Universidade do Minho
Escola de Engenharia

Semana da Escola de Engenharia
October 24 - 27, 2011

RISK CHARACTERIZATION IN WOOD COMPANIES

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KEYWORDS
Acceptability, Hazard, Risk, Wood companies.

ABSTRACT

For the formulation of the acceptance criteria it is important to know the risk of the analysed economic sector. This work aims to identify the main risks in furniture and pallets industries, in order to help in the process of formulation of the acceptance criteria for this particular sector. This study was developed in five wood companies situated in the North of Portugal. All hazards were identified and the risks characterized. In pallet company the main risk was related with fire and explosion. The furniture companies present a great variety of risks. The main risks were hand contact with machine tools and components projection. Taking into consideration the obtained results, the risk matrix may be the best approach to include all risks in an acceptance criterion.

INTRODUCTION

Organizations need to define how the risk should be minimized in order to obtain an acceptable level, being the definition of the acceptance criteria indispensable to any risk management policy and/or strategy. However, risk acceptance process is a challenging issue. The basis for risk acceptance decisions is the use of acceptance criteria, but its formulation it is not a straightforward task. For this purpose it is important to consider the type of risk, the safety goals and the available accidents data (Kjellén & Sklet, 1995; ISO 31000:2009). Thus, one of the main important aspect is to know the main risks and its characteristics.
The furniture sector represents one of the biggest economic sector of the Portuguese economy. However, the number of work accidents in this sector is high (GEP, 2010). Therefore, it is important reduce the risks, being the correct formulation of an acceptance criteria, according to the specific needs of this sector, essential.
According to Miguel *et al.* (2005) it is possible to find in this sector a great diversity of risks, as examples: contact with moving objects as saws, pinch, projection of machine parts (for example saw or saw parts) and others objects, particles projection, excessive noise, excessive effort, chemical agents exposure, falls on the same level, falling of objects, collision with moving objects and contact with hot surfaces. These risks can lead to different damages, such as injuries, fatalities and illness. Accordingly, in order to face this diversity of risks and to formulate adequately the risk acceptance criteria for this sector, it is important to know the main risks and the corresponding impact.
Therefore, this work aims to identify the hazards and characterized the main risks in furniture and pallets industries, in order to help in the process of formulation of the acceptance criteria for this particular sector.

METHODOLOGY

This study was developed in five wood companies: one pallets company and four furniture companies, all located in the region North of Portugal. First, the company hazards were identified. To support this step a checklist was formulated and applied. It included aspects related with space structure, organization, environmental factors and machines. The level of deficiency of each hazard was also characterized. For the hazards identified were characterized the risks related, in particularly the type of risk, its consequence and the associated probability, expressed qualitatively.

RESULTS AND INTERPRETATION

For each of the identified hazard, the corresponding risk was characterized. Table 1 shows the main risks that were identified and the number of hazards related to the respective risk. The pallets company is identified as A

and the four furniture companies as B, C, D and E. With regard to machines, it was considered that when more than one machine of the same type has the same hazard, this counts as one.

Table 1: Risks and number of hazards by company

Risk	Number of hazards				
	A	B	C	D	E
Falls at the same level	1	2	1	4	4
Falls from height	1	0	0	0	0
Collision with fixed objects	2	1	1	1	0
Collision with mobile objects	3	0	0	0	1
Falls of equipment and tolls	0	1	2	1	1
Falls of the forklift loads	0	0	0	0	1
Lack of access to the means of firefighting	1	1	1	1	
Fire/explosion	7	2	2	3	1
Noise exposition	3	3	3	3	3
Excessive effort	1	4	3	3	4
Hand contact with cutting surfaces	1	0	1	0	0
Hand contact with saws, blades, drill and milling cutter	0	7	4	7	7
Hand contact with manual tools	0	1	1	1	1
Hand contact with machine moving parts	0	1	3	2	1
Components projection (saws, milling cutter, objects and other components)	0	4	9	6	5
Squeeze	0	3	2	2	1
Particles projection	2	3	4	4	4
Particles inhalation	3	3	4	4	4
Chemical inhalation	0	1	0	1	1

In general, the identified risks are consistent with those referred by Miguel *et al.* (2005). Some differences in the identified risks between the pallets and furniture companies were found.

In pallets companies, the main identified risks were related with fire and explosion. Seven hazards were associated with this risk. Effectively, in this company, the process promoted the dispersion of wood particles. In addition, the raw material were wood particles and a great quantity was stored in the production area, where existed some ignition sources, in particular a forklift without any flameproof protection.

In furniture industries the main risks are related to contacts with saws, blame, drill, and milling cutter. Generically, this risk was related with: saws, drill and milling cutter without protection or protection raised; non-use of the driving-bar for cutting small pieces; pieces blocked in machines removed with the hands. One of the more problematic situations was the panel dimension saws. Only in one company the protection was used, however, it was adjusted to the upper limit, and not carrying out the supposed protection function. Taking this into consideration, and considering the continuous exposure of the operator, the probability of a cut in the hand in this sector is high. However, as no company uses an appropriate protection in this machine, this may indicate that it is a risk they are willing to accept. In the other machines, as manual crosscuts and guillotines, the protections were used in some cases.

Another important risk in this sector is the projection of some components. Without a suitable protection and maintenance, saws, milling cutter, drills and particles, can be projected and cause severe damages in workers.

CONCLUSIONS

This study highlighted that in the wood sector the risks are diverse, however, it is essential to include all these risks in the formulation of the acceptance criteria. Given these results it is important that the criteria allows to decide the acceptability of risks with different types of gravity and probability, in an easy and clear way. Include the criterion in a risk matrix seems to be the best approach for this sector. However, it is still important that in the future, based on the probability and severity of these risks, organizations can be able to define the limits of their acceptability.

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