OHS Guidelines Part 14

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G14.1 Elevating Devices Safety Act repealed

Issued August 18, 2008; Retired consequential to February 1, 2012 Regulatory Amendment

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G14.2-1 Standard - Tower cranes

Issued September 1999; Editorial Revision February 1, 2008

Regulatory excerpt
Subsection 14.2 of the *OHS Regulation ("Regulation")* states:
(6) A tower, hammerhead crane or self erecting tower crane must meet the requirements of *CSA Standard Z248-2004, Code for Tower Cranes*.
(7) A portal, tower or pillar crane must meet the requirements of *ANSI Standard ASME B30.4-2003, Portal, Tower, and Pillar Cranes*.
Purpose of guideline
The purpose of this guideline is to clarify the scope and application of *CSA Standard Z248-2004, Code for Tower Cranes* and *ANSI Standard ASME B30.4-2003, Portal, Tower, and Pillar Cranes*.
Application of the *Regulation*
Both subsections 14.2(6) and 14.2(7) set out standards applicable to tower cranes. However, the application of each subsection is determined by the difference in the "Scope" description in each standard. The scope of the *CSA Standard Z248-2004*makes it applicable to all tower cranes, irrespective of use or industry service. The scope of the *ANSI Standard ASME B30.4-2003*, as it applies to tower cranes, is limited to a tower crane not used in construction.

G14.3 Identification

Issued September 1999; Editorial Revision February 1, 2008

Regulatory excerpt
Section 14.3(2) of the *OHS Regulation ("Regulation")* states:
Each major interchangeable structural component of a crane or hoist must be uniquely identified and must be legibly marked to enable confirmation that the component is compatible with the crane or hoist.

Purpose of this guideline
The purpose of this guideline is to provide information on identification of interchangeable structural components for cranes or hoists.
Identification
This requirement is applicable to, but not limited to, lattice boom mobile cranes and tower cranes. Generally the lattice boom on a mobile crane is made up of several boom sections connected together. The configuration of the boom can be varied to meet the needs of the particular lifting task. The crane manufacturer will specify what components must be used to make up the boom to achieve any particular allowable boom configuration. Some components will be interchangeable, and may be shared between similar equipment from the same manufacturer.
Similarly, a tower crane is made up using tower and jib sections. The configuration of the crane at each setup can be varied, within limits set by the manufacturer, to suit the needs of the location. As with the mobile crane boom, it is possible to interchange components from similar equipment. To ensure that only the components that the manufacturer approves for use with the configuration are used, it is necessary to identify the components.

A catalogue or part number is sufficient for the purpose of identifying compatibility, but there are also strict inspection and certification requirements for these components. Unique identification allows cross-referencing with the inspection or certification documents to ensure the component in use is the component inspected or certified. Ideally, the identifier on each component will be a serial number provided by the manufacturer. However, interchangeable components are usually only identified by the manufacturer with a part number. This satisfies one reason for the requirement (identifying interchangeable components) but not the need to correlate documents to specific components. An additional and unique identifier is required. The identifier must be legible and durable.

G14.5 Rated capacity indication

Issued September 1999; Editorial Revision February 1, 2008

Regulatory excerpt
Section 14.5(1) of the *OHS Regulation ("Regulation")* states:
Subject to subsection (3), the rated capacity of a crane or hoist system must be permanently indicated on the superstructure, hoist and load block of the equipment.

Purpose of guideline
The purpose of this guideline is to provide information on the term 'superstructure' and supporting structure.
Superstructure and supporting structure
With respect to a bridge crane, the "superstructure" refers to the bridge girders. It is not necessary to mark the safe working load on the crane runways or the supporting structure for the bridge crane runways.

G14.13 Inspection, maintenance, and repair

Issued September 1999; Editorial Revision February 1, 2008

Regulatory excerpt
Section 14.13(1) of the *OHS Regulation ("Regulation")* states:
Each crane and hoist must be inspected and maintained at a frequency and to the extent required to ensure that every component is capable of carrying out its original design function with an adequate margin of safety.
And section 14.13(3) of the *Regulation* states:
Any repair to load bearing components of a crane or hoist must be certified by a professional engineer or the original equipment manufacturer as having returned the component to a condition capable of carrying out its original design function with an adequate margin of safety.
Purpose of guideline
The purpose of this guideline is to provide information about the frequency of inspections and load bearing components.
Frequency of inspections
Inspection and maintenance must be done to the extent and frequency recommended by the original equipment manufacturer or the applicable standard referenced in Part 14 of the *Regulation*, whichever is more stringent, and as required based on the frequency and nature of use. (See section 14.2(1) of the *Regulation* for a list of the relevant standards.)
Load bearing components
"Load bearing components" include any component that transfers load through the crane or hoist to the surface supporting the crane or hoist.

G14.29 Operator protection

Issued September 1999; Editorial Revision February 1, 2008; Editorial Revision May 1, 2008

Regulatory excerpt
Section 14.29 of the *OHS Regulation ("Regulation")* states:
The operator of a crane or hoist must be protected against hazardous conditions such as falling or flying objects and excessive heat or cold that could adversely affect the health or safety of the operator.

And section 26.13.1(1) of the *Regulation* states:
(1) Protective guards must be provided and used on a self-loading log transporter or similar equipment unless

a) it is not practicable to do so, and

b) the absence of guards does not pose a hazard to the equipment operator.

Purpose of guideline

The purpose of this guideline is to discuss the application of section 14.29 to self-loading log trucks under section 26.13.1(1).

Self-loading log trucks

Section 26.13.1(1) of the *Regulation* provides an exception to the requirements of section 14.29 that is applicable to self-loading log trucks and similar equipment. Under section 26.13.1(1) the equipment may only be used without overhead protective guards if the absence of such guards does not present a risk of injury to the operator.

Guidelines Part 14 - Equipment operation

G14.34.1 Operator certification

Issued January 1, 2007; Editorial Revision May 3, 2007; Revised December 1, 2008; Revised July 9, 2009; Preliminary Revision March 7, 2011

Regulatory excerpt

Section 14.34.1 of the *OHS Regulation ("Regulation")* states:

On and after July 1, 2007, a mobile crane, tower crane or boom truck must be operated only

(a) by a person with a valid operator's certificate issued by a person acceptable to the Board, and

(b) in accordance with any conditions stipulated on the certificate.

Purpose of guideline

This guideline outlines the crane certification program for operators to obtain valid certification to operate the various types of cranes covered by the requirement.

Background

Operators of mobile cranes, tower cranes, and boom trucks must possess a valid operator's certificate. Crane operator certification is administered through the British Columbia Association for Crane Safety ("BCACS"), in conjunction with the Fulford Harbour Group Ltd. ("FHG"), and the Industry Training Association ("ITA").

Until February 28, 2011 the certification program was subject to a phased implementation period that permitted crane operators to continue to work while testing and certification took place. That implementation period has ended. From March 1, 2011, any operator without a valid certificate will be subject to orders and may be removed from operation until a valid certificate is obtained.

Types of equipment operators covered

Section 14.34.1 applies to operators of all mobile cranes, boom trucks, and tower cranes with a rated capacity equal to or greater than five tons or with a boom length of 25 feet or greater based on manufacturer's specifications. WorkSafeBC considers this equipment to include the following:

Mobile Cranes and Boom Trucks:

As described in

- CSA Standard Z150-1998, Safety Code for Mobile Cranes
- ANSI Standard ANSI/ASME B30.5-2004, Mobile and Locomotive Cranes
- ANSI Standard ANSI/ASME B30.22-2005, Articulating Boom Cranes

Tower Cranes

As described in

- CSA Standard Z248-2004, Code for Tower Cranes
- ANSI Standard ASME B30.4-2003, Portal, Tower, and Pillar Cranes

Recognized certificates

Crane operators who possess a crane trade qualification previously issued in B.C. which may include a 'Red Seal' crane operator certificate, are validly certified to operate in B.C. and do not need to undergo further testing or assessment.

Out of province operators

Operators who possess a crane trade qualification or other valid crane operator certificate as required by a regulatory authority in another province or territory in Canada do not need to undergo further testing or assessment. However, in order to receive a B.C. crane operator certificate, out of province operators are required to register with the BCACS and complete a review of a jurisprudence package which outlines regulatory requirements and safe work practices applicable in B.C. The operator will then be issued a B.C. certificate with an out-of-jurisdiction notation thereon for the applicable crane type.

Crane operator certification

Operators of mobile cranes, tower cranes, or boom trucks are required to pass an assessment on the theory component of operating a crane. The theory assessment is based on the operating principles,

and regulatory requirements relating to the type of equipment they intend to operate. This is in addition to the practical assessment required for all operators.
New operators may qualify for an interim certificate by passing a basic theory test. This certificate will be temporary and will restrict the types of situations under which the candidate may operate a crane, and require the candidate to operate under direct or indirect supervision of a qualified supervisor, depending on the type of certificate and/or lifts being performed.

Enforcement
Crane operators must possess one of the following documents in order to operate in B.C:

- Crane operator certificate issued by FHG
- Valid crane trade certificate issued by ITA, which may include a Red Seal crane operator certificate

On inspections at workplaces, WorkSafeBC prevention officers will inquire with crane operators to determine if they possess any of the above documents. An employer that permits an uncertified crane operator to operate a crane will be subject to orders from a prevention officer, and may in some situations be subject to administrative penalties. The uncertified operator is also subject to orders prohibiting the operator from continuing to operate a crane.

Accrediting bodies acceptable to WorkSafeBC
FHG and ITA are currently the only agencies recognized by WorkSafeBC to issue operators' certificates under the *Regulation*. WorkSafeBC will also consider other applicants who wish to become valid issuers of operators' certificates in B.C. Certain criteria for acceptance have been established by WorkSafeBC, principally on the topics of the assessment of candidates and the qualifications of assessors.
Further information
Further details about the crane operator certification program are available through the BC Association for Crane Safety: www.bcacs.ca

G14.48(2) Acceptable standard for audio and video communication

Issued February 11, 2009

Regulatory excerpt
Section 14.48(2) of the *OHS Regulation* ("*Regulation*") states:
Audio and video communication systems used in a hoisting operation must be designed, installed, operated and maintained according to a standard acceptable to the Board.

Purpose of guideline
The purpose of this guideline is to specify an acceptable standard for audio and video communication systems used in a hoisting operation.
Wireless systems
Section 14.48(2) of the *Regulation* requires that audio communication systems used in a hoisting operation be designed, installed, operated, and maintained in accordance with a standard acceptable to WorkSafeBC. Generally, audio communication in hoisting operations will be conducted using two-way radios. These radio communication systems are to be

- Certified for use in Canada by Industry Canada
- Operated in conformance with all applicable licensing requirements of Industry Canada
- Designed, installed, operated, and maintained by qualified persons
- Single channel radios (as required by section 14.49(2) of the *Regulation*)
- Designed so that they do not have controls that allow the operator to vary the power output

In addition, operators of such radio communication systems are to check for interference before use, and to cease use if interference is experienced. Radio communication systems designed, installed, operated, and maintained in accordance with these criteria are considered to meet a standard acceptable to WorkSafeBC.

Hardwired systems
In some cases, it may be necessary to use video or audio communication systems that do not use radio frequencies. For example, a tunneling operation where a hoist is used to lower or raise materials through a shaft may find radio communication systems unreliable. In these scenarios, audio or video communication systems can be hardwired. Such hardwired systems are to be

- Designed, installed, operated, and maintained by qualified persons
- Able to immediately indicate any communication failure
- Compliant with applicable codes, bylaws, or legislation governing their design, installation, operation, or maintenance. For example, such systems are compliant with section 60 of the *Canadian Electrical Code* dealing with electrical communication systems

  Hardwired audio or video communication systems meeting these criteria are considered to meet a standard acceptable to WorkSafeBC.

Guidelines Part 14 - Mobile cranes, boom trucks and sign trucks

G14.64(3) Definition of "duty cycle work"

Issued August 16, 2000; Editorial Revision February 1, 2008

Regulatory excerpt

Section 14.64(3) of the *OHS Regulation ("Regulation")* states:

A crane being used for duty cycle work is exempt from the requirements of subsection (1) if the load applied to the crane is safely below the rated capacity of the crane and if the possibility of an unexpected overload does not exist.

Purpose of guideline

The purpose of this guideline is to provide information on the concepts of 'duty cycle work,' and 'safely below the rated capacity of the crane.' The guideline also discusses pulling and repositioning a pile, and support activities.

Duty cycle work

"Duty cycle work" means the use of a crane to do dragline, clamshell, dynamic compaction, or pile driving work, or with an electromagnet such as for handling scrap metal. Pile extraction using a vibrating pile extraction device is also considered duty cycle work. In duty cycle operations the loads are generally known and/or can be maintained "safely below the rated capacity" for the crane. Pile extraction without a vibrating extraction device is not to be considered within the scope of the exemption of section 14.64(3), as the load applied to the crane cannot be assured of being safely below the rated capacity of the crane.

Safely below the rated capacity of the crane

The phrase "safely below the rated capacity of the crane" means the total load being handled should not exceed 75% of the rated capacity of the crane. The rated capacity of a mobile crane varies with the configuration of the crane, such as the length of boom installed, and the boom angle/load radius. Good craning practice requires the operator to accurately know the weight of the total load to be lifted, and the rated capacity of the crane for the full range of movement of the lifted load. Typically the lifting tasks needed to support duty cycle work should involve loads of less than 50% of the rated capacity of the crane.

Pulling and repositioning a pile

When starting to drive a pile, occasionally the lower end of the pile will drift or move off of its intended position to the extent the crew will need to stop driving that pile, pull the pile back out, and reposition it before resuming driving that pile. Typically the need to do this will arise once or twice a shift, and the decision to pull and reposition the pile will be made before about 10% of the intended pile depth in the ground has been achieved. Pulling a pile in these circumstances is not typically considered a "pile extraction" operation. Generally the friction load from the soil acting on such a short length of a pile which has just been driven should be low relative to the weight of the pile. Provided the total lift needed in these circumstances can be reasonably determined to be safely below the rated capacity of the crane, it may be done by the crane being used for driving the pile without installing a load weight indicating device on that crane.

Support activities

During operations such as clam shell dredging and pile driving there are generally other lifting tasks to be performed to support the pile driving or dredging function. For example, piling material may need to be off-loaded from a truck or repositioned on the worksite or a welder or air compressor may need to be repositioned. Provided such support activities involve lifts of known weight that are safely below the rated capacity of the crane, they may be done by the crane being used for the duty cycle work without installing a load weight indicating device on that crane.

A crane on site not being directly used in the duty cycle application must conform to the requirements of sections 14.64(1) and (2) of the *Regulation*.

G14.71 Mobile crane and boom truck annual inspections

Issued February 1, 2008; Revised June 10, 2010; Editorial Revision February 6, 2012

Regulatory excerpt

Section 14.71 of the *OHS Regulation ("Regulation")* states:

(1) A mobile crane or boom truck must be inspected at least once every 12 months in accordance with good engineering practice 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*

(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.

Section 14.2(5) of the *Regulation* states:

A mobile crane, telescoping or articulating boom truck or sign truck must meet the requirements of

(a) CSA Standard Z150-1998, Safety Code for Mobile Cranes,

(b) ANSI Standard ANSI/ASME B30.5-2004, Mobile and Locomotive Cranes, or

(c) ANSI Standard ANSI/ASME B30.22-2005, Articulating Boom Cranes.

Purpose of guideline

The purpose of this guideline is to outline 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.

Good engineering practice

An annual inspection and certification of a mobile crane or boom truck is required by the *Regulation*. This inspection and certification are 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 and includes consideration of

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

Certification

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

The certification documents must include a statement that the equipment is safe for use. This means that the equipment should reasonably be expected to perform safely until the next inspection/certification is required if operated according to the manufacturer's instructions.

The certification also needs to include a statement that the structural, mechanical, and control elements of the equipment have been inspected in accordance with the manufacturer's specifications and the requirements of the applicable design and safety standards, along with the names of the qualified person(s) who carried out the inspection work, with their qualifications. The supporting documentation to the inspection needs to be readily available for an officer's review when requested.

Any necessary repairs that have been completed and re-inspected in accordance with manufacturer's instructions, the applicable standards, and the engineer's repair procedure should also be noted. If the certifying engineer deems it necessary to provide a restricted certification statement (for example, if 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 of the equipment or compliance with the *Regulation*.

The inspection 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 following the instructions 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. Appropriate qualifications for performing the inspections include a person qualified to CSA W178.2 (for visual weld inspection), CAN/CGSB 48.9712 (for non-destructive testing), and a licensed heavy duty mechanic (for mechanical/hydraulic and electrical inspection). Other qualifications based on training, education, and experience may also be appropriate.

The frequency of inspections of individual components and the extent of inspections, including dismantling, assessment, and non-destructive testing (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

The repair process

Based on the outcomes of the inspection, the certifying engineer will determine any necessary repair work. If repair work is necessary, areas affected by the repairs need to be re-inspected. Any repair to load bearing components of a crane or hoist must be certified by a professional engineer or the original equipment manufacturer as having returned the component to a condition capable of carrying out its original design function with an adequate margin of safety. As per *Regulation* 14.71(2), before use of the repaired equipment a professional engineer must certify that it is safe for use.

Records of all inspections and repairs are to be recorded in the inspection and maintenance recording system in accordance with the *Regulation* sections 14.14 and4.9.

G14.72(4) Crane certification during pile driving and dynamic compaction operations versus lifting service

Issued March 7, 2011

Regulatory excerpt

Section 14.72(4) of the *OHS Regulation* ("*Regulation*") states:

A crane used in any operation described in subsection (1) or (2) must not be returned to lifting service unless a professional engineer inspects the crane and certifies that it is safe for such use.

Purpose of guideline

This guideline explains the circumstances where engineering inspection and certification is and is not required under *Regulation* section 14.72(4).

Background

Regulation section 14.72(4) requires that a crane used for pile driving, pile extraction, or dynamic compaction (foundation-duty cycle work) be inspected by a professional engineer and certified as safe to use, prior to the crane being returned to lifting service. The intention of this requirement is to ensure that the crane is safe for lifting service after the crane has been used in foundation-duty cycle work. This requirement is in addition to the boom inspection and engineering certification required under sections 14.72(1), (2), and (3) of the *Regulation*. Certification must be performed at least quarterly for crane booms used with a vibratory hammer for driving piles or monthly for crane booms used with a vibratory pile extractor or drop hammer, or used for dynamic compaction.

Activities in support of and ancillary to the foundation-duty cycle work

The following work activities are considered to be in support of and ancillary to the foundation-duty cycle work and do not constitute a return to lifting service. Therefore, these activities may be performed by the crane being used for the foundation-duty cycle work without the engineering inspection and certification required under section 14.72(4).

In each of the following activities, the load may not weigh more than 75% of the rated capacity of the crane

- Lifting and loading a pile into the vertical leads
- Lifting and vertically stacking (positioning) a length of piling onto a previously driven pile
- Material handling, including moving piling, driving frames, equipment, or materials at the worksite, that supports the foundation-duty cycle operation
- Girder launching that is required to advance the crane onto the next bridge span or dock structure (marine or land based). This excludes the sequential placement of multiple spans

Lifting a worker(s) on a work platform suspended from a crane to support the foundation-duty cycle work is also an activity that can be conducted without the crane being "returned to lifting service." With respect to the work platform, *Regulation* section 13.27 specifies that the weight of the work platform and its rigging, plus the rated capacity, must not exceed 50% of the rated capacity of the crane. Note that other regulatory requirements apply, for example the following:

- Part 13 specifies requirements for the crane, fall protection, trial lifts, and the design and installation of the work platform (*WCB Standard WPL 2-2004 Design, Construction and Use of Crane Supported Work Platforms*)
- *Regulation* section 20.102 regulates the use of multiple load lines
- Part 14 specifies requirements for critical lifts

When the lifting is no longer in support of and ancillary to the foundation-duty cycle work being done at a work location, either because the foundation-duty cycle work is complete or it has been suspended for an extended period of time so that lifting work can be performed, or when the crane has been moved to a new work location or work task, the crane inspection and certification specified in section 14.72(4) is required before the crane is used in lifting service.

Guidelines Part 14 - Tower cranes

G14.88(5) Alternative means of jib access

Issued February 1, 2008

Regulatory excerpt

Section 14.88 of the *OHS Regulation ("Regulation")* defines "access" as follows:

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

(4) 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, 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 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

The purpose of this guideline is to provide information on

- The functions of the walkway required by section 14.88(3) & (4)
- Possible alternatives where walkways as specified by section 14.88(3) & (4) are not practicable
- An outline of the issues that typically need to be addressed when designing and implementing alternative safe means of access

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 section 14.88(5), other options for access can be considered, as long as they provide a safe means of access.

The function of the walkway

When designing safe means of access as alternatives to walkways it is important to recognize the functions or purposes served by walkways.

The walkway 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 operator's cab, if mounted on the jib. In addition, it may provide an emergency access route if it is 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 typically done from the walkway include

- Daily inspections of load trolley ropes, load hoist ropes that can reasonably be expected to be used during the shift, and their points of attachment
- Weekly inspections of structural pins and keepers, trolley rollers and tracks, gear shaft and belt drives, sheaves, bushings, pins, all 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 an extended period 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 wire ropes.

Possible alternatives to walkways

When provision of a walkway required by section 14.88(3) & (4) is not practicable on a tower crane there may be a number of other options for inspection and maintenance of components. Examples include

- For self erect cranes, lowering the jib to allow inspection and maintenance of jib components
- Use of an elevating work platform to access the jib area
- Use of a walkway narrower than specified in section 14.88(4), in combination with a horizontal lifeline along the jib
- Use of a work platform (basket) attached to the tower crane trolley, in combination with a personal fall arrest system. *Note: European Standard EN14439:2006 Cranes-Safety-Tower Cranes requires both a basket attached to the trolley, and a walkway with side protection or a horizontal lifeline along the full length of the jib.*

Issues that need to be addressed with alternative means of access

When designing and implementing a means of alternative access it is essential to ensure issues such as those listed below are addressed. The issues listed under item A would apply in all circumstances. Those listed under item B are more specific to work platforms attached to trolleys. *Neither list is intended to be complete as in the final analysis a hazard assessment specific to the equipment needs to be done and appropriate protective measures implemented.*

A. Issues of general application

- Communication procedures and equipment that will allow safe use of the access system.
- Assurance that any work platform or walkway used provides firm, non-slip footing.
- The means of compliance with the requirements for personal fall protection in Parts 11 and 13 of the *Regulation*.
- The means of inspection and certification of the device, in compliance with section 14.77 (Structural inspection) of the *Regulation*, 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 becomes incapacitated.
- Lockout of the energy supply to the tower crane in accordance with the requirements of Part 10 (Lockout) of the *Regulation*, as required for inspection and maintenance.
- Where applicable, guarding meeting the provisions of *CSA Standard Z248-2004, Code for Tower Cranes*, as required by section 14.2(6) of the *Regulation*.
- Instructions for use of the system and the training of workers.

B. Additional issues specific to work platforms attached to trolleys

- The means of compliance with certain provisions 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 wheel or axle breakage or sideloading, 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 work platform and the means of attaching it to the trolley. *(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 115 kg (250 lbs)/occupant). The system for attaching the platform to the trolley will need to ensure the platform is securely attached and remains level when occupied. 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 involved.)*
- The means of compliance with section 14.21 (Fenders) of the *Regulation*. *(This section 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) of the *Regulation*, as it applies to the platform.
- The means of guarding against shearing and entanglement hazards when the platform is traveled along the jib.
- The means of compliance with the requirements of Part 10 (Lockout) of the*Regulation* so that the platform is immobilized during servicing and inspection of machine parts, and the worker is protected from movement of any equipment while performing work.
- The means of safe access to and egress from the platform.
- The installation, operation, and inspection requirements for the trolley, including any additional requirements for the attached platform provided by the tower crane manufacturer or other applicable party. *(Note: The instructions for use are to include a stipulation that no loads are to be handled by the crane while the platform is occupied.)*

Guidelines Part 14 - Construction material hoists

G14.96 Light duty portable construction material hoists

Issued May 1, 2013

Regulatory excerpt

Section 14.2(8) of the *OHS Regulation* ("*Regulation*") states:

A construction material hoist must meet the requirements of *CSA Standard CAN/CSA-Z256-M87, Safety Code for Material Hoists*.

Section 14.96 of the *Regulation* states:

(1) Before a construction material hoist is put into use, a professional engineer must certify that

(a) the hoist is safe for use, and

(b) the installation of the hoist complies with

(i) the design criteria for that installation,

(ii) the hoist manufacturer's specifications,

(iii) the requirements of *CSA Standard CAN/CSA-Z256-M87, Safety Code for Material Hoists*, and

(iv) the requirements of this Regulation.

(2) If, after certification under subsection (1), a modification is made to the structure, mechanical components or control system of a construction material hoist or it is changed through the addition or removal of a support section of the hoist, the hoist must not be used until it is recertified as safe for use by a professional engineer.

(3) Subsections (1) and (2) do not apply to a light duty portable material hoist installed and operated in accordance with the hoist manufacturer's instructions.

(4) A copy of the certifications required in subsections (1) and (2) or the manufacturer's instructions referred to in subsection (3) must be available at the workplace where the hoist is installed.

Purpose of guideline

Light duty portable construction material hoists are widely used in workplaces throughout the province. While light duty, they may offer ergonomic benefits, increased productivity, and safety when properly installed and used.

The purpose of this guideline is to provide examples of construction material hoists that are typically manufactured to be light duty and portable under section 14.96(3) of the *Regulation*. The guideline also highlights some of the key requirements that apply to hoists and sets out the relevant sections of the *Regulation*.

Light duty portable hoists

Sections 14.96(1) and (2) of the *Regulation* require that certain certifications by a professional engineer be in place before a construction material hoist is put into use. In particular, a professional engineer must certify that the installation of the hoist complies with *CSA Standard Z256*.

These requirements do not apply to "light duty portable" material hoists (section 14.96(3)). These include, for example, track-guided, wire rope, base-mounted drum hoists that are supported by a scaffold, as well as ladder-based hoists, provided:

- They are considered by the manufacturer to be light duty portable
- Their rated capacity does not exceed 500 lb.

Under section 14.2(8) of the *Regulation*, construction material hoists must meet the requirements of *CSA Standard Z256*. Light duty portable hoists were not intended to be subject to the requirements of that standard. For example, the standard requires hoistway doors to be equipped with locks, while light duty portable hoists typically do not have doors. Likewise, there are requirements in the standard for counterweights, which are normally not present in light duty portable hoists. As a result, section 14.2(8) of the *Regulation* does not apply to light duty portable hoists.

Key applicable requirements

While the CSA Standard was not intended to apply to light duty portable hoists, there are still hazards associated with them that need to be controlled. For that reason, all other relevant requirements of the *Regulation* apply. Some of those obligations are set out below (note: this is not an exhaustive list of all applicable requirements).

Scaffold

- The employer must ensure that scaffolds are in a safe condition and are able to withstand the load (section 13.13). Scaffolds used to support a hoist must be certified by a professional engineer to ensure that the attachment of the hoist to the scaffold is adequate to support the hoist and the loads delivered. The scaffold design must take into consideration the dynamic loading based on the hoist's rate of speed (section 4.8(2)(e)).
- Scaffolds that meet the criteria set out in section 13.11 must be constructed, installed, and used in accordance with the instructions of a professional engineer.
- The major components of scaffolds must be used in accordance with technical data provided by the manufacturer, or in writing by a professional engineer (section 13.15). If specifications for use with a construction material hoist are not provided by the manufacturer, then the major components will need to be used in accordance with the written instructions of a professional engineer.

Hoisting system

- The hoist must meet good engineering practice and be able to safely perform its function (section 14.2(15)).
- The rated capacity of the hoist must not exceed the capacity of the structure supporting the hoist (section 14.11(1)).
- The hoist must be installed and operated in accordance with the hoist manufacturer's instructions (section 14.96(3)).
- The hoist must be inspected and maintained in accordance with the manufacturer's instructions and the standard(s) it is required to meet, or as specified by a professional engineer (section 4.3(2)).
- The hoist must be inspected and maintained at a frequency, and to the extent required to ensure that every component is capable of carrying out its original design function with an adequate margin of safety (section 14.13(1)).

  In the case of track-guided, wire rope, base-mounted drum hoists, this will include inspection and maintenance of components, such as the following:

- Drum
- Wire rope
- Guarding of the area under the carriage
- Shackles
- Pins
- Attachment points
- Sheave
- Track system
- Carriage
- Controls
- Braking system

  In the case of ladder-based hoists, this will include inspection and maintenance of components such as the following:

- Base of the unit
- Set up area
- Electrical connection (if electrically powered)
- Guarding and safety features
- Track or rail connections
- Drive system
- Braking system
- Bracing (if required)
- Carriage and attachments

- Any repair to load bearing components (e.g., carriage, track, sheaves, brakes, etc.) must be certified by a professional engineer or the original manufacturer (section 14.13(3)).
- Records of inspection and maintenance must be kept (section 14.14(f)).
- The manufacturer's manual (or, if not available, an engineer's instructions) must be reasonably accessible to the operator and other persons inspecting or maintaining the hoist at the workplace (section 14.12).
- The employer must ensure that the hoist is capable of safely performing the functions for which it is used (section 4.3(1)(a)).
- The hoist must be selected, used, and operated in accordance with the manufacturer's instructions (if available), safe work practices, and the requirements of the *Regulation* (section 4.3(1)(b)). This will include, for example,
- The use of communication to prevent the unintended removal of the hoist, as well as procedures for guardrail removal while unloading.
- Barricading of the area around the hoist base to prevent inadvertent worker entry.
- Workers must not ride on the hoist unless it is necessary to do so for inspection and maintenance (section 14.97).
- The hoist must prominently display a notice stating that no person may ride on the equipment, and the net rated capacity of the hoist must be clearly and durably marked on its structure (section 14.98).
- The components of the hoisting system must meet the requirements of all standards that apply under the *Regulation*.
- All applicable rigging requirements in Part 15 of the*Regulation* must be complied with.
- All applicable guarding requirements of the *Regulation* must be complied with to prevent shear and pinch points on each landing (for example, sections 12.2 and12.12).