Analysis of the performance of occupational health and safety in the production business system

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Abstract. The basic task of the occupational health and safety system in the business system is to identify all the hazards and harmfulness that occur in work processes, to assess the risks of identified hazards and harmfulness, and to design protection measures that reduce risks to an acceptable level. Monitoring and evaluating the occupational health and safety system in the business system is achieved by defining key performance indicators in the form of performance. By collecting data on the state of occupational health and safety in the business system and their analysis, we obtain information about the deficiencies of the given system. Determining the correlations between the occupational health and safety system in the business system and its performances leads to defining of the guidelines for improvement. On the basis of these data, the optimization of the given system can be performed in order to raise the level of its effectiveness and efficiency.

1. Introduction

All business processes should have defined key performance which are monitored and measured, as well as occupational health and safety processes. This approach enables the proactive measurement of the leading safety performance indicators with the goal of continuous improvement, which is one of the basic requirements of the OHSAS 18000 standard. The basic goals of the implementation of occupational health and safety measures are to reduce the risk (probability of occurrence) and to reduce the consequences of unwanted events.

Most often, only unwanted events (injuries, occupational diseases, fatalities, illnesses) are measured with all their characteristics, such as lost working hours and other costs, as performance of occupational health and safety. However, this performance covers a much wider area, for example, planning, implementing key training and training activities, participation of management in the field of occupational safety, safety culture, culture of dialogue between participants in the system of occupational health and safety (employer, trade union, workers), human resources management and the like. Occupational health and safety is an integral part of the performance of each work process and the organizational structure of the business system as a whole. Modern business and business process management tends to standardize all procedures, as well as procedures related to occupational health and safety. This approach enables the creation of additional value, competitiveness and performance of the business system. Increasing the efficiency and effectiveness of managing the occupational health and safety system means reducing the number of unwanted events and all costs
associated with unwanted events, such as accidents and injuries at work, fatalities, environmental accidents, discharge of dangerous substances, production of hazardous and non-hazardous waste, energy consumption, production hazards and all other negative effects [1]. An effective system of occupational health and safety is one of the indicators of successful operation of the organization as a whole, and we can conclude that raising the level of efficiency of this system helps in achieving business goals (Figure 1).

![Diagram of occupational health and safety measures](image)

**Figure 1.** The advantages of applying occupational safety measures in the business system [2]

Key indicators of occupational health and safety are numerical indicators that should provide information to the management of the business system on what happened in the previous period and what are the problems and difficulties in providing occupational health and safety. Based on these information, the business system consequently adjusts its response to changes in occupational health and safety. Key indicators of occupational safety and health are used to measure progress towards certain health and safety goals or monitor trends related to business organization activities [3]. Indicators provide information and what is happening around the business system, as it stands in relation to competition in terms of occupational safety. Defined key occupational safety indicators are subject to change and may be changed. Some indicators will be excluded from monitoring, and the new ones will be included depending on the stated needs and conditions in the occupational health and safety system. Key indicators are not oriented only to the past, but also towards the future and primarily prevention. From a standpoint of the success of occupational health and safety system in the business system, prevention is a dominant goal [3].

Preventive measures include planned or undertaken measures in all work processes by the employer, with the aim of preventing or reducing the risks at work. Preventive measures, work and production procedures applied by employer based on risk assessment must ensure the highest possible degree of workers' occupational health and safety. Occupational safety must be included in all work processes of employer and at all levels of organization and management. In the process of organizing the work process and entrusting the work to the worker, the employer is obliged to consider all the capabilities of workers that can influence on the protection of his/her health and safety at work [3].
In the business system in which the research presented in this paper was carried out, the following indicators of the occupational health and safety system are monitored, Figure 2:

![Figure 2. Indicators of occupational health and safety system in the observed business system](image)

2. Methods of research

2.1. Research problem and goal of research

Recording the state of the existing occupational health and safety system in the production business (extraction and processing of mineral raw materials - production of iron ore) system enables the collection of data for its improvement.

The aim of the research was to get to know about the role, significance and characteristics of the occupational health and safety system in the observed production business system and based on the adopted conclusions to define the possibilities and guidelines for its optimization.

2.2. Hypothesis

Based on the research problem, the following hypotheses have been posed:

- **H1**: By monitoring the indicators and the performances of occupational health and safety in the production business system, the level of efficiency and effectiveness of the occupational health and safety system and the business system as a whole is raised.

  2.2.1. **Auxiliary hypothesis. H2**: There is a connection between the worker's (employee's) profile and the occupational health and safety system in the organization. **H3**: There is a connection between the worker’s (employee’s) profile and the state (performance) of occupational health and safety in the organization. **H4**: There is a connection between the occupational health and safety system in the organization and the state (performance) of occupational health and safety in the organization.

2.3. Tasks

Research tasks have been set as follows:

- A survey instrument was created: a survey questionnaire with established independent and dependent variables.
• A survey has been conducted on a determined sample.
• Data from the questionnaire were collected and statistically processed.
• The results obtained were interpreted through discussion and conclusion.

2.4. Survey method
The data were collected using a research that is descriptive-analytical, in written form, voluntary and anonymous for respondents. The questionnaire contains 43 closed-type questions, categorized into 4 groups of questions.

2.5. Research variables

Table 1. Variables of survey research (independent and dependent variables)

| Independent                                                                 |
|----------------------------------------------------------------------------|
| 1. Worker profile                                                        |
| • gender                                                               |
| • age                                                                   |
| • level of education                                                     |
| • total work experience                                                 |
| 2. Profile organizational unit                                           |
| • number of worker in the organizational unit                            |
| • the activity of the organizational unit                                |
| • The occupational health and safety system in the organization (organizational unit) |
| • My workplace is safe in line with the organization's policies and rules of occupational safety |
| • Direct management (supervisors, headman, etc.) understands occupational health and safety as a priority |
| • Direct management (supervisors, headman, etc.) removes safety omission as soon as possible and provides feedback on the undertaken protection measures |
| • Direct management (supervisors, headman, etc.) does not allow work if all protective and safety measures are not taken and provides support to workers in all matters of protection and safety (advice, additional information, teaching) |
| • All safety incidents are reported and investigated, and information is available to all workers |
| • Our organization has a good safety history (injuries, safety incidents, work-related disorders, occupational diseases are not common) |
| • All means of work (machines, devices, equipment, tools) are maintained regularly, failures are immediately reported and eliminated |
| • All protective systems and devices are always available and used |
| • Plan (evacuation and rescue), equipment and available human resources in case of danger (natural disasters, accidents, fireworks, explosions, etc.) are satisfactory |
| • Occupational health and safety are the main priorities of management |
| • Management always (by its behaviour) gives a positive example when it finds itself in a work environment |
| • Management does not blame workers in case of a safety incident |
| • Management does not insist on productive performance if the condition of the occupational health and safety is problematic |
| • All workers are aware of the risks of work they perform and are involved in assessing the risk of their organizational unit and workplace |
| • The state of working environment in workplaces is good |
| • There is exposure to potential hazards and harmfulness in workplaces |
| • There is possibility of occurrence of unwanted event in workplaces |
| • There is possibility of unwanted consequences of endangering human health at |


workplaces
• Workplace risk assessments are audited, and workers are informed about changes
• Our organization recognizes, controls and manages risks in the workplace
• Our organization carries out regular medical examinations of all workers
• Personal protective equipment is always available, correct and in case it has been worn out replaced with a new one
• No operation is permitted without the use of personal protective equipment
• All workspaces are marked with appropriate safety signs - signs of danger, notifications and obligations (for example danger of electric current, obligation to use personal protective equipment, etc.)
• Occupational health and safety of the organization is the responsibility of all workers
• The occupational health and safety representative takes care of his/ her safety and the safety of other workers
• Measures are taken against workers who do not comply with the occupational health and safety rules
• Inspection controls are regularly implemented, and the observed shortcomings are eliminated as soon as possible

Dependent
• The state (performance) of occupational health and safety at work in the organization
• Assessment of the state of occupational health and safety in the organization
• Assessment of financial investments of the organization in the occupational health and safety
• Assessment of management participation in the organization's occupational health and safety system
• Assessment of the participation of workers in the organization's occupational health and safety system
• Assessment of training and education in the organization's occupational health and safety
• Assessment of the work of the trade union organization
• Assessment of the work of the Occupational safety service in the organization
• Dialogue/ cooperation between employers, trade unions, workers' representatives, workers and inspections in the area of Occupational health and safety
• The work of the Committee on occupational health and safety in the organization
(Advisory body for issues of Occupational health and safety consisting of representatives of workers, trade unions and workers)

Source: Survey Research

2.6. Research sample
Employees who are employed in the production business system (extraction and processing of mineral raw materials - production of iron ore) were defined as potential respondents in the survey i.e. about 800 potential respondents.

The expected and planned minimum number of respondents for participation in the research is:
• more than 30
• more than 10% of the total number (more than 80 respondents)
• more than the minimum representative sample determined on the basis of the variability of the dependent variables of the research (minimum scientific sample).

2.7. Statistical methods
• N – frequency
• % – percentage
• Σ – amount - sum
• M – arithmetic mean
• σ – standard deviation
• $V\%$ – coefficient of variability
• $r$ – Pearson's coefficient of correlation for testing the connection between independent and dependent variables

2.8. Data on survey research
The survey was organized in the period from 15.02.2018 to 15.03.2018. The research was carried out directly by answering the questionnaires by respondents in the presence of researchers. A total of 205 respondents participated, 2 survey ballots were invalid and 203 filled questionnaires were accepted as valid for statistical processing.

2.9. Testing the representativeness of the survey sample
The size of a simple random sample was obtained by the formula [4], [5]:

$$n' = \left(\frac{z_{\alpha/2} \cdot V}{G_r}\right)^2$$  \hspace{1cm} (1)

where is:
• $n'$ - the previous size of a simple random sample
• $z_{\alpha/2}$ – confidence or reliability coefficient for the default probability of estimation ($z_{0.025} = 1.96$ for the probability of estimation 95% and $z_{0.01} = 2.58$ for the probability of estimation 99%)
• $V$ – coefficient of population variability in percentages (%)
• $G_r$ – estimation error, expressed relative in percentages

For the probability of estimating 95% i.e. $z_{0.025} = 1.96$, the selected estimation error of 10% and the value of the variability coefficient of the population of the dependent variables 23, the sample size is $n_o = 20$, with an additional reduction ($f = n_o/800 = 0.03 < 0.05$) we get a minimal scientific sample $n_z = 20$.

The set conditions of representativeness of the sample have been met:
- $N(203) > 30$
- $N(203) > 10\% \cdot n (800)$, $N = 25.37\% \cdot n$
- $N(203) > n_z (20)$

3. Results and Discussion

| Table 2. Frequency (N) and percentage (%) of independent variables |
|---------------------------------------------------------------|
| **I. Worker’s (employee’s) profile**                          |
| **1. Gender**                                                 |
| • men - 181 (89.2%)                                           |
| • women - 22 (10.8%)                                          |
| **2. Age**                                                    |
| • up to 30 years - 16 (7.9%)                                  |
| • from 31 to 40 - 71 (35%)                                    |
| • from 41 to 50 - 33 (16.3%)                                  |
| • from 51 to 60 - 74 (36.5%)                                  |
| • over 60 years - 9 (4.4%)                                    |
| **3. Level of education**                                     |
| • high school - 170 (83.7%)                                   |
| • college - 9 (4.4%)                                          |
| • higher education (graduate engineers) - 23 (11.3%)          |
| • masters - 1 (0.5%)                                          |
| **4. Total work experience**                                  |
| • up to 5 years - 8 (3.9%)                                    |
| • from 6 to 10 - 63 (31%)                                     |
| • from 11 to 20 - 45 (22.2%)                                  |
| • from 21 to 30 - 8 (4.4%)                                    |
| • over 30 years - 78 (38.4%)                                  |

| **II. Profile organizational unit**                          |
|-------------------------------------------------------------|
| **5. Number of worker in the organizational unit**           |
| • up to 50 workers - 45 (22.2%)                               |
| **6. The activity of the organizational unit**               |
| • production and technical sector - 199 (98%)                |
Workers (employees) as respondents gave subjective assessments of raised assertions by choosing a response from 1 to 5 according to the Likert scale of intensity [4], [5]:

1. I totally disagree  
2. I mostly disagree  
3. I do not know (I neither agree nor disagree)  
4. I mostly agree  
5. I totally agree  

Table 3. Arithmetic mean (M), standard deviation (σ) and coefficient of variability (V%) of independent variables of research related to The occupational health and safety system in the organization (organizational unit)

| Serial number | The occupational health and safety system in the organization (organizational unit) | Lowest rating | Highest rating | Arithmetic mean - M | Standard deviation - σ | Coefficient of variability - V % |
|---------------|----------------------------------------------------------------------------------|--------------|---------------|---------------------|------------------------|-------------------------------|
| 1.            | My workplace is safe in line with the organization's policies and rules of occupational safety | 1            | 5             | 3.99                | 0.91                   | 22.81                         |
| 2.            | Direct management (supervisors, headman, etc.) understands occupational health and safety as a priority | 1            | 5             | 3.99                | 0.88                   | 22.10                         |
| 3.            | Direct management (supervisors, headman, etc.) removes safety omission as soon as possible and provides feedback on undertaken protection measures | 1            | 5             | 3.90                | 0.81                   | 23.33                         |
| 4.            | Direct management (supervisors, headman, etc.) does not allow work if all protective and safety measures are not taken and provides support to workers in all matters of protection and safety (advice, additional information, training) | 1            | 5             | 3.95                | 0.94                   | 23.80                         |
| 5.            | All safety incidents are reported and investigated, and information is available to all workers | 1            | 5             | 4.15                | 0.99                   | 23.86                         |
| 6.            | Our organization has a good safety history (injuries, safety incidents, work-related disorders, occupational diseases are not common) | 1            | 5             | 4.17                | 0.95                   | 22.78                         |
| 7.            | All means of work (machines, devices, equipment, tools) are maintained regularly, failures are immediately reported and eliminated | 1            | 5             | 3.76                | 1.16                   | 30.85                         |
| 8.            | All protective systems and devices are always available and used | 1            | 5             | 4.08                | 0.96                   | 23.53                         |
| 9.            | Plan (evacuation and rescue), equipment and available human resources in case of danger (natural disasters, accidents, fireworks, explosions, etc.) are satisfactory | 1            | 5             | 4.27                | 0.88                   | 20.61                         |
| 10.           | Occupational health and safety are the main priorities of management | 1            | 5             | 4.17                | 0.97                   | 23.26                         |
| 11.           | Management always (by its behaviour) gives a positive example when it finds itself in a work environment | 1            | 5             | 4.05                | 0.91                   | 22.47                         |
| 12.           | Management does not blame workers in case of an error | 1            | 5             | 3.75                | 1.07                   | 28.53                         |

Source: Survey results
### 13. Management does not insist on productive performance if the condition of the occupational health and safety is problematic
1 5 3.69 1.10 29.81

### 14. All workers are aware of the risks of work they perform and are involved in assessing the risk of their organizational unit and workplace
1 5 4.14 0.77 18.60

### 15. The state of working environment in workplaces is good
1 5 3.82 0.85 22.25

### 16. There is exposure to potential hazards and harmfulness in workplaces
1 5 3.86 0.92 23.83

### 17. There is possibility of occurrence of unwanted event in workplaces
1 5 3.76 1.05 27.93

### 18. There is possibility of unwanted consequences of endangering human health at workplaces
1 5 3.84 1.01 26.30

### 19. Workplace risk assessments are audited, and workers are informed about changes
1 5 3.86 0.99 25.65

### 20. Our organization recognizes, controls and manages risks in the workplace
1 5 3.96 0.94 23.74

### 21. Our organization carries out regular medical examinations of all workers
1 5 4.62 0.77 16.67

### 22. Personal protective equipment is always available, correct and in case it has been worn out replaced with a new one
1 5 4.46 0.86 19.28

### 23. No work is permitted without the use of personal protective equipment
1 5 4.56 0.81 17.63

### 24. All workspaces are marked with appropriate safety signs - signs of danger, notifications and obligations (eg danger of electric current, obligation to use personal protective equipment, etc.)
1 5 4.43 0.80 18.06

### 25. Occupational health and safety of the organization is the responsibility of all workers
1 5 4.45 0.88 19.77

### 26. The occupational health and safety representative takes care of his/ her safety and the safety of other workers
1 5 4.15 0.91 21.93

### 27. Measures are taken against workers who do not comply with the occupational health and safety rules
1 5 4.05 0.85 20.99

### 28. Inspection controls are regularly implemented, and the observed shortcomings are eliminated as soon as possible
1 5 4.25 1.00 23.53

| Total |   |   | 4.08 | 0.93 | 23.00 |

Source: Survey Results

#### 3.1. Correlation testing

Correlations between independent and dependent variables of the study were tested by Pearson’s correlation coefficient. The correlation coefficient \( r \) has limit values: Degrees of freedom \((N-2) = 203-2 = 201\).

Correlation significance levels [6]:
- **An extremely significant correlation** - the risk of accepting the correlation between the two indicators is less than 1%, \( r \geq 0.181 \)
- **Significant correlation** - the risk of accepting the correlation between the two indicators is less than 5%, \( r \geq 0.138 \)
Table 4. Correspondence between independent variables Worker’s (employee’s) profile and The occupational health and safety system in the organization (organizational unit)

| Serial number | Independent variables | The occupational health and safety system in the organization (organizational unit) | 1. Gender | 2. Age | 3. Level of education | 4. Total work experience |
|---------------|-----------------------|----------------------------------------------------------------------------------|-----------|--------|----------------------|------------------------|
| 1.            | My workplace is safe in line with the organization's policies and rules of occupational safety | 0.021 | 0.207** | 0.324** | 0.162* |
| 2.            | Direct management (supervisors, headman, etc.) understands occupational health and safety as a priority | 0.058 | 0.276** | 0.146* | 0.217** |
| 3.            | Direct management (supervisors, headman, etc.) removes safety omission as soon as possible and provides feedback on undertaken protection measures | 0.073 | 0.187** | 0.093 | 0.208** |
| 4.            | Direct management (supervisors, headman, etc.) does not allow work if all protective and safety measures are not taken and provides support to workers in all matters of protection and safety (advice, additional information, teaching) | 0.138* | 0.237** | 0.117 | 0.168* |
| 5.            | All safety incidents are reported and investigated, and information is available to all workers | -0.068 | 0.161* | 0.106 | 0.052 |
| 6.            | Our organization has a good safety history (injuries, safety incidents, work-related disorders, occupational diseases are not common) | -0.011 | 0.108 | 0.125 | 0.021 |
| 7.            | All means of work (machines, devices, equipment, tools) are maintained regularly, failures are immediately reported and eliminated | 0.141* | 0.222** | 0.144* | 0.117 |
| 8.            | All protective systems and devices are always available and used | 0.019 | 0.116 | 0.062 | -0.019 |
| 9.            | Plan (evacuation and rescue), equipment and available human resources in case of danger (natural disasters, accidents, fireworks, explosions, etc.) are satisfactory | 0.057 | 0.102 | 0.128 | 0.070 |
| 10.           | Occupational health and safety are the main priorities of management | 0.055 | 0.200** | 0.168* | 0.081 |
| 11.           | Management always (by its behavior) gives a positive example when it finds itself in a work environment | 0.033 | 0.141* | 0.217** | 0.078 |
| 12.           | Management does not blame workers in case of a safety incident | 0.037 | 0.240** | 0.242** | 0.194** |
| 13.           | Management does not insist on productive performance if the condition of the occupational health and safety is problematic | 0.097 | 0.060 | 0.224** | -0.035 |
| 14.           | All workers are aware of the risks of work they perform and are involved in assessing the risk of their organizational unit and workplace | 0.082 | 0.120 | 0.057 | 0.104 |
15. The state of working environment in workplaces is good

16. There is exposure to potential hazards and harmfulness in workplaces

17. There is possibility of occurrence of unwanted event in workplaces

18. There is possibility of unwanted consequences of endangering human health at workplaces

19. Workplace risk assessments are audited, and workers inform about changes

20. Our organization recognizes, controls and manages risks in the workplace

21. Our organization carries out regular medical examinations of all workers

22. Personal protective equipment is always available, correct and in case of weariness replaced with a new one

23. No work is permitted without the use of personal protective equipment

24. All workspaces are marked with appropriate safety signs - signs of danger, notifications and obligations (e.g., danger of electric current, obligation to use personal protective equipment, etc.)

25. Occupational health and safety of the organization is the responsibility of all workers

26. The occupational health and safety representative takes care of his/her safety and the safety of other workers

27. Measures are taken against workers who do not comply with the occupational health and safety rules

28. Inspection controls are regularly implemented, and the observed shortcomings are eliminated as soon as possible

Source: Survey Results

Table 5. Statistical analysis of coefficients of independent variables correlation Worker’s (employee’s) profile and The occupational health and safety system in the organization (organizational unit)

| Variable Description                                                                 | Correlation Coefficient | P-Value |
|--------------------------------------------------------------------------------------|--------------------------|---------|
| 1. Gender                                                                             |                          |         |
| Women give:                                                                          |                          |         |
| • higher score of variables: 4 ($r = 0.138^{*}$) and 7 ($r = 0.141^{*}$)             |                          |         |
| 2. Age                                                                               |                          |         |
| Respondents who are older are given:                                                 |                          |         |
| • higher score of variables: 1 ($r = 0.207^{**}$), 2 ($r = 0.5276^{**}$), 3 ($r = 0.187^{**}$), 4 ($r = 0.237^{**}$), 5 ($r = 0.161^{*}$), 7 ($r = 0.222^{**}$), 10 ($r = 0.200^{**}$), 11 ($r = 0.141^{*}$), 12 ($r = 0.167^{*}$) and 15 ($r = 0.190^{**}$) | 2  | 10  | 10  | 6  |
| 3. Level of education                                                                 |                          |         |
| Respondents who have a higher level of professional education give:                  |                          |         |
| • higher score of variables: 1 ($r = 0.324^{**}$), 2 ($r = 0.146^{*}$), 7 ($r = 0.144^{*}$), 10 ($r = 0.168^{*}$), 11 ($r = 0.217^{**}$), 12 ($r = 0.242^{**}$), 13 ($r = 0.224^{**}$), 19 ($r = 0.140^{*}$), 25 ($r = 0.171^{*}$) and 26 ($r = 0.188^{**}$) | 2  | 10  | 10  | 6  |
| 4. Total work experience                                                             |                          |         |
| Respondents who have more total work experience give:                               |                          |         |
• higher score of variables: 1 \((r = 0.162^*)\), 2 \((r = 0.217^{**})\), 3 \((r = 0.208^{**})\), 4 \((r = 0.168^*)\), 12 \((r = 0.194^{**})\) and 26 \((r = 0.165^*)\)

Source: Survey Results

**Table 6.** Correspondence between independent variables Worker’s (employee’s) profile and dependent variables The state (performance) of occupational health and safety in the organization

| Serial number | Dependent variables | Independent variables |
|---------------|---------------------|-----------------------|
|               | The state (performance) of occupational health and safety in the organization | Worker’s (employee’s) profile |
|               | Gender | Age | Level of education | Total work experience |
| 1. | Assessment of the state of occupational health and safety in the organization | -0.009 | 0.102 | 0.267^{**} | 0.008 |
| 2. | Assessment of financial investments of the organization in the occupational health and safety | 0.104 | -0.045 | 0.258^{**} | -0.089 |
| 3. | Assessment of management participation in the organization’s occupational health and safety system | -0.008 | 0.009 | 0.172^* | -0.032 |
| 4. | Assessment of the participation of workers in the organization’s occupational health and safety system | -0.177^* | -0.027 | 0.024 | -0.068 |
| 5. | Assessment of training and education in the organization’s occupational health and safety | -0.092 | 0.004 | 0.097 | -0.024 |
| 6. | Assessment of the work of the trade union organization | -0.188^{**} | -0.070 | 0.051 | -0.113 |
| 7. | Assessment of the work of the Occupational safety service in the organization | -0.052 | 0.084 | 0.239^{**} | 0.008 |
| 8. | Dialogue/ cooperation between employers, trade unions, workers’ representatives, workers and inspections in the area of Occupational health and safety | -0.089 | -0.043 | 0.255^{**} | -0.130 |
| 9. | The work of the Committee on occupational health and safety in the organization | -0.069 | -0.048 | 0.295^{**} | -0.145^* |

Source: Survey Results

**Table 7.** Statistical analysis of coefficients of independent variables correlation Worker’s (employee’s) profile and The state (performance) of occupational health and safety in the organization

1. **Gender**
   - Women give:
     • lowest score of variables: 4 \((r = -0.177^*)\) and 6 \((r = -0.188^{**})\)

2. **Level of education**
   - Respondents who have a higher level of professional education give:
     • higher score of variables: 1 \((r = 0.267^{**})\), 2 \((r = 0.258^{**})\), 3 \((r = 0.172^*)\), 7 \((r = 0.239^{**})\), 8 \((r = 0.255^{**})\) and 9 \((r = 0.295^{**})\)

3. **Total work experience**
   - Respondents who have more total work experience give:
     • lowest score of variables: 9 \((r = -0.145^*)\)

Source: Survey Results
Figure 3. Statistical analysis of coefficients of independent variables correlation. The occupational health and safety system in the organization (organizational unit) and dependent variables: The state (performance) of occupational health and safety in the organization.

| Independent variables | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. |
|-----------------------|----|----|----|----|----|----|----|----|----|
| My workplace is safe in line with the organization’s policies and rules of occupational safety | 0.457* | 0.269* | 0.418* | 0.277* | 0.219* | 0.231* | 0.360* | 0.288* | 0.277** |
| Direct measurement (sensors, beams, etc.) indicates occupational health and safety as a priority | 0.332* | 0.294* | 0.448* | 0.252* | 0.130* | 0.134* | 0.285** | 0.172* | 0.201** |
| Direct measurement (sensors, beams, etc.) cannot always be done as planned, and planning of preventive measures is not always possible | 0.237* | 0.030* | 0.230* | 0.147* | 0.218* | 0.211* | 0.109* | 0.227* | 0.176* |
| Direct measurement (sensors, beams, etc.) does not allow work if all preventive and safety measures are not taken and new safety measures are not taken to reduce accidents in workers in all areas of occupational and safety activities, additional information, feedback | 0.256* | 0.261* | 0.375* | 0.333* | 0.219* | 0.260* | 0.157* | 0.211* | 0.175* |
| All safety incidents are reported and investigated, and information is available to all workers | 0.364* | 0.297* | 0.671* | 0.343* | 0.320** | 0.327** | 0.511** | 0.392** | 0.360** | 0.311** |
| Our organization has a well-developed (bureaucratic, safety officer, work-related issues, occupational disease, etc.) safety officer | 0.418* | 0.208* | 0.535* | 0.356* | 0.345* | 0.204* | 0.351** | 0.364** | 0.326** | 0.356** |
| All cases of work-related diseases and work-related accidents are systematically monitored, incidents are systematically reported and investigated | 0.356* | 0.264* | 0.378* | 0.331* | 0.238** | 0.242** | 0.205* | 0.280* | 0.330* | 0.317* |
| All preventive systems and facilities are always available and used | 0.379* | 0.278* | 0.490* | 0.402** | 0.261* | 0.244** | 0.434* | 0.323* | 0.331** |
| First-person (workplace) equipment and facilities include human resources in case of danger (material damage, workers, technical assistance, colleagues, etc.) safety measures | 0.301* | 0.281* | 0.433* | 0.356* | 0.337* | 0.142* | 0.377* | 0.318** | 0.271** |
| Occupational health and safety is the main priority of management | 0.422* | 0.266* | 0.433* | 0.356* | 0.337* | 0.142* | 0.377* | 0.318** | 0.271** |
| Management shows (by its behavior) a positive example when it takes a lead in a work environment | 0.440* | 0.299* | 0.401* | 0.345* | 0.314* | 0.130* | 0.397* | 0.370* | 0.363** |
| Management does not blame workers in case of a safety incident | 0.443* | 0.291* | 0.440* | 0.345* | 0.314* | 0.130* | 0.397* | 0.370* | 0.363** |
| Management does not assign production performance to the condition of the occupational health and safety is jeopardized | 0.471* | 0.300* | 0.439* | 0.333* | 0.299* | 0.247* | 0.360* | 0.464* | 0.354* |
| All workers are aware of the risks of work they perform and are involved in assessing the risk of their occupational health and safety | 0.442* | 0.282* | 0.376* | 0.282* | 0.257* | 0.160* | 0.312* | 0.215* | 0.234** |
| The state of working environment in workplace is good | 0.341* | 0.226* | 0.230* | 0.364* | 0.238* | 0.347* | 0.399* | 0.287* | 0.059* |
| The organization is responsible for the safety and health of its employees | 0.076 | 0.315 | 0.028 | -0.005 | 0.025 | -0.005 | 0.033 | -0.041 | 0.012 |
| There is a possibility of occurrence of an accident event in workplace | 0.116 | 0.418 | -0.089 | -0.090 | -0.020 | -0.078 | 0.025 | -0.067 | 0.002 |
| There is possibility of occurrence of occupational health and safety in workplace | 0.123 | 0.147 | -0.089 | -0.347* | -0.016 | -0.319 | 0.014 | -0.066 | 0.303* |
| Workplace risk assessment is realized, and workers informed about dangers | 0.436* | 0.212* | 0.241* | 0.253* | 0.209* | 0.333 | 0.243* | 0.285* | 0.191** |
| Our organization recognizes, controls and improves risk in the workplace | 0.367* | 0.307* | 0.313* | 0.193* | 0.207* | 0.105* | 0.412* | 0.287* | 0.222* |
| Our organization recognizes, controls and improves risk in the workplace | 0.282* | 0.281* | 0.534* | 0.346* | 0.283* | 0.145* | 0.232* | 0.305* | 0.139* |
| Personal protective equipment is always available, correct and in case of failures replaced with a new one | 0.379* | 0.282* | 0.414* | 0.237* | 0.209* | 0.297* | 0.280* | 0.280* | 0.243* |
| No work is performed without the use of personal protective equipment | 0.337* | 0.315* | 0.560* | 0.355* | 0.311* | 0.164* | 0.322* | 0.257* | 0.364* |
| All workers are trained with appropriate safety signs - signs of danger, notifications and instructions (e.g., on danger mode of electric current, obligations to use personal protective equipment, etc.) | 0.297* | 0.225* | 0.288* | 0.195* | 0.257* | 0.333 | 0.219* | 0.114* | 0.227** |
| Occupational health and safety of the organization is the responsibility of the management | 0.340* | 0.197* | 0.313* | 0.351* | 0.311* | 0.060 | 0.355* | 0.092 | 0.167* |
| The occupational health and safety representative takes care of his own health and safety of his colleagues | 0.411* | 0.206* | 0.548* | 0.208* | 0.207* | 0.128* | 0.408* | 0.254* | 0.327** |
| Manuals are taken against workers who do not comply with the occupational health and safety rules | 0.304* | 0.171* | 0.144* | 0.364* | 0.194* | 0.214* | 0.107* | 0.216* | 0.546* |
| Inspections, controls are regularly implemented, and the observed shortcomings are eliminated in due time | 0.341* | 0.140* | 0.155* | 0.364* | 0.352** | 0.310* | 0.356* | 0.820** | 0.353* |

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4. Conclusion
By collecting data on state of occupational health and safety in the production business system, from direct participants - employees, we obtain concrete data that can be used to improve and optimize that system.

The mean average assessment of the independent variables of the research "System of occupational health and safety in the organization (organizational unit)" given by workers (employees) (4.08) is in the positive area and quite high. Based on the indicators that covered this variable, the conclusion may be drawn that the occupational health and safety in the organization is very good. This result should not stop the process of continuous monitoring and measurement of occupational health and safety indicators, as well as the improvement of the overall system of occupational health and safety in the organization.

Independent variable "Our organization carries out regular medical examinations of all workers" obtained a peak average score of 4.62. It means that the workers (employees) recognized the commitment of the employer to preserve the health of employees. In the organization which was the subject of the research, regular medical examinations are carried out based on the Risk Assessment Act, systematic reviews (every 5 years) of all employees, as well as targeted reviews as needed. The organization in direct production has a permanent medical team engaged, and the Occupational Safety and Health Service, in cooperation with the Workers’ medical care, organizes lectures on medical topics according to the established program.

The independent variable "Management does not insist on productive performance if the condition of the occupational health and safety is problematic" has the lowest score of 3.69. Thus it can be concluded that situations are happening when production continues even if it does not fully ensure adequate occupational safety.

Hypothesis: There is a correlation between The worker’s profile and The occupational health and safety system in the organization (organizational unit) is not fully confirmed, because out of possible 112 correlations, correlation of 28 variables has been established, a quarter of possible correlations, 25%.

Hypothesis: There is a correlation between The worker’s profile and The state of occupational health and safety in the organization, is not fully confirmed, because out of possible 36 correlations, correlation of 9 variables has been established, a quarter of possible correlations, 25%.

Hypothesis: There is a correlation between The occupational health and safety system in the organization and The state (performance) of occupational health and safety in the organization, is confirmed, as out of 252 possible correlation of variables, correlation of 219 variables were confirmed i.e. 86.9%.

The confirmation of this hypothesis indicates that the improvement of all components constituting an independent variable „System of occupational health and safety in the organization“ is the way to influence the state of occupational health and safety in the organization for the purpose of raising the level of efficiency and effectiveness of this system and a the business system as a whole.

Based on the previous knowledge and experience of the researchers, within this research, selected components of the occupational health and safety system and its performance were observed. However, this does not mean that some other indicators and performance that are considered significant for further optimization of the occupational health and safety system in the business system cannot be included by the research.

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