

Major inspection of cranes, hoists and winches

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Background

Major inspections of your cranes, hoists and winches are an essential component of a well-structured preventative maintenance program, and will help prevent any failure or malfunction.

This guidance note provides information for employers about how to conduct major inspections of cranes, hoists and winches and assess their suitability for ongoing safe use.

Cranes, hoists and winches can include the following:

- all types of cranes (mobile, tower, vehicle loading, bridge, gantry etc)
- telescopic handlers
- mobile elevating work platforms
- concrete placing units (truck mounted with boom)
- materials hoists
- personnel and materials hoists
- vehicle hoists.

Your duties

As an employer, you have obligations under the Occupational Health and Safety Regulations 2007 (Vic) (**OHS Regulations**) to protect the safety of employees using cranes, hoists and winches. You must, so far as is reasonably practicable, identify all hazards to health and safety associated with the installation, commissioning, decommissioning, dismantling, erection and use of cranes, hoists and winches at your workplace.

Once you have identified the hazards, you must control any associated risks. This means first taking steps to eliminate risks where practicable. Where this is not practicable, you must reduce the risk as far as is reasonably practicable, by, for example, substituting with other plant/equipment that has less risk.

As an employer, you must also ensure that cranes, winches and hoists at your workplace are inspected to the extent necessary to ensure that the risk associated with their use is monitored.

You must ensure that:

- cranes, hoists and winches under your management or control are inspected to the extent necessary to ensure their ongoing safe use
- cranes, hoists and winches under your management or control are repaired and replaced where necessary to ensure that risk associated with their use is minimised.

Australian Standards

Use *AS 2550 Cranes, hoists and winches — Safe use* (**AS 2550**) as a starting point to help control risks and comply with your legal duties. It has information about maintaining, inspecting and repairing cranes, hoists and winches.

General maintenance factors

The type, extent and frequency of maintenance to be carried out on cranes, hoists and winches should be determined after considering the following factors:

- manufacturer recommendations or in their absence, the recommendations of a competent person

Note: a 'competent person' is a person who by their training and experience has the skills and knowledge to carry out the task.

- recommendations from published technical standards
- the age and history of the plant including the number of hours of operation and the type of loading the plant has undergone
- any time spent in transit - vibrational loads applied during transit can increase the fatigue of a crane, hoist or winch
- the conditions in which the item of plant operates – for example, in a corrosive or wet environment, or in abrasive conditions
- whether parts of the item of plant may be prone to failure or high wear - the manufacturer, supplier, authorised repairer, or a competent person may provide information on parts which need to be more frequently replaced.

Note: The external visual appearance and the hours of operation of a crane, hoist or winch are not always reliable indicators of wear and fatigue.

Frequency of major inspections

Major inspections are part of the preventative maintenance program outlined in AS 2550 and should be conducted in addition to other inspections including pre-operational, routine periodic and third party periodic inspections.

Major inspections should generally be undertaken when the crane, hoist or winch has reached the end of its design life. If the design life is unknown, in most cases, the major inspection of mechanical components should be undertaken after a maximum of 10 years of service, and the major inspection of the structure after no more than 25 years. This is because design life is generally 25 years for the structure and 10 years for mechanical components unless otherwise specified by the manufacturer.

A major inspection interval of six years should be applied to concrete placing equipment due to it generally being subjected to higher stresses during its operational life compared to other cranes, hoists and winches.

Note: Years of service is calculated from the commission date. Where this information is not available the date of manufacture is used to determine the years of service.

These timeframes for the scheduling of major inspections should be used as a maximum default where no other evidence of history of the crane, hoist or winch is available and the hazard identification and risk control process does not require a shorter time interval.

Early major inspection

Circumstances that may necessitate a major inspection being undertaken at an earlier interval include:

- when a crane, hoist or winch is modified or recommissioned
- when a crane, hoist or winch is being imported or where there are no verifiable maintenance records
- when concerns are identified during a periodic inspection, assessment, or other maintenance activities
- when a crane, hoist or winch is subjected to an overload
- where there have been repeated failures of a critical component
- after major structural damage is sustained
- when the crane, hoist or winch has been designed to an unknown standard.

What should be inspected

The major inspection should be comprehensive and include inspecting for wear, fatigue and cracking of all of the components of the crane, hoist or winch critical to its safe operation and use. The inspection should include attention to both structural and mechanical elements.

Under the OHS Regulations, any records of inspection and maintenance (including repairs) carried out on the following plant **must** be retained by you as an employer, for the period that you have management or control of the plant:

- tower cranes

- self-erecting tower cranes
- concrete placing units (truck mounted with boom)
- mobile cranes with a safe working load greater than 10 tonnes

Maintenance records **should** be kept for all cranes, hoists and winches to assist in determining what components have reached the end of their intended design life at the time of a major inspection.

Major inspections should be scheduled well in advance to avoid disruptions to production. The planning process should allow for consequential repairs of the particular item of plant and should also consider alternative interim measures, such as the hire of stand-by plant.

Where unforeseen circumstances inhibit taking a crane, hoist or winch out of service for a period of major inspection, a competent person should determine if it is safe to operate the crane, hoist or winch until the major inspection and any subsequent necessary maintenance can be carried out.

Extending the interval of the major inspection

Any decision to extend the major inspection past the recommended period should be verified by the manufacturer or a competent person. A guide to undertaking such a decision can be found within AS2550.1 and is referred to as a major assessment.

Records of previous maintenance must be able to establish that all safety critical components that would normally remain in service for the design life of the crane have not been subject to excessive wear or failure requiring their replacement.

Any decision to delay the major inspection should specify the proposed date for the major inspection and further extensions should not be considered.

Assessment for continued safe use

Following a major inspection of a crane, hoist or winch, an assessment for continued safe use should be undertaken. The assessment should:

- i). Be undertaken by a competent person and, in the case of cranes, be supervised by a professional engineer experienced in the inspection, testing and assessment of the particular type of crane.
- ii). Ensure that any manufacturers field service bulletins, safety upgrade notices and / or product notifications have been completed. If none exist this should be noted in the documentation of the major inspection.
- iii). Outline the rationale behind the extent (or limitations) of the major inspection and subsequent assessment for continued safe use.

Note: the rationale should not be based only on the hour meter, as this is not a reliable record of use. The number of operating hours should be assessed along with the maintenance or utilisation records.

- iv). Identify critical components (refer to manufacturer's recommendations) and provide a summary of what components have been assessed, how the assessment was undertaken, and the results of the assessment.

Note: If necessary, machinery should be stripped down so critical components can be accessed and properly inspected. Reliance should not be placed on electromagnetic non-destructive testing of critical components (eg pins and bushes) while in their assembled state as this may not identify whether the levels of wear remain within tolerance.

- v). Provide recommendations regarding what works need to be done to the crane, hoist or winch to provide for ongoing safe use. These recommendations should consider the likely operational and environmental parameters under which the crane, hoist or winch is intended to operate. The supervising engineer or competent person should record the rationale for the recommendations made.

- vi). Document a maintenance program for the repair or replacement of components necessary to prepare the crane, hoist or winch for safe use. The program should include a list of items that should be repaired or replaced prior to the crane, hoist or winch returning to service in order to ensure the immediate safe use of the item of plant.

- vii). Include a program for the ongoing maintenance and inspection of the crane, hoist or winch. This program should include specific recommendation on the scheduling of further assessments for continued safe use and detail components that require attention in further periodic inspections.

- viii) Document how the crane, hoist or winch was tested to ensure full functionality before it was recommissioned.

WorkSafe's expectation

WorkSafe expects records of all major inspections of crane, hoists and winches, including documentation of the 'Assessment for continued safe use' to be available for inspection. Records should be readily accessible at the employer's Victorian business office.

Further Information

Australian Standards

- AS 2550: *Cranes, hoists and winches – Safe use series*
- AS 1418: *Cranes, hoists and winches – Design series*

Other

- Crane Industry Council of Australia: Guide to major inspections

Contact Details

Call us on: **1800 136 089**

Email us at: info@worksafe.vic.gov.au

For more information on occupational health and safety,
go to WorkSafe's website: **worksafe.vic.gov.au**

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