Ergonomic improvements go hand in hand with productivity in a logistic environment.

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Abstract.

Scope: in order to optimize the outbound process in the European Logistic Distribution Center of Harley Davidson, working conditions and productivity had to be improved.

Project organization: a multidisciplinary project group was established.

Human Factors topics covered: because the majority of manipulations couldn’t be eliminated, new compact workstations; new carts and a mobile packing table were created. The applied ergonomic method was both observational and participatory.

Project phases: the ergonomic support was structured in a four steps approach: 1) observation of the outbound area, 2) participatory group discussion with operators and operational management, 3) a multidisciplinary discussion with several members of the management, and 4) implementation and follow-up of the adjustments.

Conclusions: the participative approach with the operators and the multidisciplinary discussions were very effective. The operators noticed a reduction of the physical workload. Additionally, the productivity in the outbound area increased with 15 %. The multidisciplinary approach to discuss possible solutions with several members of the management was a keystone of the project. Not only larger companies, but also small and medium enterprises can benefit from ergonomic interventions. Ergonomic interventions should be affordable for every company.

Practitioner Summary: in the European Logistic Distribution Center of Harley Davidson, working conditions and productivity had to be improved to optimize the outbound process. This could only be done by a redesign of this area. This redesign consisted of new compact workstations, new carts and a mobile packing table. The ergonomic support was structured in a four steps approach (observation of the outbound area; participatory group discussion with operators and operational management; a multidisciplinary discussion with several members of the management; and implementation and follow-up of the adjustments). The participative approach with the operators and the multidisciplinary discussions were very effective. Not only larger companies, but also small and medium enterprises can benefit from ergonomic interventions.

Keywords: distribution center, working conditions, productivity, redesign, ergonomic interventions

1. Scope

Neovia Logistics in Houthalen, Belgium, is exploiting the European Logistic Distribution Center of Harley Davidson. The management of Neovia Logistics wanted to optimize the outbound process in order to improve the working conditions and the capacity and productivity in the outbound area. Small, medium and large parts are packed before shipping in this area. Depending on the season, between 15 and 30 operators work in the outbound area in two shifts. The investment level of this project was 15.000 € (for the equipment only). The project started in February 2012 and ended in April 2013.

2. Project organisation

A multidisciplinary project group was established. A project manager from Neovia Logistics was in charge while the other members consisted of the higher management, the operational management, and a
registered European Ergonomist of Mensura Occupational Health Services. The ergonomist was involved in the project from the start.

3. Human Factors topics covered

In order to reduce the physical workload and to optimize the working conditions and the workflow, the number of manipulations had to be reduced as much as possible. However, the majority of manipulations couldn't be eliminated. Thus new compact workstations; new carts and a mobile packing table had to be created. The aim of this redesign was an increased productivity (i.e. more manipulations per hour done by the same number of operators) combined with better ergonomic conditions.

The applied ergonomic method was observational and participatory. The ergonomist focused on the general redesign of the outbound area, the workstations in this area and the internal transport. A redesign of the outbound area was proposed with especially technical solutions and optimization of the workstations to diminish physical workload. The process flow was reviewed in order to minimize manual handling and to optimize it.

4. Project phases

The ergonomic support was structured in several steps: 1) observation of the outbound area, 2) participatory group discussion with operators and operational management, 3) a multidisciplinary discussion with several members of the management, and 4) implementation and follow-up of the adjustments.

Firstly, the ergonomist needed to understand the process flow and gain insight in the physical workload of all the tasks performed in the outbound area. This information was gathered by an in depth observation at the workplace. The observation was done in close interaction with the operational management and the operators.

After the observation, the ergonomist organized a participatory focus group discussion with the operators. During these group discussions, the operators were invited to give more information about difficult tasks, proposals and barriers to adapt their tasks. They also got basic information about physical load on the musculoskeletal system and the ergonomist informed about major ergonomic issues. Afterwards, they were asked about their preferences, for example working in a standing or sitting position. Based on his observations and the input from the focus group operators and after feedback to the management, propositions were made by the ergonomist to reduce the physical workload.

Thirdly, different multidisciplinary discussion groups were organized with the ergonomist and the management including the project manager, the plant manager, the operational manager and the health and safety engineer. The redesign proposition and other advices of the ergonomist such as a new cart and a mobile packing table with two levels were discussed and compromises were made.

Fig 1. Redesigned mobile packing table, compact administrative workstation, trolley with adjusted wheels.
Decisions with a big impact on the work performances were presented to the operators and try outs were done. Thus, remarks of the operators were taken into account again. The open-faced and constructive atmosphere in this company, allowed the operators to come up freely with new ideas. Based on these try outs, final adjustments were made and a Neovia engineer made the definitive redesign schema of the outbound area. After the implementation, two follow-up visits were done by the ergonomist. Some additional adjustments, like changing the position of the handles on the new cart, were implemented based on these follow-up visits.

5. Conclusions

In this case study, the management understood the importance to invest in the improvement of the working conditions by redesigning the outbound area. This has led to a reduction of the physical workload, aiming to lead to a reduction of musculoskeletal disorders on the long-term.

The participative approach with the operators and multidisciplinary discussions were very effective. This global approach was quite different from the classical approach in Belgium. The classical approach is based on risk analyses and a participatory discussion with the operators. Afterwards advice is given. A multidisciplinary discussion with the decision makers is rarely done. We always apply this global approach in our projects and we can conclude that as the multidisciplinary discussion goes better, the better the outcome of the project will be.

The subjective feeling of the operators in the area was that their physical workload reduced after the redesign of the outbound area. This feeling was expressed by almost all the operators working in the area, but wasn’t quantified. Additionally, the productivity in the outbound area increased with 15%.

The management invested quite some time in discussing step by step the planned changes with the operators. The suggestions of the operators were imbedded in the project to obtain a win-win situation. This participatory approach definitely increased the support of the adjustments from the operators. Also, the multidisciplinary approach to discuss possible solutions with several members of the management was a keystone of the project.

Not only larger companies, but also small and medium enterprises can benefit from ergonomic interventions. Ergonomic interventions should be affordable for every company. The ergonomic department of Mensura Occupational Health Services developed the described four steps approach. In this approach, as little time as possible is invested in risk analyses. Working out solutions is the most time consuming part of the approach and the cooperation of all the levels in the company is the key to success.

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