

A Cross-Sectional Research on Safety Culture Success Factors: Experience of Russia Safety Culture Success Factors



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Abstract— *The main aim of our research was to define the most important things for people in terms of their safety at work. Also, we wanted to find out why the same measures of safety improvement were effective at one enterprise, but could lead to the opposite result and would not be supported by the staff at another one. In other words, our goal was to formulate and list success factors of safety culture that could help both a country and an enterprise to avoid big expenditures related to occupational incident and accidents, as well as to save qualified staff, and most importantly, people's health and lives.*

Keywords: *Safety culture survey, occupational safety and health.*

I. INTRODUCTION

According to the International Labor Organization (ILO) estimates (20), nearly 5 000 people die every day in the world because of occupational accidents and illnesses, which gives us an annual figure of 2-2,3 million of occupational-related deaths. Moreover, every year almost 270 million of occupational incidents lead to occupational sick leave for more than 3 days. It gives us about 4% of world GDP loss (about \$1 252 billion) because of lost working hours and compensatory payments.

Over the last 150 years, a lot of scientists and practitioners have been trying to determine the reasons for such enormous human and economical losses. Some of them (for example, 18) analyze the evolution of such reasons in historical perspective. In the 1970s and 1980s, such an important element of occupational safety and health (OSH) management system as behavior-based safety (BBS) became one of the priorities for research and promotion as a tool for preventing occupational accidents, incidents and diseases. It was only at the beginning of the 21st century that academicians and experts in OSH reached an understanding that a person's behavior is only a segment, a part of safety culture needed for sustainable development of an enterprise. Safety culture became a subject of studying in terms of its structure, levels and main elements.

However, similar efforts of the employer to increase workers' safety may lead to different, sometimes opposite, results at different companies: at one enterprise actions taken in this area are quite effective, but at another one the same actions do not always lead to the expected results and are not supported by the staff.

The goal of the research was to draw out "success factors" for measures for occupational accidents prevention implemented at different organizations, as well as to determine the main reasons that moved workers to follow or, on the contrary, to breach safety regulations.

II. MATERIALS AND METHODS

2.1. Feasibility demonstration of method chosen

As per R. Wieringa (42, 43), design science is mainly used to study artifacts (characteristics that were introduced by the research procedure). This method takes a lot of time, including implementation of planned changes and permanent feedback during the whole process of the study.

Action research (for example, (14) and (34)) purports constant exchange of knowledge and experience between a researcher (a scientist) and a practitioner, as well as further dissemination of best practices for resolving specific issues.

Z. Zainal (45) defines case study as a method for skills training in a certain way designed situation. All the pros and cons of these methods are described in detail in the research of R. S. Cram's (11) and in the third edition of «The Good Research Guide» (12).

We can say that all the above-mentioned methods are very consuming in terms of time and resources; moreover, we were planning neither to implement and assess any changes nor to have a permanent feedback. Thus, we have chosen a method of survey with a questionnaire as the best suitable method for us. This method makes it possible to provide the widest sample frame and does not limit us in the resources needed.

Also, there are a lot of methods that have been used for processing of the results of different surveys conducted to assess the level and condition of safety culture, as well as its elements. For example, experts quite often use such classical methods as factor analysis (see, for example, 36; 19; 40), correlation analysis (see 16; 6), comparative analysis with weighting of each indicator (see 33; 41), meta-analysis (see, for example, 9) etc.

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As we had no task to create serious and complex mathematical models and taking the simplicity of the questionnaire into account, we decided to use a simple descriptive method based on the comparison of proportions of answers given to one or another question.

2.2. Research methodology

Different experts define different structures and assess different elements (components) of safety culture. For example, Arslan Volkan (1) defines the following assessment criteria: communication; employer-employee trust; feedback; involvement; mutual trust; problem identification; promotion of safety; responsiveness; safety awareness; training and competence. In other words, they mainly observe the “emotional” part of safety culture.

Y. Bhattacharya (4) takes the following elements of safety culture as a basis: management commitment and visibility; communication on matters of safety; productivity versus safety; focus on learning from problems rather than allocating blame; safety resources; participation and involvement in safety matters; shared perceptions about safety; visible mutual trust between stakeholders; industrial relations and job satisfaction; training.

J. K. Wachter (39) assesses the meaningfulness of such indicators as: recordable accidents; lost time accidents; emotional engagement; cognitive engagement; employee engagement composite; safety management systems; safe work procedures; employee involvement; safe task assignment; pre- and post- task safety reviews; detection and monitoring; accident investigation; communication and information sharing; safety training; cooperation facilitation; hiring for safety.

H. Nordlöf (31), who was examining not only safety culture as a phenomena, but also OSH improvement practices implemented in different organizations, segregated such elements of safety culture as: instructions; safety rules; risk acceptance; management commitment, productivity pressure, employee involvement, individual responsibility; incident reporting; no fatalism; blaming, peer feedback; safety training, communication, continuous improvements.

It was not the target of our survey to assess the level of safety culture at a particular enterprise. While designing our questionnaire, we were pursuing several aims: to define the main subjects interested in increasing safety level at organizations; to identify the most common elements of safe work practices existing at organizations; to select the factors considered to be the most meaningful by those surveyed; to detect measures (actions taken) promoting occupational safety at organizations; to determine the main reasons that moved workers to follow or, on the contrary, to breach safety regulations. Also we were not focusing on a particular industry; we were trying to assure the widest range of enterprises functioning in sectors with the highest level of injuries based on the official statistics published on the web-site of the Russian Statistics Committee¹.

The survey was conducted in a way of a targeted mail out of a questionnaire to enterprises as well as giving people an opportunity to answer questions in an interactive way on the web-sites of our Institute and the Ministry of Labor and Social Protection of the Russian Federation. We have

collected 5004 questionnaires from more than 50 organizations in total. 70% of the questionnaires have been received via e-mail as scanned documents. While creating a database, we were eliminating the questionnaires that had been filled incompletely or contained more than 2 mistakes (for example, variants of answer chosen exceeded the maximum amount of variants of answers indicated in the question), which left us with 2 799 correctly and completely filled valid questionnaires. Then, the sample was corrected taking into account the proportion of employed in the main sectors of economy (proportion was also taken from the official web-site of the Russian Statistics Committee). So, the final sample includes the questionnaires from 553 respondents.

The given answers were grouped according to respondents' position (profession, occupation), sector of economy, age and length of employment history in the profession. As the survey was quite comprehensive and detailed, here we are presenting only the most significant findings.

III. RESULTS AND DISCUSSIONS

3.1. Respondents' assessment of the OSH status at their enterprise

The question on the OSH status was in a form of a quiz. The choice given was as follows: *excellent* (both employers and employees are taking care about safety and health and openly demonstrate it; we do more than prescribed in written rules and regulations), *good* (OSH is one of the principles of day-to-day work at our enterprise, all regulations and rules are followed consciously), *satisfactory* (we are aware of OSH, but we do everything formally) and *unsatisfactory* (no one cares about OSH, we have no rules or regulations).

Most of respondents characterized the status of OSH at their enterprise as good (67%) or excellent (22,1%). Only 6,6% of those surveyed thought that OSH at their enterprise was satisfactory and 4,3% — that it was unsatisfactory. With a breakdown by age, we have found the following direct correlation: if at the age of 20-30 years old 38% of respondents evaluated OSH at their enterprise as excellent, then among the respondents at the age of 40-50 years old the ratio of those given the highest rating of OSH at their organization decreased to 15,4%. With a breakdown by occupation, the lowest share of excellent OSH condition assessment (14,3%) was given by OSH specialists.

With a breakdown by sectors of economy, OSH was assessed as excellent by 30,6% of those surveyed from construction sector, 22% from iron industry and nonferrous metallurgy, 23,5% from chemical industry and 27,5% from manufacturing industry. It should be emphasized that construction and manufacturing in the Russian Federation (probably like in most countries in the world) are traditionally on the top of anti-champions line of the occupational accidents level. This fact can indirectly confirm that people are more likely to associate OSH with the usage of equipment, in other words, with the technical side of safety, while technical reasons in the Russian Federation form only 7% of injuries, though 73% of them are caused by so called “human factor”.



3.2. Attitude to OSH at the workplace

The following choice of answers was given:

I know OSH regulations and understand the importance of following them;

- I am familiar with OSH regulations in general terms;
- My job is irrelevant to hazards or harmful conditions, so OSH is not for me;
- OSH is just a formality.

The vast majority of respondents (81,3%) answered that they knew OSH regulations and understood the importance of following them. 10% of those surveyed noted that they knew OSH regulations in general terms. For 6% of respondents OSH was just a formality.

Speaking about the assessment of the OSH status with a breakdown by age, the following positive correlation could be stated: the share of respondents at the age of 20-30 answered that they knew OSH regulations is 73,5%, and among the respondents at the age of more than 50 years old it grows up to 86,1%. 15,9% of respondents at the age of 20-30 pointed that they knew OSH regulations in general terms, while among those older than 50 this share declines to 4,9%. In other words, the younger the workers, the lower is their knowledge of OSH regulations and understanding of its importance.

It is also worth mentioning that the highest share of those who considered OSH a formality was among those with the occupational experience of 10 to 15 years (11,7%). Notably, the older the workers, the better are their OSH requirements knowledge, but also the higher the consideration of its formal nature. This could be given as a proof of a fact that the majority of occupational injuries occur with this particular group of workers, whose long working history decreases their risk perception during day-to-day common and well-known routine operations.

One more insight for us was that the lowest share (79,7%) of those who stated that they knew OSH regulation and understood its importance was among front-line managers. This should also be brought to the attention as front-line managers (especially those supervising hazardous operations) should know all the rules and regulations better than most and should understand that lives of their subordinates depend on the accuracy of following these rules.

3.3. Violation of OSH regulations because of operational needs

The following choice of answers was given:

- No, I always follow OSH regulations;
- Yes, sometimes I violate safety rules, but very rarely;
- Yes, I'm neglecting OSH regulations quite often.

Most of those surveyed (63%) responded that they consistently followed OSH regulations. A quarter of respondents (23,7%) noted rare violations. 5,1% of respondents admitted to frequently neglecting OSH regulations.

It is telling that frequently neglect OSH regulations: 1,9% of those who estimate the OSH status at their enterprise as excellent, 12,9%, of those who assess it as satisfactory and 35% of respondents who estimate the OSH status at their enterprise as unsatisfactory. Tracing the chain of further answers to the other questions, one can come to a conclusion that people assessing the OSH status as bad not only regularly

break safety rules themselves and do not consider themselves responsible for their own safety, but also consider OSH to be a formality.

3.4. What are the main parties of concern in workplace safety?

The following choice of answers was given:

- This is the employer's responsibility to take care of workers' safety and to tone at the top;
- This is the responsibility of OSH specialists as they are being paid for this;
- Employers should themselves take care of OSH not formally, but very attentively, as their own lives and health are at stake.

Most of those surveyed (64,5%) consider workplace safety to be a responsibility of workers, 30,8% are sure that this is totally employee's business, and only 4,7% note that this is a responsibility of a professional OSH specialist. Respondents assessed OSH at their enterprise as satisfactory or unsatisfactory were more intent to put the responsibility on OSH stuff (9,7% and 20% proportionally). Half of respondents (50%) assessing OSH at their enterprise as unsatisfactory considered OSH to be the employer's responsibility. With a breakdown by age, we have noted the following tendency: 50% of respondents at the age of below 20 considered OSH to be the employer's responsibility, while within the other age groups this share did not exceed 30%. With a breakdown by occupation and profession, more than a half (56%) of high-level employers considers OSH to be their own main responsibility. Other occupational groups mainly thought it to be the duty of the worker.

In other words, younger workers not only know safety rules and understand its importance worst of all, but are also sure that taking care of their own safety and work is not their business. Also, such distribution of answers indicates that at Russian enterprises there is no clear understanding of a simple fact that OSH is a mutual and equal responsibility of both employers and employees.

3.5. What are the most important factors in terms of safety precautions of workers at the workplace?

Experts from different countries proposed various approaches to define the system of indicators for the assessment of meaningfulness of one or another element influencing workers' safety. For example, G. I. Zwetsloot (49) proposed to group the main values contributing to keep occupational safety, health and welfare at a high level on the following attributes: Ethical values: valuing people (being) (interconnectedness; participation (Autonomy; Empowerment; Self-organization; Social inclusion); trust); Ethical values: valuing desired individual and collective behavior (doing) (justice; responsibility); Aspirational values: Valuing (alignment of) personal and organizational development (becoming) (development and growth; resilience). H. W. Bonaventura (5) defined the following factors influencing workers' safety: Safety culture; Communication; Empowerment; Management commitment; Leadership; Organization Learning; Reward system.

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S. M. Zin (48) listed the following factors that helped to eliminate occupational safety: Management Commitment;

Organizational Commitment; Safety Communication; Safety Leadership; Effective Safety Training; Safety Motivation; Safety Management System; Safety Guidelines and Regulation; Safety and Health Officer; Personal Protective Equipment (PPE).

In our survey we proposed the elements listed below:

- Top managers show personal example of following OSH regulations;
- Workers know about concrete hazards at their workplaces and about measures of protection from these hazards;
- Clear division of responsibilities on safe operation performance is in place;
- Clear documents, regulations, instructions and requirements on OSH are in place;
- Workers have enough visual information on safe operations performance, including exhibition stands, posters, safety signs and symbols;
- Equipment and technologies used are safe and modern;
- Safety workshops on OSH regulations and safe operation methods are of high quality;
- Workers receive regular information on OSH;
- Front-line managers give needed explanations on safety matters;
- Workers have enough knowledge and experience to work safely on their equipment;
- Workers are given an opportunity to openly discuss their security needs with their front-line managers;
- Safety compliance even in cases there is a faster but less safe way to fulfill the task;
- The system of motivation for following safety regulations and implementation of safety improvement proposals are in place.

The choice of answers on this question was divided into 2 parts. Firstly, respondents were asked to choose elements existing at their enterprise. Secondly, they were asked to choose among the same variants of answers those elements they considered to be the most meaningful regardless of its existence at their enterprise.

From the point of view of Russian respondents, the most common elements of safety provision existing at Russian enterprises are: clear safety documents, instructions and regulations (71,8%), workers' awareness on particular hazards to safety and health at their workplaces (67%), high-quality safety workshops (59,3%), visual information on OSH (57,5%), knowledge and experience allowing workers to work safely on their equipment (51,1%).

As the most meaningful, the following safety elements were chosen: personal example of the top management (45,2%), workers' awareness on particular hazards to safety and health (39,9%), usage of modern and safe equipment (38%), high-quality safety workshops (34,5%), clear safety documents, instructions and regulations (30,9%), clear division of responsibilities on safe operation performance (29%), motivation for following safety regulations (25,6%), workers' knowledge and experience on how to work safely on their equipment (25,4%), receiving visual information (22,6%), following safety regulations, even in case there is a

faster but less safe way to fulfill the task (22,6%).

From the point of view of those surveyed, it can be concluded that almost all of the most meaningful elements of safety performance are in place at the majority of Russian enterprises. The exceptions are: top management's personal example of safety compliance and safe operations performance, even in situations when there is a faster but less safe way to fulfill the task. These elements are considered to be important but are not so widely presented in practice.

The issues of OSH education and training improvement and OSH and safety knowledge distribution are quite popular among OSH experts, as there is a clear understanding of close correlation between the level of occupational incidents and the level of safety awareness of workers. Below you can find a few examples of this kind of researches conducted during the last 5-7 years.

Specific requirements associated with teaching of young workers as a specialized category were examined in the researches of lots of authors (see (17), (27), (35) and (46). M. Cecchini (7) and K. E. Koo (26) were examining the influence of OSH training on workers' behavior. New forms and methods of safety trainings were highlighted in the articles of M. S. Avnet (2), S. Bahn (3), Sh. Liu (30) and A. A. Gallegos (15).

The fact that management of different levels (top management in particular) is playing one of the key roles in workers' safety improvement and development of safety culture is well known and was recognized both by analysts and experts quite a while ago. Among the researches of this matter the following could be mentioned: F. Ismail (21), X. Du (13), N. C. Sweepers (38) and T. Kim (25). The role of top management in terms of management style was studied by T. Zuofa (50). Furthermore, W. Chunxiang (10) and I F. Ismail (22) formulated practical recommendations for top managers on strengthening their role and significance in improving safety level at their enterprises.

However, some experts identified clear relationship between the organization's level of safety culture and the role of top management. For example, F. Zhou (47) declared that safety climate showed a significant moderating effect on both the relationship between leader-member exchange (LMX) and safety behaviors, as well as between LMX and safety motivation. When the safety climate is strong, high quality of LMX may lead to more safety behavior, but when the safety climate is weak, high quality of LMX may lead to less safety behavior.

3.6. What can improve safety of operations at the enterprise?

The research conducted by H. P. Chandra (8) can be indicated as an example in a number of analyses of factors that can stimulate safety improvement at the enterprise level. As motivators to achieve a sustainable construction safety and health for workers H. P Chandra proposed: Leadership (interpersonal skill; experience; power and control; trust); Project organization (clear common goal, clear responsibilities; technology; task); Company support (tools, time, and incentives; communication rules and policy; team selection); Sustainable construction safety and health.



F. Ismail (23) surveyed the opinion of workers regarding factors that influence the improvement of safety culture and identified the following elements: Strong Commitment; OSH implementation; Knowledgeable and experience; Sharing information; Positive thinking; Enforcement; Leadership; Attended meetings held to show the concerned on safety.

The below listed indicators that could improve workers' safety were proposed in our questionnaire:

- Opportunity for workers to openly express their opinion, to give suggestions and actively participate in the development of measures and actions that can make their work more safe;
- Usage of more modern and safe equipment and technologies;
- More clear and understandable instructions and rules of performance;
- More efficient workflow management (less deadline pressure and overtime);
- More visual information on OSH (posters, safety signs and signals);
- More accredited and practical workshops and trainings on safety performance;
- More serious attitude to safety on behalf of management;
- The system of motivation for following safety regulations and punishment for its breaking;
- More attentive attitude of employees to their own safety and health.

The most effective measures of safety improvement from the point of view of those surveyed are: more attentive attitude of employees to their own safety and health (59,5%), usage of more modern and safe equipment and technologies (56,9%), the system of motivation and punishment (42,9%), more efficient workflow management (41,5%), opportunity for workers to openly express their opinion, give suggestions and actively participate in the development of measures and actions that can make their work more safe (38,5%). One-third of those surveyed (31,6%) responded that more serious attitude to safety on behalf of management was needed to increase workplace safety.

As it is seen from the above mentioned, the system of motivation and punishment takes the third place in the list of the most effective measures to improve workplace safety from the point of view of Russian respondents. But this is also a topic of interest for experts from around the world. Zh. Shu (37) analyzed possible ways to stimulate workers of the mining sector to follow safety regulations. This survey was based on "hierarchy of needs" and the following main motivators were identified: The pay incentive mechanism with the need as the core; The organization incentive mechanism with the safety system as the core; The safety training and promotion incentives with self-realization as the core; The culture incentive mechanism with the safety as the core.

In our survey we have found that, with a breakdown by age, younger workers (below 30 years old) are more likely to rely on management, norms and instruction in comparison with older workers. For instance, more attentive attitude to their own safety and health as a measure to improve safety was chosen by 53,6% of respondents younger than 30 years old, by 62,8% of respondents at the age of 40 to 50 years old

and by 70,5% of those older than 50.

The value and meaningfulness of measures to improve safety also differ among groups with different assessment of the OSH status at their enterprise: those who estimated OSH as excellent and good considered that workers should pay more attention to their own safety and health (70,6% and 64,4% correspondingly). 63,2% of those assessing OSH at their enterprise as unsatisfactory believed that more serious attention to safety on behalf of management was needed to improve safety.

More attentive attitude of workers to their own safety can be considered as a factor which directly influences workers' behavior. The necessity of developing adequate behavioral models is confirmed by the results of the research conducted by X. Yuan (44) and J. Liu (29).

However, their Polish colleague M. Jasiulewicz-Kaczmarek (24) conducted a SWAT-analysis of usage of behavioral models as a tool to measure safety culture.

He defined the weaknesses mentioned below:

- Often, only behavior that is easily recognized without going into the detail is included;
 - The quality of feedback depends on the involvement of the observers and surveillance staff analyzing the data;
 - Developing a good plan of observation requires reliable information and continuous analysis of data obtained from previous observations;
 - In general, it is necessary to benefit from support of external consultants;
 - In the absence of involvement and understanding of the principles it may lead to conflicts.
- Also, he determined the following indicators as threats:
- Lack of trust to colleagues may cause aversion to the program;
 - The current low level of education of employees may prevent the majority of workers from becoming observers;
 - Supervisors may resent the task of observers as unwarranted interference;
 - No incentive system for observers can cause unfairness during the observation;
 - The need to respond to all suggestions of employees, regardless of their merits.

3.7. What motivates people to follow safety rules?

We have proposed the following answers to choose from:

- A reprimand made by the front-line manager or OSH specialist;
- A reprimand made by a colleague;
- Concern about his/her life and liability towards family members, relatives and close once;
- Fear of punishment by management (such as penalty charge);
- Stimulation of acting in accordance with safety regulation;
- Safety compliance is a matter of principal among our staff members, so it's a norm for me.

Most respondents (80,5%) note that the main incentive for

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following safety rules is a concern about his/her life and liability towards family members, relatives and close once. In 41% of cases safety compliance is a matter of principal among the staff members and respondents consider it to be normal. 38,9% of those surveyed are stimulated to follow safety rules by the fear of punishment. A reprimand made by the front-line manager or OSH specialist stimulates 38,4% of respondents to follow safety rules, and motivation is a driver for 31,7% of those surveyed. A reprimand made by a colleague happens to have almost no power and was chosen only by 11,8% of respondents. This could be used as an explanation of the fact that so called "behavioral safety audits" cannot be considered as an effective and powerful tool to influence implementation and improvement of safety culture on most of Russian enterprises: a reprimand, made by a colleague (even if this colleague is speaking as an auditor), will not be taken seriously.

There are certain dependencies between factors motivating to follow safety regulations and age. Concern about his/her life and liability towards family members, relatives and close once is common for all groups, but the older the person, the bigger the share of those who consider it to be the main priority: from 74,8% among respondents at the age of 20-30 years old to 86,3% for those older than 50. Fear of punishment by management, on the contrary, declines together with age: from 48,6% among respondents at the age of 20-30 years old to 30,8% for those older than 50.

Similar tendencies could be defined with a breakdown by employment history: the longer the history, the bigger the share of those, whose main priority is concern about his/her life and liability towards family members: from 78,8% for those with employment history of less than 5 years up to 86,7% for those with employment history of more than 15 years. Fear of punishment by management, on the contrary, declines together with employment history duration: reducing from 43,8% for those with employment history of less than 5 years to 27,4% of those with employment history of more than 15 years.

With a breakdown by the OSH status assessment, respondents' choices of priorities differ significantly. The answer "Safety compliance is a matter of principal among our staff members, so it's a norm for me" was chosen by 57,4% of respondents assessing OSH at their enterprise as excellent and only by 16,7% of those who assessed it as unsatisfactory.

3.8. What makes people violate safety rules?

We have proposed the following answers to choose from:

- Workers leave it to chance very often;
- Everyone is violating the rules, so following the rules by individual workers makes no sense;
- Sometimes people do not know how to work safely;
- Our safety rules are unclear and are not in line with the practices;
- There is a heavy workload which does not allow to follow all safety rules;
- A desire to hit the target and get a bonus, even if it will be achieved via violation of safety rules;
- A wish to save time and fulfill the task more quickly.

Literature analysis shows that "leaving on chance" is a reason of safety rules violation that is typical not only for Russia: among occupational incidents reasons, G. Liu (28)

identified "safety accidents caused by lucky". H. Nordlöf (32) considered this issue from a bit different perspective: he was speaking about the assumption of risk and stated that most of the workers performing high-risk operations could be named "fatalists". This means they believe that their work cannot be done without zero risk so this risk is unavoidable and must be accepted as a given (the above-mentioned authors define this as "danger tolerance" and "fatalistic beliefs").

Our survey showed that most of respondents (53%) considered a wish to save time and fulfill the task more quickly to be the main reason of safety rules violation. They are followed by: leaving it to chance (49%), heavy workload (45,9%) and bad knowledge of how to work safely (36,3%). Such choice distribution is very difficult to explain in light of the fact that most of those surveyed pointed high quality and adequacy of safety workshops and occupational trainings, knowledge of concrete hazards at the workplaces and sufficiency of visual safety information. We can make an assumption that these answers were given by respondents working at enterprises with high level of turnover or with a big share of young workers with short employment history (trainings and information are in place but workers did not have enough time to implement it). This statement could be indirectly proven by the fact that the main share of those who choose the answer "Sometimes people do not know how to work safely" (41,7%) is accounted for the respondents at the age of 40-50 years old, together with the previously-mentioned (in the Subsection 3.2) very low share of respondents at the age below 30, who stated that they knew safety rules and (in the Subsection 3.4.) who noted that they were responsible for their safety and health themselves.

From the point of view of those older than 50 years old, the main reason of safety rules violation is leaving it to chance (53,7%). A wish to save time and fulfill the task more quickly is the most common reason (58,7%) for respondents with employment history of 10-15 years. This also can be considered as a proof of a previously made conclusion (Subsection 3.2) that older workers with long employment history may know safety regulation better than others but consider them to be a formality following principals like "I am doing like this all the time" or "I know how to do it better than anyone else so do not try to teach me."

With a breakdown by professions, the biggest share (14,9%) of those surveyed responded that "Everyone is violating the rules, so following the rules by individual workers makes no sense" was among front-line managers. Together with the fact that this group gave us the biggest share of those who knew safety rules in general terms and the lowest share of those who noted clear distribution of responsibilities (and distribution of responsibilities was not mentioned at all as an element for safety improvement by this group), this should give pause to reflect on effectiveness of OSH management systems at such enterprises.

The main reasons for violating safety rules also differ among groups with different OSH status assessment at their enterprise: unclear safety rules and instructions are reasons

for violating those rules for 7,8% of respondents who assessed the OSH status as excellent and for 40% of those assessed it as unsatisfactory; 36,3% of respondents who assessed the OSH status as excellent and 65 % of those assessed it as unsatisfactory pointed heavy workload as a reason for safety rules violation.

IV. CONCLUSION

The main findings of the cross-sectional survey conducted to define success indicators of safety culture at enterprises are as follows.

The most common factors in ensuring security at Russian enterprises are the following²:

- Workers know about concrete hazards on their workplaces and about measures of protection from these hazards;
- Clear documents, regulations, instructions and requirements on OSH;
- Enough visual information on safe operations performance;
- High quality safety workshops on OSH regulations and safe operation methods;
- Workers have enough knowledge and skills to work safely on their equipment.

In addition to the above-mentioned, the following success factors of safety culture³ could be listed:

- Top managers' personal example of following OSH regulations;

Safety compliance, even in case there is a faster but less safe way to fulfill the task.

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