WORK SAFETY SELF-ASSESSMENT (PART III). APPLICATIONS: Work Means / Work Equipment; Work Environment by Workplaces / Workstations

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Rezumat. *În vederea evaluării nivelului securităţii muncii din unităţile mici şi mijlocii se aplică Metoda de autoevaluare a securităţii în muncă, care reprezintă un instrument simplu şi eficient. Metoda se bazează pe o serie de întrebări care acoperă toate aspectele esenţiale referitoare la securitatea şi sănătatea în muncă dintr-o companie. Metoda permite o autoevaluare calitativă, prin tabelul Puncte tari – Puncte slabe, şi o autoevaluare cantitativă pe componentele sistemului de muncă. Lucrarea de faţă descrie aplicarea metodei de autoevaluare a securităţii în muncă pentru componentele: „Mijloace de muncă / Echipamente de muncă” şi „Mediul de muncă pe locuri de muncă / Posturi de lucru”.*

Abstract. *In order to assess the level of occupational safety in small and medium-sized units, the Occupational Safety Self-Assessment Method is applied, which is a simple and effective tool. The method is based on a series of questions that cover all essential aspects of occupational safety and health in a company. The method allows for a qualitative self-assessment, through the Strengths - Weaknesses table, and a quantitative self-assessment on the components of the work system. This paper describes the application of the occupational safety self-assessment method for the components: "Work Means / Work Equipment" and "Work Environment by Workplaces / Workstations".*

Keywords: occupational safety and health, qualitative self-assessment, quantitative self-**assessment**

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1.Introduction

The National Research and Development Institute of Occupational Safety – INCDPM "Alexandru Darabont" Bucharest, has developed a method for self-

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assessment of occupational safety, a method that is successfully applied to small and medium-sized enterprises, [1].

The classical application of the self-evaluation method is difficult, requiring manual processing of the evaluated data. It was necessary to digitize the method by applying the Excel software from the "Microsoft Office" package [2]. Some examples of the application of the self-evaluation method are also presented in the works "Work Safety Self-Assessment. Application, Work Load" [3] and "Work Safety Self-Assessment. Application, Worker" [4].

The paper carries out a self-assessment of occupational safety for two of the dependent components of the work system, namely, for components "Work Means / Work Equipment" and "Work Environment by Workplaces / Workstations" with application in the Metal Casting Laboratory within the Faculty of Materials Science and Engineering of the "Gheorghe Asachi" Technical University of Iași.

Each question in any component of the work system is evaluated. Depending on the assigned self-assessment value and a grid, the strengths - weaknesses table is established, as a qualitative assessment, based on which the necessary measures are applied to turn weaknesses into strengths and maintain strengths.

For each component of the work system, based on the assigned self-assessment values, a quantitative evaluation is also performed by determining a "Score" ranging from 0-100% and a grade corresponding to the score.

The occupational safety self-assessment method is related to the occupational safety level assessment method [5, 6] and the occupational risk assessment method [7-10]. In addition, the method is also related to occupational health and safety management [11, 12] and risk analysis [13, 14].

2.Self-assessment method

The method was designed for self-assessment of occupational safety for both small and medium-sized enterprises and large enterprises on subsystems, only by the designated employee in the company with responsibilities in occupational safety and health. The questions of the method are structured in sections and chapters, which include all important aspects in the field of occupational safety and health [1]. Each section or chapter has a series of questions.

Each applicable question is evaluated with a score from the interval [0, 5] with an increment of 0.5. For non-applicable questions the value {-1} is assigned. The assigned values are summarized in sheet 01_Items_Self-Assessment of the Excel document [2], and the analysis is performed taking into account sheet 02_Standard_Grid of the same Excel document which contains the spreadsheets

01_Items_Self-Assessment, 02_Standard_Grid, 03_Qualitative_Self-Assessment and 04_Quantitative_Self-Assessment.

By the method, the general table of weak points - strong points (WP-SP) is obtained in sheet 03_Qualitative_Self-Assessment and the tables of weak points - strong points (WP-SP) in sheet 04_Quantitative_Self-Assessment.

3.Applying of work safety self-assessment method

The application of the evaluation method for work system components "Work Means / Work Equipment" and "Work Environment by Workplaces / Workstations" was carried out for Metal Casting Laboratory within the Faculty of Materials Science and Engineering of the Gheorghe Asachi Technical University of Iaşi.

3.1.Work system

The work system is composed of four elements, according to the Law on Safety and Health at Work no. 319/2006 [15] and the Government Decree 1425/2006 – Methodological Norms for the Application of the Provisions of the Law on Safety and Health at Work [16]. The components are: the workload, the worker, the means of work or work equipment, the work environment at workplaces or workstations. Among these, the paper presents the following components: Work Means / Work Equipment; Work Environment by Workplaces / Workstations.

3.2.Work Means / Work Equipment

The application of the work safety self-assessment for the Work Means / Work Equipment requires the creation of the tables regarding: Items_Self-Assessment. Work Means / Work Equipment, Table 1; Standard_Grid. Work Means / Work Equipment, Table 2; Qualitative_Self-Assessment. Work Means / Work Equipment, Table 3; Quantitative_Self-Assessment. Work Means / Work Equipment, Table 4 [2]. The appreciation of the quantitative self-assessment is based on the value of the obtained score [1, 2].

3.3.Work Environment by Workplaces / Workstations

The application of the work safety self-assessment for the Work Environment by Workplaces / Workstations requires the creation of the tables regarding: Items_Self-Assessment. Work Environment by Workplaces / Workstations, Table 5; Standard_Grid. Work Environment by Workplaces / Workstations, Table 6; Qualitative_Self-Assessment. Work Environment by Workplaces / Workstations, Table 7; Quantitative_Self-Assessment. Work Environment by Workplaces / Workstations, Table 8 [2]. The appreciation of the quantitative self-assessment is based on the value of the obtained score [1, 2].

Table 1. Items_Self-Assessment. Work Means / Work Equipment

"Section/Chapter/Item"	*"Abbreviated Item"*	*"Value granted"*
1. "The ability to control risks"		
1.4. "Keeping up with technology"		
6. Are you keeping in touch with new technological breakthroughs in your field of activity? When providing your answer, please keep in mind the following options: Discoveries related to: - means of production; - new products and technological solutions; - health and safety at work. Assess this matter by reference to the most unfavourable situation, also taking into account the funds available for information and documentation.	6. Knowing the news	4.5
1.6. "Adaptation of work tasks to the human factor (ergonomic aspects) "		
8. In your company: - are you choosing, as a priority, the equipment whose security features contribute actively to productivity? (intrinsic protection) - are you considering the previous training or experience of your staff in carrying out similar tasks? - are you considering the physical measures of your employees when choosing equipment and materials? - are you making sure that the monotony of work is minimized by proper organization and proper choice of materials, products and procedures? Assess your attitude towards the adaptation of work to the characteristics of the human operator, by referring to the concrete situation in your unit.	8. Attitude towards ergonomics	3.5
1.7. "Collective and individual protection"		
9. In your Company: - are you choosing (do you prefer) collective protection measures against individual protection (e.g. railing instead of safety belts)? - are you considering the means of eliminating or reducing risks at the source before distributing, for example, hearing protectors or masks (with or without a special filter)? Assess, by reference to the concrete situation in your unit, the degree to which you prioritize collective protection over individual protection.	9. Prioritizing collective protection	2.0
3. "Traffic, horizontal and vertical risks"		
3.1. "Traffic"		
22. Assess the conditions of soil surfaces from internal	22. Surfaces of	4.5

"Section/Chapter/Item"	*"Abbreviated Item"*	*"Value granted"*
transport areas (for example, pits, destroyed signs, surfaces that are not flat, etc.)	traffic areas	
3.3. "Vertical risk"		
29. Appropriate means for vertical traffic (access to and from the workplace located at height). Are these means: - numerous enough and adapted to the numbers of employees? - wide enough (especially for loads that need to be moved)? - strong enough? - stable enough? Assess the suitability of vertical access means by referring to the actual situation in your unit.	29. Adaptation of vertical traffic	5.0
30. The quality of means for vertical traffic (access to and from the workplace located at height). - are there support rods in the stairwells? - are the stair steps equipped with anti-slip devices? - are the stairs in good condition (repaired)? Assess the quality of the means of access to and from the workplace located at height by referring to the actual situation in your unit.	30. Quality of means for vertical traffic	4.0
4. "Machine protection"		
33. The quality of machine security devices In your company, the machines used are equipped with the following security devices: - emergency stop buttons or devices? - a system that allows accidental start-up of machinery (for example, security keys or dual control?) - a system to prevent the use of machinery without protective devices (for example, a switch to be operated when the protection devices are not active)? - are all moving parts of machines protected (by devices such as screens, grills, light rays)? Assess the quality of machine protection devices by referring to the actual situation in your unit.	33. The quality of protection	3.5
5. "Noise and vibration"		
5.1. "Noise"		
38. Reducing noise at the source. Assess the following: - are the machines that produce noise equipped with attenuators? - are the noisy machines equipped with soundproof cases? - are there sound-absorbent panels in the vicinity of noise-producing machines? - if you can choose between two machines with identical performance, do you choose the least loud? Assess noise reduction at the source by reference to the actual situation in your unit.	38. Reducing noise at the source	2.0
40. Assess the effectiveness of individual noise protection devices that you provide to employees (for example, real noise	40. Efficiency of individual	4.5

"Section/Chapter/Item"	*"Abbreviated Item"*	*"Value granted"*
mitigation, comfort, if they can be worn, etc.).	protection	
5.2. "Vibrations"		
45. Assess the anti-vibration protection of the tools purchased by your company (for example, the presence of vibration absorbing handles on pneumatic hammers or of devices absorbing the vibrations produced by compressed air on punching hammers).	45. Purchase of anti-vibration tools	5.0
6. "Temperature and refreshing the air"		
48. In warm places (near fires or radiant surfaces), does the company provide: - drinks to prevent dehydration? - screens to protect against heat? - suitable protective clothing? Assess the matter by reference to the actual situation in your unit.	48. Prevention of high temperatures	3.5
49. In cold places (for example, outside work areas in winter, cold rooms, etc.), does the company provide: - warm drinks? - a heated room for rest periods? - suitable protective clothing? Assess the matter by reference to the actual situation in your unit.	49. Prevention of low temperatures	4.0
50. Air quality. Does your company provide: - capture devices for dust, toxic and/or flammable gases? - regular air refreshing? Assess air quality by reference to the most unfavourable situation.	50. Air quality	5.0
7. "Lighting"		
59. Safety lighting. Does your company have: - safety lighting? - regular safety lighting checks according to requirements? Assess the quality of safety lighting by reference to the requirements in place.	59. Safety lighting	3.5
60. Assess the security of special lighting (if such lighting exists).	60. Security special lighting	5.0
8. "Risks of fire, explosion and electrical hazards"		
8.1. "Fires and explosions"		
61. Partitioning for fire prevention. Are there, in your company: - fire-resistant doors that allow workers to safely evacuate? - fire resistant walls? Assess partitioning by reference to the actual situation in your unit.	61. Partitioning	3.0
62. Fire extinguishing equipment. Are there, in your company: - fire extinguishers? - fire detection systems? - automated fire extinguishing systems (sprinklers)?	62. Extinguishing material	4.5

"Section/Chapter/Item"	*"Abbreviated Item"*	*"Value granted"*
Assess the fire extinguishing equipment by reference to the actual situation in your unit.		
69. Equipment. Does your company have: - anti-static equipment in areas with e explosion risks? - safety valves for pressure equipment? - devices to capture substances that may explode when coming in contact with the air (for example: flour, solvents, dust, etc.)? Assess the equipment by reference to the actual situation in your unit.	69. Special material	2.0
8.2. "Electric hazards"		
71. Assess the load of the power supply network in relation to the power of the machines needed for the work.	71. Electrical network	3.0
72. Assess the earthing or null bindings of your machines and equipment.	72. Earthing	4.5
73. Are there in your company: - switches or systems to protect you against overloads? - electrical shock protection systems? - proper insulation of electrical cables? - properly maintained outlets? Assess the matter by reference to the actual situation in your unit.	73. Electrical network protection	5.0
74. Assess the individual protective equipment provided to workers for protection against electrical hazards.	74. Individual protection against electricity	5.0
9. "Dangerous materials: risks related to health and labour protection"		
78. Assess the quality and clarity of product labelling in your company. - is this labelling recorded in a specific file? - does this file contain a list of all the dangerous products used in your company? - are you aware of the effects of these products on health? - among the products having the same effect, did you choose the least dangerous? - are you aware of the places where dangerous materials are: • used? • handled? • stored? - did you establish: • who may use them? • for how long? - did you warn the users about the risks they involve? - do you know how to prevent accidents due to accidental exposure?	78. The labelling of hazardous materials	3.5
79. Assess the importance you grant to: - product toxicity when purchasing a product; - the labelling of the product during its storage and use.	79. Purchase based on toxicity and labelling	3.0

"Section/Chapter/Item"	*"Abbreviated Item"*	*"Value granted"*
Assess the importance by reference to the actual situation in your unit.		
80. Assess the elimination of vapours and/or dust generated by dangerous products, by reference to the actual situation in your unit. - Do you have: • fixed hoods? • mobile hoods? • exhausters incorporated in the used equipment? - Do you have places suitable for decanting dangerous products? - Do you have devices for measuring dangerous concentrations? - Do you have the means for prevention and protection against the following fire risks: • static electricity? • sparks and hot surfaces? • unprotected flames? • welding activities? • storage of hazardous waste?	80. Inhaling	3.0
81. Assess the extent to which your workers are informed on the risks associated with the handling of products and substances.	81. Information of employees on dangerous materials	4.0
10. "Collective and individual protection at work and in the surrounding areas"		
10.1. "Collective protection"		
91. Assess the integration of collective protection within the company's prevention policy.	91. Integration of collective protection	4.5
10.2. "Individual protection"		
96. Means of protection. Does your company have: - suitable protective gloves? - suitable protective footwear? - suitable protective clothing? - suitable protection glasses? - suitable hearing protectors? - suitable protection helmets? Assess the means of protection by reference to the actual situation in your unit.	96. Means of individual protection	4.0
11. "Transport of weights"		
11.2. "The mechanical transport of weights"		
103. Adapting the equipment to your company's requirements. Are there in your company: - belt conveyors? - pallet lifting forks operated manually? - self-elevators? Assess the suitability of the equipment to meet your company's requirements by reference to the actual situation in	103. Adaptation of handling material	3.0

"Section/Chapter/Item"	*"Abbreviated Item"*	*"Value granted"*
your unit.		
12. "Maintenance activity"		
106. Assess the quality and suitability of your maintenance equipment.	106. Quality and material suitability	3.0
13. "First aid organization"		
112. First aid kits. Does your company: - have first-aid kits? - organize a regular check of their content? - have signs indicating the location of these kits? - enable easy access to these kits? Assess first aid kits by reference to the actual situation in your unit.	112. Aid kit	5.0

Table 2. Standard_Grid. Work Means / Work Equipment

"Section/Chapter/Abbreviated Item"	*"Standard Grid"*											*"Logical values"*		
1. "The ability to control risks"														
1.4. "Keeping up with technology"														
6. Knowing the news	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
1.6. "Adaptation of work tasks to the human factor (ergonomic aspects) "														
8. Attitude towards ergonomics	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
1.7. "Collective and individual protection"														
9. Prioritizing collective protection	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
3. "Traffic, horizontal and vertical risks"														
3.1. "Traffic"														
22. Surfaces of traffic areas	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
3.3. "Vertical risk"														
29. Adaptation of vertical traffic	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
30. Quality of means for vertical traffic	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
4. "Machine protection"														
33. The quality of protection	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
5. "Noise and vibration"														
5.1. "Noise"														
38. Reducing noise at the source	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
40. Efficiency of individual protection	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
5.2. "Vibrations"														
45. Purchase of anti-vibration tools	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
6. "Temperature and refreshing the air"														
48. Prevention of high temperatures	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
49. Prevention of low temperatures	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2

"Section/Chapter/Abbreviated Item"	*"Standard Grid"*											*"Logical values"*		
50. Air quality	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
7. "Lighting"														
59. Safety lighting	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
60. Security special lighting	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
8. "Risks of fire, explosion and electrical hazards"														
8.1. "Fires and explosions"														
61. Partitioning	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
62. Extinguishing material	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
69. Special material	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
8.2. "Electric hazards"														
71. Electrical network	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
72. Earthing	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
73. Electrical network protection	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
74. Individual protection against electricity	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
9. "Dangerous materials: risks related to health and labour protection"														
78. The labelling of hazardous materials	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
79. Purchase based on toxicity and labelling	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
80. Inhaling	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
81. Information of employees on dangerous materials	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
10. "Collective and individual protection at work and in the surrounding areas"														
10.1. "Collective protection"														
91. Integration of collective protection	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
10.2. "Individual protection"														
96. Means of individual protection	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
11. "Transport of weights"														
11.2. "The mechanical transport of weights"														
103. Adaptation of handling material	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
12. "Maintenance activity"														
106. Quality and material suitability	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
13. "First aid organization"														
112. Aid kit	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2

Table 3. Qualitative_Self-Assessment. Work Means / Work Equipment

"Section/Chapter"	*"Weaknesses"*	*"Strengths"*
1. "The ability to control risks"		
1.4. "Keeping up with technology"		
	-	6. Knowing the news
1.6. "Adaptation of work tasks to the human factor (ergonomic aspects) "		
	-	8. Attitude towards ergonomics
1.7. "Collective and individual protection"		
	9. Prioritizing collective protection	-
3. "Traffic, horizontal and vertical risks"		
3.1. "Traffic"		
	-	22. Surfaces of traffic areas
3.3. "Vertical risk"		
	-	29. Adaptation of vertical traffic
	-	30. Quality of means for vertical traffic
4. "Machine protection"		
	33. The quality of protection	-
5. "Noise and vibration"		
5.1. "Noise"		
	38. Reducing noise at the source	-
	-	40. Efficiency of individual protection
5.2. "Vibrations"		
	-	45. Purchase of anti-vibration tools
6. "Temperature and refreshing the air"		
	-	48. Prevention of high temperatures
	-	49. Prevention of low temperatures
	-	50. Air quality
7. "Lighting"		
	-	59. Safety lighting
	-	60. Security special lighting
8. "Risks of fire, explosion and electrical hazards"		
8.1. "Fires and explosions"		
	61. Partitioning	-
	-	62. Extinguishing material

"Section/Chapter"	*"Weaknesses"*	*"Strengths"*
	69. Special material	-
8.2. "Electric hazards"		
	71. Electrical network	-
	-	72. Earthing
	-	73. Electrical network protection
	-	74. Individual protection against electricity
9. "Dangerous materials: risks related to health and labour protection"		
	78. The labelling of hazardous materials	-
	79. Purchase based on toxicity and labelling	-
	80. Inhaling	-
	-	81. Information of employees on dangerous materials
10. "Collective and individual protection at work and in the surrounding areas"		
10.1. "Collective protection"		
	-	91. Integration of collective protection
10.2. "Individual protection"		
	-	96. Means of individual protection
11. Transport of weights		
11.2. "The mechanical transport of weights"		
	103. Adaptation of handling material	-
12. "Maintenance activity"		
	-	106. Quality and material suitability
13. "First aid organization"		
	-	112. Aid kit

Table 4. Quantitative_Self-Assessment. Work Means / Work Equipment

"Section/Chapter/Abbreviated Item"	*"Weaknesses"*	*"Strengths"*
1. "The ability to control risks"		
1.4. "Keeping up with technology"		
6. Knowing the news	-	2
1.6. "Adaptation of work tasks to the human factor (ergonomic aspects)"		
8. Attitude towards ergonomics	-	2
1.7. "Collective and individual protection"		

"Section/Chapter/Abbreviated Item"	*"Weaknesses"*	*"Strengths"*
9. Prioritizing collective protection	1	-
3. "Traffic, horizontal and vertical risks"		
3.1. "Traffic"		
22. Surfaces of traffic areas	-	2
3.3. "Vertical risk"		
29. Adaptation of vertical traffic	-	2
30. Quality of means for vertical traffic	-	2
4. "Machine protection"		
33. The quality of protection	1	-
5. "Noise and vibration"		
5.1. "Noise"		
38. Reducing noise at the source	1	-
40. Efficiency of individual protection	-	2
5.2. "Vibrations"		
45. Purchase of anti-vibration tools	-	2
6. "Temperature and refreshing the air"		
48. Prevention of high temperatures	-	2
49. Prevention of low temperatures	-	2
50. Air quality	-	2
7. "Lighting"		
59. Safety lighting	-	2
60. Security special lighting	-	2
8. "Risks of fire, explosion and electrical hazards"		
8.1. "Fires and explosions"		
61. Partitioning	1	-
62. Extinguishing material	-	2
69. Special material	1	-
8.2. "Electric hazards"		
71. Electrical network	1	-
72. Earthing	-	2
73. Electrical network protection	-	2
74. Individual protection against electricity	-	2
9. "Dangerous materials: risks related to health and labour protection"		
78. The labelling of hazardous materials	1	-
79. Purchase based on toxicity and labelling	1	-
80. Inhaling	1	-
81. Information of employees on dangerous materials	-	2
10. "Collective and individual protection at work and in the surrounding areas"		
10.1. "Collective protection"		
91. Integration of collective protection	-	2
10.2. "Individual protection"		
96. Means of individual protection	-	2
11. "Transport of weights"		
11.2. "The mechanical transport of weights"		
103. Adaptation of handling material	1	-

"Section/Chapter/Abbreviated Item"	*"Weaknesses"*	*"Strengths"*
12. "Maintenance activity"		
106. Quality and material suitability	-	2
13. "First aid organization"		
112. Aid kit	-	2
TOTAL puncte	**10**	**21**
SCOREWork Means / Work Equipment**:**	**67.74**	
AppreciationWork Means / Work Equipment		
*"***Medium Score**. You have to be more careful*"*.		

Table 5. Items_Self-Assessment. Work Environment by Workplaces / Workstations

"Section/Chapter/Item"	*"Abbreviated Item"*	*"Value granted"*
5. "Noise and vibration"		
5.1. "Noise"		
37. Assess the noise pollution in your company. Has the assessment of admissible noise limits been carried out by specialized personnel?	37. Discomfort caused by noise	3.5
42. Appreciate the regularity with which noise levels are measured within your company (if you have noise-producing machines and you have not performed any measurements so far, the score on this question is 0).	42. Regularity of noise measurement	3.0
5.2. "Vibrations"		
43. Assess exposure to vibrations in your company.	43. Discomfort due to vibrations	3.5
44. Assess the possibility of mounting machines that produce vibrations on vibration-damping elements.	44. Installation of vibrating machines	4.0
6. "Temperature and refreshing the air"		
51. Assess the air currents control measures.	51. Prevention of air currents	-1.0
7. "Lighting"		
53. Assess the suitability of lighting levels for the type of activity being carried out (a higher level of lighting is required for precision tasks as compared to simple tasks) in comparison with the necessary requirements.	53. Lighting levels	3.0
54. Assess the lighting of particular areas (stairwells, warehouses, corridors, exterior areas) in comparison with the necessary requirements.	54. Lighting in special areas	3.5
55. Assess the measures taken to avoid shade areas.	55. Shade areas	2.0
56. Assess whether in your company there are examples of: - direct shine (for example, lamps in the light of sight)? - indirect shine (for example, the reflection of sunlight or lamps on shiny surfaces)? Assess the shine by reference to the requirements in place.	56. Blinding lighting	4.0
57. With regard to lighting solutions, does your company take into account:	57. Lighting adjustment	5.0

"Section/Chapter/Item"	*"Abbreviated Item"*	*"Value granted"*
- the need to reproduce colours (for example, by printing, safety colours, labels)? - the need to prevent the occurrence of luminous flux pulse near rotating machines in order to prevent the stroboscopic effect (there is the danger of them being perceived as stationary)?		
9. "Dangerous materials: risks related to health and labour protection"		
87. Assess the extent to which you are aware of the procedures for treating the waste produced by your company.	87. Waste disposal	2.0
88. Assess the extent to which you are aware of the procedures for destroying the waste produced by your company.	88. Waste destruction	5.0
10. "Collective and individual protection at work and in the surrounding areas"		
10.1. "Collective protection"		
95. Assess the specific waste storage and disposal measures.	95. Evacuation of fumes/wastewater	3.5

Table 6. Standard_Grid. Work Environment by Workplaces / Workstations

"Section/Chapter/Abbreviated Item"	*"Standard Grid"*											*"Logical values"*		
5. "Noise and vibration"														
5.1. "Noise"														
37. Discomfort caused by noise	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
42. Regularity of noise measurement	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
5.2. "Vibrations"														
43. Discomfort due to vibrations	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
44. Installation of vibrating machines	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
6. "Temperature and refreshing the air"														
51. Prevention of air currents	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
7. "Lighting"														
53. Lighting levels	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
54. Lighting in special areas	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
55. Shade areas	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
56. Blinding lighting	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
57. Lighting adjustment	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
9. "Dangerous materials: risks related to health and labour protection"														
87. Waste disposal	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
88. Waste destruction	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2
10. "Collective and individual protection at work and in the surrounding areas"														

"Section/Chapter/Abbreviated Item"	*"Standard Grid"*											*"Logical values"*		
10.1. "Collective protection"														
95. Evacuation of fumes/wastewater	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	-	1	2

Table 7. Qualitative_Self-Assessment. Work Environment by Workplaces / Workstations

"Section/Chapter"	*"Weaknesses"*	*"Strengths"*
5. "Noise and vibration"		
5.1. "Noise"		
	-	37. Discomfort caused by noise
	42. Regularity of noise measurement	-
5.2. "Vibrations"		
	-	43. Discomfort due to vibrations
	-	44. Installation of vibrating machines
6. "Temperature and refreshing the air"		
	-	-
7. "Lighting"		
	-	53. Lighting levels
	-	54. Lighting in special areas
	55. Shade areas	-
	-	56. Blinding lighting
	-	57. Lighting adjustment
9. "Dangerous materials: risks related to health and labour protection"		
	87. Waste disposal	-
	-	88. Waste destruction
10. "Collective and individual protection at work and in the surrounding areas"		
10.1. "Collective protection"		
	-	95. Evacuation of fumes/wastewater

Table 8. Quantitative_Self-Assessment. Work Environment by Workplaces / Workstations

"Section/Chapter/Abbreviated Item"	*"Weaknesses"*	*"Strengths"*
5. "Noise and vibration"		
5.1. "Noise"		
37. Discomfort caused by noise	-	2
42. Regularity of noise measurement	1	-
5.2. "Vibrations"		

"Section/Chapter/Abbreviated Item"	*"Weaknesses"*	*"Strengths"*
43. Discomfort due to vibrations	-	-
44. Installation of vibrating machines	-	2
6. "Temperature and refreshing the air"		
51. Prevention of air currents	-	-
7. "Lighting"		
53. Lighting levels	-	2
54. Lighting in special areas	-	2
55. Shade areas	1	-
56. Blinding lighting	-	2
57. Lighting adjustment	-	2
9. "Dangerous materials: risks related to health and labour protection"		
87. Waste disposal	1	-
88. Waste destruction	-	2
10. "Collective and individual protection at work and in the surrounding areas"		
10.1. "Collective protection"		
95. Evacuation of fumes/wastewater	-	2
TOTAL puncte	**3**	**8**
SCOREWork Environment by Workplaces / Workstations**:**	**72.73**	
AppreciationWork Environment by Workplaces / Workstations		
*"***Medium Score**. You have to be more careful*"*.		

3.4.Interpretation of the results

Tables 1 and 5 show the complete questions from the 14 sections and chapters and also the abbreviated questions. The last column gives the values assessed by the person designated for occupational safety and health. Tables 3 and 6 represent the WP-SP tables determined based on the self-assessment values and the standard grid in Tables 2 and 6. Tables 4 and 8 are also WP-SP tables used for quantitative self-assessment. Depending on the value of the calculated Score, the assessment is obtained through the following qualifications: "Very Good. Some aspects can be improved. Keep the same way" for a score between 75 and 100; "Medium Score. You have to be more careful" for a score between 50 and 75; "Critical Situation. You have to improve the theme as soon as possible" for a score between 25 and 50; "It is time to act. You have many things to do in order to improve to situation" for a score between 0 and 25.

For weaknesses, the worker designated for occupational health and safety in the company must request financial and material resources to turn them into strengths, and for strengths, they request resources to maintain them in this status.

Conclusions

The method was designed for self-assessment of occupational safety for both small and medium-sized enterprises and large enterprises on subsystems, only by the designated worker in the company with responsibilities in occupational safety and health.

A classic evaluation involves a large amount of work on processing the obtained data, given that human error in processing cannot be eliminated. By using the Excel tool from the Microsoft Office package, the working time is reduced by half, and the confidence in the processed results is maximum. In addition, this tool is usually present on the vast majority of computing devices and it is not necessary to install specialized database software.

The results of applying the occupational safety self-assessment method are used to assess the risk of occupational accidents and illnesses at the workplace or work station in order to establish the prevention and protection plan.

R E F E R E N C E S

[1]Darabont A, Kovacs S, Darabont DC. Guidelines for occupational safety self-assessment for SMEs, INCDPM, Bucureşti, Romania, 1997.

[2] Bejinariu C, Darabont DC, Baciu ER, Ionita I, Bernevig-Sava MA, Baciu C. Considerations on the Method for Self-Assessment of Safety at Work, Environmental Engineering and Management Journal, Iasi, vol. **16**, no 6, pp. 293-298, 2017, WOS:000409071500022, ISSN: 1582-9596.

[3] Bejinariu, C., Darabont, D.C., Cioca, L.I. Work Safety Self-Assessment. Application, Work Load. Annals of the Academy of Romanian Scientists, Series on Engineering Sciences, Volume **16**, Number 1/2024, pp 5-22, DOI: 10.56082/annalsarscieng.2024.1.5, ISSN 2066-8570.

[4] Bejinariu, C., Darabont, D.C., Cioca, L.I. Work Safety Self-Assessment (Part II). Application, Worker. Annals of the Academy of Romanian Scientists, Series on Engineering Sciences, Volume **16**, Number 2/2024, pp 119-133, DOI: 10.56082/ANNALSARSCIENG.2024.2.119, ISSN 2066-8570.

[5] Darabont A, Tanase N. Guidelines for assessment of the occupational safety level, INCDPM, Bucureşti, Romania, 1997.

[6] Bejinariu C, Darabont DC, Baciu ER, Georgescu IS, Bernevig-Sava MA, Baciu C. Considerations on Applying the Method for Assessing the Level of Safety at Work,

Sustainability, Basel, Switzerland, 2017, **9**, 1263, doi:10.3390/su9071263. 2017, WOS:000406709500190, ISSN: 2071-1050.

[7] Pece S. Risk assessment in the human-machine system, Atlas Press Publishing House, Bucureşti, Romania, 2003.

[8] Pece S. Occupational injury and illness risk assessment, Europrint Publishing House, Galaţi, Romania, 2011.

[9] Bejinariu C, Darabont DC, Burduhos-Nergis DP, Cazac AM, Chiriac-Moruzzi C. Considerations Regarding the Application of the Occupational Injury and Illness Risk Assessment Method at Workplaces/Workstations, in Relation to the ISO 45001 Standard. Sustainability. Volume **15**. Issue 3. Article Number 212. DOI 10.3390/su15032121. FEB 2023. Accession Number WOS:000930875800001. eISSN 2071-1050.

[10] Moraru RI, Băbuţ G, Matei I. Guide for occupational risk assessment, Focus Publishing House, Petroşani, 2002.

[11] Cioca, L. I., Occupational health and safety management, "Lucian Blaga" University of Sibiu Publishing House, Romania, 2010.

[12] Cioca, L. I. şi Moraru, R. I. Management of the psychosocial professional risks, "Lucian Blaga" University of Sibiu Publishing House, Sibiu, ISBN 978-973-924-3, Romania, 2010.

[13] Moraru RI, Băbuţ G. Risk Analisys, Universitas Publishing House, Petroşani, Romania, 2000.

[14] Vasilescu GD. Probabilistic calculation methods used for industrial risk prognosis and diagnosis, 2008, INSEMEX Publishing House, Petroşani.

[15] *** Occupational Health and Safety Law no. 319/2006, Romania.

[16] *** Government Decision no. 1425/2006 – Methodological Norms for Applying the Occupational