

A.N.S.I.

OVERHEAD AND GANTRY CRANES

**PAGES FROM A.N.S.I. ASME B30.2-1990 STANDARDS
FOR OVERHEAD AND GANTRY CRANES.**

**Chapter 2 – 3
Operation**

Section 2-3.1 – Qualifications for and Conduct of Operation

2-3.1.1 Operation of Cab-Operated and Pulpit-Operated Cranes

- A) Cranes shall be operated only by the following qualified personnel:
1. Designated persons;
 2. Trainees under the direct supervision of a designated person;
 3. Maintenance and test personnel, when it is necessary in the performance of their duties.
- B) No one other than personnel specified in para. 2-3.1.1 A shall enter a crane cab or pulpit, with the exception of persons such as oilers and supervisors, whose duties require them to do so, and then only in the performance of their duties and with the knowledge of the operator or other appointed person.

2-3.1.2 Qualifications for Operators of Cab-Operated and Pulpit-Operated Cranes

- A) Operators shall be required by the employer to pass a written or oral examination and a practical operating examination unless able to furnish satisfactory evidence of qualifications and experience. Qualifications shall be limited to the specific type equipment for which examined.
- B) Operators and operator trainees shall meet the following physical qualifications:
1. Have vision of at least 20/30 Snellen in one eye, and 20/50 Snellen in the other, with or without corrective lenses;
 2. Be able to distinguish colors, regardless of position of colors, if color differentiation is required for operation;
 3. Hearing, with or without hearing aid, must be adequate for a specific operation;
 4. Have sufficient strength, endurance, agility, coordination, and speed of reaction to meet the demands of equipment operation;
 5. 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, may be cause for disqualification. In such cases, specialized clinical or medical judgments and tests may be required.
 6. Evidence that an operator is subject to seizures or loss of physical control shall be reason for disqualification. Specialized medical tests may be required to determine these conditions.
- C) 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 characteristics.

2-3.1.3 Operators of Floor-Operated Cranes

Cranes shall be operated only by the following qualified personnel:

1. Designated persons;
2. Trainees under the direct supervision of a designated person;
3. Maintenance and test personnel, when it is necessary in the performance of their duties;
4. Inspectors (crane)

2-3.1.4 Qualifications for Operators of Floor-Operated Cranes

Personnel shall be required by the employer to pass a practical operating examination. Qualification shall be limited to the specific type equipment for which examined.

2-3.1.5 Operators of Remote-Operated Cranes

Cranes shall be operated only by the following qualified personnel:

1. Designated personnel;
2. Trainees under the direct supervision of a designated person;
3. Maintenance and test personnel, when it is necessary in the performance of their duties;
4. Inspectors (crane)

2-3.1.6 Qualifications for Operators of Remote-Operated Cranes

The use of remote-control equipment involves such a wide variety of service requirements and conditions that each installation should be carefully analyzed and operation reviewed at least monthly for the first 6 months of operation to determine whether para. 2-3.1.2 or 2-3.1.4 should apply.

2-3.1.7 Conduct of Operators

- A) The operator shall not engage in any practice that will divert attention while actually engaged in operating the crane.
- B) When physically or otherwise unfit, an operator shall not engage in the operation of the equipment.
- C) The operator shall respond to signals from the person who is directing the lift, or an appointed signal person. When a signal person or a crane follower is not required as part of the crane operation, the operator is then responsible for the lifts. However, the operator shall obey a stop signal at all times, no matter who gives it.
- D) Each operator shall be responsible for those operations under the operator's direct control. Whenever there is doubt as to safety, the operator shall consult with the supervisor before handling the loads.
- E) If a warning device is furnished, it shall be activated each time before traveling, and intermittently when approaching workpersons.
- F) Before leaving a cab-operated crane unattended, the operator shall land any attached load, place controllers in the off position, and open the main line disconnect device of the specific crane.
- G) The operator shall not close the main switch (crane disconnect) until certain that no worker is on or adjacent to the crane. If there is a warning sign or lock on the device, it shall not be energized until the sign or lock is removed by the person who placed it there, or by an authorized person.
- H) Before closing the main switch (crane disconnect), the operator shall be sure that all controllers are in the off position.
- I) If power goes off during operation, the operator shall immediately place all controllers in the off position. Prior to reuse of the crane, operating motions shall be checked for proper direction.
- J) The operator shall be familiar with the equipment and its proper care. If adjustments or repairs are necessary, or any defects are known, the operator shall report the same promptly to the appointed person who shall be responsible for the operation and maintenance repairs of the crane. The operator shall also notify the next operator of any remaining uncorrected defects upon changing shifts.

- K) Contacts with runway stops or other cranes shall be made with extreme caution. The operator shall do so with particular care for the safety of persons on or below the crane, and only after making certain that any persons on the other cranes are aware of what is being done.
- L) Operators of outdoor cranes shall secure them when leaving.
- M) When the wind-indicating device of cab-operated outdoor crane gives the alarm, crane operation shall be discontinued and crane shall be prepared and stored for excessive wind conditions.
- N) Before the operator performs any maintenance work on the crane, the operator shall lock, tag, or flag the main switch (see para. 2-2.3.2) in the de-energized position.
- O) All controls shall be tested by the operator before beginning a new shift. If any controls do not operate properly, they should be adjusted or repaired before operations are begun.
- P) Persons boarding or leaving overhead cranes should do so only at authorized locations and designated boarding entrances.

Section 2-3.2 Handling the Load

2-3.2.1 Load Weight

The crane shall not be loaded beyond its rated load except for test purposes as provided in para. 2-2.2.2, or for special over rated load lifts as provided in para. 2-3.2.1.1.

2-3.2.1.1 Special Over Rated – Load Lifts

Lifts in excess of the rated load may be required from time to time for specific purposes such as new construction or major repairs. Each instance of exceeding the rated load shall be treated as a specific problem and the following requirements shall be met for each instance. If special lifts are to be made frequently, the crane should be rerated for the load being handled. (see para. 2-1.4.3 for rerating).

- A) A written review of the crane service history shall be prepared, including reference to previous over rated-load lifts, structural repairs, and modifications of original design.
- B) Structural, mechanical and electrical components of the crane design shall be checked for the load to be lifted by a crane manufacturer or other qualified person, according to accepted crane design standards, such as CMAA#70 or AISE #6.
- C) The crane supporting structure design shall be checked for conformance to AISC or other applicable design criteria. The crane support shall be inspected any any deterioration or damage shall be taken into consideration in design calculations for the load to be lifted.
- D) A complete inspection of the crane as described in para. 2-3.1.3 shall be made just prior to making the lift.
- E) The lift shall be made under controlled conditions under the direction of a designated person in accordance with a previously prepared lift plan. All persons in the area of the crane runway shall be alerted.
- F) The operator shall test the crane at the special over rated-load by lifting the load a short distance and setting the brakes. Any failure to hold the load shall be corrected before proceeding with the lift.
- G) After the special over rated-load lift is concluded, an inspection shall be made in accordance with para. 2-2.1.3.
- H) A record of the over rated-load lift, including all distances moved, shall be placed on file where available to appointed personnel.
- I) The rated load test that is specified in par. 2-2.2.2 is not applicable to special over rated-load lifts.

2-3.2.2 Attaching the Load

- A) The hoist rope shall be free from kinks or twists and shall not be wrapped around the load.
- B) The load shall be attached to the load block hook by means of slings or other devices.
- C) Care shall be taken to make certain that the sling clears all obstacles.

2-3.2.3 Moving the Load

- A) The appointed person directing the lift shall ascertain that:
 - 1. The load, sling, or lifting device is seated in the bowl of the hook.
 - 2. The load is secured, balanced and positioned in the hook, sling, or lifting device before the load is lifted more than a few inches (millimeters).
 - 3. The hoist rope is not kinked.
 - 4. Multiple part lines are not twisted around each other.
 - 5. The hook is brought over the load in such a manner as to minimize swinging.
 - 6. The rope is seated in the drum grooves and in the sheaves, if there is or has been a slack rope condition.
- B) During lifting, care shall be taken that:
 - 1. There is no sudden acceleration or deceleration of the moving load.
 - 2. Load does not contact any obstacles.
- C) Cranes shall not be used for side pulls except when specifically authorized by a qualified person who has determined that:
 - 1. The various parts of the crane will not be overstressed.
 - 2. The hoist rope will not bear or rub against other members of the crane, such as girders or trolley frame, except members specifically designed for such contact.
 - 3. Such side pulls will not cause the hoist rope to be pulled out of the sheaves or across drum grooves.
 - 4. Such side pulls will not result in excessive swinging of the load block or load.
- D) The operator shall not cause the crane to lift, lower, or travel while anyone is on the load or hook.
- E) The operator should avoid carrying loads over people.
- F) The operator of a floor-operated crane having a lifting magnet should exercise caution due to the hazard of possible falling metal.
- G) The operator shall check the hoist brake(s) at least once each shift if a load approaching the rated load is to be handled. This shall be done by lifting the load a short distance and applying the brake(s).
- H) The load shall not be lowered below the point where two wraps of rope remain on each anchorage of the hoisting drum unless a lower limit device is provided, in which case, no less than one wrap shall remain.
- I) When two or more cranes are used to lift a load, one qualified person shall be in charge of the operation. This person shall analyze the operation and instruct other personnel involved in the proper positioning, rigging of the load, and the movements to be made.
- J) The operator shall not leave the position at the controls while the load is suspended over an area accessible to people.

2-3.2.4 Hoist Limit Devices (Switches)

- A) Prior to the initial use of any hoist during each shift, the operator shall verify operation of the primary upper limit device under no-load conditions. Care shall be exercised; the block shall be inched into the limit or run in at slow speed. If the device does not operate properly, the operator shall immediately notify the appointed person.
- B) The hoist limit device that controls the upper limit of travel of the load block shall not be used as an operating control in normal operation unless additional means are provided to prevent damage from overtravel.

Section 2-3.3- Signals

2-3.3.1 Standard Signals

- A) Signals to the operator shall be in accordance with this volume, unless voice communication (telephone, radio, or equivalent) is utilized.
- B) Signals should be discernible or audible to the operator.
- C) Hand signals shall be posted conspicuously and should be as illustrated in Figure 2.

2-3.3.2 Special Signals

- A) Special operations may require additions to our modifications of standard signals.
- B) Special signals shall be agreed upon and understood by the signal person and the operator.
- C) Special signals shall not conflict with standard signals.

Section 2-3.4 - Miscellaneous

2-3.4.1 Ladders

- A) Hands shall be free from encumbrances while personnel are using ladders.
- B) Articles that are too large to be carried in pockets or tool belts shall be lifted and lowered by hand line.

2-3.4.2 Cabs

- A) Necessary clothing and personal belongings shall be stored in a manner that does not interfere with access or operation.
- B) Tools, oil cans, rags, and other necessary articles shall be stored in a fire resistant container and shall not be permitted to lie loose in or about the cab.

2-3.4.3 Fire Extinguishers

Operators shall be familiar with the operation and care of fire extinguishers provided (see para 2-1.5.5)