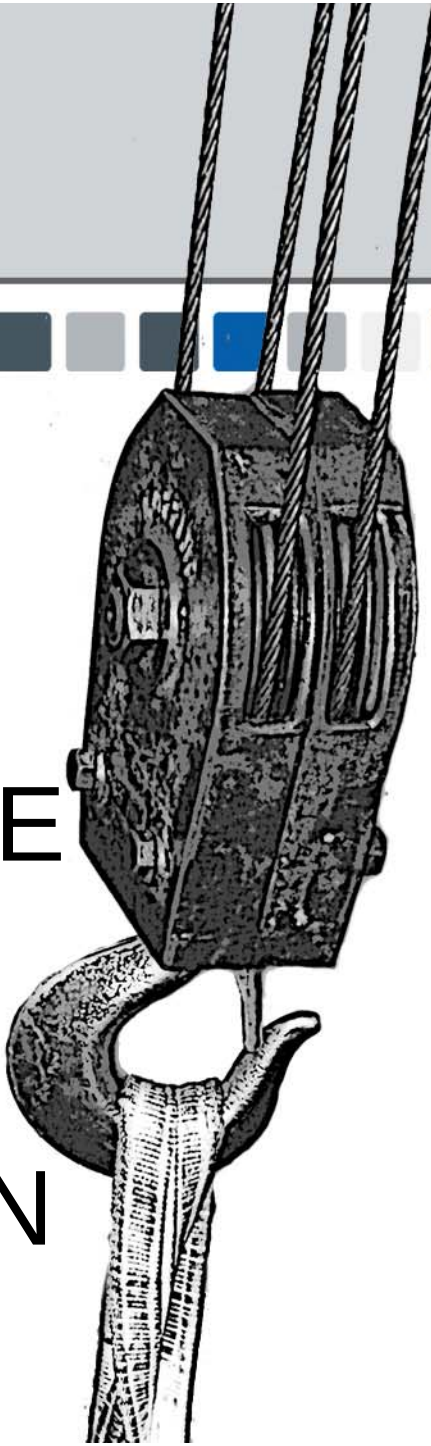
COLUMBUS McKINNON

OVERHEAD HOIST & CRANE INSPECTION AND CERTIFICATION



About this Course

- This course covers a wide variety of crane and hoist configurations and inspection items associated with them.
- Classroom instruction will be followed by an **optional** written examination. The test in an open book format and consists of multiple-choice questions. While taking the exam, you may use any reference material provided to you by the instructor.
- To receive "Certification" you must achieve a minimum score of 80%.

The written examination is optional. All Class participants will receive a Certificate of Completion. If "Certification" is desired, taking and passing the exam is required.

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ASME B30.2-2.1 Inspection

SECTION 2-2.1: INSPECTION

2-2.1.1 General

(a) This Chapter on Inspection and Testing establishes and defines the criteria for determining whether cranes can be expected to perform as intended.

(b) Five types of inspections are defined, each with the common purpose of keeping equipment performing as intended. Each inspection is directed toward a different set of circumstances. The five types of inspection are

(1) initial inspection
(2) functional test inspection
(3) frequent inspection
(4) periodic inspection
(5) inspection of equipment not in regular use

(c) In addition to the five types of inspection listed in para. 2-2.1.1(b), the inspection provisions found in manuals supplied by the manufacturer(s) of the crane and the crane components shall be followed.

(d) All inspections shall be performed by a designated person. Any deficiencies identified shall be examined and a determination made by a qualified person as to whether they constitute a hazard, and if so, what additional steps need to be taken to address the hazard.

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CMAA #78 - 2.2 Crane Inspector

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Any person engaging in the testing, examination and/or certification of cranes, including but not limited to overhead traveling single or double girder top running, under running, gantry cranes, monorails & associated hoisting equipment

CMAA #78 - 2.2.1 Work Experience

A crane inspector should have a minimum of 2,000 hours of relevant work experience & training related to maintaining, inspecting, servicing, repairing & modifying cranes. This individual shall have a working knowledge of how to identify deficiencies to mechanical, structural & electrical crane components & associated hoisting equipment. Under no circumstances shall an individual be permitted to perform inspections that has not received appropriate training & cannot demonstrate a working knowledge of the codes, regulations & the product being inspected.

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CSA B167-16

6.2.1

Persons who perform periodic inspections shall be competent in the tasks they will be performing. Crane inspectors shall be technically knowledgeable, experienced, and trained in all aspects of crane operation and maintenance. They shall be able to provide records of training in, and knowledge of, applicable requirements, safety practices, and standards upon request. The employer of inspection personnel is ultimately responsible for ensuring that they are competent and capable of doing the work. At a minimum they shall have the following qualifications:

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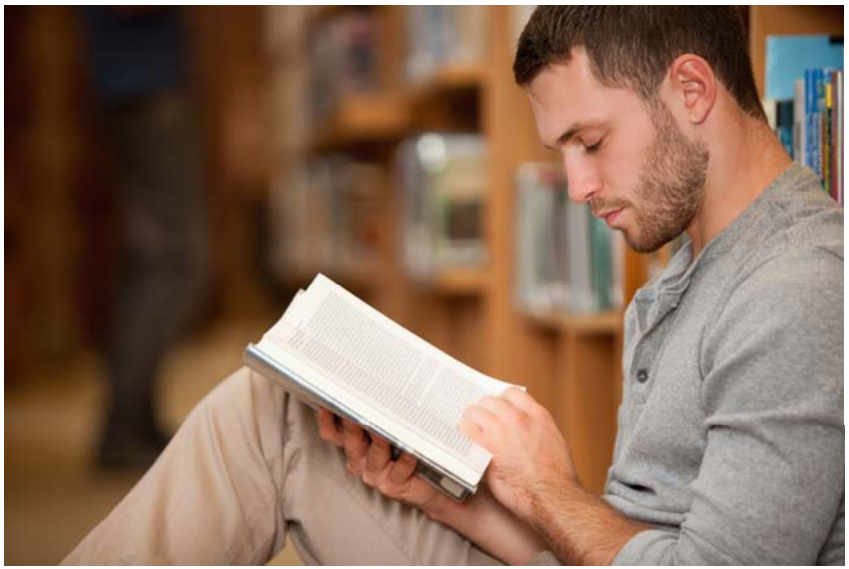
CSA B167-16

a) recognized trade qualification as
   i) a journeyman electrician;
   ii) a journeyman millwright; or
   iii) an equivalent qualification in terms of skills and knowledge, which has been reviewed and approved by an appropriate authority; and



CSA B167-16

b) 8000 hrs. of direct experience working on the maintenance, repair, or manufacture of cranes or hoists, or working under the direct or indirect supervision of

i) a qualified crane inspector having 8000 h of experience; or

ii) an engineer.

CSA B167-16

Notes:

1) An appropriate authority for the purposes of this Clause may be either a provincial/territorial government, or an engineer with experience and knowledge of cranes.

2) *Some or all of the hours spent in the initial trade qualification (e.g., for a journeyman electrician or millwright) may be applied to the total hours of crane experience, provided the activity focused exclusively or almost exclusively on crane repair and maintenance. This number may also include experience with the design or manufacture of cranes.*

3) *Additional hours of experience or other additional qualifications could be needed for inspectors of specialized cranes, or cranes use in hazardous locations (e.g., with ignitable gases or fibres).*

4) *Clause 8.2 specifies qualification requirements for maintenance personnel (service technicians).*

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6.2.2

Persons with less than 2000 h of crane experience (e.g., through maintenance and repair training) shall not perform inspection activities.

Note: *This requirement is intended to ensure that a person working under supervision (see Clause 6.2.1 (b)) has sufficient experience before they are given responsibility for crane inspection activities.*

6.2.3

Indirect supervision of a crane inspection may only be used if a qualified crane inspector or engineer
has approved the inspection program and frequency;
is consulted for all discrepancies or defects; and
formally approves the inspection report.

Note: *A crane inspector or engineer could be needed to assist some portion of the inspection, but does not necessarily need to be present for the entire duration of the inspection.*

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Applicable Standards

OSHA 1910.179

Overhead and Gantry Cranes

Crane Manufacturer's Association of America, Specification 70

Top running bridge and gantry type multiple girder electric overhead traveling cranes

Crane Manufacturer's Association of America, Specification 74

Specifications for Top Running Single Girder Electric Traveling Cranes Utilizing Under Running Trolley Hoist.

Crane Manufactures Association of America, Specification 78

Standards and Guidelines for Professional Services Performed On Overhead Traveling cranes and Associated Hoisting Equipment

Hoist Manufacturers Institute

American Society of Mechanical Engineers / American National Standards Institute

- **B30.2** Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)
- **B30.10** Hooks
- **B30.16** Overhead Hoists (Underhung)
- **B30.17/B30.11** Overhead and Gantry Cranes (Top running Bridge, Single Girder, Underhung Hoist)/Monorails and Underhung Cranes
- **B30.20** Below-the-Hook Lifting Devices
- **B30.21** Manually Lever Operated Hoists

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What is the OSHA General Duty Clause?

CFR 29, USC 654, Section 5(a)(1), (a)(2) and (b)

- (a) Each employer:
  - (1) shall furnish to each of his employees, employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees
  - (2) shall comply with occupational safety and health standards promulgated under this Act
- (b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act, which are applicable to his own actions and conduct

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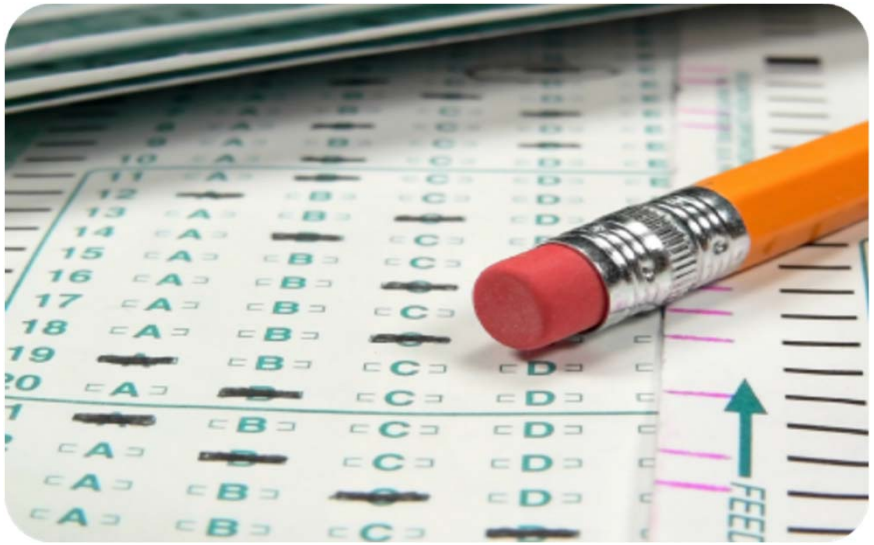
2.2.5 Testing

- The Inspector **shall** be required to demonstrate proficiency by passing both a written and practical examination.

- The Inspector **should** be able to present documentation of successful completion of the above qualifications.



Crane & Hoist Registrations

OSHA® B30.20 Section V

New & Existing Installations to be Compliant

- The effective date of ANSI standards for purposes of defining new and existing installations shall be 1 year after its date of issuance.
- Construction, installation, inspection, testing, maintenance and operation of equipment manufactured and facilities constructed after the effective date of this volume shall conform to the mandatory requirements of this volume.
- Recommended changes shall be made by the owner (user) within 1 year.

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Mandatory & Advisory Rules

- **Mandatory** rules are characterized by use of the word **shall**.
- ***Shall:*** a word indicating a requirement.(ASME B30.2-0.2; definitions)

- If a provision is of an **advisory** nature, it is indicated by use of the word **should** and is a recommendation to be considered, the advisability of which depends on the facts in each situation.
- ***Should:*** a word indicating a recommendation.
  (ASME B30.2-0.2; definitions)

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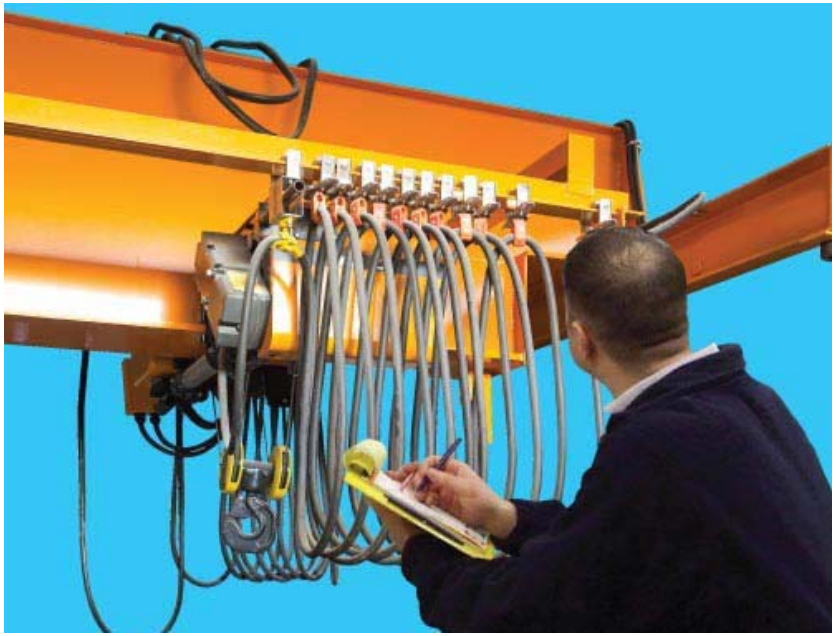
Section 1
General Safety

Training Objective

- At the completion of this section, students should have a thorough knowledge of:
  - Crane maintenance and inspection safety requirements
  - Equipment deficiencies which might justify taking the crane or hoist out of service until corrected.



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Safety

- Inform the crane operator or responsible person that maintenance is being performed
- Place warning or out of order signs or equivalent on the crane and on floor beneath the crane being serviced
- Where other cranes remain active on the same runway, rail stops or other suitable means shall be provided to prevent interference with the idle crane
- Inspecting / testing controls may require two people. If the crane operator will be operating the controls brief him or her on your procedure prior to initiating.

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Safety

- Always follow lock out / tag out procedures (OSHA 1910.147 & 1910.145)
- If the crane is remote control, take the control with you or lock it up.
- Use proper PPE (Personal Protective Equipment)
- Use appropriate tools and test equipment.

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Safety

- Observe all Dangers, Warnings and Cautions
- Replace all guards removed during inspection
- Report all safety related issues to your supervisor, plant contact or responsible person and obtain written acknowledgement before leaving the facility

The following is a partial list of conditions which, if discovered while inspecting a crane, **may warrant taking the crane out of service until corrected.**

- Structural cracks, missing bolts
- Faulty limit switches
- Worn or damaged block / hook or sheaves
- Worn or damaged wire rope
- Inoperative or missing warning devices
- Malfunctioning operating controls
- Missing fire extinguisher / insufficient charge
- Malfunctioning or modified safety devices

If it is a safety issue,

you or your supervisor

must make a decision.

Electrical Current & the Human Body

- **Direct** Injury or death can occur whenever electric current flows through the human body. Currents of less than 30 milliamperes (mA) can result in death. (A milliamp is 1/1000 of an Amp.)
- **Indirect** Although the electric current through the human body may be well below the values required to cause noticeable injury, human reaction can result in falls from ladders or scaffolds, or movement into operating machinery. Such reaction can result in injury or death.

A Real Electrocution

In February 1996, an individual who was high on PCP, was trying to kill himself. The situation lasted for about 45 minutes. What you're seeing now is the end of the situation. He had already walked from a previous power pole by means of walking on the low voltage wire and hanging on to the other wire that was around him. The power company had de-energized the low voltage wire at this point. What you see now is this person ascending to the level of HIGH VOLTAGE. The wires above him are energized at 16,600 volts.

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A Real Electrocution

He then reached out his hand and grabbed the conductor. At that instant 16,600 volts shot through his body. If you can believe it . . . the guy is inside of the ball of fire that you see. He didn't fall at that moment. The air surrounding him became ionized and began to conduct and actually burn. The small ball of fire that you see towards the bottom near the street lamp, is where the arc went to the ground through the secondary conductors. Notice the whipping action of the wire he's holding onto.

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A Real Electrocution

- **As you can see, the ball of fire has started to subside.**
- **If you look closely you can see his legs at the bottom of the fire ball, he is still standing on the cross-arm.**
- **A flash of electrical power of this magnitude is almost certain death.**

This guy is still alive today!

- A special thanks to Jimmy of the Janesville Power & Water Department

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EMERGENCY
EXIT ONLY
THERE ARE
NO STAIRS
OUTSIDE THIS
DOOR
YOU MUST JUMP
DOOR EXITS
CLOSE TO
ROUTE 413
BE AWARE OF
THE TRAFFIC

Bad Idea

Don’t be a Safety Goober

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This is a Goober

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Questions??

Thanks for your attention,
let's take a break!

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