



CCO

CANDIDATE HANDBOOK

- **OVERHEAD CRANE OPERATOR**

®



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Certification Policies

OVERHEAD CRANE OPERATOR

ELIGIBILITY

To be eligible for certification, candidates must:

- Be at least 18 years of age
- Comply with CCO's Substance Abuse Policy
- Comply with CCO's Code of Ethics
- Pass a written examination
- Pass a practical examination

EXAMINATION FEES

For all exam and related fees, visit www.nccco.org/fees.

CCO CERTIFICATION TIME FRAMES

Candidates have 12 months from the time they pass the initial written or practical exam they take to pass the corresponding (written or practical) exam.

Any tests passed within a 12-month period count towards certification. For example, a candidate who fails the Overhead Crane Operator Written Exam in December 2024 but passes the Overhead Crane Operator Practical Exam in January 2025 has until the end of January 2026 to retake (and pass) the Overhead Crane Operator Written Exam.

RECERTIFICATION REQUIREMENTS

CCO Overhead Crane Operator certification is valid for five years. ***Recertification candidates must complete all of their recertification requirements during the 12 months prior to their certification's expiration date.*** Regardless of the date of the exams within that one-year period, the new five-year certification period begins from the date of expiration of the candidate's initial certification.

Recertificants must:

- Pass the Overhead Crane Operator Written Examination
- Comply with CCO's Substance Abuse Policy
- Comply with CCO's Code of Ethics

Candidates who can attest to at least 1,000 hours of crane-related experience during their period of certification do not need to take the practical exam to recertify. *Crane-related experience* is defined as: operating, maintaining, inspecting, or training on cranes.

Recertification candidates who do need to take the practical exam for any reason, however, must do so before their certification expires. ***There is no grace period after their***

certification's expiration date. Candidates whose certification has lapsed must take the full written and practical examinations to be certified again.

Note: Candidates who recertify more than 12 months prior to their certification's expiration date will have their new certification period begin immediately, not from the end of their current certification period.



Written Examination Outline

OVERHEAD CRANE OPERATOR

65 QUESTIONS/60 MINUTES (CALCULATOR PERMITTED)

The Overhead Crane Operator Written Examination tests the following knowledge areas relating to the operation of overhead cranes:

Domain 1: Pre-Operation Activities

- Approximately 30% of test

Domain 2: Work Requirements

- Approximately 30% of test

Domain 3: Load Handling

- Approximately 33% of test

Domain 4: Shutdown & Secure

- Approximately 7% of test

DOMAIN 1: PRE-OPERATION/INSPECTION ACTIVITIES

- 1.1 Conduct emergency stop function when necessary
 - 1.1.1 Conditions that require emergency shutdown
 - 1.1.2 Location of emergency stop switch
- 1.2 Perform emergency shutdown procedures
 - 1.2.1 Actions and sequence of shutdown procedures after an emergency stop
 - 1.2.2 ASME/OSHA standards and regulations for emergency stops
- 1.3 Locate and verify access to main runway disconnect
 - 1.3.1 Location of main runway disconnect(s)
 - 1.3.2 Technical knowledge of ASME standards regarding disconnects
- 1.4 Resolve lockout/tag-out conditions
 - 1.4.1 Lockout/tag-out requirements and condition resolutions
- 1.5 Identify and inspect visual and audible warning systems
 - 1.5.1 Audible and visual warning systems that one may encounter
 - 1.5.2 Proper and appropriate functioning of warning systems (e.g., decibels of audible devices)
 - 1.5.3 Location of warning devices
- 1.6 Verify proper control labeling and conditioning
 - 1.6.1 Technical knowledge of ASME control layout
 - 1.6.2 Technical knowledge of OSHA and ASME crane and attachment labeling requirements
- 1.7 Ensure pendant control is adequately supported
 - 1.7.1 Pendant control strain relief requirements
 - 1.7.2 Risks of improper support
- 1.8 Ensure warning and capacity labeling meet requirements
 - 1.8.1 Warning and capacity labeling requirements per ASME/OSHA/manufacturer
- 1.9 Check for oil leaks
 - 1.9.1 Location of potential oil leaks, and procedures to rectify
 - 1.9.2 Crane manufacturer's operating instructions
- 1.10 Inspect wire rope or chain condition and spooling
 - 1.10.1 Removal criteria
 - 1.10.2 Minimum wraps required
- 1.11 Ensure guards meet applicable requirements
 - 1.11.1 Required guard location
 - 1.11.2 Technical knowledge of ASME/OSHA guard requirements
- 1.12 Ensure fire extinguishers meet applicable requirements
 - 1.12.1 Fire extinguisher classes
 - 1.12.2 Required locations for fire extinguishers
 - 1.12.3 Proper use of fire extinguishers
- 1.13 Ensure bumpers/stops meet applicable requirements
 - 1.13.1 Bumper stop functionality
 - 1.13.2 Bumper stop locations
- 1.14 Check all limit devices and control functions
 - 1.14.1 Types of limiting devices
 - 1.14.2 When/how to test limiting devices
 - 1.14.3 Various types of control functions
 - 1.14.4 Various types of control layouts
 - 1.14.5 Technical knowledge of ASME control layout standards
- 1.15 Conduct brake test on bridge, trolley, and hoist
 - 1.15.1 Brake test setup requirements
 - 1.15.2 How the crane reacts with respect to drift

- 1.16 Ensure load block, hook and latch meet requirements
 - 1.16.1 Technical knowledge of ASME/OSHA standards and regulations related to requirements
 - 1.16.2 Various load block, hook, and latch configurations and potential defects
- 1.17 Verify communication devices (e.g., radios) are functioning correctly
 - 1.17.1 Appropriate communication devices
 - 1.17.2 Communication device usage requirements
 - 1.17.3 Identification of malfunctioning devices
 - 1.17.4 How to change communication methods, if needed

DOMAIN 2: WORK REQUIREMENTS

- 2.1 Calculate the weight of the load
 - 2.1.1 How rigging effects load weight
 - 2.1.2 Basic math calculations, and volume calculations
- 2.2 Demonstrate the proper use of below the hook lifting devices
 - 2.2.1 Types of below the hook lifting devices
 - 2.2.2 When to use various below the hook lifting devices
 - 2.2.3 Technical knowledge of ASME B30.20-Below-the-Hook Lifting Devices
- 2.3 Select and apply rigging
 - 2.3.1 Various rigging materials
 - 2.3.2 Proper rigging attachment locations
 - 2.3.3 Conditions in which rigging selection is safe vs. unsafe and appropriate vs. inappropriate
 - 2.3.4 Technical knowledge of OSHA 1910.184-Slings
 - 2.3.5 Technical knowledge of ASME B30.30-Ropes
- 2.4 Move the crane into correct lifting positions
 - 2.4.1 Importance of true vertical lift
 - 2.4.2 Identification of hazardous lifting setups
- 2.5 Move the load using safe start, travel, and stop techniques
 - 2.5.1 Side pulling and load swinging avoidance
 - 2.5.2 Shock loading

- 2.5.3 Proper controller movement techniques
- 2.5.4 Mitigating hazardous load conditions during start, travel, and stop
- 2.6 Utilize a signalperson
 - 2.6.1 Who may be a signalperson
 - 2.6.2 Where a signalperson may be located
 - 2.6.3 When a signalperson is required
- 2.7 Interpret ASME B30.2 hand signals and other appropriate signaling methods
 - 2.7.1 Technical knowledge of ASME standard operating hand signals
 - 2.7.2 Appropriate use of alternate signals (e.g., radio) that may be used during operation
- 2.8 Communicate lift activity to other workers
 - 2.8.1 Various proper communication methods
 - 2.8.2 Who should be in communication
 - 2.8.3 Circumstances in which communication is required

DOMAIN 3: LOAD HANDLING

- 3.1 Perform hoist brake check with load
 - 3.1.1 Hoist brake check requirements
 - 3.1.2 When a hoist brake check must be performed
 - 3.1.3 How to proceed with lifts based on hoist brake check results
- 3.2 Navigate the load path safely
 - 3.2.1 Hazards that may be present (e.g., personnel, obstructions, loss of power)
 - 3.2.2 Operation scenarios that require emergency stops
 - 3.2.3 Safe load movement techniques
- 3.3 Activate a warning alarm system
 - 3.3.1 Technical knowledge of ASME warning alarm activation requirements
 - 3.3.2 Various warning alarm system locations
 - 3.3.3 Warning alarm functionality
- 3.4 Operate the hoist, bridge and trolley functions safely
 - 3.4.1 Hoist, bridge, and trolley control functions
 - 3.4.2 Safe control operation techniques
 - 3.4.3 Hazardous conditions that may present during operation and appropriate reactions

- 3.4.4 Operator responsibilities with regard to operation safety
- 3.4.5 Causes of shock loading, load swing, and load rotation
- 3.4.6 Mitigating shock loading, load swing, and load rotation
- 3.5 Land the load in a safe manner
 - 3.5.1 Ensure that the load is level/steady
 - 3.5.2 Factors that contribute to and mitigate shock loading
- 3.6 Remove the rigging from the load and hook

DOMAIN 4: SHUTDOWN AND SECURE

- 4.1 Shutdown and secure the crane at the end of the shift
 - 4.1.1 Requirements of locations for parking indoor and outdoor overhead cranes
 - 4.1.2 Technical knowledge of ASME/OSHA standards for securing overhead cranes
 - 4.1.3 Proper storage of the remote
 - 4.1.4 Safe vs. unsafe parking locations
 - 4.1.5 Proper place to leave crane components (hoist/hook/bridge/trolley/cab/platforms,etc.)
- 4.2 Identify and report deficiencies observed during shift to appropriate personnel
 - 4.2.1 Deficiencies that might be observed
 - 4.2.2 Technical knowledge of ASME deficiency reporting requirements



Practical Examination

OVERHEAD CRANE OPERATOR

SKILLS TESTED

The CCO Overhead Crane Operator Practical Exam may be taken on either of the following crane types:

- Cab-operated
- Pendant/remote control

The practical examination comprises four main tasks that increase progressively in the skill level tested. Skills tested are: trolley travel, hoisting, bridge travel, and combination (multifunction) operations. Crane operation with load and without load is required.

The following is an outline of the practical testing procedure, as provided to candidates at the time of testing.

NOTE: The use of Rubber-tire Gantry (RTG) cranes for the practical exam is NOT permitted.

CANDIDATE INSTRUCTIONS

The following sections describe the specific tasks that you will be performing when taking the practical examination. It is important that you understand these instructions. If there is anything you do not understand, please request clarification from the Proctor.

TASKS

The practical exam tasks are:

- *Task 1: Pre-Operational (Shift) Inspection*
- *Task 2: True Vertical Lift*
- *Task 3: Place Load in Circle*
- *Task 4: Negotiate Right Angle Corridor with Obstructions*
- *Task 5: Trolley Laydown*
- *Task 6: Safe Securing Procedures*

There is also a Pre-Test Briefing and a Pre-Test Familiarization Period. You will be required to complete all phases of the test in sequence.

The Test Site Coordinator is responsible for setting the testing schedule. If you are familiar with the operation of the test crane, you may elect to test first to allow other candidates time to review the operator's manuals. Otherwise, selection shall be by random drawing or by assignment of the Test Site Coordinator.

During the practical examination, you are under the direction of the Proctor and must follow the Proctor's directions at all times.

Once you have completed all of the tests you are taking, you must leave the test area. Only personnel involved in the administration of the test are allowed in the test area.

TIME LIMITS

For all scored tasks an *optimum* time limit has been set and is stated as part of the task descriptions.

If the task is completed within this time period, you receive no time penalty. Once you exceed this time limit, however, you will lose points on a gradual basis. The optimum time for each task is stated as part of the task descriptions. At one-and-a-half times the optimum time the Proctor may end the task and move on to the next task.

PRE-TEST BRIEFING

While you are waiting to take your test you will have sufficient time to read this description of the tasks to be performed and review the operator's manual for the crane you will operate. In addition, you will be informed of the make and model of the crane and the weight of the test load. You will also watch a short video showing all the tasks you will be required to perform during the examination.

CIRCUMVENTING THE COURSE

Circumventing the course on the CCO Overhead Crane Operator Practical Exam is defined as when:

- Chain leaves the corridor while on or off the ground and passes more than one pole left still standing on the original string line before re-entering the corridor; you **must** enter the circles from inside the corridor to avoid this being marked as a deficiency
- Chain leapfrogs from one leg of corridor to another with the chain off the ground, outside the corridor
- Trolley or bridge adjustment of the hook after the rigging has been attached
- Chain passes four or more poles consecutively with the chain off the ground, inside the corridor
- Test weight and chain enters or exits the corridor without vertically clearing the hurdle (i.e., by going around the hurdle)

UNSAFE ACT

If, at any time during the Pre-Test Familiarization Period or during the test, you commit an unsafe act, you will be disqualified from continuing with the test. An “unsafe act” is defined as an action by a candidate that is uncontrolled or reckless, and is sufficient to cause safety concern for persons or property damage.

The Proctor has the authority to stop the test at any time for reasons of safety. Please ask the Proctor if you have any questions. If you are disqualified due to an unsafe act, you will not be permitted to take any additional practical exams that day.

Note that you may not walk through the Right Angle Corridor at any time during the exam.

WEATHER CONDITIONS AND EQUIPMENT PROBLEMS

For outdoor tests, the Proctor will use an anemometer to check the wind speed and then will record the weather conditions on the score sheet.

The Proctor has the responsibility to determine if weather conditions or equipment problems are such that a test needs to be suspended. If the test is interrupted due to weather conditions or equipment problems, the procedure for restarting is as follows:

- You will resume the test at the beginning of the task you were performing at the time of the interruption.
- You will be entitled to a Pre-Test or Pre-Task Familiarization period before resuming the test.
- If testing resumes on a different machine, you must start the test over from the beginning. The first score sheet will be marked as “VOID” with an explanation and returned to CCO.
- If the testing is delayed to a different day, the test must be restarted from the beginning.

PRE-TEST FAMILIARIZATION PERIOD

- You will be allowed five minutes to familiarize yourself with the crane and to examine anything on the crane that you feel is necessary to operate it comfortably.
- You will be allowed to get the feel of the controls and run the crane through its functions. The brakes and other devices will have been set according to the crane manufacturer’s recommendation.

- You may not interfere with the test course, lift the test weight, or shadow the Right Angle Corridor.
- You must finish the Pre-test Familiarization Period with the load hook under control in Circle #1 within the five-minute period.
- The Proctor will notify you when there is one minute remaining.
- If you are ready in less than five minutes, you may indicate this to the Proctor.
- If, at the end of the Pre-Test Familiarization Period, you feel you are not ready to take the examination, you should notify the Proctor. You will have, in effect, disqualified yourself from taking the examination at this time, and you will be required to sign to that effect on the Candidate Score Sheet.
- You may not walk through the test course at any time during any task.

CRANE WALK AROUND

- Before you begin operations, you are allowed a couple of minutes to walk around the crane to ensure proper setup.

TASK 1: PRE-OPERATIONAL (SHIFT) INSPECTION

- The Proctor will identify five items regarding the crane that are part of the pre-operational inspection. One at a time, you will describe how you would conduct the inspection and what deficiencies you would look for.
- You have approximately one minute per item.

TASK 2: TRUE VERTICAL LIFT

Optimum time: 1:45

- At the Proctor’s indication to start, at which point timing begins, raise the load hook to clear all obstacles and personnel.
- Bring the load hook from Circle #1 to the Test Weight Circle within approximately one foot over the center of the test weight.
- When you indicate that you are ready for the test weight rigging to be attached to the load hook, timing will end and the Assistant Proctor will attach the rigging to the hook.
- You are **not** allowed to adjust the position of the hook after the test weight rigging is attached. The Proctor or Assistant Proctor may adjust the rigging so that bunching or shock loading does not occur.

- At the Proctor's indication, lift the test weight until the chain leaves the floor; you are not allowed to bridge or trolley once the Proctor has given the *hoist* signal.
- Once the test weight chain has left the floor, the Proctor will give you a *stop* signal, a *lower* signal, and a *stop* signal, in that order. You are not allowed to stop hoisting while lowering the test weight.
- If your time exceeds one-and-a-half times the optimum time, the Proctor may stop you and move on to the next task.
- Points are deducted for the following:
 - a. Hook contacting test weight
 - b. Test weight touching ground outside of the 42 in. circle
 - c. Test weight, chain, or hook touching any part of the course
 - d. Stopping while lowering test weight
 - e. Exceeding the optimum time

TASK 3: PLACE LOAD IN CIRCLE #1

Optimum time: 2:30

- At the Proctor's indication to start, at which point timing begins, raise the suspended test weight and chain to a sufficient height to clear all obstacles and personnel. Bring it from its starting position in the Test Weight Circle and place it on the ground completely within Circle #1.
- The Proctor will give you the *stop* signal once the test weight is under control inside the outer perimeter of the circle.
- The task is not complete until the test weight is placed completely within the outside perimeter of the circle. If the Proctor does not give you a *stop* signal, this indicates the weight is not within the circle and the task continues to be timed.
- If your time exceeds one-and-a-half times the optimum time, the Proctor may stop you and move on to the next task.
- Points are deducted for the following:
 - a. Exceeding the optimum time
 - b. Test weight or chain hook touching any part of the course
 - c. Load touching ground outside of circle

TASK 4: NEGOTIATE RIGHT ANGLE CORRIDOR AND OBSTRUCTIONS

Optimum time: 4:00

- At the Proctor's direction to start, at which point timing begins, lift the test weight and guide it from Circle #1 through the Right Angle Corridor.
- Avoid touching anything, but keep the chain on the ground until any part of the chain has touched or crossed the first denotation line, which is located 4 ft. before the hurdle.
- Raise the test weight and chain over the horizontal PVC pole without touching or knocking over the hurdle.
- Once clear, lower the test weight and chain until the chain makes contact with the ground before reaching the second denotation line.
- Continue to guide the test weight along the corridor to the Test Weight Circle without touching the ground with the test weight or touching or knocking over any part of the PVC pole barrier.
- After passing the line that is 4 ft. before the second horizontal PVC pole, raise the test weight and chain high enough to clear the horizontal pole obstruction and PVC pole barriers and place the test weight within the larger Test Weight Circle outside perimeter.
- Timing ends with the task completed when you have placed the test weight on the ground completely within the outside perimeter of the larger Test Weight Circle and the Proctor has given you a *stop* signal. If the Proctor has not given you a *stop* signal, this indicates that the test weight is not within the circle and the task continues to be timed.
- The Proctor will direct you in centering the test weight within the smaller circle before detaching the test weight from the hook.
- At the Proctor's indication, move the crane hook over to the Pin Assembly in readiness for the next task.
- If your time exceeds one-and-a-half times the optimum time, the Proctor may stop you and move on to the next task.
- Points are deducted for the following:
 - a. Knocking ball off pole
 - b. Moving pole base off line
 - c. Knocking pole over
 - d. Chain leaving or touching ground outside of designated areas

- e. Passing poles with chain off the ground (includes poles passed after the second denotation line with chain not touching the ground)
- f. Load touching ground outside of circles
- g. Touching or knocking off horizontal bars
- h. Circumventing the task
- i. Exceeding the optimum time

TASK 5: TROLLEY LAYDOWN

Optimum time: 2:00

- At the Proctor's direction, position the Chain-and-Ring assembly directly over the pin.
- The Proctor will then position the ring on the pin before beginning Task 4.
- At the Proctor's indication to start, at which point timing begins, lay down the master links within the targets.
- Once each master link makes contact with the carpet and is down and stable either inside or outside the target, the Proctor will say "Go," which indicates you should proceed to the next target.
- Do not apply excessive side-load pressure that will pop the ring off the pin.
- Timing ends when the last set of master links has been placed within the third target and is under control.
- At the Proctor's direction, bring the load hook to Circle #1 in readiness for the next candidate.
- Remain in the cab or at the operator's station until the Proctor gives you a clear indication that you may leave.
- Return all controls to neutral position and de-energize the runway disconnect or depress the emergency stop button on pendant or remote control units before leaving.
- If your time exceeds one-and-a-half times the optimum time, the Proctor may stop you and move on to the next task.
- Points are deducted for the following:
 - a. Master links missing targets
 - b. Ring pops off pin
 - c. Exceeding the optimum time

TASK 6: SAFE SECURING PROCEDURES

- Describe the procedures you would follow to secure the crane at the end of the work day.



Reference List

OVERHEAD CRANE OPERATOR

The latest versions of the following reference materials are used by CCO's Examination Committee to verify the accuracy of CCO test questions.

Candidates are strongly advised to become familiar with manufacturers' operator's manuals in preparing for the CCO certification examinations.

ASME B30.2 OVERHEAD AND GANTRY CRANES (2022)

ASME B30.20 BELOW-THE-HOOK LIFTING DEVICES (2021)

www.asme.org

OSHA PART 1926 SUBPART CC—CRANES AND DERRICKS IN CONSTRUCTION

OSHA PART 1910.179—OVERHEAD & GANTRY CRANES; AND PART 1910.184—SLINGS

www.osha.gov

IPT'S CRANE AND RIGGING TRAINING MANUAL (2020)

www.iptbooks.com

BOB'S OVERHEAD CRANE & RIGGING HANDBOOK

www.donpellow.com

CMAA SPECIFICATION NO. 79—CRANE OPERATOR'S MANUAL

imis.mhi.org



CCO Policies

OVERHEAD CRANE OPERATOR

Code of Ethics

www.nccco.org/coe

Disciplinary Policy

www.nccco.org/discipline

Substance Abuse Policy

www.nccco.org/abuse

Testing Accommodations

www.nccco.org/accommodations

Test Security

www.nccco.org/security

Information Release Policy

www.nccco.org/inforelease



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