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RISK AT WORK: ASSESSMENT IN A ROMANIAN PRECAST CONCRETE ELEMENTS MANUFACTURING COMPANY

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Abstract: *The present paper aims to develop a detailed occupational health and safety risk assessment in the case of the workplace "Cellular concrete cutter machinist" operating in a manufacturing company which is an important producer of precast concrete elements in the South-West of Romania. The paper includes a synthetic description of the method employed (structure, tools, working procedure). A case study for a particular working system is included in order to highlight the proper use of the method. The ultimate goal is to illustrate an example of good practice in the field of occupational risk assessment, in order to facilitate the adoption of effective prevention and protection measures targeting the risk minimization in industrial working environments.*

Key words: *safety at work, occupational risk assessment, working system, construction material manufacturing, prevention*

1. INTRODUCTION

Occupational safety and health (OSH) is a multidisciplinary field concerned with the safety, health and well-being of people at work, practically reflected in their well-being, social, mental and physical condition [1]. In order to achieve this goal, organizations, especially those that are highly developed in terms of the number of employees and whose activities are at a high level of complexity given their type and multitude, set out guidelines to be implemented [2, 3].

These are contained in a document that is fully and responsibly assumed by the organization's top management [4]. This is also an obligation contained in national legislation which, at the level of each employer, must establish the technologies, the way work is organized, the working conditions, and the management of the labor factors, so as to ensure optimal safety conditions [5, 6].

The promotion of safety, health and well-being at work is materialized through a joint effort of employers, employees and other participants in the work process. According to this principle, the employer also takes into account the need to be involved in the process of improving the general health and comfort of all staff members included in activities taking into account their needs and opinions [7, 8]. Complying with this principle has many positive effects, including reducing absenteeism and staff turnover, increasing motivation, job satisfaction and productivity, and can also lead to a consistent improvement in the image of the employer by proving the seriousness of the entire organization [9].

The process involves choosing the appropriate methods that lead to favorable results and controlling exposure to hazards. This process is adapted to the specifics of the activities carried out in an organization as a component part of the general management or included in the organizational culture and practices of the organization [10].

Its success is ensured only by the real involvement and commitment of the top management and the involvement of employees. It should be a continuous process of learning from own or other organizations' experiences and includes the activities described in ISO

31000: 2018 - Risk management: principles and guidelines for implementation [10].

Based on the analysis of the current risk ranking methods from other countries and their adjustment to the concrete conditions of Romania, a tool was developed, by the National Institute for Research and Development in Occupational Health and Safety [11].

This paper synthesizes the results of a research aimed at subsequent practical application of the tool in an industrial manufacturing company.

2. MATERIAL AND METHOD

Risk assessment involves the identification of all risk factors within the system under examination and the quantification of their dimension, based upon the combination between severity and frequency of the maximal possible consequences for the human body [12]. Thus, partial risk levels are obtained for each risk factor, respectively the overall risk level for the entire system under examination. Although there is no valid universal principle for occupational risk assessment methodology, two rules are still essential in the field [13]:

- the assessment must be structured in such a way that all potential hazards and risks are analyzed (for example, cleaning tasks will not be ignored, even if this activity is carried out outside the normal working hours);
- when a risk has been identified, the first question to be answered is whether the associated hazard cannot be eliminated.

The theoretical model of the genesis of work-related accidents and diseases, drawn up by the National Research Institute for Labor Protection in Bucharest, broaches in systematic manner the causality of such events, allowing the creation of a pragmatic instrument for the identification of all risk factors within a system. The tool's quotation scales of the severity and probability are given in Table 1 [14].

Table 1

Severity and likelihood/probability quotation scales.

SEVERITY CLASSES CONSEQUENCES		**SEVERITY OF CONSEQUENCES**
1	**NEGLIGIBLE**	Minor reversible consequences with predictable disablement, up to 3 calendar days (healing without treatment)
2	**LIMITED**	Reversible consequences with predictable disablement between 3-45 days, which require medical treatment
3	**MEDIUM**	Reversible consequences with predictable disablement between 45-180 days, which require medical treatment including hospitalization
4	**IMPORTANT**	Irreversible consequences with diminution of the ability to work of maximum 50 % (IIIrd degree invalidity)
5	**SEVERE**	Irreversible consequences with loss of the ability to work of 50-100 %, but with capacity of self-service (IInd degree invalidity)
6	**VERY SEVERE**	Irreversible consequences with total loss of the ability to work and of the self-service capacity (Ist degree invalidity)
7	**MAXIMUM**	decease
PROBABILITY CLASSES		**PROBABILITY OF CONSEQUENCES**
OCCURENCE		
1	EXTREMELY RARE	Extremely low (**$P < 10^{-1}$/year**)
2	VERY RARE	Very low (**$10^{-1} < P < 5^{-1}$/year**)
3	RARE	Low (**$5^{-1} < P < 2^{-1}$/year**)
4	LOW FREQUENCY	Average (**$2^{-1} < P < 1^{-1}$/year**)
5	FREQUENT	High (**1^{-1}/year $< P < 1^{-1}$/month**)
6	VERY FREQUENT	Very high (**$P > 1^{-1}$/month**)

The application of the method is finalized with two basic documents:
a) *Workplace assessment card*, including the partial risks levels for each risk factor and the global risk level for the workplace;
b) *Prevention actions card*, including technical/organizational measures provided by regulations in force. In order to assess the risk, we followed the next stages:

A. Risk identification in the system;

B. Determination of the consequences on the victim (severity of such consequences);

C. Determination of the probability of their action on the worker;

D. Attribution of risk levels depending on the severity and probability of the consequences.

These steps are carried out using specific developed working instruments:

i) Risk factors identification list;
ii) List of the possible consequences of the action of risk factors;
iii) quotation scale for the severity and probability of consequences on the human body;
iv) Risk assessment grid;
v) Risk/safety level quotation scale (table 2);
vi) Workplace assessment card;
vii) Proposed prevention measures card.

Table 2

Risk/safety levels quotation scale

RISK LEVEL	SEVERITY – PROBABILITY COUPLING	SAFETY LEVEL
1 Minimum	(1,1) (1,2) (1,3) (1,4) (1,5) (1,6) (2,1)	7 Maximum
2 Very low	(2,2) (2,3) (2,4) (3,1) (3,2) (4,1)	6 Very high
3 Low	(2,5) (2,6) (3,3) (3,4) (4,2) (5,1) (6,1) (7,1)	5 High
4 Medium	(3,5) (3,6) (4,3) (4,4) (5,2) (5,3) (6,2) (7,2)	4 Medium
5 High	(4,5) (4,6) (5,4) (5,5) (6,3) (7,3)	3 Low
6 Very high	(5,6) (6,4) (6,5) (7,4)	2 Very low
7 Maximum	(6,6) (7,5) (7,6)	1 Minimum

A detailed analysis of the workplace is performed, aiming at:

- Identification / description of the components of the system and its operation: purpose, description of the technological process, of working operations, technical equipment in use – parameters and functional characteristics, tools, etc.;
- Express specification of the working task which is incumbent upon the worker within the system (based on job description, the written orders and decisions, verbal dispositions currently given, etc.);
- Description of environmental conditions;
- Safety requirements, for each component of the system.

Relevant data and information are extracted from company documents (technological card, technical equipment handbooks, job description, technical conditions, test bulletins for environmental factors, norms, standards and instructions for safety at work).

A complementary source of information is constituted by discussions with workers. The risk factors that have been identified are inscribed in the Workplace Assessment Card. For each identified risk factor, the severity is then assessed on the basis of the grid given in Table 1. Important information can be obtained from the statistics of work-related accidents and occupational diseases occurred at the respective workplace or at similar workplaces, if statistic data available are considered reliable enough. Using the risk/safety levels quotation scale the partial risk level allotted to each risk factor is then determined.

The overall risk level (Nr) at the workplace is computed as a weighted average of the risk levels established for the identified risk factors. Because the obtained result must reflect the reality as accurately as possible, as weighting element should be used the risk factor rank, which is equal to the risk level. The calculation formula for the global risk level is:

$$N_r = \frac{\sum_{i=1}^{n} r_i \cdot R_i}{\sum_{i=1}^{n} r_i} \quad (1)$$

where: Nr = global risk factor for the workplace; r_i = rank of the risk factor "i"; R_i = level of risk for the risk factor "i"; n = number of risk factors that have been identified at the workplace. If the overall risk level exceeds the value of 3.5, it is considered that the working system - as a whole - enters the area of un-tolerable risk. To determine the measures that are required for the improvement of the safety level of the investigated system, it is imperative to take into consideration the hierarchy of assessed risks, according to the risks/safety levels scale.

3. RESULTS AND DISCUSSION

3.1 Analysis of the investigated company and work process: "Cellular concrete cutting machinist"

The analyzed company is the largest producer of precast concrete elements in the South-West of Romania, the product range including: Autoclaved Cellular Concrete (BCA) masonry and thermal insulation systems, paving systems that provide all the necessary elements for exterior design and sewerage systems in concrete. The company is a solid name in the field of construction materials, with a presence of 50 years on the Romanian market, years that have made the company a brand with tradition, a strong brand, a brand with undisputed expertise in the field, a benchmark for quality and professionalism in the industry [15].

The following products are manufactured:

a. Autoclaved aerated concrete: BCA Aeropor; BCA Izopor; BCA Structopor; BCA Termopor

b. Concrete pipes and chimneys: Concrete sewer pipes; Tubes for concrete footbridges; Concrete fireplace elements.

c. Pavements and edges: Paving elements; Concrete curbs

d. Prefabricated concrete: Road plate PL 555; Reinforced concrete curbs; High edges; Frames type c2 and p2; Trench and gutter from prefabricated elements; Centrifugal pre-stressed concrete columns for overhead power lines; Formwork elements.

The work process aims at "*Cutting the precast concrete block*" to the dimensions ordered for the realization of the elements of autoclaved aerated concrete masonry. The upstream process is "*Transport of the aerated concrete block with the crane*" to the cutting machine, the block having the dimensions of 6000 x1550x700 mm.

The downstream process is "*Three-row stacking of grids with cut cellular concrete elements*" these stacks will pass through a waiting tunnel after which it enters the hydrothermal treatment in autoclaves. The work process aims at "*Cutting the precast concrete block*" to the dimensions ordered for the realization of the elements of autoclaved aerated concrete masonry. To illustrate the particularities that characterize the components of the investigated work system, photographs were taken, which are shown in Figures 1, 2, 3, 4, 5 and 6.

3.2 Components of the evaluated work system:

a. Means of production / work equipment:

- Cellular concrete block cutting machine;
- Cellular concrete elements;
- Overhead crane with hydraulic control operated with remote control;
- Overhead crane with hydraulic control operated with ground control;
- Screws for transporting the cellular concrete side caps to the waste sludge mixer;
- Machine for making cutting wires;
- Installation for greasing the support grills;
- Dust absorption installation from cleaning the support grilles;
- Container for collecting changed and / or broken cutting wires;
- Steel wire concrete block cutter;
- Nipples;
- Stripping oil for grating metal grills;
- Hydraulic oil;
- Compressed air system.

Other important details regarding the specific equipment and the work environment are shown in Figures 7, 8, 9 and 10.

Fig.1. Laying the concrete block on the cutting machine.

Fig. 2. Cutting machine overview.

Fig. 3. Conveyor for transporting cut items.

Fig. 4. Longitudinal cutting.

Fig. 5. Concrete block after cross-cutting.

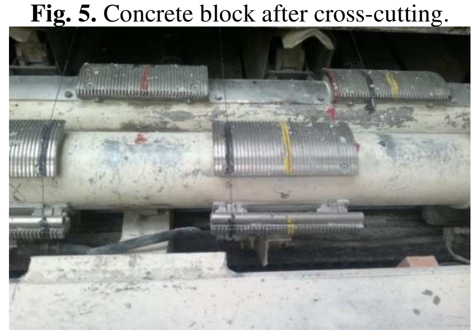

Fig. 6. Detail cross-cutting wires on oscillators.

Fig. 7. Prefabricated block conveyor overhead crane.

Fig.8. Control desk.

Fig. 9. Machine with bi-manual control for making nipple wires.

Fig. 10. Preventively changed wire container.

b. The work task

- Knowledge of how to operate the machine;
- Application of specific technologies, instructions and procedures;
- Maintenance of the equipment;
- Compliance with occupational safety and health and psi regulations;
- Responds to organization's demands for the achievement of production objectives;
- Complies with the work schedule established by the internal regulations;
- Is responsible for the quality of the process on the machines on which it works

c. The work environment

Machinists work in a production hall:

- Natural and artificial lighting;
- High temperatures in summer due to the exothermic process of pre-hardening the concrete mixture and the process of autoclaving the cellular concrete elements;
- Natural ventilation;
- Drafts favored by the opening of doors and windows, leaks, natural draft when opening the skylights on the roof;
- Dust from the crushing of small pieces of autoclaved aerated concrete by forklifts and from the cleaning with compressed air.

3.3 OSH risk assessment at the analyzed workplace

Applying the tools and the procedure specific to the INCDPM Bucharest method, the concrete forms of manifestation of the risks were identified, the severity classes and the probability classes related to each of the identified risks were assigned, and then - using the scale of framing the risk levels, the partial risk levels were set. The results obtained are centralized in Table 1. The meaning of the notations in table 3 is as follows: WSE - Work system element; IR - identified risk; RF – risk factor; MC - Maximum consequence; S - Severity; Likelihood; RL - Risk level; WE - Working equipment; OE - Occupational environment; WT - Working task; HF - Human factor; N-negligible; LTI 3-45 – Lost Time Injury from 3 to 45 days; LTI 45-180 – Lost Time Injury from 45 to 180 days; INV I – first degree invalidity; INV II – second degree invalidity; INV III – third degree invalidity; D – death.

The overall risk level of the job is:

$$N_{rg} = \frac{\sum_{i=1}^{52} r_i \cdot R_i}{\sum_{i=1}^{52} r_i} = \frac{3\cdot(4\times4)+39\cdot(3\times3)+9\cdot(2\times2)+2(1x1)}{3\times4+39\times3+9\times2+2x1} = \frac{437}{149} = 2{,}93 \quad (2)$$

Table 3

The risk assessment card – Excerpt.

Company: XYZ		***WORKING PLACE RISK ASSESSMENT CARD***	**Exposed individuals:** 3			
Unit: Autoclaved Cellular Concrete			**Exposure length:** 8 h/shift			
Workplace: Machine for cutting precast cellular concrete			**Assessment team members:**			
WSE	**IR**	**The concrete form of manifestation of risk factors (description, parameters)**	**MC**	**S**	**L**	**RL**
WE	Mech. RF	1. Moving machine parts - catching and crushing the operators by the device for lifting / lowering the oscillators during the cross-cutting operation	D	7	1	3
		2. Moving machine parts - catching and crushing the operators by the cutting wagon, the support grill during longitudinal cutting	D	7	1	3
		3. Machine parts in motion - gripping and driving the conveyor belts of recovered cellular concrete caps	D	7	1	3
		5. Moving machine parts - holding the hand to the wire making machine	LTI 45-180	3	1	2
		6. Means of transport- hit by the means of car transport in the warehouses of finished products, the plaster depot, the sand depot, on the roads	D	7	1	3

		7. Means of transport - hitting by forklifts when moving in the warehouses of finished products and inside the autoclaved aerated concrete section	D	7	2	4
		8. Means of transport - hitting by front loaders, bulldozer when moving through deposits of synthetic gypsum, gypsum stone, sand	D	7	2	4
		9. Gravity-impact displacements- hit by free fall of parts / subassemblies from overhead cranes moving over the area of the cutting machine	D	7	1	3
		12. Gravity-impact displacements - rolling of stacked concrete pipes not insured against uncontrolled movements	D	7	1	3
		13. Displacement under the propulsion effect - ejection of tensioned cutting wires and / or nipples when they break during cross-cutting	INV III	4	2	3
		14. Displacement under the propulsion effect - ejection of aerated concrete particles at the exit of the wires from the aerated concrete block	LTI 3-45	2	5	3
		16. Displacement under the propulsion effect - particle ejection - sparks, splinters, slag, cutting during maintenance	INV II	5	1	3
		19. Hazardous surfaces and contours - accidental slipping on the oil stains on the floor, leaking at the defective joints of the pipes in the hydraulic installation		3	2	2
	Thermal	20. Accidental contact with welded, cut or polished metal materials during maintenance operations	INV III	4	1	2
	Electrical RF	21. Direct touch electric shock - open (unsecured) electrical panels and switchboards near the control panel of the cutting machine	D	7	1	3
		22. Electric shock by indirect touching of some metal parts of the installations in case of accidental destruction of the electrical protection devices	D	7	1	3
		23. Electric shock when step voltage occurs - when moving through the factory premises near a grounded outlet or an uninsulated electrical conductor that has fallen to the ground	D	7	1	3
	Chemical RF	24. Toxic substances - accidental contact with Texaco stripping oil for automatic lubrication (changing containers or mounting the pump)	N	1	5	1
		25. Toxic substances - accidental contact (hands) with hydraulic oil Shell during additions to the hydraulic system	N	1	3	1
		26. Flammable substances - Texaco stripping oil, maximum four 200 liter metal barrels placed in the retention tray, near the lubrication system	D	7	1	3
		28. Air temperature is high in summer due to the autoclaving process (190 ^{0}C) of the aerated concrete	LTI 3-45	2	5	3
		29. Air currents favored by the opening of doors and windows, leaks, natural draft when opening the skylights on the roof	LTI 3-45	2	6	3
		30. Noise from the cutting machine, overhead cranes, steam exhaust from autoclaves	LTI 3-45	2	5	3
		31. Natural disasters - severe earthquake with damage to the structure and closures of the hall	D	7	1	3
		32. Pneumoconiogenic powders in the workplace atmosphere - dust from the crushing of small pieces of autoclaved aerated concrete	LTI 3-45	2	3	2
	Chemical RF	33. Exhaust gas from forklifts transporting finished goods to the warehouse from neighboring workplaces	LTI 3-45	2	3	2

		34. Toxic vapors from lubricating metal molds (temp >45 ºC) with stripping solutions at nearby workplaces	LTI 3-45	2	5	3
WT	Inadequate content	35. Entering the danger area (on the conveyor) to replace broken vertical wires while the machine is running (without activating the interlock system)	D	7	2	4
		36. Cleaning the grates of pre-hardened concrete waste by blowing with compressed air (formation of suspended dust)	LTI 3-45	2	5	3
	Overload	37. Static effort : ortho-static working position in front of the control panel	LTI 3-45	2	6	3
		38. High pace of work imposed by technology	LTI 3-45	2	6	3
		39. Overburdening short-cycle repetitive movements (about 4 minutes) and cutting wires to see as quickly as possible if they break	LTI 3-45	2	6	3
HF	Wrong actions	40. Execution of unforeseen operations during the workload	D	7	1	3
		42. Interventions on equipment during operation	D	7	1	3
		43. Starting the cutting machine without confirming the safety functions	D	7	1	3
		44. Work without access door interlock devices	D	7	1	3
		45. Work without a screen protector against the ejection of broken wires and pieces of concrete	INV III	4	2	3
		46. Leaving the cutting machine during operation	D	7	1	3
		47. Carrying unauthorized remediation operations on electrical installations	D	7	1	3
		48. Improper handling of the compressed air jet while cleaning the machine	INV III	4	2	3
		49. Staying in hazardous areas: on car access roads, under the load of lifting equipment, etc.	D	7	1	3
		50. Falling at the same level (slips, trips, unbalancing	LTI 45-180	3	1	2
		51. Falling from height at change of wires at the cutting machine	D	7	1	3
	Omissions	52. Omission of operations that ensure worker's own safety at work;	D	7	1	3
		53. Failure to use PPE and other protective equipment.	INV III	4	2	3

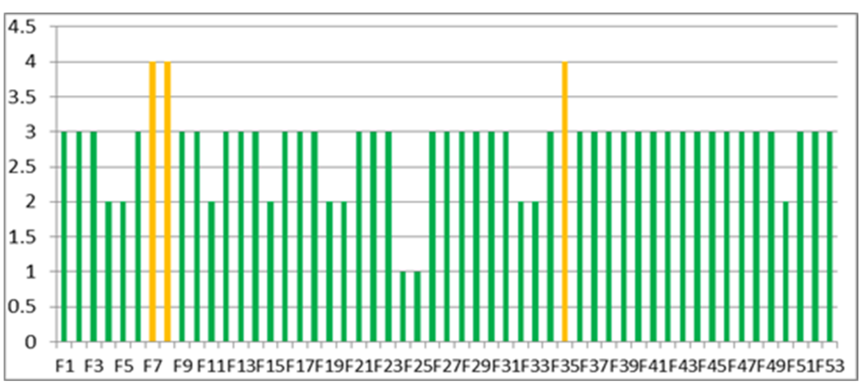

Fig. 11. Partial risk levels by risk factors. Job: "Cellular concrete cutter machinist". Overall risk: 2.93.

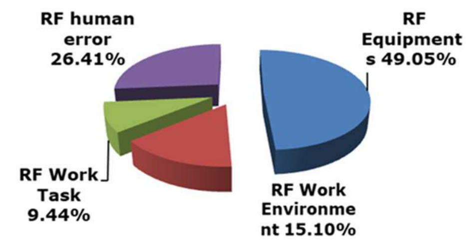

Fig. 12. The share of risk factors identified by the elements of the work system.

Table 4

Proposed action sheet. Job: „Cellular concrete cutter machinist" – excerpt.

Risk Factor	RL	Prevention measures
F7. Means of transport - hitting by forklifts in warehouses and inside the autoclaved aerated concrete section	4	***Technical measures:*** • Physical separation (or marking where separation is not possible) of pedestrian traffic lanes for forklift traffic lanes • Limiting the speed of the forklifts to 15 km / h with the front and 5 km / h with the back • Installation of video surveillance cameras in the areas where pedestrian-forklift traffic intersects ***Organizational measures:*** • Daily check before starting work of technical condition and safety devices on forklifts • Prohibition of commencement or continuation of work if the protective devices are found to be missing, damaged or incorrectly placed; • Training of forklift operators.
F8. Means of transport - hitting by front loaders, bulldozer when moving through deposits of synthetic gypsum, gypsum stone, sand.	4	***Technical measures:*** • Mounting video cameras on bulldozers and front loaders to eliminate angles / areas without backward visibility • Installation of signs prohibiting the access of unauthorized persons in the warehouses of raw materials ***Organizational measures:*** • Daily check before starting work of the technical condition and safety devices on the bulldozer and front loader • Prohibition of commencement or continuation of work if the protective devices are found to be missing, damaged or incorrectly placed

The structure of the identified risk factors according to their partial risk level is represented in Figure 11, while the proposed prevention-protection measures proposed is given in Table 4.

3.4 Interpretation of results

The global risk level calculated for the "cellular concrete cutter machinist" job is equal to 2.93, which places it in the category of jobs with a low to medium risk level, which does not exceed the maximum acceptable limit (3.5). The result is supported by the "*Risk Assessment Card*", which shows that out of the total of 53 identified risk factors, only 3 exceed, as a partial level of risk, the value of 3 falling into the category of average risk factors. The 3 risk factors that are in the unacceptable range are:

F7 - Means of transport - hitting by forklifts when moving in the warehouses of finished products and inside the autoclaved aerated concrete section - partial risk level 4

F8 - Means of transport - hitting by front loaders, bulldozer when moving through deposits of synthetic gypsum, gypsum stone, sand - partial risk level 4

F35 - Entering the hazard zone (on the conveyor) to replace the broken vertical wires while the machine is running (without activating the interlock system) - partial risk level 4.

4. CONCLUSION

Systematic risk assessment lies at the basis of risk management by business organizations and government authorities. The obtained results allowed the establishment of the acceptability of risks, the prioritization of intervention needs and the prevention and protection measures necessary to minimize the risks of accidents and occupational diseases for the investigated working system.

The application of this tool into an enterprise will allow:

i. To identify all risk factors at workplaces, operation that is necessary to draw up enterprises own instructions concerning safety at work;
ii. To scan the existing situation of each workplace, in such manner as to ascertain acceptable risks;
iii. To ascertain the risk levels at each workplace, as well as their hierarchy;
iv. To set priorities regarding prevention measures for each workplace, respectively the optimal utilization of resources assigned for such purpose;
v. To set a hierarchy of workplaces from the point of view of hazards and noxiousness;
vi. To compare different workplaces as regarding occupational accident and disease hazards, with applications for the optimal use of economic lever factors;
vii. To manage workplace risks with computer-aided techniques if reliable databases are available.

The tool does possess some advantages, such as accessibility, simplicity in use and is fitted for training/learning the workers basic concepts, such as probability, frequency and gravity, in a qualitative manner. It comes that these methods can be ideal awareness tools for the workers and staff members.

The method described and illustrated through a case study was approved by the Romanian Ministry of Labor and Social Protection and experimented until now in the industrial field, in thousands of workplaces. Furthermore, based on this method, a significant number of safety practitioners have been trained and authorized as assessors. When applying the risk assessment tool presented, it is imperious to stay focus on the goal of risk ranking. Keeping this in mind, the effect of the subjectivity will decrease and the overall aim will be achieved.

The approach research topic presented in the paper is of great interest nowadays due to the post-pandemic period and the related new preventive, protective measures that have been implemented in the manufacturing filed.

Future research will consider the automation of the assessment process as presented by [16] and the application of new methods and tools for the ergonomics risks characterization [17-19]. From the practical perspective, future studies will be developed in the contractual context (technical consulting contracts) offer by the university-industry collaborations [20]. Finally, the extend of knowledge and development of innovative solution for the risk assessment (ergonomics and occupational health and safety) should considered the ergonomics and human factors regional educational CEEPUS Network potential [21] as an important knowledge pool and sharing.

In addition, an important attention should be paid to the design and implementation of a modern e-learning platform and program that could support specialists in the occupational risks' assessment filed [22, 23]. Thus, safety culture and leadership could contribute to the increase of productivity and the quality of product and process, having a positive impact on companies' competitiveness and could promote the workplace wellbeing concept [24-26].

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Riscul ocupaţional: evaluare într-o companie industrială producătoare de prefabricate de beton

Rezumat: *Lucrarea de față își propune să dezvolte o evaluare detaliată a riscurilor pentru sănătatea şi securitatea în muncă în cazul postului de lucru „Operator maşină de tăiat beton celular" care își desfășoară activitatea într-o firmă de producţie care este un important producător de elemente prefabricate din beton în sud-vestul României. Lucrarea include o descriere sintetică a metodei utilizate (structură, instrumente, procedură de lucru). Un studiu de caz pentru un anumit sistem de muncă este inclus pentru a evidenţia utilizarea corectă a metodei. Scopul final este de a ilustra un exemplu de bună practică în domeniul evaluării riscurilor profesionale, pentru a facilita adoptarea unor măsuri eficiente de prevenire şi protecţie care vizează minimizarea riscurilor în mediile industriale de lucru.*

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