

# Workplace Health and Safety Bulletin



## Guidelines for Safety Training of Overhead Crane Operators and Supervisors

### Purpose

These guidelines present minimum recommended safety requirements for ensuring the safe and efficient operation of overhead cranes. Training materials used by instructors preparing and presenting training courses should address all subjects presented.

Successful completion of this training material should help to ensure that workers are suitably trained to safely operate overhead cranes. Being suitably trained is one component of worker competence. The other components are being adequately qualified and possessing sufficient experience. The *Occupational Health and Safety (OHS) Regulation* and Code — the regulations governing health and safety practices in Alberta workplaces — require workers to be competent in order to work without direct supervision [see *OHS Regulation* sections 1(g), 13(1), 13(3), 15; *OHS Code* sections 1, 64].

The term “overhead crane” includes lifting devices such as hoists, jib cranes, gantry cranes, monorails, top running and under slung cranes and below-the-hook lifting devices. Operators must also have a general understanding of rigging.

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## Prerequisites for overhead crane operator

- The minimum requirements for an overhead crane operator are the physical and mental capability and competence to perform the work. Unless able to provide satisfactory evidence of qualifications and experience, operators should be required to pass a written or oral examination and a practical operating examination. The assessment of operator qualifications should be limited to the specific type of equipment for which the operator is examined.
- Operators and operator trainees should have normal depth perception, field of vision, reaction time, manual dexterity, coordination, and no tendencies to dizziness or similar undesirable conditions. (Refer to Appendix A for additional information.)

## Training content

Any overhead crane-safety training program should follow the course outline described on the following pages. Training content should include, but not be limited to, the topics listed in this industry recommended Safety Bulletin. Additional materials may also be used to complement a course.

- (A) Legislated and other requirements in Alberta
- (B) Identifying cranes and their components
- (C) Pre-operational requirements
- (D) Operational requirements
- (E) Post-operating requirements
- (F) Rigging components, inspection/rejection criteria
- (G) Site-specific training requirements
- (H) Supervisor training and responsibility
- (I) Trainer qualifications
- (J) Successful course completion

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## (A) Legislated and other requirements in Alberta

Workers should be able to demonstrate knowledge of the topics listed below. This may be accomplished through on-site training materials and other training programs.

	<b>Reference Section</b>
<b>Occupational Health and Safety Act</b>	
▪ Employer and worker responsibilities	Section 2
▪ Imminent danger with scenarios	Section 35
<b>Occupational Health and Safety Regulation</b>	
▪ Competent worker	Section 1(g) and 13
▪ Safety training	Section 15
▪ Equipment	Section 12
<b>Occupational Health and Safety Code</b>	
▪ Housekeeping	Section 185
▪ Requirements to follow the manufacturer’s recommended practices (manufacturer’s specifications) for installation, operation and maintenance	Section 12
▪ Control of Hazardous Energy	Part 15
▪ Signallers	Section 191
▪ Rigging	Part 21
▪ Cranes, Hoists and Lifting Devices	Part 6
<b>Canadian Standards Association</b>	
▪ Knowledge of CSA Standard B167-96 (R2002), <i>Maintenance and Inspection of Overhead Cranes, Gantry Cranes, Monorails, Hoists, and Trolleys</i>	

## Other references

### **American Society of Mechanical Engineers (ASME)**

- 📖 ASME Standard B30.2-2005, *Overhead Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)*
- 📖 ASME Standard B30.9-2006, *Slings Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks and Slings*
- 📖 ASME Standard B30.10-2009, *Hooks Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks and Slings*
- 📖 ASME Standard B30.17-2006, *Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)*
- 📖 ASME Standard B30.20-2006, *Below the Hook Lifting Devices*
- 📖 ASME Standard B30.26-2004, *Rigging Hardware Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks and Slings*

### **Canadian Standards Association (CSA)**

- 📖 CSA Standard B167-08, *Overhead travelling cranes – Design, inspection, testing, maintenance, and safe operation*

## (B) Identify overhead cranes and their components

- Crane terminology
- Identify types of cranes
- Identify and describe key components
- Identify other types of overhead lifting devices
- Demonstrate the ability to recognize each applicable lifting component's capacity
- Determine overall lift capacity

## (C) Pre-operational requirements

- Define responsibility for the pre-operational check
- Review how to perform the required sequential pre-operational check based on the manufacturer's specifications (recommended practices) or specifications certified by a professional engineer
- Check log book for comments
- Inspect the crane operation area for hazards and clear area if necessary
- Check/inspect chains, cables, hooks, safety latches and crane movement
- Ensure operational controls are functioning properly

- Identify location of the crane's disconnect switch/isolator and know how to ensure it is functioning properly
- Discuss additional site-specific safety concerns such as the isolation of specific areas, personnel entry or exit, and the operation of mobile equipment such as forklifts in the vicinity of the crane

## (D) Operational requirements

- Identify roles and responsibilities
- Determine if a formal lift plan is necessary
- Perform a hazard assessment related to crane operation and assess:
  - environmental conditions e.g. weather
  - physical conditions e.g. new materials, processes and equipment
  - personnel e.g. new staff, temporary replacement staff
- Determine when to seek competent assistance
- Determine the safest route and destination of loads
- Determine load weight and centre of gravity
- Identify a critical or over-capacity lift
- Select appropriate rigging equipment and know its load limits
- Determine the safest location from which to operate
- Review both universal and site-specific crane signals for lifts
- Review lifting, loading, travelling techniques and demonstrate where applicable
- Maintain good housekeeping habits
- Review and describe the need for emergency response procedures for various situations such as:
  - electrical or mechanical failure
  - operator retrieval procedures (cab cranes)
  - incidents
- Describe parking and shut down procedures for safety and security
- Follow lock out and tagging procedures
- Review why near misses are recorded and reported to the appropriate person
- Maintain log book records
- Use of records to support changes to, or development of, improved policies and procedures

## (E) General rigging requirements

- Establish who has responsibility and authority for rigging
- Determine when to seek competent assistance
- Identify and describe different types of rigging and the load capacity rating for slings, shackles, clamps, spreader bars and hooks

- Describe the need for load ratings prior to using non-standard rigging and below-the-hook devices
- Determine the manufacturer's inspection and rejection criteria
- Demonstrate correct rigging procedures by:
  - selecting appropriate rigging equipment
  - interpreting loads with calculations and rigging charts
  - visually inspecting rigging hardware for wear and damage
  - describing the proper use of tag lines
  - demonstrating how to properly store rigging equipment
- Demonstrate understanding of consequences of shock loading and how to avoid it

## (F) Post-operational requirements

As required by Section 65 of the OHS Code for hoists with a rated load capacity of 2,000 kg or more, provide log book entries which include

- defects or deficiencies
- service and maintenance history

## (G) Site-specific training requirements

Employer should convey site-specific requirements to the trainer for incorporation into the safety training program.

## (H) Supervisory personnel training and responsibility

- It is recommended that supervisory personnel successfully complete an operator training course.
- Supervisory personnel should monitor and evaluate the operator's performance (to ensure that the worker is following the employer's safe work practices), taking appropriate action as required.

## (I) Trainer qualifications

It is recommended that the trainer possess:

- relevant knowledge
- operator experience
- instructional experience
- excellent communication skills

## (J) Successful course completion

- Comprehensive examination of the content presented in this Safety Bulletin
- Certificate of successful completion
  - Theory — Grade of 70 percent or better
  - Practical — Grade of 70 percent or better
- Recommended minimum training course duration based on rated load capacity:

Rated load capacity	Recommended minimum training hours
Less than 2000 kg crane	4 hours, including practical evaluation
2000 kg to 5000 kg crane	8 hours, including practical evaluation
More than 5000 kg crane	12 hours, including practical evaluation
Manually operated hoists	1 hour


- Recommended refresher training within a three-year period or complete training after three years.

## Resource information

 <http://www.qp.alberta.ca>  
*Occupational Health and Safety Act*

 <http://www.qp.alberta.ca>  
*Occupational Health and Safety Regulation*

 [http://industry.alberta.ca/documents/WHS/WHS-LEG\\_ohsc\\_2009.pdf](http://industry.alberta.ca/documents/WHS/WHS-LEG_ohsc_2009.pdf)  
*Occupational Health and Safety Code*

 [http://employment.alberta.ca/documents/WHS/WHS-LEG\\_ohsc\\_2009.pdf](http://employment.alberta.ca/documents/WHS/WHS-LEG_ohsc_2009.pdf)  
*Occupational Health and Safety Code Explanation Guide*

## Appendix A

**This reference is not a mandatory part of this Safety Bulletin.** It is presented as information only.

### Generally Accepted Physical Qualifications:

ASME Standard B30.2 – 1996, *Overhead and Gantry Cranes, Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist*

#### Section 2-3.1.2

(b) Operators and operator shall meet the following accepted physical qualifications:

1. Have vision of at least 20/30 Snellen in one eye, and 20/50 in the other, with or without corrective lenses.
2. Be able to distinguish colours, if colour differentiation required for operation.
3. Be able to hear, with or without hearing aid, adequately for a specific operation.
4. Have sufficient strength, endurance, agility, co-ordination and speed of reaction to meet the demands of equipment operation.
5. Not have evidence of physical defects, or emotional instability that could render a hazard to the operator or others, or which, in the opinion of the examiner, could interfere with the operator's performance. Evidence of such conditions may be cause for disqualification. In such cases, specialized clinical or medial judgments and tests may be required.
6. Not have evidence of being subject to seizures or loss of physical control. Evidence of such conditions shall be reason for disqualification. Specialized medical tests may be required to determine these conditions.

*Alberta Employment and Immigration, Workplace Policy and Standards, acknowledges the leadership and assistance of industry representatives in the preparation of this Safety Bulletin*



## Contact us:

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### Province-Wide Contact Centre



Edmonton

780-415-8690



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1-866-415-8690

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