INVOLVING WORKERS IN PLANNING A SAFE AND ERGONOMIC CARPENTRY WORKSHOP USING THE SOBANE METHOD AND SIMULATION

General information

Country: Belgium

Sector: Materials and processing

Type of organisation: Provincial authority

Size of organisation: 1,250 workers. The team involved in the approach is part of the Service technique du patrimoine immobilier (property assets technical department). The team has 3 carpenters included in a group of 22 workers from other professions.

Location: Urban

Job/tasks: Carpentry

Workplace and task characteristics: Build and maintain furniture, transport goods, almost permanently working in a static standing position.

Workplace participation measures: Carpenters participated in analysing work and risks, as well as defining specifications for the development of their future workshop based on simulation.

The action

Background

Project start-up

The property assets technical department (which carries out repairs and maintenance) for the province of Namur are spread across several buildings. Namur planned to modernise and combine the separated units in one building. However, the manager of the unit was not convinced that the right building had been chosen. The province had several projects underway to improve working conditions in the carpentry department. These projects addressed the considerable risks from carpentry activity, such as musculoskeletal disorders (MSDs), safety, noise and dust, and the high level of absenteeism. Furthermore, this was the first department to start activities after the relocation to new premises.

To develop the new carpentry workshop, the employer decided to ask the prevention department's trainee ergonomist to provide ergonomic input to the project. The site for the carpentry department and the size of the workshop had already been defined by the project architect. To define the sizing needs of the premises, the architect had only based his choices on the standard measurements of the workshop machines. He did not consider their real operational space requirements and did not consult the carpenters.

The ergonomist introduced a participatory approach to help produce a development plan for the new workshop. The approach was used to establish technical and organisational recommendations to ensure the carpenters' wellbeing and performance. The unit manager saw this as an opportunity to demonstrate to senior management that the building chosen and the space allocated were not suitable.

The department is now located in a larger building than the one initially planned.

The carpentry department

The carpentry team oversees the building and maintenance of furniture for the Namur province departments. Tasks include drawing plans on the computer, managing stock, cutting and machining wooden parts, assembling, painting and managing waste. The activity has a substantial impact on lower back and lower limb disorders. The carpenters associate these physical difficulties with the job's static position and the fact that they have to stand most of the time when they are working.

Prevention policy

The province of Namur has set up a dynamic risk management system. The objective is to foster employee wellbeing, and it includes an overall risk analysis approach for each job. There is no specific approach for preventing MSDs.

The workers follow basic occupational safety and health (OSH) training when they are hired. On inception day for new employees, the prevention department gives a 30-minute presentation on the wellbeing policy. Other agents working for the employer also provide input.

Encouraging a culture of participation

Department heads are required to perform a risk analysis for each new worker that has been recruited. When requested by the person in charge of a department, the prevention department specialist actively involves the department operators in risk analysis and identification of preventive measures.

In the property assets maintenance and repair unit, the person in charge organises daily meetings with all employees to present the day's schedule. These meetings do not really encourage dialogue between the managers and workers when they could in fact be an opportunity for the workers to report problems. The manager wanted to invest in a new machine to reduce supplier costs. He presented several models to the carpenters who were able to give their opinion about the most suitable machines for their activity.

Participants and stakeholders

Two of the three workshop carpenters were involved in the project. The third carpenter was on long-term sick leave. These two carpenters had been working in the workshop for five and seven years, respectively. They took part in all the phases of the project, from analysing risks to defining specifications for the development of the new workshop, especially through a model-based simulation.

The ergonomist was involved in the project as part of his Master's degree specialising in risk management and wellbeing at work. Moreover, he had worked for the Namur province prevention department for 18 years. He coordinated the various steps of the ergonomic approach and took part in the development project steering committee. The person in charge of the property assets maintenance and repair unit had occupied his position for 23 years. He followed the project and participated in the steering committee. He referred to the specifications drawn up by the operators and ergonomist to define the second building development. The civil servant (trained architect) in charge of monitoring the project to combine the departments for the project owner also participated in the steering committee. Trade union representatives were asked to validate the action plan, but did not participate in the project management.

Participatory approaches, methods and tools

Overview of the approach

The ergonomist presented the approach during a meeting with the managers and carpenters. He suggested following the Screening, Observation, Analysis, Expertise (SOBANE) method to perform risk analysis and simulation in developing the new workshop. In this health and safety risk management strategy, all actors actively participate in screening for potential safety risks and finding solutions.

Risk analysis based on the current situation

- After observing the carpenters' activity for a day, the ergonomist organised an immediate debriefing session with them in the workshop to share his first observations and start discussions about work-related difficulties.
- Based on this first step, he designed a workshop plan considering the working space around the workstations. At the workshop, the carpenters could present their activity in relation to the plan. This step was used to determine the traffic flows.
- To complete the data, an overall risk analysis was performed with the two carpenters present during a 3-hour meeting. The Deparis consultation guide (participatory risk screening) for the wood sector was used to support this work. The manager was also invited but did not attend, which allowed the carpenters to speak more freely.
- At the end of the meeting, the ergonomist summarised the discussions, inviting the carpenters to make any adjustments to the report.
- This first step showed there was a need to perform a more in-depth analysis of the risks relating to MSDs, lighting and noise. The ergonomist assessed the MSD risks using a questionnaire based on a scale of discomfort (Corlett and Bishop, 1976), which the carpenters had filled in. The ergonomist then discussed the

results with the carpenters. They guided the ergonomist as he measured the noise and lighting levels in the workshop according to the work activity.

Finding solutions

- The results of the risk analysis were presented to the steering committee in the presence of the carpenters. The steering committee members decided to visit another carpentry workshop in the city. Their tour of this workshop and discussions with its users led to new ideas emerging for the future workshop development.
- The ergonomist built a large 2D plan on which sticky notes were placed to represent the tools and machines to scale. Over the course of two days, the carpenters progressively simulated different organisations and space scenarios. The ergonomist supervised each simulation iteration. The strong points and constraints identified in the previous step were taken into account. Various design aspects relating to the premises emerged during the simulation: air exhaust system, general layout, noise, entrance door, light, storage, signposting, handling equipment and height-adjustable workbenches.
- The resulting plan and design recommendations for the premises were presented to the steering committee. Following this presentation and the ensuing discussions, the carpenters, guided by the ergonomist, took half a day to make some readjustments.
- From an organisational point of view, the improvement proposals were put together by the workers and the ergonomist. These included raw material order management, which was seen as a source of stress. These recommendations were then discussed and validated during a steering committee meeting.
- Finally, the planned workshop was found to be unsuitable because it was too small to accommodate one of the machines (the wood panelling machine) and the space required around it to work. Therefore, management decided to move the carpentry workshop to a bigger building and allocate more space to it.
- Based on the plan drawn up by the ergonomist and the carpenters, as well as the design recommendations, the person in charge of the department and the architect designed the machine layout in the new space. The manager then validated this layout with the carpenters.

Implementing solutions

During the move, the carpenters suggested swapping the positions of the two machines that took up the same amount of floor space. Their request was accepted. The two carpenters also took part in a team of 10 workers in charge of the new building development project.

What was achieved

Finding solutions

The participatory approach and the simulation made it possible to propose a workshop plan placing the different workstations and machines in a way that reflects the real-life situation of the carpenters. In this way, problems relating to health and performance could be avoided. For example, one of the machines occupies three times more space when operating than it does when it is not operating. The first plans drawn up by the architect only considered the space requirements of the machine when it was not in operation.

Several design and equipment recommendations were made by the operators, the manager and the ergonomist:

- Equipment recommendations for MSD prevention (assistance with manual load handling): pallet truck, forklift truck, footrest bar systems installed below the workstations, loading bay to facilitate the transfer of parts and waste from the workshop to the vehicle, and height-adjustable workbenches.
- Organisational recommendations: reorganisation of waste disposal, storage and supplies.

These solutions were being implemented at the time of this case study.

The workers' experience

The carpenters felt that they had been heard, were involved in the project and recognised for their contribution. All the department's workers, including the carpenters, who took part in the development project were able to strengthen their work collective.

Improvements

The modifications better satisfied the needs of the carpenters' activity while protecting their health and wellbeing. Encouraged to be involved in each phase of the project thinking, the carpenters actively participated in analysing risks, defining specifications and moving to the new premises.

The participatory ergonomic approach implemented by the ergonomist was a first experience for the authority. Following the ergonomic intervention, the manager used the experience to appoint 10 workers to be in charge of the new building development project. During the project, he visited the site two to three times a week to meet up with the workers and collect their feedback. The ideas suggested by the team were taken into account.

Case extracts

The ergonomist and the manager were committed to their mission, facilitating worker participation and anticipating production system transformation projects. The ergonomist communicated regularly with the manager to review the progress of the intervention. The manager was reassured about what was happening between the ergonomist and the carpenters.

Members of the steering committee decided to visit an external workshop. Their tour of this workshop and discussions with its users led to new ideas emerging for the future workshop development.

Resources, costs and benefits

- Time off work for those concerned to participate in the working groups, simulation, interviews and steering committee meetings.
- Financial resources to acquire recommended equipment.
- Time set aside to perform the work, good working relationship between the ergonomist and the carpenters.
- Knowledge of the SOBANE participatory approach.

Analysis

Barriers

- The ergonomist was invited by the employer to be part of the overall development architecture quite late in the project.
- The small budget made it difficult to buy new equipment.
- Workers were involved only after the initial decisions on space had been decided. Although they were involved before it was altogether too late, involving them earlier could have avoided, for example, the mistake about the real space needed to operate one of the machines.

Facilitators

- The ergonomist had worked in the company for many years and thus benefitted from his seniority.
- He carried out this study as part of his Master's degree and was therefore able to formally put into practice his skills.
- He suggested to management that a participatory approach should be implemented with a steering committee and involve the workers in each step of the project management.
- The workers put more effort and time into the project because they were included in the thinking around it.
- The participatory approach created a dialogue between the managers and the employees: the employer invited the group members to take part in the meetings.
- The methodology was based on the actual work activity.
- A group tour to a different workshop allowed new ideas to emerge for making the project a success.
- The simulation of the future workshop encouraged the carpenters to think ahead and anticipate design errors.

Innovative features

- Analogue simulation made the design transparent and easy to change.
- Workers participated from beginning to end.
- Visits to the other workshops.

Lessons learned

- The participatory approach and the simulation made it possible to consider the overall reality of the carpenters' situation and prevent health problems from arising.

- According to the ergonomist, the workers' involvement in the project thinking, rather than simply having decisions imposed on them, meant that it was easier to gain their acceptance of the dynamic risk management system set up by the employer. In the future, they will be more inclined to pay attention to the collectively identified risks and make proposals.

Transferability

The SOBANE method for participatory risk analysis and simulation can be used in all business sectors and in companies and organisations of different sizes. In a small company, the various SOBANE guides indicate which actors need to be involved at which stage. There are websites to help with the implementation of workspace simulation. The use of a whiteboard with sticky notes is a simple method that can easily be applied by a micro and small enterprise.

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In addition, the case description builds on two interviews with the ergonomist and the manager of the property assets maintenance and repair unit.