Safety is no accident
5 steps for a safer workplace

Safety First

In today's workplace, getting the most out of your producing assets at your plant or quarry is critical but safety aspects must always be considered. Proper maintenance plays an important role in safety and it is a legally required aspect of providing a safe workplace. This short eBook will introduce some key aspects of your liabilities and obligations as they apply to safety and maintenance.

THE COST OF WORK-RELATED INJURY AND ILLNESS PER YEAR

In the EU

- **€476 billion in the EU**
- **3.3% of EU GDP**
- **7.1 million DALY**
  (disability-adjusted life years) worldwide

Worldwide

- **€2 680 billion worldwide**
- **3.9 % of GDP worldwide**
- **123.3 million DALY**
  (disability-adjusted life years) worldwide

>200,000

people work in the aggregates industry in Europe.

"Studies estimate that for every euro invested in OSH, there is a return of 2.2 euros."

Your liability as a business owner / plant manager

EU directive 89/391/EEC covers the safe use of work equipment. It has been translated into EU law in all EU countries. **The EU summarises the directive's employer's obligation as:**

"The employer shall take every measure to ensure the safety of the work equipment made available to workers. During the selection of the work equipment the employer shall pay attention to the specific working conditions which exist at the workplace, especially in relation to safety and the health of the workers. If risks cannot be fully eliminated during the operation of the work equipment, the employer shall take appropriate measures to minimize them."

It continues as follows "Throughout its working life, the employer shall keep the work equipment compliant by means of adequate maintenance. The employer shall ensure that the work equipment is installed correctly and is operating properly by inspection/testing of the work equipment (initial, after assembly, periodic and special) by competent persons. The results of inspections shall be recorded and kept.

If the use of work equipment is likely to involve a specific risk the employer shall ensure restricted access to its use and stipulate that any modification done shall be by expert personnel only. Ergonomics and occupational health aspects shall be taken fully into account by the employer."

Failure to follow the directive can lead to criminal offences and compensatory legal action by any party impacted by noncompliance.

As can be seen, the act of maintenance can directly and indirectly cause health and safety to be compromised. This e-book explores your specific responsibilities.

Definitions

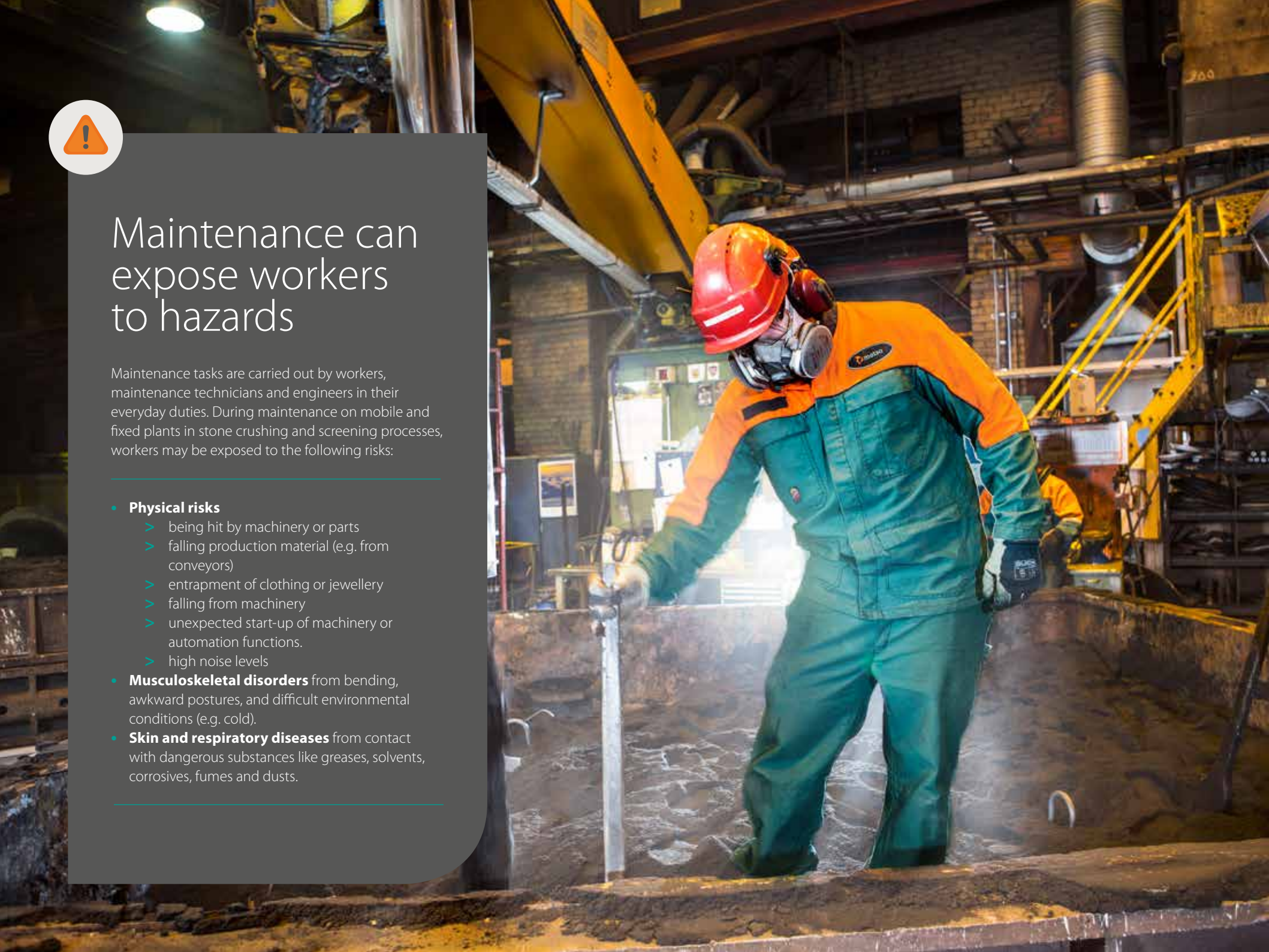
Maintenance of equipment and plant includes technical, administrative and managerial actions intended to keep it in, or restore it to, a state in which it can perform the required function, protecting it from failure or decline. Maintenance activities include

- Inspection
- Testing
- Measurement
- Replacement
- Adjustment
- Repair
- Fault detection
- Replacement of parts
- Servicing

Maintenance can expose workers to hazards

Maintenance tasks are carried out by workers, maintenance technicians and engineers in their everyday duties. During maintenance on mobile and fixed plants in stone crushing and screening processes, workers may be exposed to the following risks:

- **Physical risks**
  - being hit by machinery or parts
  - falling production material (e.g. from conveyors)
  - entrapment of clothing or jewellery
  - falling from machinery
  - unexpected start-up of machinery or automation functions.
  - high noise levels
- **Musculoskeletal disorders** from bending, awkward postures, and difficult environmental conditions (e.g. cold).
- **Skin and respiratory diseases** from contact with dangerous substances like greases, solvents, corrosives, fumes and dusts.



The impact of poor maintenance

Whether the maintenance being performed is small or larger in scope, it can have a serious impact on the health and safety of the workers performing it as well as on others. Here are a few examples:

- **An accident may occur** during the maintenance process. These can lead to serious injury and in the worst case death.
- **Poor quality maintenance** can cause serious accidents and injuries to workers as well as damage equipment and invalidate warranties. Examples of poor quality maintenance are:
  - **using the wrong parts for replacement or repair** – e.g. made of the wrong alloys, incorrect tolerances, missing features;
  - **following incorrect maintenance procedures** – e.g. under tightening or over tightening bolts, failing to lock out machines;
  - **failure to follow local safety guidelines** – e.g. correct marking of guards, missing markings;
  - **altering/not using dust containment systems** designed to protect workers from dust
- **Lack of maintenance** may not only shorten the lifespan of equipment or buildings, but also cause accidents — e.g. conveyors could fail causing material to be flung from the belt resulting in injury and lost production.

Five basic rules for safe maintenance

Planned work is safe work. The maintenance process starts before the task itself begins, and finishes when the work has been checked, signed off and the task documentation has been completed.

Participation of workers and/or their representatives in all stages and aspects of this process increases not only the safety of the process, but also the quality of work.

The five steps to safe maintenance are further explained hereunder.

1. Plan the maintenance
2. Work in a safe environment
3. Use the appropriate equipment
4. Follow safe working practices
5. Check the work

1. Plan the maintenance

The employer must conduct a risk assessment for the maintenance activity and should involve the workers in this process. The following points must be considered:

- **Define the scope of the task:** what needs to be done, how much time is needed for maintenance tasks, how other workers and activities will be impacted at the workplace.
- **Identify hazards:** for example electricity, exposure to dangerous substances, presence of dust in the air, confined space, moving parts of machinery, falling from or through something, heavy objects to be moved, parts difficult to reach or to access.
- **Follow the recommended maintenance procedures:** these are designed to ensure safe and successful maintenance. Incorrect procedures can result in equipment being unsafe and voiding warranties.
- **Identify needs:** skills and number of workers needed, who is involved, the roles of each individual person (responsible contacts for: contract workers and the host employer, task management, reporting possible problems), tools that must be used, personal protective equipment (PPE) and other measures to protect workers (e.g. scaffolding, special lifting tools) that may be needed.
- **Safe access:** to the work zone, and means of (quick) escape.
- **Provide training/information:** for the workers involved, as well as those working around them, about the task (to ensure competence of workers and their safety), the 'chain of command' and any procedures that will be used during the activity, including reporting problems. This is especially important if the maintenance is done by subcontractors.

Involve workers: they can identify hazards and the most efficient ways of dealing with them. The risk assessment findings and outcomes of the planning stage should be communicated to the workers participating in the maintenance task and also to others who may be affected. Involving the workers, including subcontractors, in the training and familiarizing them with the established procedures are very important elements in ensuring their safety.

2. Work in a safe environment

The procedures developed at the planning stage in risk assessment have to be put into action. For example, the power supply to the equipment worked on should be switched off and the agreed lock-out system used. The warning card — with the date and time of lock-off as well as the name of the person authorized to remove the lock — should be attached. This way, the safety of the worker performing maintenance on the machine will not be jeopardized by anyone inadvertently starting up the machine. Workers should also check that there is a safe way to enter and leave the work zone, in accordance with the work plan, and that appropriate safety guards are in place.

3. Use the appropriate equipment

Workers performing maintenance tasks should have the appropriate tools and equipment, which may be different from those normally used. They may be working in areas that are not normal workstations and be exposed to many hazards. Therefore, they must also have appropriate PPE. For example, workers replacing crusher liners may be exposed to lifting risks and falling liners if the correct tools are not used to store and handle liners. The tools needed for the job and PPE identified in the planning and in risk assessment have to be available (together with instructions on how to use them, if required) and used.

4. Follow safe working practices

The work plan should be followed even when there is time pressure: shortcuts can be very costly and may lead to accidents, injuries, or damage to property. It may be necessary to notify supervisors and/or consult with other specialists should anything unexpected happen. It is very important to remember that exceeding the scope of one's own skills and competence may result in a very serious accident.

5. Check the work

A final inspection and test run should be performed to ensure that the task has been completed, the item maintained is in a safe condition, and all waste material generated has been cleaned away. When all is checked and declared safe, then the task can be signed off, the locks can be removed, supervisors and other workers notified.

The final step is to complete a report for the management, describing the work done, including comments on difficulties encountered and recommendations for improvement. Ideally, this should also be discussed at a staff meeting where the workers involved in the process, as well as those working around them, can comment on the activity and come up with suitable suggestions to improve the process.

Summary

- **Plan the maintenance** – identify risks and how to mitigate all those involved.
- **Work in a safe environment** – always follow the recommended maintenance processes.
- **Use the appropriate equipment** – make sure parts meet specifications and all recommended tools are used.
- **Follow safe working practices** – ensure all staff use a common lock out procedure.
- **Check the work**– before returning it to operation, ensure equipment is checked again

Metso can provide maintenance services, "made to specification" parts and specialized tools to increase the safety of maintenance activities.

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