

Guidelines for Safety Training of Overhead Crane Operators and Supervisors

OHS information for workers and employers

These guidelines present minimum recommended operator training requirements for ensuring the safe and efficient operation of overhead cranes. Training materials used by instructors should include all the subjects presented.

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.

Successful completion of this training material should ensure that operators are suitably trained to safely operate overhead cranes. Being “suitably trained” is one component of worker competence as defined by the *Occupational Health and Safety (OHS) Act*. The other components are being “adequately qualified” and “having sufficient experience to perform the work safely without supervision”. As required by section 64 of the OHS Code, for example, only competent workers authorized by the employer can operate lifting equipment.

It is recommended that supervisors who oversee overhead crane operators successfully complete an operator training course. This helps supervisors understand how the work is being done by the operator(s) they supervise.

According to the *OHS Act*, supervisors must ensure that a worker under their supervision

- a) complies with the requirements of the *OHS Act*, regulations and OHS Code,
- b) uses all hazard controls, and
- c) properly uses or wears the assigned or required
- d) personal protective equipment.

Supervisors must take appropriate corrective actions based on their observations.

Purpose and training content

The purpose of operator training is to ensure that overhead crane operators

- a) have the knowledge and experience to safely perform their assigned tasks,
- b) operate, and understand that they must operate, the lifting equipment according to the manufacturer’s instructions, and
- c) comply with all legislated requirements in the *OHS Act*, the regulations, and the OHS Code.

Overhead crane safety training programs should follow the course outline described in the following pages. Additional topics may also be included.

Theory-based training component

Theory-based training is intended to help operators

- a) understand the equipment,
- b) know how to safely operate the equipment,
- c) understand the importance of operating the equipment according to the manufacturer’s operating instructions,
- d) be aware of and understand the occupational health and safety legislation that applies to operators, and

- e) be aware of relevant safety standards issued by the Canadian Standards Association (CSA) and the American Society of Mechanical Engineers (ASME) that deal with overhead lifting equipment and rigging.

Theory-based training materials must be up-to-date, reflecting the most current or referenced legislation and standards at the time the course is given.

Theory-based training can be provided in a classroom or online. In either case, it should be followed up with testing of the student's knowledge.

Practical training component

Practical training should include hands-on operation of the equipment while handling typical loads for the workplace. Class size should be limited to no more than 12 student operators per instructor.

Practical training should include an evaluation of student performance, with written procedures and evaluation criteria. The results of the evaluation should be summarized in a written record for each student.

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Training certificates

Training certificates issued by training providers are normally valid for a period of three years. If an operator has taken a full training course and has been actively operating cranes or hoists over the three-year period since that training, it is suggested that they take a one-day refresher course to renew their training certificate for an additional three years. The refresher should be taken before the expiry date of the initial three-year period and consist of both theory and practical components.

Following this six-year period, it is recommended that operators take a full training course. At that point, they may again be eligible for renewal by means of a refresher course.

(A) Legislated and other requirements in Alberta

Workers should be able to demonstrate an understanding of the topics listed below.

Occupational Health and Safety Act	Reference Section
Employer responsibilities	Section 3
Supervisor responsibilities	Section 4
Worker responsibilities	Section 5
Service provider responsibilities	Section 7
Duty to provide information	Section 14
Right to refuse dangerous work	Section 31
Employer not to make worker work in dangerous conditions	Section 34

Occupational Health and Safety Regulation	Reference Section
Equipment	Section 12
Competent worker	Sections 13 and 14
Safety training	Section 15

Occupational Health and Safety Code	Reference Section
Part 6 Cranes, Hoists and Lifting Devices	Sections 59-74, 93-95.1
Requirements to follow the manufacturer's instructions for installation, operation and maintenance	Section 12
Housekeeping	Section 185
Signallers	Section 191
Part 15 Control of Hazardous Energy	Sections 212-215.3
Part 21 Rigging	Sections 292-307

Canadian Standards Association	
CSA Standard B167-16 <i>Overhead cranes, gantry cranes, monorails, hoists, and jib cranes</i>	

The following standards include information that can also be added to an operator training course. In some cases these standards are referenced in the OHS Code.

American Society of Mechanical Engineers (ASME) Standards

- B30.2:2016, *Overhead And Gantry Cranes (Top Running Bridge, Single Or Multiple Girder, Top Running Trolley Hoist)*
- B30.9-2014, *Slings*
- B30.10-2014, *Hooks*
- B30.16-2012, *Overhead Hoists (Underhung)*
- B30.20-2013, *Below-the-Hook Lifting Devices*
- B30.26-2015, *Rigging Hardware*

(B) Identify overhead cranes and their components

- a) Understand crane terminology.
- b) Identify different types of cranes and hoists.
- c) Identify common components and describe their function.
- d) Identify safety devices and describe their function.
- e) Demonstrate the ability to recognize each applicable lifting component's capacity.
- f) Demonstrate the ability to determine overall lift capacity.

(C) Pre-operational requirements

- a) Define who is responsible for the pre-operational checks.
- b) Describe and perform the pre-operational checks to be done with the power off such as hook empty, no lockouts, area free of obstructions, no oil leaks or obvious defects, rigging inspected visually, etc. and those to be done with the power on such as confirming that control switches function properly, hoisting assembly is damage-free, brakes operate properly, etc.
- c) Review how to perform the required pre-operational checks based on the manufacturer's instructions.
- d) Review how to check the log book for comments.
- e) Inspect the crane's operating area for hazards and clear the area if necessary.
- f) Locate the crane's disconnect switch/isolator and know how to confirm that it functions properly.
- g) Discuss additional site-specific safety concerns such as isolating specific areas, restricting entry or exit of personnel, and limiting the operation of mobile equipment such as forklifts in the crane's vicinity.

(D) Operational requirements

- a) Identify operator roles and responsibilities.
- b) Review site-specific policies and procedures for the operation of lifting equipment.
- c) Review manufacturer-specific information as required.
- d) Perform a hazard assessment related to crane operation and assess

- i environmental conditions such as weather,
 - ii physical conditions such as the use of new materials, processes and equipment, and
 - iii personnel such as new workers or temporary replacement workers who may be unfamiliar with the safe operation of overhead cranes.
- e) Determine if a formal lift plan is necessary.
- f) Describe when it's time to get help from another competent operator.
- g) Determine the safest route and destination of loads.
- h) Determine load weight and its centre of gravity.
- i) Determine if the lift is a critical lift requiring additional planning.
- j) Select appropriate rigging equipment and know its load limits.
- k) Determine the safest location from which to operate.
- l) Review both universal and site-specific crane signals for lifting operations.
- m) Review lifting, loading, and travelling techniques and demonstrate them.
- n) Review the importance of maintaining good housekeeping habits.
- o) Review and describe the need for emergency response procedures for various situations such as:
 - i electrical or mechanical failure,
 - ii operator retrieval procedures (cab cranes), and
 - iii incidents.
- p) Describe parking and shut down procedures for safety and security.
- q) Review typical lock out procedures and lock out points.
- r) Review why near misses are recorded and reported to the appropriate person.
- s) Review the information that must be recorded in the log book as required by section 67 of the OHS Code.
- t) Review the importance of maintaining accurate log book records to support changes to, or development of, improved policies and procedures.

(E) General rigging requirements

- a) Describe who has responsibility and authority for rigging.
- b) Describe when it's time to get help from a competent rigger.
- c) Identify and describe different types of rigging and the load capacity rating for slings, shackles, clamps, spreader bars and hooks.
- d) Discuss the importance of knowing load ratings prior to using non-standard rigging and below-the-hook devices.
- e) Describe where to find and how to interpret the rigging manufacturer's inspection and rejection criteria.
- f) Demonstrate correct rigging procedures by
 - i selecting appropriate rigging equipment,
 - ii interpreting loads with calculations and rigging charts,
 - iii showing how to visually inspect rigging hardware for wear and damage,

- iv showing when worn or damaged rigging hardware should be removed from service and how,
 - v describing the proper use of tag lines, and
 - vi demonstrating how to properly store rigging equipment.
- g) Discuss the consequences of shock loading and how to avoid it.

(F) Post-operational requirements

- a) Demonstrate that the crane must be returned to its designated parking area, with the power switched off and the pendant secured.
- b) Demonstrate completion of all required post-operational checks.
- c) Discuss the importance of documenting notable findings in the Daily Operations portion of the log book, including dating and signing the log book.
- d) Discuss the importance of reporting damage and deficiencies to the supervisor.

(G) Site-specific training requirements

In advance of the course, the instructor should speak with the employer and visit the work site (if possible) to determine any site-specific requirements that should be part of the safety training program.

(H) Instructor qualifications

The instructor should possess

- a. relevant knowledge,
- b. experience as an operator of overhead lifting equipment,
- c. experience instructing adult learners, and
- d. excellent communication skills.

The instructor should have attended and successfully completed a “train the trainer” or equivalent program. The instructor should have a valid certificate indicating successful completion of the program.

To keep their knowledge up-to-date, instructors should attend at least one “train the trainer” or equivalent refresher program prior to the expiry date of their certificate.

(I) Successful course completion

- a) Comprehensive examination of the content presented in this Safety Bulletin.
- b) Certificate of successful completion
 - i Theory — Grade of 70 percent or better
 - ii Practical — Grade of 70 percent or better

Contact Us

OHS Contact Centre

Throughout Alberta

- 1-866-415-8690

Edmonton & surrounding area

- 780-415-8690

Deaf or hearing impaired:

- 1-800-232-7215 (Alberta)
- 780-427-9999 (Edmonton)

PSI Online Reporting Service

alberta.ca/report-potentially-serious-incidents.aspx

Website

alberta.ca/occupational-health-safety.aspx

Get Copies of OHS Act, Regulation and Code

Alberta Queen's Printer

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Occupational Health and Safety

alberta.ca/ohs-act-regulation-code.aspx

FOR MORE INFORMATION

<http://www.qp.alberta.ca/documents/Acts/O02P1.pdf>

Occupational Health and Safety Act

http://www.qp.alberta.ca/documents/Regs/2003_062.pdf

Occupational Health and Safety Regulation

<http://www.qp.alberta.ca/documents/OHS/OHS.pdf>

Occupational Health and Safety Code

<https://open.alberta.ca/publications/4403880>

Occupational Health and Safety Code Explanation Guide

Alberta Labour, Occupational Health and Safety, acknowledges the leadership and assistance of industry representatives in preparing this Safety Bulletin.

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