

# COMPARATIVE ASPECTS OF THE ASSESSMENT OF THE HEALTH OCCUPATIONAL RISK AND OF THE OCCUPATIONAL SAFETY WITHIN A METALLIC CONFECTIONS UNIT

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**Abstract:** The paper approaches a present subject, both in the field of the occupational health and of the occupational safety. The purpose of the study is the quantitative assessment of the risk level regarding the occupational health, through a personal method that consists in the transposition of the computation formula of the occupational safety risk level in the field of the occupational health, taking into account the method presented by INCDPM (The National Institute for Development and Research in the field of Labour Protection) (2) and the comparative analysis of the gravity of the safety risk factors with the gravity of the generated affections, of the probability of the safety risk factors, of the partial risk levels of the risk factors and the generated affections and of the safety risk level with the health risk level.

**Keywords:** occupational health, risk factors

**Rezumat:** Lucrarea de față abordează un subiect de actualitate, atât în domeniul sănătății ocupaționale, cât și în domeniul securității în muncă. Scopul studiului este evaluarea cantitativă a nivelului de risc pe linie de sănătate ocupațională, printr-o metodă de concepție proprie ce constă în transpunerea modelului de calcul al nivelului de risc de securitatea muncii, în domeniul sănătății ocupaționale, după metoda prezentată de INCDPM (2) și analiza comparativă a gravității factorilor de risc de securitate cu gravitatea afecțiunilor provocate, a probabilității factorilor de risc de securitate cu probabilitatea apariției afecțiunilor provocate, a nivelurilor de risc parțiale ale factorilor de risc și afecțiunile provocate și a nivelului de risc de securitate cu nivelul de risc de sănătate.

**Cuvinte cheie:** sănătate ocupațională, factori de risc

## INTRODUCTION

The scientific research in the field of labour medicine is an active process that has always interested people, and today, even more, due to the changes and transformations that take place in the labour, social and economic field. (1).

This paper approaches a present subject, both in the field of the occupational health and in the occupational safety, regarding a workplace with the largest weight in the technological process, respectively SNR Rulmenti company – rectification and assembly lines.

## PURPOSE OF THE RESEARCH

The part of the paper dealing with the personal research aims at the quantitative assessment of the risk level regarding the occupational health.

## MATERIAL AND METHOD

The research was accomplished through an original method, through the transposition of the computation formula of the occupational safety risk level in the field of the occupational health, taking into account the method presented by INCDPM (2) and the comparative analysis of the gravity of the safety risk factors with the gravity of the generated affections, of the probability of the safety risk factors, of the partial risk levels of the risk factors and the generated affections and of the safety risk level with the health risk level.

## RESULTS AND DISCUSSIONS

### I. General data about the factory taken into consideration:

- It is a company with entire foreign private social capital;
- Has as its main object of activity – the production of ball bearings and conic roller bearings;
- The activity is developed in working halls specially designed;
- The finished products are exclusively meant for exportation;
- The produced goods are used in the main sectors of industry: automotive, air-spatial, other industry sectors;
- It has been present in Sibiu since April 2003;
- It produces 45.000 bearings daily.

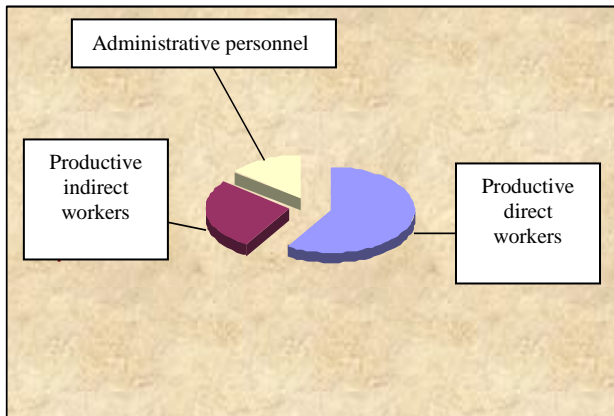
### Structure of the personnel

**Table no. 1. Classification of the employees' batch according to the productive sector**

No.	Professional category	No. of employees
1	Productive direct workers	209
2	Productive indirect workers	96
3	Administrative personnel	51
4	<b>TOTAL</b>	<b>356</b>

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**Picture no. 1. Classification of the employees' batch according to the productive sector.**



**II. Assessment of the safety risks regarding accidents and occupational diseases: rectification and assembly lines.**

- It was made by a team of specialist engineers – risk level assessors;
- The INCDPM method was issued.

**Table no. 2. Occupational safety risk level:**

$$NRG_{1a} = \frac{\sum_{i=1}^{20} R_{iri}}{20} = \frac{1(4 \times 4) + 5(3 \times 3) + 9(2 \times 2) + 5(1 \times 1)}{1 \times 4 + 5 \times 3 + 9 \times 2 + 5 \times 1} = 2,42$$

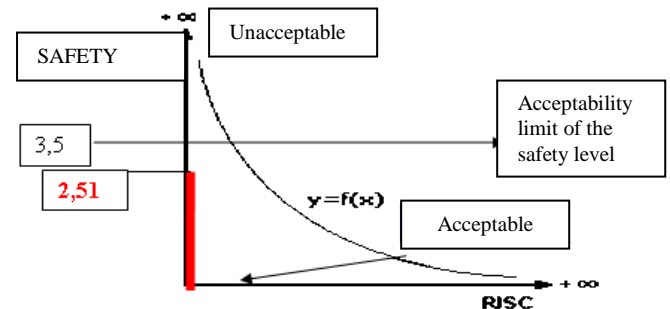
**III. The assessment of the occupational safety risk level: rectification and assembly lines will be accomplished as follows:**

**Table no. 3. The estimation of the labour health risks: rectification and assembly lines:**

$$NRS = \frac{\sum_{i=1}^{26} R_{fi}}{26} = \frac{6(2 \times 2) + 6(3 \times 3) + 1(4,72 \times 4,72) + 1(2,66 \times 2,66) + 1(2,23 \times 2,23) + 1(3,45 \times 3,45) + 1(2,29 \times 2,29)}{6 \times 2 + 6 \times 3 + 1 \times 4,72 + 1 \times 2,66 + 1 \times 2,23 + 1 \times 3,45 + 1 \times 2,29} = 2,51$$

The risk level estimated for the occupational health: rectification and assembly lines is equal to 2,51, value that places it in the category of the workplaces with small towards average risk level, not exceeding the accepted maximum level (3,5) according to the standard.

**Picture no. 2. Limit between the acceptability/unacceptability of the risk level.**



**Table no. 4. Comparative situation through the safety and health method of gravity, probability, partial and general risk levels for the WORKPLACE 1: RECTIFICATION AND ASSEMBLY ROOM**

No.	Risk factors	Gravity (G)	Probability (P)	Safety risk partial level (Nprs)	Gravity of affections (G)	Probability regarding the occurrence of affections (p)	Health risk partial level (medical) Nprm
1	MECHANICAL	3	III	3	7	V	7
2	ELECTRICAL	7	I	3	7	II	4
3	THERMAL	6	I	2	3	IV	3
4	NOISE	4	I	2	2	II	2
5	BIOLOGICAL	2	IV	2	2	V	3
6	CHEMICAL	6	II	4	2	VI	3
7	PHYSICAL STRESS	3	II	2	3	V	4
8	PSYCHICAL STRESS	2	I	1	2	III	2
9	OMISSIONS	4	I	2	7	II	4
<b>NRG<sub>1</sub> = 2,42</b>					<b>NRS<sub>1</sub> = 2,51</b>		

The comparative analysis of gravity (G), probability (P) and of the safety risk factors with the gravity and probability of the affections generated, of the safety general risk levels (NRG) and health (NRS) may be emphasised as follows:

- Risk factors' gravity (G) is estimated through the method used for the assessment of the occupational safety risk; it registers the highest values for the electric (7) thermal (6) and chemical (6) risk factors,

the probability (P) for the event to occur being extremely rare (1) for the thermal and electric risks and very rare for the analysed chemical risks. The largest probability (P), IV, was encountered in the case of the biological risk factors. (Table no. 4)

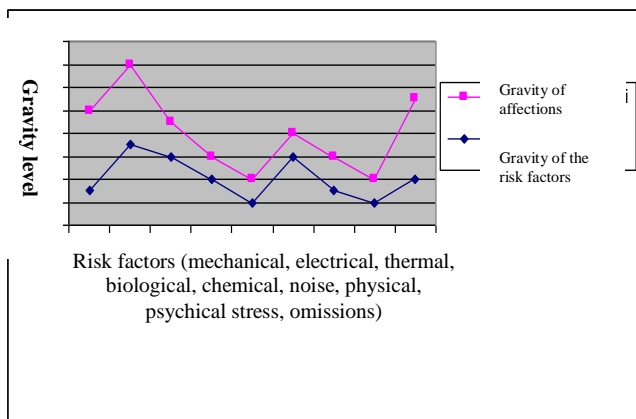
- The mirror situation of the gravity (G) of the affections in relation with the risk factors, estimated through the method used for the assessment of the proposed health risk, revealed the largest values for

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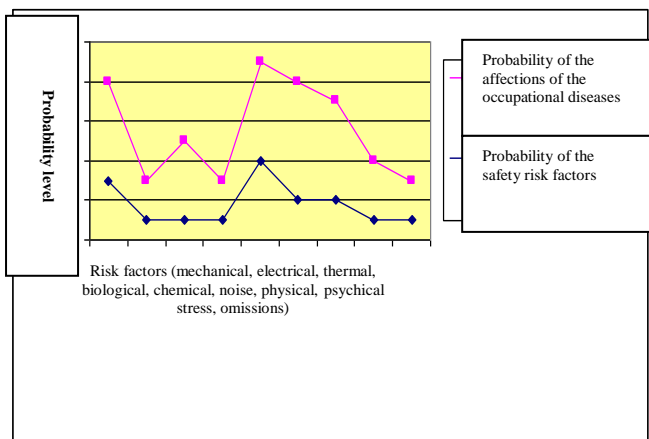
the mechanical (7) electrical risk factors (7) and omissions (7). The probability (P) for the affections to occur is frequent for the mechanical factors and very rare for the electrical factors and omissions (II). The largest probability (P) - VI is registered by the chemical factors. (Picture no. 3)

- It results that, in none of the cases, the probability of the safety risk factors is identical with the probability of the generated affections. (Picture no. 4)
- The total lack of coincidence is also reflected from the analysis of the safety risk partial levels (Nprs) and of those of health (Nprm). (Picture no. 5)
- NRG (safety general risk level) equal to 2,42. For the *RECTIFICATION AND ASSEMBLY* workplace, it is less than NRS (2,52) (health general risk level) with 0,09, in relation with that of the risk factors with a larger probability for the affections to occur, which is placed at high values, as against the probability of the risk factors. (Picture no. 6)

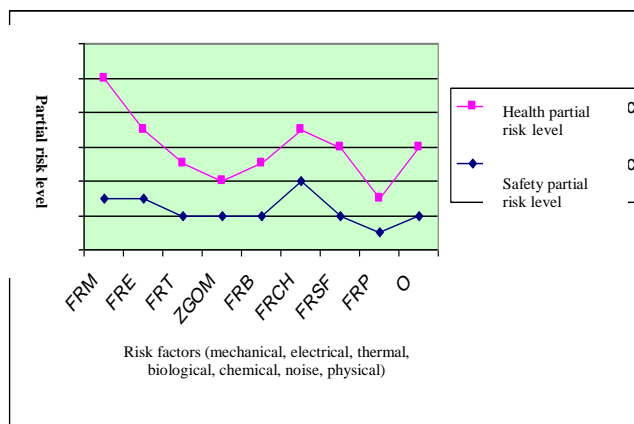
**Picture no. 3. Comparative situation of the gravity of the safety risk factors and of the gravity of the generated affections for the workplace: RECTIFICATION AND ASSEMBLY ROOM**



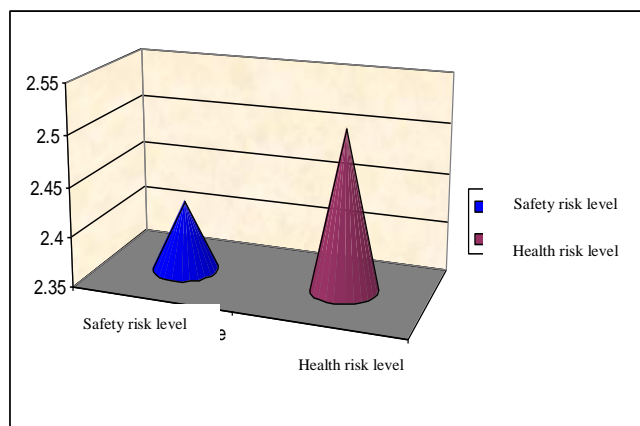
**Picture no. 4. Comparative situation of the probability of the safety risk factors and of the probability for the affections to occur, regarding the workplace: RECTIFICATION AND ASSEMBLY ROOM.**



**Picture no. 5. Comparative situation of the partial risk levels and the affections generated, regarding the workplace: RECTIFICATION AND ASSEMBLY ROOM.**



**Picture no. 6. Comparative situation of the safety risk level and of the health risk level for the workplace: RECTIFICATION AND ASSEMBLY ROOM**



## CONCLUSIONS

1. Regarding the above-mentioned workplace, the labour health risk level was estimated, taking into account a **medical original method**, which was obtained as a result of the:
  - transposition of the computation formula of the general risk from the method issued by INCDPM;
  - by using the table elaborated by the Ministry of Health, with possible consequences of the action of the risk factors on the human organism;
  - classification of the possible affections that may occur within the process of work, in a class of gravity and probability, by using the transposition of the gravity/probability method of INCDPM.
2. The specialized engineers, who have drawn up the company's documentation, provided the assessment of the occupational health and safety general risk.
3. All the above-mentioned data helped me enormously in order to perform the comparative analysis per

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workplaces and at general level, regarding the results obtained through the two methods.

4. Labour health risk assessment and its numerical estimation, taking into account a mathematical formula is a new element.
5. These methods used for the assessment of the occupational health and safety play an important part in the identification of the highest risks that may occur in the process of work and in order to take, *a priori*, the technical, sanitary and organizational measures necessary for removing or reducing their intensity, before the occurrence of the occupational accidents.

### REFERENCES

1. Bardac D. Folosirea evaluării riscului profesional pentru implementarea unor schimbări în activitatea unei întreprinderi: Buletin informativ, Promovarea sănătății la locul de muncă. Fundația Romtens, București, nr.2, 2008.
2. INCDPM. Metoda de evaluare a riscurilor de accidentare și îmbolnăvire profesională. București, 1998.  
\*\*\*Hotărârea de Guvern 493/2006 privind cerințele minime de securitate și sănătate referitoare la expunerea lucrătorilor la riscurile generate de zgomot.
3. \*\*\* Normele metodologice a Legii nr. 319/2006 (HG nr.1425/2006).