Healthy Workplaces Good Practice Awards 2023–2025

CASE STUDY

Digital systems for occupational safety and health monitoring, prevention and alerting in waste management

AWARDED

ORGANISATION/COMPANY	COUNTRY	SECTOR	TASKS
Amarsul – Treatment and Valuation of Solid Waste, S.A.	Portugal	Solid waste management	Collection, transport, treatment, separation and routing of solid urban waste

Introduction to the case study

Workers who deal with the management of solid waste often work in isolation or in noisy facilities with conveyor belts. If a worker is injured, falls or loses consciousness, a delay in emergency response could have severe consequences. For this reason Amarsul, a waste management company in Portugal, has invested in digital technologies that monitor the safety and health of its workers. Wearable devices, for example, immediately alert security to send medical assistance when a worker is immobilised, and automatic conveyor belt locking systems prevent serious incidents at facilities.

Background

Amarsul, with 415 workers, is a company dedicated to the integrated and sustainable management of urban waste, ensuring this public service for the inhabitants of the Setúbal Peninsula, Portugal. With one eco-waste transfer, three eco-parks and seven eco-centres distributed across the municipalities, Amarsul is firmly committed to environmental protection and the promotion of a circular economy. It offers innovative solutions for the collection, treatment, and organic and energy recovery of urban waste. It also develops educational programmes and awareness-raising campaigns to promote recycling and environmental practices in the community and continually invests in advanced technologies to minimise environmental impact and improve safety conditions in its workplaces.

The timely detection and warning of a risk scenario that can cause injury and serious consequences for worker health and safety is key to Amarsul's policy and guiding principles. Late reporting of an occurrence or dangerous situation increases the likelihood of an accident and delays the capacity and effectiveness of responding to emergencies and providing first aid.

Work is often carried out in isolation at urban waste treatment units and sanitary landfills, with 24-hour rotating shifts, or in teams collecting and transporting waste outside the premises. Such solitary work poses several risks that can impact the safety and wellbeing of workers. Other workers in manufacturing units, distracted by the noisy environment, may not notice a coworker's injury or fall. When working near conveyor belts, workers may be exposed to hazards that require an immediate response to lock conveyor lines.

Aims

Recognising the benefits of digital solutions, the company aims to adopt AI and wearable devices to monitor the safety of operations and workers, prevent risks and provide security alerts that ensure real-time responses in emergencies.

What was done and how?

By carrying out alert and simulated tests at Amarsul facilities, it was possible to test the implementation and digitalisation of preventive safety and health measures. These tests included isolated work monitoring devices,

automatic conveyor belt locking systems and all associated emergency procedures. The satisfactory results have led to the company's investment in a digital monitoring system in its operational areas, with software parameterisation and respective equipment along with adequate worker training for its use.

If a worker is immobilised for any reason, a wearable device contacts the security post and management, identifying the worker's exact location. In cases of threats of aggression or threats to integrity, animals and/or others, the worker may use the 'panic button' to make a distress call.

The system provides:

- protection in isolated work, providing a constant digital connection with the support team and 24-hour security post, a vital procedure in the event of an emergency response or accident;
- quick responses to dangerous situations (e.g. falls, sudden unusual movements, situations of danger to physical integrity, lack of movement due to loss of consciousness), enabling the worker to trigger a request for immediate assistance. As a result, the support team, management and security post receive the alert in real time and act quickly;
- remote activation of calls for help, enabling the emergency response team to precisely locate the worker at risk and direct help more quickly.

To ensure the safety of workers when working on conveyor belts, the company has installed a digital system for the automatic detection of operator falls and activation of emergency locking of the conveyor belt consisting of the following measures:

- redefinition of equipment consignment procedures;
- installation of a locking system on pre-pressing or crushing conveyor belts, in situations where a worker falls, with automatic detection and alert by specific sensors that communicate with a wearable device (present on bracelets worn by all workers), instantly blocking the conveyor belts, and reporting the incident to provide assistance;
- detection of a worker within the danger zone, in which case the system prevents the line equipment from starting again until the worker is removed from the zone and communicates with the command centre's digital system to identify the alert.

What was achieved?

Digitalising the security systems has resulted in:

- fewer false alarms;
- quicker response time to requests for assistance;
- better communication between teams and security elements;
- reduction in accident severity;
- efficiency in emergency response procedures regarding waste management activities;
- promotion of worker mental health and wellbeing owing to the constant connection with digital support for detecting risks and speeding up activation of the emergency structure.

Success factors

- Robust risk assessments recognised and identified the need to improve working procedures and conditions.
- Workers were consulted and actively participated in training and testing of the new technology.
- Surveillance teams were involved in reporting anomalies and false alarms.
- Records and analyses of near misses made it possible to identify dangerous scenarios.
- Operational area managers, supported by senior management, recognised the need for digital solutions to improve worker safety and were committed to the objectives proposed by the Amarsul Sustainability Team.

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Transferability

The entire approach could suitably be transferred to similar companies working in waste management. The use of wearable devices could also easily be adapted in any sector involving at-risk workers who work in isolation. In addition, the use of the digital monitoring system to detect and prevent accidents near conveyor belts is easily adaptable.

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Costs and benefits

€67,000–70,000

These digital monitoring devices have not only enabled a more timely and accurate response to incidents and accidents, but have reduced the number of sick leave days by 230. It further promotes accident prevention, meeting the needs of good practices in the sector.

Key features of good practice example

- The company is committed to investing in new technologies that ensure the safety and wellbeing of its workers.
- The continuous monitoring of workers in high-risk areas and those who operate in isolated situations has led to the reduction of occupational accidents.
- By providing automatic alerts that trigger quick responses to emergency situations, workers feel more confident about their safety.

Further information

Further information can be found at

https://amarsul.pt/

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