# Healthy Workplaces Good Practice Awards 2020-2022

# CASE STUDY

## Applying participatory ergonomics to improve the safety of textile maintenance workers

COMMENDED

| ORGANISATION/COMPANY | COUNTRY | SECTOR | TASKS |
|---|---|---|---|
| Zegna Baruffa Lane Borgosesia SpA | Italy | Manufacturing | Plant and machinery maintenance |


*Source: Zegna Baruffa Lane Borgosesia SpA.*

## Background

Zegna Baruffa Lane Borgosesia SpA produces high-end yarns for knitwear, all made exclusively in Italy.

Maintenance technicians in the factory work on many types of machinery, under different environmental conditions and often as needed. The tasks are diverse and unpredictable. Consequently, the physical load is also unpredictable and uncertain. The type of physical effort required involves a significant biomechanical load, both for the postures assumed and for the type of movements, as well as for the weight moved and the force required. As a result, the risk of developing musculoskeletal disorders (MSDs) increases.

The variability and complexity of the work tasks performed also means that it is difficult to measure the biomechanical risks that the maintenance workers are exposed to. In addition, it is difficult to apply standard ergonomic risk assessment methods to very variable tasks. The lack of knowledge of the exposure to risk can contribute to the persistence of hazardous situations, or lead to an

underestimation of the risk by safety personnel, or by maintenance personnel themselves.

The ergonomics training of maintenance technicians combined with the experience gained over time is essential to safely perform work activities. Traditional ergonomic risk assessment, effectively conducted on production lines, offers only approximate results when it comes to maintenance activities. A different approach with further analysis is required to fully consider the diversity of tasks and specific operating conditions in maintenance work.

Risk prevention therefore requires a participatory ergonomics approach with the direct involvement of maintenance workers to use their knowledge and experience, to identify risks and to make decisions on solutions.

## Aims

The company aims to conduct a participatory ergonomics intervention to improve the safety of maintenance workers and to prevent MSDs.

## What was done and how?

To improve the safety of 40 maintenance workers for its industrial plants and machines and to prevent work-related MSDs, the yarn company sought the assistance of ICS Maugeri, an external organisation that specialises in occupational medicine. Participatory ergonomics was implemented, involving workers throughout the whole risk reduction process.

A 6-month participatory ergonomics intervention was carried out by the head of the company's prevention and safety service, with the supervision of an external specialised ergonomist.

The maintenance workers were involved in the following two phases:

- **Phase 1:** ergonomics training dedicated to the principles of biomechanics, posture, load handling, environment and workspaces.
- **Phase 2:** identification of workstation risks through key questions and simplified assessment that led to an initial classification of the type of risk.

Next, the ergonomist directly observed the most critical activities carried out by the maintenance technicians, collecting information and reconstructing their impact on a representative work year. This was done to quantify the risk of exposure with greater precision and to identify the need for intervention.

Finally, the relevant ergonomic aspects were discussed with the maintenance team and the head of the prevention and safety service. Possible solutions were identified and their feasibility discussed. Both urgent and longer-term actions were set.

The following preventive measures were implemented:

- Modify spaces or rearrange work areas, for example, some steps were replaced with a fixed walkway.
- New or modified equipment was introduced. For example, hydraulic aids and lifters, bespoke manual trolleys: a trolley especially shaped to handle packing machine cylinders, a specially shaped trolley for printing machine cylinders, and a trolley with a height-adjustable platform to reach machine motors that have to be dismantled.
- Changes in work organisation were implemented.

## What was achieved?

*Source: Zegna Baruffa Lane Borgosesia SpA.*

The participatory ergonomics intervention made it possible to:

- obtain a more precise profile of the risk exposure of maintenance workers for 11 production sectors;
- identify the criticalities of the specific workstations that require an urgent or short-term intervention;
- reach a shared agreement between the employees and the company regarding the improvement interventions to be implemented;
- determine what impact the ergonomic interventions had on the calculated risk levels of the tasks, eliminating exposure to high levels of risk and increasing the availability of aids to facilitate the most demanding tasks;
- increase employees' sense of responsibility towards health and safety in the workplace, laying the foundation for a fruitful collaboration with the company's safety and prevention service;
- increase the ergonomic knowledge acquired by maintenance workers, which they can then pass on to new colleagues;
- create a database of recurring failures, machine downtime and specific criticalities, all useful in better organising maintenance activities;

- codify the know-how of expert maintenance technicians that constitutes important information both for safety and for the effectiveness of maintenance interventions;
- increase the efficiency of the maintenance technicians' intervention, thanks to the supply of aids; and
- contain an injury rate for maintenance workers equal to 0.

Furthermore, at the end of the intervention, the maintenance workers expressed their desire and intention to continue participating in further ergonomics training. With the intervention of a dedicated physiotherapist, the company responded to this request by organising a course on maintaining wellbeing and health through correct postures and targeted physical exercises.

## Success factors

Success factors included:

- the use of external expertise to help with a specific complex problem; and
- training workers so that they could be fully involved in the process, and involving them in all stages of the systematic intervention process.

*Source: Zegna Baruffa Lane Borgosesia SpA.*

## Transferability

A participatory ergonomics approach could be transferred to other companies but could also be transferable to organisations in other industries.

## Costs and benefits

**Costs:**

The intervention costs (external ergonomist and cost of aids and implemented modifications) did not exceed the company's annual budget dedicated to prevention and safety.

- Aids (€4,500)
- Intervention of consultant for staff training and collaboration with specialised ergonomist (€60,000)

**Benefits:**

- **Perception of safety and working climate in maintenance workers:** Satisfaction of maintenance workers for the attention paid to their activity and for the actual interest on the part of the company. The working climate has benefited from this, with an increase in the level of safety also perceived by line workers, and a greater willingness of maintenance workers to expose specific problems and discuss possible solutions with the company.
- **Way of understanding the maintenance activity within the company:** The active participation of maintenance technicians in the risk identification and assessment process has sparked an innovative way of understanding the maintenance activity within the company.
- **Reporting of malfunctions and creation of a fault database:** The direct involvement of maintenance technicians in the timely reporting of malfunctions is a prerequisite for the creation of a company database on recurring failures of different types of machinery. This will allow the planning of preventive maintenance more effectively and notifying maintenance workers of particular types of interventions.
- **Transmission of knowledge to maintenance technicians in training:** The ergonomics training of the most experienced maintenance technicians indirectly improves their ability to transmit relevant information and know-how to the new maintenance technicians in training. This avoids the loss of an important repository of knowledge that is useful for properly running the machines.
- **Reduction of downtime due to breakdowns and malfunctions:** Thanks to the aids provided, the repairs carried out by the maintenance technicians are faster and more efficient. An average reduction of 10% in machine downtime (and therefore in loss of production) has been recorded.
- **Zero accidents for maintenance personnel:** The intervention contributed to maintaining an injury rate of 0 in maintenance personnel (registration during the period 2018-2021).

## Key features of good practice example

- Carrying out participatory ergonomics by involving all workers throughout the entire intervention to better assess ergonomic risks and to identify ergonomic solutions in reducing these risks.
- Extensive involvement of a broad range of stakeholders (workers, employer, workers' representative for prevention and safety, external ergonomist) in improving the safety of workers and preventing MSDs.
- The results of the assessments were also summarised to create a tool to better assess workers' capability in carrying out the different tasks.

## Further information

Further information can be found at https://www.baruffa.com/en/

***Worker participation resulted in practical solutions and a database of maintenance incidents that enables better organisation of maintenance activities.***