THE IMPLEMENTATION OF ERGONOMIC PROGRAMS IN PRODUCTION LOGISTICS

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Abstract: This contribution addresses the necessity of ergonomic programs implementation in production logistics in Slovakia; it also shows the importance of evaluation of their effectiveness regarding the costs and benefits. One of the appropriate methods for monitoring all costs and benefits from ergonomic programs is the cost-benefit analysis.

Key words: ergonomics, production, logistics, CBA

1. INTRODUCTION

Adaptation of workplace dimensions to individual workers provides opportunity to increase their work effectiveness (Hatiar & Cagáňová, 2009). This can be done by the ergonomic programs. The ergonomic programs and production logistics represent individual supporting processes of the company with specific goals. The logistics is aimed at: “Delivering the product in the right quantity, composition, quality, and time to the required place at minimum costs with optimum supply services.” The ergonomics is aimed at the efficiency of human work through,” ensuring the human health, i.e. also their physical, mental and social satisfaction of people together with cost benefits.

The interconnection of these partial targets may lead to the penetration of individual areas as well as to opportunities to meet the customer requirements for supplies and services on required level while taking care of human health in all necessary main and supporting processes being realized to meet these customer needs. Individual goals will be thus interconnected and harmonized achieving so satisfaction for both the customer and the staff and finally for the company.

2. ERGONOMICS IN PRODUCTION LOGISTICS

The role of ergonomics as a supporting process in the logistics would be to perform duties associated with checking impact of work, means of work equipment and working environment on employees’ health and thereafter perform activities by properly defined measures to prevent negative impact on work performance of employees. This should be done through ergonomic solutions.

To apply ergonomic knowledge and principles in the production logistic it is possible to use an ergonomic program based on participatory ergonomics principles as a supportive tool. This process usually includes a five stages cycle with following contents (Cook et al., 2000):

- stage I – identification of problems in the system, which is subject to investigation,
- stage II – analysis of the problem reasons and definition of their solution,
- stage III – problem solution proposal,
- stage IV – implementation of the solution,
- stage V – evaluation of the solution benefits (health effect and cost benefit).

The workers in production logistics may be exposed to a risk factor in terms of ergonomics which affects their work performance and thus the efficiency of companies and the quality of manufactured products.

In production logistics the area can be which offers opportunities for the application of ergonomic principles as outlined in the following table.

<table>
<thead>
<tr>
<th>Production logistics</th>
<th>The area for the applying of ergonomics principles</th>
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<tbody>
<tr>
<td>application of decision processes in production</td>
<td>minimizing the static load of musculoskeletal system,</td>
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<tr>
<td>the planning and managing of production and manufacturing stocks,</td>
<td>the choice of appropriate type and location of knops and dials,</td>
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<tr>
<td>optimization of batches size,</td>
<td>the choice of appropriate level of mechanization and automation,</td>
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<tr>
<td>reduction of production running times,</td>
<td>reducing carrying weight of loads on manual handling,</td>
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<tr>
<td>transport, storage and manipulation in production.</td>
<td>the choice of appropriate handling units (containers, pallets, cars),</td>
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<td></td>
<td>minimizing the monotony of work.</td>
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</tbody>
</table>

Tab. 1. The scope for the application of ergonomics principles in production logistics

The afore-mentioned areas can be examined within the analysis which is a part of the ergonomic program. In present, the application and implementation of ergonomic programs is not the matter of course in Slovakia. Ergonomics is mainly applied in companies with foreign capital participation. The following tab. 1&2 describe the results of ergonomic analysis of the selected company showing the need of the ergonomics application in production logistics. In ergonomic analysis the impact on musculoskeletal system disorders of the employees was observed. Next aspect is to review the work environment factors on musculoskeletal disorders of employees.
and benefits. The cost benefit analysis is therefore none of the following steps should be skipped. The procedure is considered as one of the possible procedures, and their random reshuffle could lead to not good results and could complicate the achieving of valid results. This stage of CBA follow each other in a logical sequence, and absolutely strict as well as their definitions. Nevertheless, the recommended procedure in the processing by CBA is as follows (Sieber, 2004):

- define the nature of the project,
- specify the structure of beneficiaries,
- describe the differences between the investment and zero option,
- determine and quantify all relevant costs and benefits for all life phases of the project,
- set apart supplementary 'invaluable' costs and benefits and their verbal description,
- transfer 'valuable' costs and benefits to cash flows,
- determine a discount rate,
- calculate criteria,
- carry out an analysis of sensitivity,
- judge the project on the basis of calculated criteria, invaluable effects and a sensitivity analysis,
- decide about the plausibility and funding of an investment.

4. CONCLUSION

Human and especially workers may be taken as one of the limiting factors in production logistics. Therefore, it is necessary to prepare such appropriate work conditions that the worker is able to perform his/her work while minimizing the effects of risk factors. The elimination of risk factors effects should be achieved through the implementation of ergonomic programs. Cost-Benefit Analysis is a suitable method for evaluating the ergonomic programs efficiency as not profitable projects. The goal of ergonomic programs implementation into the area of production logistics is:

- propose appropriate work conditions with minimizing influence of risk factors,
- evaluating of effectiveness of accepted measures through CBA.

Implementation of ergonomic program should help for rising of company competitiveness; to faster adaptation for market changes and better functioning of logistic processes in company.

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6. REFERENCES


