a variant of the corporate culture concept, called "zero mortality" in Sweden, which supposes management of the road traffic objects with minimisation of the fatal accident risk, was recognised abroad [9].

Overview of the existing foreign works in the construction safety area shows that despite the growing use of new technologies, the safety indices are closely connected with the safety culture and safety climate [13, 14].

The occupational safety culture and climate can differ and be measured according to the presentations about employee safety [15, 16].

The safety climate conditions include perception of safety at the workplace, awareness and attitude to safety, and management involvement degree [15,17,18].

Many sublevels can be distinguished in the safety climate depending on whether employees hold the executive position [19] and even at which employee management level they are. Thus, employees holding different positions based on the safety climate in their subgroup can have different safety perceptions [15, 20].

In our country, separate publications occur, in which the corporate culture is considered the basis for the professional risk management system [5].

In recent years in Russia, the intensification of corporate culture research as a factor in professional risk management is distinctly traced. Moreover, detecting the elements, which have maximum influence on the professional risk management system efficiency, is essential for evaluating the corporate culture as an occupational safety factor.

S.A. Zhukova, V.N. Turchenko, I.A. Bessonova emphasises that the leading role in the efficient management of professional risks has belonged particularly to the corporate culture. They highlight such components as follows: the accepted leadership system; styles of conflict resolution; operating communication system; the position of the individual in the

organisation; accepted symbolics: slogans, organisational taboos, rituals [21].

D.M. Kostin highlights the following occupational safety culture elements: valuables, principles and presentations, which penetrate all levels of the organisation; the system of behavioural responses and practical procedures, which put into practice and significantly intensify the basic principles; occupational safety at the workplace, as well as the phenomenon conditionally determined as the safety "climate" or "atmosphere" – total presentations formed at the workers about the work environment, firstly perception of the occupational safety at the workplace by the employees [22].

The occupational safety corporate culture phenomenon is studied in construction companies. So E.V. Fedina, S.L. Pushenko highlight the same elements as in the work of D.M. Kostin: valuables, principle and social presentations being the basis for the organisation of the general, occupational safety system; system of behavioural responses and practical procedures, which put into practice and significantly intensify the basic principles [10].

Thus, for psychological assessment of the corporate culture as an occupational safety factor, it is necessary to rest on the following theoretical provisions: 1. The corporate culture is a very complex multi-component non-substantial phenomenon in the organisation. 2. The corporate culture allows involving the representatives of all management levels of construction companies in the occupational safety assurance process: top managers, on-site managers and workers.

3. METHODS AND METHODOLOGIES

The top managers (heads) of 12 construction companies in Saint-Petersburg (12 persons), mid-level managers (occupational safety engineers) (9 persons) and on-site managers (site supervisors) (17 persons) were interviewed.

The empirical problems of the research were 1) analysis of the organisational and cultural factors of occupational safety; 2) assessment of the corporate culture type. According to the empirical problems of the research, the following methodologies were used: the modified variant of the questionnaire of M.I. Kotik to evaluate organisational and cultural factors of the occupational safety on the construction site and OCAI methodology of K. Cameron and R. Quinn for evaluation of corporate culture. Moreover, the mathematical and statistical processing methods of data, particularly the procedures of descriptive statistics and such statistical criteria as Mann-Whitney U-test and $\chi 2$ — Pearson.

4. RESEARCH RESULTS

The questioning results were analysed by detecting general trends and determining the reply specificity for the top managers, mid-level managers, and on-site managers of the construction companies in the North-Western Region.

According to the obtained data in the construction companies of the North-Western Region, about a half of respondents have noted that minor faults in the work of the occupational safety service are conditioned by insufficient training in safe labour and its promotion, control for the fulfilment of the rules, reward of safe labour, as well as tolerance of violations. Moreover, the on-site managers included more persons, which indicated that the situations of the occupational safety violations were more than among the top managers and mid-level managers (p<0.1)

All respondents stated that the protection equipment is provided at the workplaces. Only 25% of top managers, 22% of mid-level managers and 12% of on-site managers consider that the personal protection equipment completely allows workers to avoid damages. Most respondents consider that they protect only partially. A major part of the respondents (51% of top managers, 55% of mid-level managers and 89% of on-site managers) consider that personal protection equipment can partially protect the worker. In all groups examined, very different responses occur about the causes, why the workers can't use the personal protective equipment. The following trends can be noted. More than half of the respondents deny the probability that the equipment poorly protects the workers. There are more people among the on-site managers than among the top-managers and mid-level managers, who are sure that the worker can't use PPE, as they complicate work performance (59%, 42% and 33% accordingly, p<0,1)

Contrary to the top managers and mid-level managers, a major part of the on-site managers (77%) is not sure that at the equipment serviceability and observance of the occupational safety accident will not occur (p<0.05).

A major part of the examined persons indicated that avoiding physical danger mainly motivates the workers to fulfil the safety rules. Besides, many people noted that on-site observance of the regulations was also conditioned by the aim to avoid punishment, not to get the crew, foreman into trouble, and just action by the form of habit.

Most respondents (83% of top managers, 89% of mid-level managers and 94% of on-site managers) consider that hurry during plan execution increases the probability of accident occurrence.

A minor part of respondents (17% of top managers, 11% of mid-level managers, and 18% of on-site managers) answered that their company's worker briefing was conducted according to all rules. 33% of top managers and 67% of mid-level managers and on-site managers indicated that the safety briefing was not conducted systematically.

Most respondents (75% of top managers, 67% of mid-level managers and 71% of on-site managers) consider that it is impossible to exclude the probability of industrial accidents completely; only their quantity can be reduced. It can be achieved by improving occupational safety and protective equipment, training and education of workers, labour organisation, strengthening punishments for violation of safety regulations, and introducing rewards for safe work.

The majority of respondents (75% of top managers, 89% of mid-level managers and 77% of on-site managers) consider that it is practicable to discuss preconditions for incidents during technical reviews (i.e. cases where injuries were avoided) (question No. 45).

Summarising the interview results, it can be noted that the problem of labour safety, particularly its psychological aspects, is significant for construction companies in the North-West region. Most of the interviewed employees in construction companies indicated that accidents at their company occur 1-3 times a year. They believe that the probability of accidents at work cannot be eliminated entirely; you can just reduce their number.

According to the obtained data, the causes of accidents at construction sites are firstly such factors as follows: hurry in the implementation of the plan; lack of training, promotion of safe work, monitoring of compliance with the rules and stimulation of safe work, as well as silent agreement; compliance with safety regulations makes it difficult to perform work; workers have their own rules, which they consider to be correct.

The results of the examination of on-site managers statistically significant differences from the data of top and mid-level managers in the number of indices: on-site managers more often indicate that workers are paid for the work performed, and not for hours worked; on-site managers report significantly lower levels of "personnel turnover"; on-site managers believe that safety incidents are often hidden; on-site managers are more confident that workers often do not use personal protective equipment because they make it difficult to get the job done; on-site managers are less confident that if equipment functions correctly and workers follow safety rules, an accident will not happen.

An analysis was made of the severity of different types of corporate culture in construction companies: clan (A), adhocratic (B), bureaucratic (C) and market (D).

Table 1. Results of comparative analysis among values of studied criteria in samples of top managers and mid-level managers (the form by Cameron K. and Quinn R.)

Criteria	Top managers		Mid-level managers		Uemp value
	Mx	∑R	Mx	∑R	
General leadership style in a company serves as an example of efficiency, aggressiveness, commitment to qualitative results (type C)	11.43	34.5	19.17	56.5	Uemp=6.5; p=0,03
Organisation is integrated via commitment to innovation and development, the need to be at the leading edge is promoted (type B)	8.3	7	18	29	Uemp=1; p=0.05

For all groups of respondents, the highest average values were determined in terms of the clan corporate culture.

We also performed a comparative analysis based on the values of the studied indices in the samples of top managers, mid-level managers and on-site managers using the Mann-Whitney U-test. The following components of corporate culture were assessed: the essential characteristics, the general style of leadership in the organisation, management of employees, connecting essence of the organisation, strategic goals, criteria for success.

When comparing the results of top managers and mid-level managers, statistically significant differences were determined in terms of the overall leadership style and the connecting essence of the organisation (Table 1). Mid-level managers, in comparison with top-managers, consider that currently, the general leadership style in the organisation serves as an example of efficiency, aggressiveness, focus on quality results (type C; U=6.5); in the future, the organisation will be tied together by a commitment to innovation and improvement, and the need to be at the forefront will be

emphasised (type B; U=1).

When comparing the results of top-managers and on-site managers, the following statistically significant differences in the essential characteristics of the organisation were obtained (Table 2): top-managers, to a greater extent than on-site managers, consider that the organisation is currently unique in its characteristics, as a large family, and employees have a lot in common (type A; U=17.5); on-site managers, to a greater extent than top managers, consider that currently, the organisation is a highly structured and controlled community, where the behaviour of employees is determined by formal procedures (type D; U=15.5).

When comparing the examination results of mid-level managers and on-site managers, differences were determined in one of the characteristics of strategic goals (Table 3). Mid-level managers, to a greater extent than on-site managers, consider that in the future, the organisation will determine success based on winning the market and staying ahead of competitors in its field of activity, and the key to success will be competitive leadership (type C; U=4.5).

In this case, in the sample of on-site managers, the

Table 2. Results of comparative analysis among values of studied criteria in samples of corporate culture criteria in samples of top managers and on-site managers (the form by Cameron K. and Quinn R.)

Criteria	Top managers		On-site managers		Uemp value
	Mx	∑R	Mx	∑R	
An organisation is currently unique because of its features, it resembles a large family, and employees have a lot in common (type A)	50	94.5	30.42	95.5	Uemp=7.5, p=0.04
An organisation is currently a strictly structured and controlled community where formal procedures direct what people do (type D)	9,29	43.5	17.67	146.5	Uemp=15.5, p=0.022

Table 3. Results of comparative analysis among values of studied criteria in samples of corporate culture criteria in samples of mid-level managers and on-site managers (the form by Cameron K. and Quinn R.)

Criteria	Mid-level managers		Local managers		Uemp value
	Mx	∑R	Mx	∑R	
A company is defined by success based on market conquest and outdistancing competitors in their business sector, while competitive leadership is the key to success (type C)	35	50.5	11.5	40.5	Uemp=4.5, p=0.02

following statistically significant differences were obtained between statements about the current and preferred conditions of the organisation's corporate culture. On-site managers believe that in the future, the organisation shall become unique in its characteristics compared to the current condition, like a large family, where employees will be formed into one body, will have a lot in common (type A; p=0.01); will pay less attention to competitive actions and achievements, there will be the tension of forces and a desire to win in their field of activity to a lesser extent in comparison with the current condition (type C; p=0.04); will determine success based on human resource development, teamwork, the dedication of the employees to the joint activity and the organisation's concern for the employees in comparison with the current condition (type A; p=0.05) to a greater extent.

According to the interview results, all examined specialists in the construction field were divided into 2 samples, i.e, those who believe that little attention is paid to occupational safety issues in their organisation (x) and those who believe that it is enough (y). Significant differences in values of the number of indices characterising the corporate culture in the organisation were determined between these groups (K. Cameron and R. Quinn): "The general leadership style in the organisation is an example of monitoring, the motive to help or teach" (M_x=17.88 and M_y=10.71, U=29 p=0.022); "The organisation is connected together by the dedication and mutual trust, commitment in the organisation is at a high level" (M_x=17/5 and M_y=10/88, U=32 p=0/033); "The organisation focuses on humane development. High trust, openness and complicity are persistently maintained" M_x=17.56 and M_y=10.86, U=31.5 p=0.031).

All respondents were again divided into 2 samples: for those who noted that penalties (x) are provided for in their organisation and are not provided for (y). Between these samples, significant differences were determined in the values for several indices characterising the corporate culture in the organisation (K. Cameron and

R. Quinn): "The management style in the organisation is characterised by the stimulation of teamwork, unanimity and participation in decision-making" (M_x=17.31 and M_y=10.97, U=33.5 p=0.042); "The style of management in an organisation is characterised by a guarantee of employment, the requirement of subordination, predictability and stability in relationships" (M_x=15 and M_y=8.75, U=34 p=0.044).

5. DISCUSSION AND CONCLUSIONS

The following psychological features of corporate culture can be distinguished as a factor of occupational safety in Russian small and middle construction companies.

1. According to the data obtained in the construction companies of the North-West region, there is a difference in attitude to the observance of the standards of employees' working hours and breaks during the work, to wages, to "personnel turnover", to accidents and safety measures. This indicates the inadequacy of information support for labour protection.

2. An assessment of the features for the occurrence of accidents showed that accidents at construction enterprises depend on the season, collective protective equipment can only partially protect the worker, workers may not use PPE, as they make it difficult to perform work; workers have their own rules, which they consider to be correct; hurry to implement the plan increases the probability of accidents; the state of even a slight alcoholic intoxication makes it impossible for the worker to work safely.

3. The major part of the examined persons indicated that avoiding physical danger mostly motivates the workers to fulfil the safety rules. Besides, many people noted that on-site observance of the regulations was also conditioned by the aim to avoid punishment, not to get the crew, foreman into trouble, and just action by the form of habit.

4. The more respondents are focused on increasing labour productivity, the less they strive to improve the quality and safety of workers.

5. For all groups of respondents, the maximum average values were found out by the index of clan corporative culture, which is characterised by the availability of common valuables and principles, friendlike, confidential relations between employees, teamwork style, aim to help and train. Degradation of the clan corporative culture can appear in the form of irresponsibility and permissiveness.

6. Moreover, it is detected that there are differences in perception of the corporative culture by the top managers and the on-site managers. In comparison with on-site managers, top managers believe that the organisation is like a big family to a greater extent. And in comparison with top managers, on-site managers indicate more that there are established formal relations in the organisation. On-site managers hope to reduce tensions in professional relationships and increase forming of the team into one body in the future.

7. In organisations where penalties are provided, employees report greater motivation for teamwork and insistence on high standards and predictable and stable relationships.

AUTHOR CONTRIBUTIONS

All authors were contributed to the design and implementation of the research. IG collected the experimental data. IK and EB performed the data analysis. AM, IK, and EB aided in interpreting the results. VB and IS made a literature review. All authors discussed the results and contributed to writing the manuscript.

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