

G14.71 Inspection and certification of a mobile crane or boom truck

Proposed revision March 2007

Regulatory excerpt

The proposed revision to section 14.71 of the *OHS Regulation* ("Regulation") states:

- Annual inspection** **14.71** (1) A mobile crane or boom truck must be inspected **at least once every 12 months** in accordance with good engineering practice ~~at intervals not exceeding 12 months~~; **to ensure it meets**
- (a) the crane or boom truck manufacturer's specifications,**
 - (b) the requirements of the applicable design or safety standard specified in section 14.2, and**
 - (c) the requirements of this Regulation** ~~and certified as safe for use by a professional engineer, the crane manufacturer or the crane manufacturer's authorized representative.~~
- (2) **A mobile crane or boom truck must not be used after an inspection under subsection (1) unless a professional engineer certifies it is safe for use on the basis of that inspection.** ~~A mobile crane or boom truck temporarily located at a remote workplace may have the annual inspection and certification required by subsection (1) delayed up to 3 months after its due date, but the next annual inspection and certification must be done within 12 months of the due date.~~

Purpose of guideline

This guideline outlines some of the factors that should be considered when determining if an inspection has been conducted in accordance with "good engineering practice" under section 14.71. It also provides information on who is authorized to certify that the inspection has been done and that the crane or boom truck is safe for use.

The concept of good engineering practice

An annual inspection and certification of a mobile crane or boom truck is required by the *Regulation*. This inspection and certification is to be done in accordance with good engineering practice. The concept of good engineering practice as it applies to section 14.71 means inspection, assessment, repair (if necessary) and certification of the equipment, is to be done in consideration of

- Applicable regulations, safety codes and standards
- Manufacturer's instructions for operation, inspection, maintenance, servicing, and repair
- Operating, maintenance and service records

Who may do the certification

Certification will be done by a professional engineer. If the inspection, assessment and any necessary repair work is done in BC, the engineer, as required by the *Engineers and Geoscientists Act*, must be licensed to practice in BC. If this work is being done outside BC, for example in Alberta, the engineer must be licensed to practice in that jurisdiction.

The inspection and certification process

The employer or owner of the equipment should consult the certifying engineer in advance to arrange the location of the inspection, testing and necessary repair work,

and to ensure qualified people and adequate facilities are used. Generally the "hands on" part of inspection, testing and repair will be done by mechanics, service technicians, non-destructive testing (NDT) technicians and other qualified workers as necessary (for example, welders), working under the direction of the certifying engineer.

Inspection and certification requires assessment of the "critical components", meaning the structural, mechanical and control system components that affect the safe operation of the equipment. The specific identity of these components will vary from one type of equipment to another, depending on the design and configuration of the equipment.

The frequency of inspections of individual components and the extent of inspections, including dismantling, assessment and NDT or other testing, will be determined by the certifying engineer. The factors relevant in making these determinations include:

1. Requirements of the applicable regulations, safety codes and standards
2. The equipment manufacturer's specifications and instructions
3. The certifying engineer's familiarity with the particular design and model of equipment, including known reliability problems or component problems
4. Previous inspection history and results
5. Age of the equipment and number of hours of use
6. Circumstances of use of the equipment (for example, heavy duty vs. light use) and any known incidents since the last certification
7. The general condition of the equipment
8. The environment in which the equipment has been used (for example, a corrosive environment vs. a clean, dry shop or yard area)
9. The available use, service, inspection and maintenance records
10. The certifying engineer's knowledge of the overall effectiveness of the service and maintenance program

Based on the outcomes of the inspection, the certifying engineer will determine any necessary repair work.

The certification document will include a statement that the equipment is "safe for use" at the completion of the inspection and any necessary repair. This means that the equipment should then reasonably be expected to perform safely until the next inspection and certification is required if operated according to the manufacturer's instructions.

If the certifying engineer deems it necessary to provide a restricted certification statement (for example, that some components are currently acceptable for safe use but will likely require replacement or renewal before the next annual inspection), the engineer will ensure the owner or employer is made aware of these concerns. He or she will also note the concerns on the equipment inspection and maintenance records. It is not acceptable for the certifying engineer to provide a certification when there are outstanding deficiencies affecting the safe performance or compliance of the equipment with the *Regulation*.

G14.88(5) Alternative means of jib access

Proposed March 2007

Regulatory excerpt

The proposed amendments to section 14.88 of the *OHS Regulation* (“*Regulation*”) state:

Access ladders 14.88
Access

- (1) ~~An access ladder must be provided and fixed in position on the mast and crown of a tower crane.~~

A tower crane must have a fixed ladder installed in or on the mast to provide access to the jib and crown of the crane.

- (2) ~~An access ladder on a tower crane must be able to support two 1.1 kN (250 lbs) point loads between any two consecutive attachment points, and there must be a minimum horizontal distance of 15 cm (6 in) between the rungs and the object to which the ladder is attached.~~

The ladder under subsection (1) must meet the following requirements:

- (a) **the ladder must be able to support two 1.1 kN (250 lbs.) point loads between any two consecutive points where the ladder is attached to the crane;**
 - (b) **there must be a minimum horizontal distance of 15 cm (6 in.) between the rungs and the object to which the ladder is attached;**
 - (c) **landing platforms must be provided at least every 9 m (30 ft.) on the ladder;**
 - (d) **each section of the ladder must be offset horizontally from adjacent sections or the landing platforms must have trap doors;**
 - (e) **if a section of the ladder has a climb exceeding 6 m (20 ft.) in length, that section of ladder must have a ladder safety cage 68 cm to 76 cm (27 in. to 30 in.) in diameter or a ladder safety device must be used.**
- (3) ~~Landing platforms must be provided at least every 9 m (30 ft) on the access ladder of a tower crane.~~

Each tower crane jib must have a continuous walkway from the mast to the tip.

- (4) ~~Each section of access ladder on a tower crane must be offset horizontally from adjacent sections or the landing platforms must have trap doors.~~

The walkway referred to in subsection (3) must meet the following requirements:

- (a) **the walkway must be at least 30 cm (12 in.) wide and constructed with a non-skid surface;**
- (b) **a handline, which is approximately 1 m (39 in.) above the level of the walkway, and a midline must be provided on both sides of the walkway not more than 30 cm (12 in.) out from the edge of the walkway and supported at intervals not exceeding 3 m (10 ft.);**
- (c) **the handline and midline referred to in paragraph (b) must be wire rope of at least 1 cm (3/8 in.) diameter;**

- (d) if it is not practicable to provide handlines in accordance with paragraph (b), alternative means of fall protection, such as a horizontal lifeline system, must be provided in accordance with the requirements of Part 11 (Fall Protection) and must be set out in the fall protection plan.
- (5) If a section of ladder on a tower crane has a climb exceeding 6 m (20 ft) in length, that section of ladder must have a ladder safety cage 68 cm to 76 cm (27 in to 30 in) in diameter or a ladder safety device must be used.
- If, due to the design or size of the tower crane, it is not practicable to meet the requirements set out in subsections (1) to (4), alternative safe means of access acceptable to the Board must be provided.
- (6) The climbing space of a tower crane mast must be clear of protruding objects and must provide a safe and unobstructed passage.
- (7) A written fall protection plan, which addresses the requirements of fall protection when a person is operating, inspecting, servicing and maintaining the tower crane, must be developed and implemented.

Purpose of guideline

For some tower cranes it may not be practicable to attach a walkway to the jib in a manner that would meet the requirements of section 14.88(3) & (4). For example, in some cases, there may be a walkway that can extend only as far as the trolley drive assembly, and on others it may not be feasible to fit a walkway at all.

Under the terms of proposed section 14.88(5), other options for access can be considered. One option that has been developed is the use of a work platform (basket) mounted on the tower crane trolley. Other options may also be possible, for example the use of an elevating work platform to access the jib area.

If an employer or other party wishes to use an alternative means of access they need to make a submission to WorkSafeBC to determine acceptability. This guideline provides information on

- The functions of the walkway as required by section 14.88(3) & (4)
- What to include in a submission under section 14.88(5)
- Where to send the submission

The functions of the walkway

The walkway required by section 14.88(3) & (4) is intended to provide a means of safe access by a worker to all points along the jib. Access along the full length is needed for the purposes of inspections, maintenance, and any repairs on the jib or its support system. The walkway also provides access to the cab, if mounted on the jib. In addition, it may provide an emergency access route should it be necessary to rescue a worker from the jib.

The *CSA Standard Z248-2004 Code for Tower Cranes* lists the types of inspections that must be done on the components of the crane, and their frequency. Inspections that would typically be done from the walkway include

- Daily inspections of guy lines and guy line connections, and load hoist ropes
- Weekly inspections of structural pins and keepers, trolley rollers and tracks, gear shaft and belt drives, sheaves, bushings, pins, rope attachments, pendant lines, cable clips, thimbles, and ferrules
- Monthly inspections of all running ropes, the jib structure, sheaves, bearings and mounts

If the crane will be in place for extended periods of time, annual inspections are needed of the jib structure using nondestructive testing methods, all load carrying equipment, including sheaves, blocks, rings, shackles and hooks, and all fixed and running wire ropes.

When reviewing a submission, WorkSafeBC will consider the capability of the alternative proposed by the applicant to provide protection for workers to carry out activities that would otherwise need to be done from the walkway.

What to include in a submission

At minimum, a submission should cover the items listed below. The items are provided in two groups: Those of general application, and the additional items that are specific to trolley-mounted work platforms. The lists are not intended to be comprehensive. It is up to the applicant to ensure that the submission covers all relevant points. When reviewing a submission, WorkSafeBC will contact the applicant if it determines additional information is needed.

A. Items of general application

- Communication procedures and equipment that will allow safe use of the access system.
- Assurance that any work platform used provides firm, non-slip footing.
- The means of compliance with Part 11 (Fall Protection) of the *OHS Regulation*, as it applies to personal fall protection for a worker.
- The means of inspection and certification of the device, in compliance with section 14.77 (Structural inspection), if the device is part of the tower crane.
- An emergency procedure and means of rescuing a worker in the event that the access system fails, or the worker has become incapacitated.
- Instructions for use of the system.

B. Additional items specific to trolley-mounted work platforms

- The means of compliance with section 14.2(5) (Standards), which requires that tower cranes meet the requirements of *CSA Standard Z248 - 2004, Code for Tower Cranes*. (*Among other things, for trolley systems, the Standard sets out requirements for braking the trolley, the means to prevent the trolley from becoming detached in the event of trolley wheel or axle breakage, and the means of stopping the outward movement of the load trolley in the event of trolley drive rope breakage*).

- The design and fabrication of the trolley-mounted work platform (“platform”) and the means of attaching it to the crane. The platform should be designed and fabricated by the crane manufacturer specifically for the crane on which it is used, and be permanently marked with the manufacturer’s information, the rated capacity, a part number, and the number of occupants for which it is designed (at 250 lbs (114 kg)/occupant). The system for attaching the platform to the trolley will need to be of a design that ensures the platform remains level. If a platform system is built by another party, it will need to be accompanied by an engineering certificate and drawings that address the engineering issues previously noted.
- The means of compliance with section 14.21 (Fenders). *This provision requires that trolley wheels be fitted with fenders or guards if there is a possibility of injury to the worker from contact with trolley wheels moving along the rail.*
- The means of compliance with section 4.58 (Specifications for guards and guardrails), as it applies to the platform.
- The means of safe access to and egress from the platform.
- The installation, operation and inspection requirements for the trolley, including any additional requirements due to the attached platform, as provided by the tower crane manufacturer, or other equivalent source. *(Note: The instructions for use to include a stipulation that no loads are to be handled by the crane while the platform is occupied).*
- The means of protecting the worker from the hazards of moving or operating equipment during servicing and inspection of machine parts.

Where to send the submission

Submissions should be sent to the Regulatory Practices Department of WorkSafeBC at the following address:

Regulatory Practices Department
Worker and Employer Services Division
WorkSafeBC
PO Box 5350 Station Terminal
Vancouver BC, V6B 5L5